Simultaneous Media Use and Advertising:
The Effects of Salient Web Ads in a New Media World

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This dissertation titled

Simultaneous Media Use and Advertising:
The Effects of Salient Web Ads in a New Media World

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Abstract

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Simultaneous Media Use and Advertising: The Effects of Salient Web Ads in a New Media World

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The current study represents one of the first attempts to use experimental design to explore individuals’ processing of both web ads and television ads in simultaneous media environment. Particularly, based on the theoretical propositions of Elaboration Likelihood Model (ELM) of persuasion, the study examines the relationship between salient web ad design, manipulated as a complex web ad in a simple background, and cognitive processing route in simultaneous media environment. The findings suggest that simple web ads lead to a better recall of brand and product than complex web ads when users are watching television at the same time. The results also imply that users do not view complex web ads more positively than simple web ads in simultaneous media environment.

The current study contributes to both simultaneous media use and cognitive processing literature. The study also provides recommendations for web advertisers, suggesting them to refine ad designs and make web ads
simple in order to generate better recall. The study may motivate more research devoting to explain how people process web and television content simultaneously and what factors contribute to attract users’ attention and/or influence their attitudinal evaluations.
Dedication

To Ashley (Jiangxue).

And to my parents.
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Table Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>iii</td>
</tr>
<tr>
<td>Dedication</td>
<td>v</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>vi</td>
</tr>
<tr>
<td>List of Tables</td>
<td>x</td>
</tr>
<tr>
<td>List of Figures</td>
<td>xi</td>
</tr>
<tr>
<td>Chapter 1: Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Chapter 2: Review of Literature</td>
<td>13</td>
</tr>
<tr>
<td>Simultaneous Media Use</td>
<td>13</td>
</tr>
<tr>
<td>Salience and Complex Design</td>
<td>28</td>
</tr>
<tr>
<td>Dual-Process Models</td>
<td>42</td>
</tr>
<tr>
<td>Chapter 3: Methodology</td>
<td>58</td>
</tr>
<tr>
<td>Participants</td>
<td>58</td>
</tr>
<tr>
<td>Design</td>
<td>59</td>
</tr>
<tr>
<td>Stimulus Materials</td>
<td>62</td>
</tr>
<tr>
<td>Procedure</td>
<td>66</td>
</tr>
<tr>
<td>Independent Variables</td>
<td>71</td>
</tr>
<tr>
<td>Design of web ads</td>
<td>67</td>
</tr>
<tr>
<td>Media preference</td>
<td>68</td>
</tr>
<tr>
<td>Dependent Variables</td>
<td>72</td>
</tr>
<tr>
<td>Product recall</td>
<td>69</td>
</tr>
<tr>
<td>Attitudes toward products</td>
<td>70</td>
</tr>
<tr>
<td>Purchase intention</td>
<td>74</td>
</tr>
<tr>
<td>Chapter 4: Results</td>
<td>75</td>
</tr>
<tr>
<td>Chapter 5: Discussions</td>
<td>82</td>
</tr>
<tr>
<td>Interpretation of Results</td>
<td>82</td>
</tr>
<tr>
<td>Theoretical and Practical Implications</td>
<td>99</td>
</tr>
<tr>
<td>Future Directions</td>
<td>101</td>
</tr>
<tr>
<td>Chapter 6: Conclusions</td>
<td>106</td>
</tr>
<tr>
<td>References</td>
<td>117</td>
</tr>
</tbody>
</table>
Appendix A: Questionnaire ........................................ 141
Appendix B: Ohio University Consent Form ................. 147
Appendix C: Experimental Protocol ............................. 149
List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1: Two Different Brands for Each Condition</td>
<td>61</td>
<td></td>
</tr>
<tr>
<td>Table 2: Difference between Media Use Preference in Product Recall and Attitudes toward TV or Web Ad Product</td>
<td>77</td>
<td></td>
</tr>
<tr>
<td>Table 3: Difference between Web Ad Designs in Product Recall and Attitudes toward TV or Web Ad Product</td>
<td>79</td>
<td></td>
</tr>
<tr>
<td>Table 4: Difference between Web Ad Designs in Purchase Intention towards TV or Web Ad Product</td>
<td>81</td>
<td></td>
</tr>
</tbody>
</table>
List of Figures

Page

Figure 1. Clif complex web ad. .........................63
Figure 2. Nature Valley complex web ad. ...............63
Figure 3. Clif simple web ad ..........................64
Figure 4: Nature Valley simple web ad .................64
Chapter 1: Introduction

The development of new communication technologies in the past few years has provided unprecedented diverse media platforms for people to stay close with others and keep up with world events. As media alternatives increase, media users’ consumption habits change correspondingly. In particular, given the multitude of information flow and multiple media platforms at hand, it is more convenient for users to take advantage of different media outlets at one time in order to maximize information processing efficiency in today's fragmented media environment (e.g., Pilotta & Schultz, 2005; Jordan, Jeong, & Fishbein, 2006). Therefore, the concept of simultaneous media usage, or media multi-tasking, is introduced to better understand the phenomenon of inter-media interaction. For example, in 2004, a study conducted by Pilotta, Schultz, Drenik, and Rist showed that among 7,800 respondents, more than half identified themselves using different media, such as television, laptop, and cell phone, simultaneously at any given time.

The changing behavior in media consumption raises difficulties in evaluations of media effects. Particularly, with the large quantity of information that the new media provided and diverse media platforms available for
audiences, studies on media content and audiences’ media consumption are confronted with new challenges (Chaffee & Matzger, 2001). Specifically, the increasing popularity of simultaneous media usage raises questions to the traditional media measurement and estimation methodology, which perceive that each media exposure occurs in isolation (Pilotta, et al., 2004).

In the field of advertising research, effectiveness is often estimated based on audiences’ cognitive and affective evaluations of the advertised products (e.g., Wells, 1997; Mehta, 2000). More often, studies in advertising effectiveness have been typically conducted based on the assumptions that a particular medium does not necessarily need to be examined in the context of multi-medium environment in which each platform competes for audiences’ attention with each other (e.g., Bhat, Bevans, & Sengupta, 2002; Diehl, & Terlutter, 2006; Hu, Lodish, Krieger, & Hayati, 2009; Rubinson, 2009; Cauberghe, Geuens, & De Pelsmacker, 2011). In other words, the effects of media have been frequently discussed in the context of single media exposure and its subsequent influences on users’ perceptions, attitudes, and behavior outcomes. Given the new pattern emerging in audiences' media consumption—recent
popularity of multi-tasking—advertisers are obliged to re-think their campaign designs and take both the advertising content and medium platforms into consideration in adjustment to a simultaneous media exposure (Jordan, Jeong, & Fishbein, 2006). Thus, it is important to understand multitasking in media effects as well as in advertising and media management research.

Only in recent years have researchers begun to pay attention to advertising effectiveness in a multiple media environment (e.g., Naik & Raman, 2003; Havlena, Cardarelli, & De Montigny, 2007; Wakolbinger, Denk, & Oberecker, 2009; Zigmond & Stipp, 2010). However, there is still a pressing need to explicate how people process advertisements shown on multiple mediums in order to better understand the persuasive effects of advertising. Indeed, the increased availability of media platforms and the ease to use of media technologies provide more choices for users to constantly tailor their media consumption. For instance, media users can chat with friends on the Internet while watching soap opera on the television at home. When people are at work, they can check and reply to emails using their computers, and update their Facebook newsfeeds using their smart phones at the same time. Further, simultaneous media
use is not confined to two media combinations; media users can take advantage of more than two media outlets to maximize their media enjoyment and information reception.

For researchers, multi-media usage may challenge the traditional discourse of media effects. In examining media effects, difficulties have been raised in tackling users’ reactions to media content through different channels, because both the content and the medium convey messages. As the well-known statement of McLuhan (1964) proclaimed, the medium is the message. The fundamental argument of McLuhan’s is that communication technologies can influence people’s perceptions and behaviors. Therefore, in simultaneous media use, how do media platforms influence people’s processing of media content? The current study intends to provide answers to this question.

With a particular interest in web ads, in the context of the Internet, salient ads can catch users’ immediate and involuntary attention (Diao & Sundar, 2004). By drawing people’s attention, salient stimuli, such as a complex ad design in a simple context, evoke more cognitive efforts to process the stimulus and induce effortful and automatic information processing of web advertisements (Reeves & Nass, 1996; Nass & Moon, 2000). According to the
literature, visual complexity is a function of the following three factors, including 1) the number of distinct elements in the stimuli; 2) the dissimilarity between such elements, and 3) the degree to which the combinations of stimulus elements correspond to a single unit (Berlyne, 1958a; Lord, 2004). Researchers found that consumers were more motivated to attend to complex ads (MacInnis, Moorman, & Jaworski, 1991), spend more time viewing such ads (Morrison & Dainoff, 1972), and process such ads with more cognitive efforts (Philips, 1997). In the case of web ads, if an ad has many pictorial elements, such as logos, products, letters, etc., and these elements are not arranged in correspondence to a single unit, viewers will need more efforts to process it (Lord, 2004).

Both the Elaboration Likelihood Model (ELM) of persuasion (Petty & Cacioppo, 1981, 1986) and Heuristic-Systematic Model (HSM) (Chaiken, 1980) of information processing proposed that people process persuasive messages and form attitudes through two routes of information processing. Petty and Cacioppo (1986a; 1986b) proposed a more effortful “central route” and a less effortful “peripheral route.” Chaiken (1980) proposed a more effortful “systematic” and a less effortful “heuristic”
processing. Message recipients who use the central route or systematic processing are engaged in a more effortful information processing, and they are more likely to form attitudes after a careful consideration of persuasive communication. The “peripheral” route or “heuristic” processing is used when recipients do not scrutinize the issue-related information and exert much less cognitive effort in an evaluation of persuasive messages (Petty, et al., 2002). With regards to effect on actual behavior, neither ELM nor HSM predicted that attitudes should be positively associated with consumers’ purchase behavior. Prior studies suggested that behavioral intent is a consequence of attitude and a predictor to actual behavior (Fishbein, 1967; Litvin & MacLaurin, 2001). Attitude is an important variable for advertising researchers and practitioners. Therefore, both ELM and HSM are influential theoretical frameworks in understanding how attitudes are formed and changed.

In addition, both ELM and HSM hold that motivation and ability in elaboration upon the message determine the route to persuasion or two ways of information-processing, either central (systematic) processing or peripheral (heuristic) processing. If individuals' motivation and ability are both
sufficient, they are more likely to process persuasive messages in the central route to processing (Petty & Cacioppo, 1981) or systematically (Chaiken, 1980). If either motivation or ability is lacking, people are more likely to process information in the peripheral route to processing (Petty & Cacioppo, 1981) or heuristically (Chaiken, 1980). People who go through peripheral processing or heuristic processing depend on heuristic cues to form their judgments.

More recent studies using ELM and HSM in examining the effects of website-human interaction showed the presence of cues can elicit heuristic processing (Sundar, 2008). For instance, on the e-commerce website, at the point we are asked for payment information in order to complete the transaction, we sometimes see a “lock” sign shown next to where we should type in our credit card information. It is possible that people do not have enough ability to evaluate the safety of their online transactions simply because they do not have the resources; it is also possible that shoppers do not have ample motivation to find out if the e-commerce website is secure, because their major goal is to purchase the product. In either case, people are likely to go through peripheral or heuristic processing, and the
presence of a lock function is a heuristic cue. People depend on such cues to make judgments. In this case, they trust the e-commerce website because the “lock” gives them a sense of security.

Although ELM and HSM share similarities in many aspects, they are not identical. The major difference between ELM and HSM is that ELM argues that people process information using either central or peripheral route, while HSM holds that systematic and heuristic processing can be exploited at the same time (Smith & Decoster, 2008). The current study hypothesizes that by catching people’s involuntary attention, salient stimuli are more likely to lead to central processing route, and central route only. Therefore, the theoretical propositions of ELM are more applicable for this study. In particular, in simultaneous media environment, complex designs, such as busy web ads, elicit central processing of web ads and people should process television ads peripherally. If such hypothesis holds, the current study can contribute to ELM by showing that besides motivation and ability, characteristics of the stimuli can also influence individuals’ information processing route.
In addition, people are more likely to be persuaded when they are distracted (Strack & Deutsch, 2004). In other words, in the field of advertising, persuasive information that is processed with less effort and consideration may be more effective than one that is consciously evaluated, although people intuitively think the latter may lead to greater persuasive effects.

With specific regard to salience in ads, since drawing people’s involuntary attention asks for more information processing efforts (Nass & Moon, 2000), the ads may be less effective in terms of persuasion. Particularly, in the context of simultaneous media usage, to evaluate the effects of salient ads, medium messages should also be taken into consideration. When media users are using more than two mediums at the same time, the amount of attention drawn by different mediums can impact how persuasive messages are processed. In this sense, when viewing a television ad with a complex web ad, people may pay more attention to the web ad since it is a salient stimulus that attracts people’s involuntary attention. In addition, in terms of persuasion, it is more effective when people process information without much cognitive effort (Gilbert, et al., 1993; Strack & Deutsch, 2004). Therefore, the
television ad may be viewed as more favorable at implicit level when audiences are exposed to a complex web ad at the same time.

The current study employs an experimental design to examine variables that may influence the recall of ads when people are processing information from different media, especially television and computer/laptop at the same time. Further, based on ELM (Petty & Cacioppo, 1981, 1986), which proposed that persuasive effects could occur when processing effort is high or low in distinctive situations, this study is devoted to explore effectiveness of advertisements when various media platforms are potentially competing with each other. With special respect to different routes to persuasion, the current study pays attention to the influence of characteristics of web ads on information processing route in simultaneous media use environment.

This study will benefit advertising research and practice, because it examines the effectiveness of advertisements when audiences are provided with various accessible media platforms at one time. This study will enrich the methodological and theoretical perspectives of ELM as well, which will be discussed later.
This study will be organized as follows. Chapter 2 will review literature on simultaneous media use, complex web design, and the Elaboration Likelihood Model (ELM) to persuasion, which provides a rationale for the study. The current study examines the relationship between complex web ad designs and central route processing in simultaneous media environment and proposes that when complex web ads are viewed while people are watching television ads, complex web ads are more likely to be processed using central route processing, since such stimuli are salient, compared with television ads. When shown in the commercial break during the television program, television ads can hardly “stand out,” because both television ads and the television program use similar format and features, such as audio and video. Research questions will be asked and hypotheses will be proposed. Chapter 3 describes the methodology used for conducting the experiment in order to answer the proposed research questions and test hypotheses. Chapter 4 displays the results. Chapter 5 will discuss the interpretations of the findings, theoretical and practical implications, study limitations and directions for future research. Finally, chapter 6 will summarize the major
results and conclude the study with its contributions to
the existing literature and research.
Chapter 2: Review of Literature

The current study examines the effects of web ad designs, simple versus complex, on persuasive outcomes, such as attitudes and recalls of products and ads, in simultaneous media use. Based on theories and previous studies on simultaneous media use, salience and complex design, and ELM, the current study intends to extend the theory of ELM to simultaneous media use environment and provide design suggestions for advertisers.

Simultaneous Media Use

Simultaneous media exposure is defined by Pilotta, et al. (2004) as “individual consumers being exposed to more than one media system or approach at a single point in time” (p. 286). Koolstra, Ritterfeld, and Vorderer (2009) defined it as engaging in two or more information-processing tasks at the same time. Koolstra et. al., also argued that conceptually, simultaneous use of media and media multitasking could be used interchangeably. Other researchers refer to simultaneous media use as “media layering” (e.g. Gardner, 2008, p.1). It is defined as combining different sources of media, and users choose two
or more sources of media to accommodate their needs simultaneously. The concept of simultaneous media use may not be foreign to most people, and it is commonly used in our daily lives; for instance, people watching television while using personal laptops to get work done. This information acquisition pattern shows that human beings are capable of doing two different things simultaneously. In today’s media environment, where multiple media devices can be used at the same time, people are often engaged in simultaneous media use because their time to process an increasing number of media alternatives is very limited (Pilotta, et al., 2004).

The prevalence of simultaneous media use has been demonstrated by many different studies (Robinson & Godbey, 1997; Jordan, Jeong, & Fishbein, 2006; Pilotta & Schultz, 2005). For instance, a survey conducted by Pilotta, et al. (2004) showed that among 7,800 respondents, more than half identified themselves using different media simultaneously at any given time. When asking about their attention allocation, only 51.1% of the respondents said they paid attention to one medium more than other(s), while 32.9% of the respondents indicated that they paid equal attention to each medium that they use. The researchers suggest that
media users have the capability to use different media simultaneously, and simultaneous media use requires multi-processes of information as well.

As a rising media phenomenon, simultaneous media use has been studied mainly at a descriptive level (e.g., Zhang, Jeong & Fishbein, 2010; Liu & Wong, 2012). Researchers have not yet addressed the questions including, “Which media have the most power in attracting users’ attention in simultaneous media usage?”; “Which features of media programs command the most attention during simultaneous media use?”; “What type of messages and length are most attention-grabbing during simultaneous media use?”; and “Which media/messages are more intriguing with simultaneous usage” (Pilotta, et al., 2004, p. 286-287)?

Although research using survey questionnaires can provide a general picture of how users attend to various mediums, the results are insufficient to show the processes people go through in simultaneous media exposure. For example, the majority of respondents indicated that they paid more attention to a single medium over the other(s) in Pilotta, et al’s (2004) study. However, questionnaires were distributed and answered in an uncontrolled manner. In other words, researchers did not know if questionnaires
were answered right after respondents’ simultaneous media exposure. In this case, it is questionable that people could articulate the allocation of their attention. In addition, survey design did not take variations in content into consideration. The difficulty in measuring people’s attention in simultaneous media exposure is that attention is constantly changing depending on different content shown on different mediums. People may have difficulty recalling their allocation of attention to media in simultaneous media exposure in response to subsequent questionnaires (Brasel & Gips, 2011).

Simultaneous media usage brings the long-standing dilemma in psychology to the center of discussion, which is whether attention is unitary or divisible. This has been argued among scholars with different research backgrounds since the nineteenth century. Some researchers argue that, in accordance with Broadbent’s filter theory, only one stimulus can be perceived at a time as the result of selective attention (e.g., Broadbent, 1958; Wickens, 1991). In other words, attention is unitary. Furthermore, when two stimuli are presented to people at the same time, one of them is perceived immediately, while the other one remain unattended until the perceptual analysis of the first
stimulus is completed. This process is also called “bottleneck model of attention” (Kahneman, 1973), emphasizing the stage of internal processing which can only operate on one stimulus or one response at a time.

Other studies argue that attention is divisible. For example, the capacity theory of attention proposes that people’s capacities to perform mental work are limited (Moray, 1967). When carrying out multiple activities at the same time, people’s total amount of attention allocated to each input is limited. Different mental activities require different capacity demands; easy tasks demand little effort while difficult tasks ask for more effort. When the supply of attention does not meet the demands, the activity fails and inputs cannot be processed successfully. For instance, previous study showed that emotional stimuli might influence priority processing because their “intrinsic stimulus significance” (Schupp, et al., 2007, p. 1082). In other words, stimuli that are emotionally significant or emotion triggering, are more likely to attract people’s attention and to be processed first.

In simultaneous media use, arguments for both unitary and divisible attention can stand. On one hand, people can perform several tasks in parallel. The phenomenon mentioned
previously that watching television while using laptops to do work can serve as an example here. Also it is common that people video chatting with one person while texting to other person using mobile phones. Their attention is therefore divided to all activities with different levels of intensity.

To better understand the attention devoted to different mediums when more than one media alternative is presented, theoretical background of attention is therefore reviewed. First of all, according to the filter theory, unattended messages can never be decoded in perceptual analysis (Broadbent, 1957, 1958). The filter theory may argue that a single medium is chosen because it is salient to its audiences and other media content is “noise.” However, based on the argument proposed by the bottleneck model (Deutsch & Deutsch, 1963), information selection takes place before the stage of response selection. In this sense, the bottleneck model proposes that all available media are attended to, but audiences will only respond to one.

Although these theoretical models differ in predicting allocation of attention in simultaneous media environment, a critical question arises: what makes a particular media
being attended to while others being ignored? It has not been fully determined that what kind of variables determine users’ simultaneous media pattern, and under what conditions users will respond to a particular media platform. For instance, Webster, Phalen, and Lichty (2006) proposed that two variables influence simultaneous media use: media factors and audience factors. Media factors refer to both structural media factors and individual media factors. Structural media factors are the availability of the media technologies and individual media factors emphasize the accessibility of media technologies to general users. Audience factors refer to the characteristics of the media users, including their demographics, socio-economic status, and psychological traits. Perse (1996) suggested that high sensation seekers are more likely to watch television and involve in other distracting activities at the same time.

Besides media factors and audience factors, research also showed that younger generations, in particular, are more likely to adopt this media use pattern (Jeong et al., 2005). The study reported that teens are especially prone to simultaneous media use, and they rarely use a single medium at one time. Survey research also confirmed this
result by suggesting that 80 percent of teens regularly use more than one media at a time (Pendleton, 2004).

Another aspect of simultaneous media research focuses on the type of media that people frequently use at a given time. Pilotta and Schultz (2005) identified 24 types of media combinations, and found that Internet and music, and Internet and television are the two most popular combinations. Jeong et al., (2005) supported this result by indicating that combining the Internet with audio media and combining the Internet with television were identified as the most common types of simultaneous media use. It was also suggested that the ease of multitasking across media could influence audiences’ choice of media combination.

However, few studies have fully addressed the question of what factors determine or contribute to simultaneous media usage besides the availability of media platforms. Previous studies have only examined three predictors: gender, race and sensation-seeking, related to simultaneous media usage (Jeong, et. al., 2005). However, research on single media usage suggested more predictors of media use behavior. These factors include motivations (e.g., Palmgreen, 1984; Cooper & Tang, 2011), social influences from peers (Lin & McDonald, 2007), families (McDonald,
1986), audiences’ different personalities (Bulik, 2009) and also message characteristics, for example, video messages, audio messages and text messages. As our knowledge of the simultaneous media usage accumulated, the connection between empirical observation and theoretical contribution has not been well established. Moreover, the implication of simultaneous media usage to advertising has not yet addressed in previous studies.

While using different media at the same time, users’ motivation, attention and attitudes toward those media are different. Since it is possible that motivation and attention may change and shift from one media platform to another constantly in a simultaneous media environment, it is critical yet difficult for researchers to accurately measure the amount of attention that individuals pay to each medium at any given time, and identify the role of preferred media in association with media messages (Jeong, & Fishbein, 2007). For researchers, the phenomenon of simultaneous media use asks for a more comprehensive understanding of the processes of multiple media usage. For media producers and advertising practitioners, to understand the influences of users’ media preferences on their attitudes toward media content can help better
attract users’ attention, generate positive attitudes and better performance of product recall, and finally result in a stronger purchase intention.

With particular respects to media preference in a single media exposure setting, previous studies in advertising have compared the influences of different media platforms on people’s perceptions of advertising in single media exposure (Pasadeos, 1990; Guo, Tan, & Cheung, 2010; Meulemann, 2012). In addition, in terms of information density, compared with newspaper and magazine, television as a source of product information was evaluated as more informative than the other two media (Guo, Tan, & Cheung, 2010). Also, the theory of uses and gratifications (Katz, Blumler, & Gurevitch, 1974) suggested that based on audiences’ needs, attitudes, and expectations of media use, in addition to psychological and social environment in which audiences’ are immersed, they exhibit different patterns of media exposure to satisfy such needs or desires (Jeong & Fishbein, 2007). Previous studies have been devoted to understand the influences of personality, cognition, motivation, and social and psychological circumstances on media use. For instance, Rubin (2009) summarized gratifications that people use media to fulfill,
including acquisition of education, emotional release, escaping from daily life, and entertainment. Emphasis on personal motives and involvement in the media uses and effects process also leads to an argument that users’ behaviors or outcomes of different use of medium and media content may vary accordingly as well.

Finally, previous studies showed the influences of audiences’ media preferences on their media consumption. Prior research suggested a positive relationship between people’s preference for a particular medium and possibility to seek information using the medium that they preferred over others (Mundorf & Brownell, 1990; Harwood, 1999; Kim & Frick, 2011). For instance, if a person prefers laptops to televisions, s/he is more likely to seek information using laptops than using television. Few studies have paid attention to media preferences and their influences on perceptions of media content in simultaneous media use environment. In other words, in previous studies, audiences were not given the option to use more than one media outlet at one time when they were asked about their media preferences. Therefore, it is still unclear if media preferences can influence audiences’ media consuming
behaviors when they are in a simultaneous media use environment.

In addition, product and advertising message recalls have been used to assess the effectiveness of advertising in various media platforms (e.g., Lee & Cho, 2010; Yoo & Peña, 2011; Fraser & Bradford, 2013). According to previous studies, information stored in memory is a necessary, although not sufficient, step in advertisements processing (Lodish, 1986). Furthermore, attitude and behavior as the results of ads exposure are positively related to product recall (Fazio & Williams, 1986). In a richer media environment, in which multimedia platforms are frequently employed for advertising, individual’s ad recall remains the focus of advertising researchers and practitioners.

Specifically, some scholars looked into the effects of advertising clutter in web environment on people’s memory and attitudes toward ads (Lee & Cho, 2010). Participants were randomly assigned into one of fourteen news websites with varying frequency and clutter of animated banner ads. The results showed that banner clutter did not have negative effects on ad recall and attitude. However, it was negatively associated to ad recognition. In addition, frequency had positive impact on users’ memory and
attitudes toward brand when the ad is displayed with other ads cluttering the website. It can be inferred from Lee and Cho’s study that when the ad is shown as contrasting with a background of nondescript ads that keep changing from one page to the other, the reappearing ad stands out from the crowd. Therefore, the visual salience should be examined in terms of its effects on memory and attitude. Zanjani, Diamond, and Chan (2011) examined the effects of ad-context congruity and ad memory in an e-magazine context. The study also sought to understand the role of task orientation—information seeking vs. non-information seeking—and perceived ad clutter in the relationship between context congruity and memory. The results suggested that when the editorial material was consistent with ads in e-magazine, information seekers exhibited better ad recognition. Furthermore, perceived clutter was a significant mediator between ad-context congruity and recognition. Different from the implication of Lee and Cho’s study (2010), the results of Zanjani, et al’s (2011) research emphasized the importance of context and ad consistency for people who use the medium to seek specific information. In other words, the salience effects may obstruct information seekers’ abilities to memorize ads.
In-game advertising, as a more innovative advertising strategy, has caught the attention of many researchers recently (e.g., Yoo & Peña, 2011; Dardis & Schmierbach, 2012). For instance, Dardis and Schimerbach (2012) investigated the impact of multiplayer contexts on the effectiveness of in-game advertising and found that playing with a partner, as opposed to playing alone, enhanced players’ ad recall. Moreover, the relationship between playing mode, multiplayer versus single player, and ad recall was mediated by the attitudes toward one’s partner. The study suggested that for videogame advertisers, creating a positive playing environment, in which friendly interaction between players is promoted, can effectively increase advertising effectiveness. If, as the study suggested, positive viewing or playing experiences are likely to associated with positive attitudes toward brands, it is reasonable to argue that preference for particular media outlet(s) may have positive effects on ad recall in simultaneous media environment.

In a more recent study, Fraser and Bradford (2013) hypothesized that background music with more frequent harmonic and textual changes might interfere with processing of the ads and reducing ads recall by capturing
viewers’ attention, imposing cognitive load, and creating frequent distraction. The study supported the hypothesis and indicated that backgrounds with less-frequent change lead to better ad recall. In other words, background music that is less distracting leads to better encodings of the textual information. Fraser and Bradford’s study revealed that users’ processing of information shown in the text format may be interrupted by information that is presented in an audio format. Information conveyed by a different medium could be competing with each other in getting users’ attention.

According to previous studies on simultaneous use of media and advertising effectiveness in new media environments, both individual user factors, such as information seeking (Zanjani, et al., 2011), and individual media factors, such as media preferences (Jeong & Fishbein, 2007) can predict patterns of media or content usage. Meanwhile, few studies focused on the relationship between media preference and users’ product recall and attitude in the simultaneous media environment. The current study intends to explore whether the preferred media can influence people’s perceptions of the advertisements shown
on television or the Internet. Therefore, the following research questions are proposed:

RQ1: Do significant differences exist between media preferences and performance of product recall of web and television ads?

RQ2: Do significant differences exist between media preferences and attitudes toward the products promoted in web and television ads?

Besides recall, to assess the effectiveness of advertising, abundant studies have been conducted to explain attitude change and the relationship between attitude and behavior (e.g., Petty & Wegener, 1998; Goodrich, 2010; Kim & Sundar, 2010). When it comes to better understanding about persuasion, variables that are dominant in the underlying processes by which the persuasive communication in mass media precipitate attitude change should be examined from different theoretical perspectives.

**Salience and Complex Design**

The limited capacity theory proposes three major subprocesses of information processing, including encoding, storage, and retrieval (Lang, et. al., 1999). As
information processors, people only have limited mental resources that can be used to process information. Information processing refers to the procedure of perceiving stimuli, turning them into mental representations, and outputting them in the same or altered forms (Lang, et. al., 1999). A complete information processing route can be inhibited either because recipients choose not to allocate much resources to a situation or the situation itself demands more processing resources than the recipients can possibly offer (Lang, 2000). The limited capacity model has applied in the analysis of television audiences to understand how people allocate their processing resources when exposed to content shown on the television (Sundar & Kalyanaraman, 2004). Lately, researchers used the limited capacity model to explain web users’ encodings of online messages (Chowdhury, Finn, & Olsen, 2007).

According to the limited capacity theory, people continually select, either consciously or unconsciously, information from the environment in which they are exposed to and encode the information they acquired into their working memory (Lang, 2000). During this process, two types of information are more likely to be selected because they
catch people’s attention. The first type is information that is relevant to its recipients. The other type is novel information. Stimuli that are unexpected or represent changes in the environment can be easily attended. Especially given the fact that recipients’ processing resources are limited, these two types of information have higher probabilities to be selected and encoded (Lang, 2000).

Salient stimuli, defined as information sticking out from a particular setting or context to “capture the attention of all of the people some of the time” (Kardes, 2002, p.38), share similar characteristics with the second type of information identified by Lang (2000) that is more likely to be selected during the message-encoding phase. Salient stimuli may have higher possibility to be encoded in people’s memory formation process. Banner ads, for instance, often have varied elements, such as color, font, image, and message, in an attempt to catch users’ attention and draw clicks (Clifford, 2008). Previous study on banner ad effectiveness hypothesized that when a commercial is displayed in a complex background, users’ attention will be drawn to the background rather than to the commercial itself (Stevenson, Bruner II, & Kumar, 2000). In other
words, the competition for attention between the background and the commercial can reduce the effectiveness of the web ads. The results confirmed the hypothesis that complex webpage background, manipulated as adding items, color, and movement in the study, is not beneficial to enhance advertising effectiveness. The simple webpage, manipulated as a plain black background without any word, leads to better ad attitude, brand attitude, purchase intention, and website attitude (Stevenson, et al., 2000). Therefore, when a webpage background is simple, such as a single colored background, commercial that contains multiple colors, words, and even animations can make itself stand out to users. A complex web ad design in a simple web background should be more attention grabbing.

Complexity is a function of two main characteristics. The first characteristic is the amount of variety of the figure, which was theorized by Atteneave (1954) as redundancy and relative uncertainty. If a stimulus is comprised of distinct shapes and colors, it takes longer time for people to process (Berlyne, 1960). Magazine designers intentionally avoid making the magazine covers too “busy,” with a number of distinguishable elements such as fonts, colors, words, and pictures, because readers may
not have enough mental resources to attend to the headlines that need to be prioritized. The second characteristic is the amount of material. If a stimulus includes many similar figures, viewers may also perceive such stimulus as complex. For example, we are sometimes overwhelmed by the starry sky, even though stars look quite similar with one another in terms of shape and brightness. We cannot easily count the number of the stars or focus our attention on one or two stars without feeling fatigue. It is because there are too many of them; we simply do not have the mental capability to attend to all at one time.

The impacts of ads complexity on attitude and behavior intention have not been studied thoroughly over the years (Stevenson, Bruner II, & Kumar, 2000). Previously, considerable work has been done by Berlyne (1958a, 1958b) in the field of psychology in explicating the effects of complexity. Berlyne was especially interested in the characteristics of complexity or the constitution of complex designs. Through experimental research, Berlyne (1958b) identified variables that constitute visual complexity, including the irregularity of arrangement, amount of material, heterogeneity of element, irregularity of shape, incongruity, and incongruous juxtaposition.
Specifically, irregularity of arrangement is similar to the concept of “visual surprise.” Human beings have an inherent desire for balance; irregularity of arrangement interrupts our expectation for balance, which makes it difficult to process. Amount of material constitutes complex design because “figures with more elements contain more ‘distinguishable groups or clusters’ or more degrees of freedom and hence more ‘logons’ (Berlyne, 1958a). More elements indicate higher probability of variations and more information. Heterogeneity of element refers to the dissimilarity between elements. If differences between elements are redundant, processing such stimulus may require more mental efforts. Irregularity of shape is the break from our expectation for symmetry and predictability of changes in curvature. If the stimulus contains elements that do not have regular geometrical shape, it will be considered as a complex design.

Incongruity has been defined and operationalized differently by different researchers. For instance, Berlyne (1958a) manipulated incongruity by showing the participants a picture of an incongruous animal. Participants in the control group were presented with a picture of a normal animal. The incongruous animal contained incompatible parts
and was designed intentionally to be contradictory with expectations of the appearances of certain animals, such as an elephant with an elephant head and a dog body. Later researchers examined the effects of music-advertised product incongruity (Hung, 2000; advertisement picture-text incongruity (Areni & Cox, 1994), and television program context-advertised product incongruity (Furnham, Gunter, & Richardson, 2002). Incongruity increases the difficulty to make predictions and elicits deeper semantic processing (Hung, 2000). Research also showed that incongruent ads lead to better recall of advertised product than congruent ads (Houston, Childers, & Heckler, 1987).

The final factor that can contribute to visual complexity is incongruous juxtaposition. To manipulate incongruous juxtaposition, Berlyne (1958a) showed the participants a picture of two objects together, a car and a rabbit. But the body of the car and the body of the rabbit were switched. Participants saw a car with a rabbit body, and a rabbit head with a car body. In cognitive psychology, the effects of incongruous juxtaposition can be explained by the theory of processing fluency (Lee & Labroo, 2004). Processing fluency refers to the ease of identifying or recognizing certain stimuli (Lee & Labroo, 2004). It is
often used to explain the effects of repeated exposure. For instance, Seamon, et al. (1995) found that prior exposure to a stimulus can enhance the ease of processing such stimuli in subsequent encounters. Perceptual fluency, in particular, focuses on the ease of identifying physical features of a stimulus (Lee & Labroo, 2004). Incongruous juxtaposition reduces perceptual fluency by increasing difficulty of identifying objects, such as switching the body of the car and the body of the rabbit in Berlyne’s study (1958a). According to Berlyne’s argument, if a stimulus elicits reduction in perceptual fluency, such stimulus cannot come to viewers’ mind easily.

Berlyne’s studies (1958a, 1958b) showed that people spent more time on complex stimuli. In addition, complex or novel stimuli are curiosity arousing, which can drive continued examination. Although Berlyne’s experiments were conducted more than 50 years ago, later researchers continued using Berlyne’s explications of complexity in their experiment stimuli designs to examine media users’ responses to complex ads (e.g., MacInnis, Moorman, & Jaworski, 1991; Putrevu, Tan, Kenneth, & Lord, 2004; Wang, Shih, & Peracchio, 2013).
According to the conceptual study on effects of advertising executional cues on consumers' motivation, opportunity, and ability to process brand information (MacInnis, et al., 1991), researchers proposed that the more complex the array of advertising executional cues in an ad, the greater users' motivation to pay attention to the ad. MacInnis et al. (1991) argued that previous studies showed that complex stimuli, through cinematographic techniques, could significantly increase attention to ads and product recall. Moreover, memory of a product wears out more slowly when it is shown in a complex ad than shown in a simple ad (Cox & Cox, 1988). The theoretical link drawn between complex ad design and attention and memory mediated by users' motivation to attend to complexity provided the opportunity for further empirical examinations.

Putrevu, et al. (2004) explored the influence of individual differences on processing of complex ads. The experimental study manipulated ad complexity along four dimensions: visual, technical, lexical, and information complexity. Specifically, for visual complexity, Peutreve, et al. (2004) used the Berlyne's (1958a) original designs and manipulated (1) the number of distinct elements in the stimuli; (2) the dissimilarity between the elements; (3)
the degree to which the combinations of stimulus elements correspond to a single unit. Technical complexity is of particular interest in promotion of technology-related products, such as electronic devices and computers. It refers to technical language and jargon used in advertisements. Lexical complexity is the “linguistic structure and semantic content of communications” (p. 10). If an ad contains sentences with many words and complicated structures, it should be considered as a complex ad. Previous study suggested that the lexical complexity of ads was positively associated with its usefulness (Chamblee, Gilmore, Thomas, & Soldow, 1993). Information complexity refers to the density of information provided in ads to persuade consumers making purchase decisions. Information complex ads often contain extensive details about the product or its usage. The study showed that the effects of complex ads were moderated by individual differences, such as need for cognition (NFC), knowledge, and gender. People who are high in NFC showed more favorable evaluation to complex ads than those are low in NFC. More favorable response toward complex ads in the high-knowledge group than the low-knowledge group was found. Finally, male
prefer technological complexity while females prefer visual, lexical and informational complexity.

Pieters, Wedel, and Batra (2010) focused on visual complexity and distinguished “feature complexity” and “design complexity”. Advertisements can be visually complex when they have dense perceptual features (“feature complexity”) and/or they have extensive creative designs (“design complexity”). The study used an eye-tracking device to capture participants’ attention allocation during ad exposures. The results indicated that feature complexity impairs attention to the product and leads to less favorable attitudes toward the ad. Design complexity, on the other hand, enhances the attention to the ad, increases the general comprehensibility of the ad, and generates more favorable attitudes toward the ad.

In a more recent study, Wang, et al. (2013) examined the relationship between banner ad complexity and processing fluency. As explained earlier, processing fluency refers to the ease of encoding and processing certain stimuli that is facilitated by repeated exposure (Lee & Labroo, 2004). Wang, et al. (2013) used both a priming phase and a testing phase, during which participants were exposed to two banner ads for the same
product. Different from previous studies (e.g., MacInnis, et al. 1991; Putrevu, et al. 2004), in which the amount of visual elements contained in ads were manipulated as complexity, Wang, et al. (2013) argued that pictures are less complex and easier to be recalled than words. The results showed that complex banner ads (text only) lead to more favorable evaluation of the product and ad when the time of priming phase increased.

Wang et al’s (2013) study implied that complex ads can enhance processing fluency and generate favorable attitudes when they are shown repeatedly. The result is in accordance with Cox and Cox’s argument (2002) that complex designs have inherent uncertainty, and accumulative exposure might decrease uncertainty or increase evaluations, thus complex ad designs would be benefited more from repetitions. In other words, complex ads might generate better attitudes with accumulative exposure since they were attention grabbing and might take time to be fully appreciated. Simple ads, on the other hand, were easy to comprehend, and positive evaluations could be easily worn off with repetitive exposure.

However, complexity as an important ad design element has not been studied in depth in the context of
simultaneous media use. Also, rather than using the theories of congruity (Furnham, Gunter, & Richardson, 2002) and processing fluency (Lee & Labroo, 2004), the current study intends to examine the effects of complex ads in simultaneous media environment using salience and ELM. Finally, it was not entirely clear whether attention catching can necessarily lead to positive evaluations of products and ads, especially when repetition is not a variable of interest in the current study.

In summary, complex design in a simple web page background constitutes salience. Salient stimuli represent a change from the background, which can capture people’s involuntary attention. Studies in advertising have paid much attention to the collative properties in increasing the allocation of mental effort and their effects on evaluations of advertisements (Lang, 2000). The current study focuses on the concept of salience and argues that complex ad designs can elicit people’s automatic attention, which is closely related to people’s cognitive processing and memory storage (Yoo & Kim, 2005). In particular, when media users are exposed to both web ads and television ads, salient web ads are hypothesized to be more attention grabbing, simply because it “stands out.” As opposed to
complex web ad designs in simple context, television ads may draw less attention, because unless it is silent, television ads do not show great changes from the context platforms. However, when simple web ads are shown in the simple context, web ad salience no longer holds. In this case, television ads may be more salient, simply because the visual and audio elements are more stimulating. Thus, users may perform better in television ad recall.

Therefore, the first set of hypotheses can be proposed:

H1: The product recall of a television ad will be significantly higher when the television ad is consumed with a simple web ad than when it is consumed with a complex web ad.

H2: The product recall of a complex web ad will be significantly higher than a simple web ad when a television ad is consumed at the same time.

Prior research argued that attention is closely related to people's cognitive processing, and higher amount of attention might indicate more cognitive efforts exerted in information processing (Stevenson, et al., 2000). Therefore, to better understand how salient stimuli, particularly complex web ad designs in simple context, are processed and their impacts on attitudinal outcomes, a
review of dual information processing literature is provided.

**Dual-Process Models**

Both the Elaboration Likelihood Model (ELM) (Petty & Cacioppo, 1986) and Heuristic-Systematic Processing Model (HSM) (Chaiken, 1980) propose that people process persuasive messages and form their attitudes through two routes of information processing: a more effortful “central route” and a less effortful “peripheral route” (Petty & Cacioppo, 1986) or “systematic” and “heuristic” processing (Chaiken, 1980). Message receivers who undertake the central route or go through systematic processing are engaged in an evaluation of the media content, and they are more likely to form their attitudes after a careful consideration of the persuasive communication.

The peripheral route or heuristic processing is being used when recipients do not scrutinize the issue-related information and rely on peripheral cues to construct their judgments. In addition, both ELM and HSM hold that motivation and ability in elaboration upon the message determine the route to persuasion or two ways of information processing, either central (systematic) or
peripheral (heuristic). The difference between ELM and HSM is that ELM argues that people process information using either central or peripheral route, while HSM holds that people could go through systematic and heuristic in a simultaneous fashion (Smith & Decoster, 2008).

The ELM is often used as one of the important theoretical models in understanding the potential role of multitasking in media effects because the limitation of the HSM, which is its focus on domain-specific heuristics (Shah & Oppenheimer, 2008). For instance, the audience response heuristics (Axsom, Yates, & Chaiken, 1987) suggests that messages delivered by enthusiastic communicators are more likely to elicit positive attitudes toward the message. Consensus heuristic (Maheswaran & Chaiken, 1991), source likability heuristic (Chaiken, 1980), and expertise heuristic (Chaiken, 1980) also state the possibility that people are more likely to be persuaded if the message is related to positive-valenced sources. Although these heuristics indicate that certain cues could directly influence people’s attitudes, it has not been reliably tested that heuristics could actually reduce effort. In other words, empirical support is still lacking to confirm that people readily use heuristics in making judgments when
certain cues are present. As Shah & Oppenheimer (2008) argued, “heuristics are implicitly defined as cues that are used when they are present, rather than processes that reduce effort by using certain cues” (p. 209). In this case, HSM may have over-simplified the persuasion process.

ELM, on the other hand, proposes that working on some tasks while using media can distract users and reduce their abilities to attend to media content (Jeong & Fishbein, 2007). As a result, in simultaneous media environment, users are more likely to process media content peripherally. This may reduce the likelihood of long-term effects of media exposure on attitudes, intentions, and behaviors (Jeong & Fishbein, 2007). Given the limitation of HSM and application of the dual-process models in prior studies (e.g., Putrevu, et al., 2004; Jeong & Fishbein, 2007), the current study draws conceptually from the ELM to better understand the effects of salient web ads in simultaneous media use.

The main proposition of ELM is that the message recipients use either central processing or peripheral processing in response to incoming messages, depending on individuals’ motivation and ability to process the information (Petty et al., 2002). Message recipients who go
through the central route are more likely to form their attitudes after careful evaluations of the given messages (Kardes, 2002). Peripheral processing occurs when message receivers do not exert much mental effort and avoid scrutinizing issue-related media communications to which they are exposed (Petty et al., 2002). As opposed to central processing, persuasion is invoked by simple cues in the persuasion context that influence attitudes (Petty et al., 2002).

ELM holds that motivation (whether information is personally relevant and consequential) and ability (whether they have the requisite knowledge and capability to think) determine the route to persuasion in which people take to process information—whether actively or passively (Petty & Cacioppo, 1981). When a person’s motivation and ability to view the media content are both high, one is inclined to actively involve oneself in issue-related media content. When either motivation or ability is low, people process information using the peripheral route (Petty & Cacioppo, 1981).

ELM suggests that distraction could reduce users’ ability to process the messages. As a result, users are more likely to process the messages peripherally (Voorveld,
2011). Such hypothesis was partially tested in Chowdhury et al.'s study (2007). Chowdhury et al. examined the effects of simultaneous presentation of advertising and television programming on ad-avoidance intention, cognitive responses, and brand evaluations. Researchers found that users are easily distracted by simultaneous presentation of TV ads and programming. Simultaneous presentation of advertisements and television programming was achieved by displaying advertisements with a volleyball game using split screens on the television. The results showed that television programming reduced the cognitive response generated by the advertising message. Further, in accordance with the proposition of the ELM, fewer central thoughts (support and counterarguments) than peripheral thoughts (execution thoughts and program thoughts) were generated in simultaneous presentation condition. These findings indicate that the simultaneous presentation of ads and television programming is more profitable for ads that do not contain much cognitive arguments but more peripheral cues, such as pictures, music, or style. Similar to imposing two viewing tasks simultaneously in Chowdhury, et al.'s (2007) study, watching television ads while viewing
web ads may also lead to peripheral processing of each ad by increasing the high cognitive load.

Previous experimental conditions have been designed to avoid imposing secondary cognitive load on participants to ensure that their capacity to process the persuasive content is not limited (Gilbert & Hixon, 1991). According to the limited capacity theory, individuals only have a certain amount of cognitive capacity to allocate among different tasks (Zhang, et al., 2010). In situations where individuals were exposed to more than one media at the same time, these media will compete for cognitive resources and users’ attention to and comprehension of media content will decrease (Voorveld, 2011). In simultaneous presentation of different advertising messages, the demands for cognitive load will increase. As a result, the attention and cognitive response to each ad may decrease.

Based on the theoretical explanations provided by both the ELM and limited capacity approach, it can be predicted that simultaneous media use may reduce the cognitive effects of simultaneous presentation of media contents because users do not have adequate cognitive capacity to attend to all media messages. Only a few studies have been conducted previously that examined the effects of media
multitasking on users’ response to media messages, such as advertising (Voorveld, 2010). For instance, Armstrong and Chung (2000) examined the effects of background television on recall and recognition of reading material. Participants were asked to read newspaper science articles with background television or in silence and then complete recall and recognition questionnaires. The results showed that viewing television had negative effects on processes of initial comprehension and long-term memory encoding of the science articles, when these two tasks were performed simultaneously. Zhang et al. (2010) explored the situation in which media multitasking (reading a news article and watching television simultaneously) impaired ability to recognize sexually explicit television content. In addition, multitasking decreased users’ ability to recognize audio information more than their ability to recognize visual information.

Nam, Kwon, and Lee (2010) paid particular attention to simultaneous presentation of advertising in an IDTV environment (Interactive Digital Television). IDTV allows users to play back the video content of live television with the ability to pause, skip, fast-forward, and replay the content (Carlson, 2006). The advent of IDTV has changed
the advertising environment and users’ attitudinal, cognitive, and behavioral response to ads (Nam, et al., 2010). Users can now avoid ad exposure by fast-forwarding them, which is called zipping. Ad zipping impairs advertising effectiveness because only part of the advertising messages are exposed to their audiences. Simultaneous display of ads and television programs may be a more effective strategy because audiences are obliged to view the ads with their preferred television program. The study revealed that simultaneous presentation of advertising is effective in reducing zipping and increasing recall. However, simultaneous presentation advertising was also proven to be intrusive and generated a negative evaluation of the advertised product.

Research on advertising in simultaneous media use is still scarce. Moreover, research on the effectiveness of cross-media campaigns combining online advertising with television advertising has not taken into account the ads’ effects in today’s overwhelming media environment (Voorveld, 2011). The current study fills in the gap and intends to explore audiences’ attitudinal and cognitive reactions to online and television ads when they are consumed simultaneously. The study also pays particular
attention to salient web ad designs, complex versus simple, and argues that media users will be engaged in a central route to persuasion when they are exposed to complex web ad designs and process television ads in a peripheral manner, since complex web ads in a simple context constitutes salience. Television ads, on the other hand, do not differentiate themselves from audio and visual context on television. For example, when we multi-task using laptops and television, and we happen to see an attention-grabbing ad shown on a webpage, we do not necessarily look up to see what is showing on the television unless we hear something salient. The silent ad shown during the Super Bowl commercial break is salient, because we hear no sound, which makes it stands out from the constant stimulating television context.

On the other hand, when simple web ad designs are shown in a simple online context, television ads may capture more attention, because motion shown on television is more arousing than static counterparts in nature (Reeves & Nass, 1996). Therefore, television ads will be processed centrally while simple web ads will be processed peripherally. Previous studies have shown that we are more likely to be persuaded when we are distracted (Gilbert et
al., 1993). In other words, by asking for more cognitive efforts, central route of processing is more likely related to less positive attitudes toward persuasive content. Further, one drawback of simultaneous presentation advertising is its intrusive nature (Nam, et al., 2010). Especially when an ad is perceived as interrupting the goal of the viewer, negative emotional and attitudinal reactions may be generated automatically (Lee & Labroo, 2004). Therefore, if salience web ads attract more attention, which may interfere with viewers’ processing of television ads, they are more likely to generate unfavorable reactions to the product promoted in the web ads. If television ads attract more attention, which may interrupt viewers’ processing of the online reading material, they are more likely to result in negative evaluations of the television ad product. Hence, the second set of hypotheses can be proposed:

H3: Attitudes toward a web ad product will be significantly more positive when exposed to a simple design web ad than a complex web ad when the web ad and television ad are presented at the same time.
H4: Attitudes toward a television ad product will be significantly more positive when presented with a complex design web ad than when presented with a simple web ad.

Besides attitude and recall, purchase intention is an important variable as campaign results for researchers and advertisers (Voorveld, Neijens, & Smit, 2011). However, most research still investigates the effects of each medium on purchase intention for advertised products in isolation (Danaher & Rossiter, 2011). Only a few studies looked into purchase intention of ad product in simultaneous media use situations. For instance, Bolls and Muehling (2007) compared the effects of low-imagery and high imagery radio advertisements when audiences were asked to simultaneously perform a visual-processing task (viewing a series of pictures unrelated to the ads or a blank screen). Imagery refers to “a multidimensional, cognitive construct that varies in terms of quantity, vividness, affective meaning or valence, and sensory modality” (Bolls & Muehling, 2007, p. 35).

In this study, the high versus low imagery is the strong versus weak ability of the radio ads to engage listeners’ imaginations so they can ‘visualize’ the advertised products and services. The results showed that
high-imagery radio ads led to better advertising involvement, attitude toward the ad, brand attitude, and purchase intention than low-imagery ads when no competing visual stimulus was introduced (viewing a blank screen). When visual-processing task was present (viewing pictures), responses to high-imagery radio ads become less favorable, including involvement and attitude. The moderating effect was not found for brand evaluation and purchase intention.

In another study on the effects of combining online advertising with advertising in offline media, Voorveld (2011) found that during media multitasking, exposure to a combination of a banner ad and a radio ad (both the banner ad and the radio ad were for Panasonic products) resulted in a higher purchase intention compared to two radio ads (both radio ads were for Panasonic products). Voorveld’s study focused on the campaigns combining effects rather competing effects. The study supported that combining radio and online advertising is more profitable than radio advertising only.

A later study (Voorveld, et al., 2011) investigated the psychological processes when people are exposed to ads shown in multiple media, such as TV, print, and the Internet. One interesting finding was that purchase
intention for product that was advertised using multiple media was higher than advertised using a single medium, because of the “multiple source perception.” The “multiple source perception” indicates that people evaluate a brand positively based on the amount of advertising. If this argument holds, the effectiveness of advertising using multiple media should be re-examined because “multiple source perception” is used as heuristics. In other words, previous studies do not answer that under what condition an effect of simultaneous presentation advertising is most likely to occur. It is still not clear that if certain ads features, such as salient web ad design, can contribute to higher or lower purchase intention when television ads are presented at the same time. Therefore, the final research question should be proposed:

RQ3: Do significant differences exist between web ad designs (simple versus complex) and purchase intention when web ads and television ads are consumed simultaneously?

Simultaneous media use is regarded as “one of the most unjustifiably ignored features of the contemporary media landscape” (Hassoun, 2012, p.1). Although media scholars and advertising practitioners have incessantly discussed its functions, effects, and implications, little is known
in terms of how users process media contents simultaneously and what content features significantly influence users attention, attitude, memory, and behavioral intention. On one hand, most research on synergy of simultaneous advertising exposure, which occurs when the combined effect of multiple advertising media exceeds the sum of their individual effects (Voorveld, et al., 2011), showed promising outcomes, indicating that advertisers should take advantage of multiple media platforms to promote their products and deliver advertising messages (Voorveld, 2011). On the other hand, research that used ELM and limited capacity theory to explain the detrimental influences of media multitasking on cognition (e.g., Armstrong & Chung, 2000; Bolls & Muehling, 2007; Zhang, et al., 2010), such as ads recall and recognition, suggest that when different media content compete for users’ limited cognitive capacity, users’ ability to comprehend and memorize the message will decrease. However, the majority of studies are still limited to the discussion of general effects of simultaneous advertising exposure.

The current study seeks to determine whether certain features of web ads can influence the advertising outcomes when consumed with television ads. By doing so, we may be
able to better explain how and why users react to ads shown in different media distinctively in simultaneous media use. The hypotheses of the current study are established on previous studies and concentrate on the positive effects of salient web ads, complex ads in simple backgrounds, on product recall and negative effects on brand attitude when television ads are shown at the same time. The study also aims to explain the effects of salient web ads, when shown with television ads, on purchase intention. Finally, the study explores the role of individual factors, such as media preferences, in the relationship between web ad designs and advertising outcomes, such as attitude, brand recall, and purchase intention when web ads and television ads are consumed in a simultaneous fashion.

Answers to these questions and tests of the hypotheses can help researchers develop a more rich understanding of users’ media use patterns in the simultaneous media environment and find out the effects of characteristics of the ads, salience in this case, on people’s attitudes and behavioral intentions. For advertisers, the current study can provide suggestions to better grab consumers’ attention and establish better evaluations of their products through web ad designs when people are exposed to multiple media
content. This experimental study seeks to determine the possible causal relationships between salient web ad design and attitude, purchase intention, as well as ads’ memory.
Chapter 3: Methodology

Participants

A between-subject experiment was conducted. A total number of 168 undergraduate students enrolled in media classes at a large mid western university comprised the participant pool. There was no criteria for exclusion of participants as long as they were university-enrolled students and 18 years and older. Students were informed in advance that their participation was voluntary and confidential. Students all received extra credit for courses when they signed up for participation in the experiment. Alternative assignments were provided to maintain the fairness of the recruitment.

After the experimental sessions, all the participants were asked to complete an online survey. The experimental procedure will be explained in more details in the later section. Statistical Package for Social Science (SPSS) was used to analyze the data. Among the participants (N = 168) who completed online survey questionnaires, 41.7% (70) were females and 58.3% (98) were males. Participants reported an average age of 20.47 years (SD = 2.11), and two people did not indicate age. Participants were primarily Caucasian
(89.3%), reflecting a major demographic feature of the university. Among 168 participants, six did not indicate their session number that was given by the researcher; therefore, these cases were excluded from further analysis.

**Design**

The two-condition, between-groups experiment was conducted in a simultaneous media environment. Each participant was given a laptop, in which a three-page news story was shown with web ads on the right side. In the meantime, television was showing a 6-minute documentary with a commercial break. Both the news story and the documentary were about the inhabitant of deep ocean. During the commercial break on television, an advertisement was presented to all participants. The product that appeared on the television was different from the one that was shown on the laptops.

All participants (N = 168) were invited to participate in one of the two experimental sessions. With the television program showing as a contextual stimuli, participants were randomly assigned to view a three-page news article with either a simple web ad or with a complex web ad using a laptop.
Participants who were exposed to simple design web ads were further divided into two groups. One group watched the television program with a commercial break for Nature Valley bar with a web ad for Clif energy bar. The other group watched a television commercial for Clif energy bar and a web ad for Nature Valley bar. Similarly, participants who viewed complex web ads saw either a Nature Valley television commercial and a Clif web ad or a Clif television commercial and a Nature Valley web ad.

As such, the independent variable was web ad design, and the two values were simple and complex. The experimental groups were labeled as “central route” and “peripheral route.” Participants who were presented with complex design web ads were “central route” group, since complex ads activated more effortful processing. And participants who were presented with simple design web ads were “peripheral route” group, since they exerted less cognitive efforts than their counterparts.

“Central route” group was randomly divided into “central route (N)”, which indicated that they saw a Nature Valley television commercial with a complex design Clif web ad, and “central route (C)”, which indicated that they saw a Clif television commercial with a complex design Natural
Table 1

Two Different Brands for Each Condition

<table>
<thead>
<tr>
<th>Nature Valley simple web ad / Clif television commercial</th>
<th>Clif simple web ad / Nature Valley television commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature Valley complex web ad / Clif television commercial</td>
<td>Clif complex web ad / Nature Valley television commercial</td>
</tr>
</tbody>
</table>

Valley web ad. Similarly, “peripheral route” was further divided into “peripheral route (N)”, which indicated that participants saw a Nature Valley television commercial with a simple design Clif web ad and “peripheral route (C)”, indicating participants saw a Clif television commercial with a simple design Natural Valley web ad.

Randomly assigning participants to different conditions can minimize the influence of prior attitudes toward a particular brand. That was why this experiment had two different brands for advertising: Nature Valley bar and Clif energy bar (see Table 1). For instance, since participants were randomly assigned to either viewing the Clif web ad or Natural Valley web ad, the influence of
existing positive or negative attitudes toward Clif or Natural Valley on measured DVs can be minimized.

After stimuli presentation, participants' product recall, brand-related attitude, and purchase intention for the products shown on both the web pages and television were examined respectively as dependent variables.

**Stimulus Materials**

Two products that were chosen for this experiment were Nature Valley bar and Clif energy bar. Simple design and complex design web ads for both products were created by the researcher using Adobe® Dreamweaver® CS5. The researcher also created web pages to place the web ads. The design and layout of the web pages duplicated the *New York Times* webpage. Both Nature Valley and Clif television commercials were recorded beforehand and incorporated into the documentary clip that was about plants in the Deep Ocean. Both television commercials took approximately 1 minute and included information about the products’ attributes, such as nutritious and taste. Product and brand images were also shown in both television commercials.

Participants in the “central route” group saw either a Nature Valley television commercial with a Clif complex web
ad (see figure 1), or a Clif television commercial with a Nature Valley complex web ad (see figure 2). In the “peripheral route” group, participants saw either a Nature Valley television commercial with a Clif simple web ad (see figure 3), or a Clif television commercial with a Nature Valley simple web ad (see figure 4).

Figure 1 Clif complex web ad

Figure 2 Nature Valley complex web ad
According to the definition of visual complexity by Berlyne (1970), the complex ad design incorporates a number of heterogeneous elements and embellishments. Further, the elements are irregular in arrangement. In the “central
route” group, both “central route (N)” and “central route (C),” the web ads include the product, logo, and product attribute words. More than six colors were used and the arrangement of product attribute words was placed irregularly (see figure 1 & 2). By contrast, in the “peripheral route” group, the simple web ads include the product image only. Two colors were used (see figure 3 & 4).

The four web ads (see figures 1,2,3, & 4) were pretested to gauge perceptions of their complexity and to ensure the complexity manipulation was not confounded with other characteristics of the web ads. Participants' perceived complexity of the stimuli in the pretest was measured using a 5-point semantic differential scales anchored by complex-simple (1=simple, 5=complex), adopted from Cox and Cox (2002). The mean perceived complexity of the simple designs and complex designs was compared to test the effectiveness of the manipulation. Complex ads were rated significantly higher in complexity than simple ads ($t=3.03; p=.003$).

As mentioned earlier, the design and layout of the three web pages duplicated the New York Times webpage. However, the web pages did not include any banner ads or
attributes that were associated to the New York Times. The complex/simple ads were shown on the right side of the web pages. The news article (on the web pages) that was shown along with the web ads was similar to the topic that was covered by the television documentary clip. The news provided participants with information about plants growing in the Deep Ocean.

Procedure

A big classroom equipped with a projector and a big widescreen was used to conduct the experiment. The researcher arranged the room with tables and chairs to make all the seats facing toward the screen. Laptops were handed to each participant by the researcher, and they were directed to sit facing toward the screen. The television program used in the experiment was recorded beforehand and played on the widescreen during the experiment. In order to efficiently mimic the conditions of simultaneous media use that participants experience in reality and also control any possible influence from peers, only eight participants were asked to sign up for each session. The participants were sitting far enough apart to make sure they were not able to see the content shown on others' laptop screens.
All participants were asked to sign an informed consent form (see Appendix B) upon their arrival at the experimental session. The purpose, procedures, possible benefits, and risks of the study were explained in the consent form, as the Institutional Review Board (IRB) required. However, the complete explanations of the purpose of the study were not revealed to the participants before the experimental session. Participants were told that they were participating in a study examining audiences’ media uses. They were informed that they could proceed with the study after signing the consent form. During the experiment, the researcher gave instructions to participants in the four conditions according to the same protocol in order to maintain the integrity of the study (See Appendix C). Participants were fully informed of the intent of the study in the debriefing session at the end of the experiment.

Participants were randomly assigned to a condition from a single sample prior to the study sessions in order to rule out the effects of individual differences (Aronson, Carlsmith, & Brewer, 1985). To do so, the researcher created a series of “ID numbers” beginning with “A” and “B,” wherein the letter “A” designated that participants
were assigned to the “peripheral route” group and the letter “B” assigned participants to the “central route” group. The ID numbers were placed in a Ziploc™ baggie, and participants were instructed to blindly pick up a folded ID number from the bag.

The researcher decided which television commercial was shown to the participants before each session. Depending on which, each group of participants, whose ID numbers either started with A or B, were randomly assigned to “Nature Valley TV ad & Clif Web ad (N),” in which they saw the Nature Valley television commercial and Clif web ad, or “Clif TV ad & Nature Valley Web ad (C),” in which they watched the Clif television commercial and Nature Valley web ad.

If, for instance, the first session was showing the Nature Valley television commercial, after drawing ID numbers, participants, who were in “N” group in this example, were instructed to take laptops with odd numbers on the screens, such as 1, 3, 5, and 7 in a row. These laptops were equipped with only Clif web ads. Two links named “A” and “B” were shown on the desktops of their laptops. Participants were asked to click the link that matched the first letter of their ID numbers. Those who had
ID numbers started with “A” saw web pages with the simple
design web ad for Clif. Those whose ID numbers started with
“B” were presented with complex design web ad for Clif.

Similarly, for example, if the second session was
presenting the Clif television commercial. Participants
were asked to use laptops with even numbers marked on the
screens, such as 2, 4, 6, and 8 in each row. They were also
instructed to open either the “A” or “B” link on their
desktops, based on their ID numbers. The difference was
that participants with ID numbers that started with “A” saw
web pages with the simple design web ad for Nature Valley,
while those who opened link “B” saw the complex design web
ad for Nature Valley.

The researcher made sure participants were
appropriately seated, and the distance between each
participant was far enough, so they could not disturb each
other during the experiment. After all participants were
ready to begin the experiment, the researcher read an
instruction to them (see Appendix C for the experimental
protocol). Participants were provided with a video clip
shown on the big widescreen, which simulated television set
and a three screen-page news shown on the laptop screen.
Participants were informed that they would be presented
with a news article on the laptop and a video clip on the screen. They were also told that could use the two different media platforms freely as they would normally do.

Participants then were given the time to start using the laptops and television. In the “central route” group, participants saw a three screen-page news article with a complex design web ad, while in the “peripheral route” group, the exact same news article was presented with a simple design web ad. Participants were scanning the information on web pages at their own pace while watching the documentary with a commercial break, which simulated the simultaneous media use environment.

After completion of the experiment, participants completed an online questionnaire assessing the product recall, attitude, and purchase intention for both Nature Valley bar and Clif energy bar. In case participants would figure out the intention of the questions from later measures, the online survey was designed with the function that prevents users from going back to questions they have already answered.
Independent Variables

**Design of web ads.** Each of the two products used in this study, Nature Valley bar and Clif energy bar, had two different web ad designs. Participants were presented with a television documentary with an ad shown in the commercial break, either for Nature Valley or Clif, and web pages with a web ad, either for Nature Valley or Clif. In each condition, the product that was shown on television was different from the product that was promoted in the web ad.

**Media preference.** Participants’ media preference was measured as the second independent variable. According to previous literature, media preference may influence participants’ brand recall, attitude towards the product, and purchase intention. It is possible that people who prefer watching television as their attended media in simultaneous media environment are more likely to view television ads more positively, in other words, perform better in product recall, have more positive attitudes toward the product, and indicate stronger purchase intention, than web ads, despite the type of web ad designs. On the other hand, those who prefer using laptops may view web ads more positively than television ads.
Preference for media usage was assessed with two five-point Likert scale items. Participants were asked their level of agreement to questions as "I prefer watching TV than using Computer/Laptop (with Internet connection) in general," and "I prefer using Computer/Laptop (with Internet connection) than watching TV in general," where at 1 represented "strongly disagree" and 5 represented "strongly agree." Participants who scored 4 or higher on each scale were later coded as having a preference for either TV or Computer/Laptop.

**Dependent Variables**

**Product recall.** An online survey was conducted after participants' exposure to both web ads and television ads. Participants' aided product awareness was measured. Instead of asking what do they remember about the product from the ads, they were given five options with one product that was just shown, three similar product brands, and one option as "Don’t Know". In addition, they were asked to choose one out of five options to indicate the type of the product, the name of the product, the attributes of the product they have seen on the television and the web pages, respectively (Jablonski, Gomen, & Galbraith, 1998).
For instance, the questions were “The product that was shown on TV advertisement is about...” and “The product that was shown on web is about...” followed by five choices, where 0 represented “Beauty product” “Household Cleaning Product” “Drink,” and “Don’t Know,” and 1 represented the correct answer “Snack.”

The other set of questions asked “The name of the product that was shown on TV advertisement is...” and “The name of the product that was shown on web ads I just saw is...” where 0 presented all the incorrect answers and 1 presented the correct answer. Participants’ responses in this scale were later coded into two categories of product recall: product recall of the TV ad and product recall of the web ad.

**Attitudes toward products.** Attitudes toward products in web ads and TV ads, respectively were measured, using two sets of eight five-point semantic differential scales anchored by positive and negative adjectives (Palmgreen, et al., 1991). The questions also borrowed concepts from the ABC model, which proposes that attitude is comprised of three components, including affects, behavior, and cognition (Sheth et al., 1999, Solomon, 2007).
The overall Cronbach’s alpha coefficient of attitude scale was .906. Participants’ responses in this scale were first computed as two variables: attitudes toward Nature Valley Bar and attitudes toward Clif energy bar. Then recoded into two new variables respectively: attitudes toward TV ad product and attitudes toward web ad product.

**Purchase intention.** Participants’ purchase intention was assessed using two five-point scales ranging from “would definitely intend to buy” to “would definitely not to buy (Erickson et al., 1984). The overall Cronbach’s alpha coefficient of the purchase intention scale was .702. Participants’ responses were later coded into two categories: purchase intention towards TV product and purchase intention towards web product.
Chapter 4: Results

Overall, 23 of the 162 participants (14.2%) reported a media preference for television (i.e., rated 4 or higher on medium preference measure), 105 participants (64.8%) reported preference for computer/laptop, and 32 participants (19.7%) showed no preference for television or computer/laptop. With regards to product recall, 129 (79.6%) correctly identified the category and brand of the products shown in TV ads, while 81 of 162 respondents (50%) correctly identified the category and brand of the products that were promoted in web ads. In terms of the different web ad designs, 78 participants (48.1%) saw the simple ad design, while 84 participants (51.9%) saw the complex ad design.

Among participants (N=79) who saw the Natural Valley TV ad, 65 (82.3%) correctly recalled both the brand category and the exact brand of product on TV. 39 out of 79 participants (49.4%) correctly recalled both the brand category and the specific brand name of the web ad product.

Among a total number of 83 participants who were presented with the Clif Energy Bar TV ad, 64 (77.1%) correctly recalled the brand category and the brand name of
the TV ad product, and 42 (50.6%) correctly recalled the brand category and the brand name of the web ad product.

Research Questions 1 and 2 were answered using independent t-tests (see table 2). The first research question asked whether significant differences exist between media preferences and performance of product recall. The results showed that when exposed to TV and web at the same time, TV as a preferred medium was not significantly different from computer/laptop as a preferred medium on web ads recall \((t=.27; p=.79)\). Participants who preferred computer/laptop showed slightly better performance of TV product recall than participants that prefer TV, but the difference was not significant \((t=-.42; p=.68)\).

The second research question asked whether significant differences exist between different media preferences on attitudes toward the product. The independent t-tests results (see table 2) indicated that when using both the TV and the laptop at the same time, participants who preferred TV showed slightly more positive attitudes toward TV ad product than people preferred computer/laptop, but it was not significant \((t=.73; p=.47)\). In addition, participants who liked computer/laptop more did not show
Table 2

*Difference between Media Use Preference in Product Recall and Attitudes toward TV or Web Ad Product*

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Prefer TV</th>
<th></th>
<th>Prefer Computer</th>
<th></th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>TV Product Recall</td>
<td>1.65</td>
<td>.71</td>
<td>1.71</td>
<td>.63</td>
<td>-.41</td>
</tr>
<tr>
<td>Web Product Recall</td>
<td>1.17</td>
<td>.89</td>
<td>1.11</td>
<td>.96</td>
<td>.29</td>
</tr>
<tr>
<td>Attitudes toward TV ad product</td>
<td>2.61</td>
<td>1.17</td>
<td>2.43</td>
<td>.67</td>
<td>.73</td>
</tr>
<tr>
<td>Attitudes toward Web ad product</td>
<td>2.75</td>
<td>.93</td>
<td>2.57</td>
<td>.76</td>
<td>.96</td>
</tr>
</tbody>
</table>

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

significantly more positive attitudes toward web ad product (t=.96; p=.34).

In summary, the results indicated that whether participants prefer TV or prefer computer/laptop when they were consuming media simultaneously did not make significant differences on either their performance of product recall of TV ads or performance of product recall of web ads. Furthermore, whether participants prefer TV or prefer computer/laptop when they are consuming media simultaneously did not make significant differences on
either their attitudes toward TV ads related product or web ads related product.

Hypothesis 1 proposed that the product recall of a television ad will be significantly higher when the television ad is consumed with a simple web ad than when it is consumed with a complex web ad. It was tested using product recall of TV ads as the dependent variable, and different web ad designs as the independent variable. The independent t-tests results (see table 3) showed that participants who watched the TV ad and a simple web ad did not have significantly better recall of TV ad than those who have seen the TV ad with a complex web ad ($t=.24; p=.81$). Thus, hypothesis 1 was not supported.

Hypothesis 2 proposed that the product recall of a complex web ad will be significantly higher than a simple web ad when a television ad is consumed at the same time. The two tailed independent t-tests results (see table 3) showed that when participants watched the TV ad and saw a simple web ad design simultaneously, they had a significantly better recall of the web ad product than those who watched the TV ad and saw a complex web ad design ($t= 3.37; p= .001$).
Table 3

Difference between Web Ad Designs in Product Recall and Attitudes toward TV or Web Ad Product

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Simple Ad Design</th>
<th>Complex Ad Design</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>TV Product Recall</td>
<td>1.69</td>
<td>.65</td>
</tr>
<tr>
<td>Web Product Recall</td>
<td>1.35</td>
<td>.91</td>
</tr>
<tr>
<td>Attitudes toward TV ad product</td>
<td>1.54</td>
<td>2.56</td>
</tr>
<tr>
<td>Attitudes toward Web ad product</td>
<td>1.56</td>
<td>.23</td>
</tr>
</tbody>
</table>

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

Hypothesis 3 and 4 were tested by independent t-tests (also table 3) as well. Hypothesis 3 proposed that attitudes toward a web ad product will be significantly more positive when exposed to a simple design web ad than a complex web ad when the web ad and television ad are presented at the same time. Hypothesis 4 proposed that attitudes toward a television ad product will be significantly more positive when presented with a complex design web ad than when presented with a simple web ad. The
independent t-tests results showed that participants who
saw a TV ad with a simple web ad and participants who saw a
TV ad with a complex web ad did not differ significantly in
attitudes toward web ad ($t= .451; p=.65$) or TV ad ($t= -.53;
p=.59$).

Noticeably, the standard deviation of attitudes toward
the TV ad product was considerably higher for people who
saw a simple ad design than those who saw a complex ad
design. In other words, when exposed to a simple web ad,
users tend to have extreme evaluations of a TV ad product
than those who saw a complex web ad. It is possible that
when exposed to a simple web ad, users’ cognitive capacity
may not be exhausted by processing the web content.
Therefore, they are able to view the TV ad carefully. As a
result, in accordance with the data, people might either
like the TV ad very much or dislike it. The noticeable
difference in attitudes toward the TV ad product between
participants viewed a simple web ad design and a complex ad
design is interesting, because it showed that simple web
ads can lead to extreme evaluations of the TV ads.

Research question 3 asked what is the relationship
between web ad designs (simple versus complex) and purchase
intention in simultaneous media environment. This research
Table 4

*Difference between Web Ad Designs in Purchase Intention towards TV or Web Ad Product*

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Simple Ad Design</th>
<th>Complex Ad Design</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Purchase Intention towards TV ad product</td>
<td>2.79</td>
<td>1.16</td>
</tr>
<tr>
<td>Purchase Intention towards Web ad product</td>
<td>2.77</td>
<td>1.06</td>
</tr>
</tbody>
</table>

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

The question was answered using participants’ purchase intention towards product on TV/web ads as the dependent variable, and different web ad designs as the independent variable. The independent t-tests results (see table 4) showed that participants who saw a TV ad with a simple web ad and participants who saw a TV ad with a complex web ad did not show significant difference in purchase intention towards either the TV ad product (t = -.89; p=.37) or the web ad product (t = .88; p=.38).
Chapter 5: Discussions

Interpretation of Results

This study represents one of the first attempts to use experimental design to examine the effects of salient web ads in simultaneous media use environment, in which web ads are consumed with television programs and ads at the same time. Theoretically, the study is particularly interested in the influence of web ads’ characteristics on information processing route when two media platforms are potentially competing with each other.

The results showed that media preference is not a significant predictor of product recall. Among 162 participants, regardless of conditions they were assigned to, 14.2 percent of the participants indicated that television was their preferred medium, while 64.8 percent of the participants said they liked computer/laptop more no matter what media content is shown. For those who preferred television as a media platform, their performance in television ads recall in general did not differ significantly from those who preferred computer/laptop. Similarly, people who liked computer/laptop more did not
exhibit higher product recall of web ads than those who liked television.

No significant difference was found between media preference on attitudes toward the products. Specifically, participants who had more favorable attitudes toward television than computer/laptop did not rate television ad products significantly higher in attitudinal evaluation. Meanwhile, web ad products were not evaluated more positively than television ad products among laptop endorsers. The answers to the first two research questions lead to an argument that medium is not perceived as message, at least consciously, when people use multiple mediums at the same time.

McLuhan’s (1964) long-standing argument that medium is the message might not be empirically supported here in simultaneous media exposure. If McLuhan’s statement holds, it should be expected that medium can influence people’s media consumption outcomes. However, media preference does not show significant impact on people’s recall of media content. Therefore, it is possible that when using two media at the same time, people make choices of information to attend based mainly on media content, rather than medium type, at least at the conscious level. The current study
did not assess participants’ media preferences based on their prior media use patterns. Therefore, at the unconscious level, their media preference may be different from answers they provided to the questionnaire.

It is also possible, especially for younger generation, which has more experience in multi-tasking media use, to treat the television and laptop as communication technologies indiscriminately. The differences between print media and television are more obvious than the differences between television and computer/laptop. People can expose to both audio and video stimuli using television and computer/laptop. In particular, the task in the current study did not involve any user interaction with either the television or the laptop. Then the influences of televisions and laptops on people’s attention and memory are similar. If complex interactive web ads were used in the experiment, participants might be more engaged in the computer-mediated content (Sundar & Kim, 2005). Those who preferred computers/laptops may have a better recall and more positive attitudes toward web ad products.

Previous study showed that simultaneous presentations of advertising and television programming had negative effects on attitudes and recalls of strong messages.
(Chowdhury, Finn, & Olsen, 2007). Some researchers argued that multitasking generally resulted in diminished comprehension and performance (Bardin, Rohm, & Sultan, 2010). However, studies have shown that consumers may be able to develop skills to cope with multitasking and diminish its negative impact on attention and memory (Johnson, Bardhi, & Dunn, 2008). Paradoxes of technology theory (Mick & Fournier, 1998; Bardin, Rohm, & Sultan, 2010) has been proposed to understand the costs and benefits from multitasking. The theory suggested that frequent media multitasking activities might cultivate user socialization with media and technology. As a result, users can become more effective in attending and processing media content (Johnson, et al., 2008). Drawn from the implication of the paradoxes of technology theory, another explanation for the non-significant relationship between media preference and attitudes toward the product is that younger users may not think of media while they are exposed to information delivered by different media platforms. Instead, since media multitasking activities can become automated and ritualistic (Bardin, et al, 2010), users may only process media content and ignore information concerning the medium. In other words, as McLuhan would
argue that every medium is an extension of some human faculty (1964), user socialization with media and technology may have made medium as an extension of content.

In addition, uses and gratifications (Katz, el al., 1974) suggested that audiences’ needs, attitudes, expectations of media use, and psychological and social environment, could shape media users’ media exposure. Users choose different media outlets and use them differently to fulfill their needs or desires. Previous studies showed that people use the computers mainly for the purposes of entertainment, social interaction, passing time, escaping, and seeking for information (Kaye, 1995). Prior studies also examined the motivations for television use, and found that people watch television to escape reality, to seek for companionship, and to acquire news and information (Rubin, 2009).

Therefore, the reason why no significant relationship was found between media preference and product recall and attitude might be the “mis-match” between the expectation for medium and medium provision. Specifically, people might expect to use laptops for entertainment purposes; they were asked to read a news article in an experimental setting in which they might feel pressured to use mediums in a certain
way. Therefore, the influence of media preference on content evaluations may be underestimated.

The results showed that people who saw television ads with simple design web ads did not recall products shown on television significantly better than those who watched the same television ads with complex web ads, leaving H1 unsupported. The first possibility is that the salient web ads were not salient enough. Although complex ads were rated higher in complexity than simple ads, indicating the manipulation worked, the manipulation of complex ads may still not be strong enough. The study highlighted two characteristics of complex design that were originally theorized by Atteneave (1954) and used in previous studies to develop stimuli. The first characteristic is the amount of variety of the figures. The second characteristic is the amount of material. The web ads used in the experiment did not include unfamiliar and irregular figures in order to simulate real web ads. Strange figures may lead to participants’ suspicion that the stimuli were designed intentionally to catch people’s attention. The current study used complex web ad designs in a simple online background as a manipulation of salience. However, the complex designs might not be salient enough in triggering
greater attention and more central (systematic) processing. Future studies may take advantage of more advanced technological features, such as interactivity and navigability (2008), to generate more salient stimuli.

The lack of significant differences in recall of television ads among the control and experimental groups may be attributed to the limitations of the study design. Specifically, participants only had limited time of exposure to both the television and web content during the experimental sessions. Participants might feel pressured to process information shown on the television and the laptop. Therefore, their performances of encoding can be impaired by the “one-shot” exposure. As a result, participants did not perform a better recall for the simple web ad product than the complex web ad product when consuming television content at the same time.

Additionally, another argument can explain the result that simple ads did not elicit better recall than complex ads when consumed with television ads. Previous study showed that simultaneous presentation of programming and advertising could distract people from processing advertising-messages, especially for strong messages (Chowdhury, Finn, & Olsen, 2007). Message strength, in
consistence with the argument quality that influences the persuasive effects in central processing (Petty & Cacioppo, 1986), refers to the strength of the claims related to the product attributes. Chowdhury et al (2007) argued that the distraction effect of simultaneous advertising has significant adverse effects on strong advertising messages, but not on weak messages. Their study also revealed that the number of central thoughts, such as support or counterarguments, of participants’ in simultaneous presentation advertising condition was fewer than the number of peripheral thoughts, such as execution thoughts and program thoughts. Therefore, the researchers argued that simultaneous presentation format might work better for ads that do not contain strong cognitive arguments. Less cognitive-based ads that used more peripheral cues, such as visuals and music, may be more beneficial during simultaneous media use. Since both complex and simple web ads are visual and image based, they can be categorized as “weak messages.” In the meantime, television ads containing both visuals and audio can be “weaker” than web ads, in terms of message strength.

Although the current study did not focus on the effects of message strength in simultaneous media exposure, the
explanation of results provides a direction for future studies to measure the number of central and peripheral thoughts in processing of advertising in simultaneous presentation, in order to explicate the differences between web ads and television ads in terms of their cognitive loads. Also, the current study did not measure cognitive processing, so it is difficult to provide empirical support for either ELM or HSM. Evidence of central (systematic) and peripheral (heuristic) processing will be helpful to understand how people process media content in simultaneous environment. Therefore, future studies may use measures (Chaiken, 1980), such as thought-listing, to gauge cognitive processing.

In addition, results showed that exposure to simple design web ads and television ads leads to significantly better product recall of web ads than exposure to complex design web ads and television ads. The results can be explained by the limited capacity theory (Lang, et. al., 1999). As information recipients, people only use limited mental resources to comprehend mediated messages. Information processing can be hampered if the situation requires more cognitive resources than the users can provide (Lang, 2000). Therefore, as opposed to simple
designs, complex web ads require more mental resources. When processed with television programs and ads, complex web ads may cause information overload and exhaust people’s limited processing capacity. Therefore, people might not have enough mental resources devoted to message encoding. As a result, participants performed poorly in product recall of the complex web ads than the simple web ads in simultaneous media environment.

In terms of the attitudinal outcomes, the findings suggested that people who saw complex web ads perceived the product slightly more favorable than those who saw simple design web ads in simultaneous media setting. In other words, simple ads do not lead to more positive attitudes than complex ads. Previous studies looked into the relationships between salience ads, complex print ads in simple backgrounds, and attitudes toward products using the exposure frequency as a moderator (Krugman, 1962; Cox & Cox, 1988). They found that complex ad designs would be appreciated more with repetition. When exposed to media simultaneously, the frequency of exposure might still be a moderator in the relationship between web ad designs and attitudes toward products. As repetition increases, complex
ads will be evaluate more favorable when watched with television.

Further, participants in the complex design condition did not have more positive attitudes toward the products in the television ads than participants in the simple design condition. Therefore, H4 was not supported. A possible explanation for the lack of significant difference in evaluations of products in television ads between the simple web ad design condition and the complex web ad condition is based on the theoretical distinction between ELM (Petty & Cacioppo, 1986) and HSM (Chaiken, 1980). The current study employed ELM, and developed H3 and H4 according to the assumption that people would process salient ads, complex web ads in this case, centrally, and process simple ads in a peripheral route in a simultaneous media environment. The ELM has been applied as one of the important theoretical models in the context of studies in simultaneous media use because the limitation of the HSM. Researchers argued that HSM emphasizes domain-specific heuristics (Shah & Oppenheimer, 2008). While ELM proposed that people process information either in a central route or a peripheral route (Petty & Cacioppo, 1986), HSM (Chaiken, 1980) stated that systematic (central) processing
and heuristic (peripheral) processing could occur in a simultaneous fashion. Therefore, according to HSM, the lack of difference in attitudes toward web ad products between simple and complex conditions would occur because people tend to use both systematic and heuristic processing at the same time. In particular, in the simple web ads and television ads combination, participants processed web ads both systematically and heuristically, because they have enough mental resources to allocate to web ads. In the complex web ads and television ads combination, participants could still process web ads using two strategies. They could not involve in a complete systematic processing because both television content and complex ads asked for mental resources more than participants could offer. Therefore, participants in two conditions might have the same amount of systematic and heuristic processing of the web ads, which lead to similar attitudes toward web ad products.

From a broader viewpoint, the lack of significant difference in evaluations of television ads among the control and experimental groups may be attributed to an innate preference for computers/laptops that most people are unaware of. Brasel and Gips (2011) conducted an
experimental study and recorded participants’ interaction with a computer and television when they were multitasking across television and Internet content. Their study showed that individuals primarily attend to the computer during media multi-tasking. During the simultaneous exposure to both television and Internet content, people gazed longer on the computer than the television. However, participants significantly underestimated the amount of gaze duration, which indicates individuals do not always have insight into their media consumption behaviors. Brasel and Gips’s (2011) study provided evidences for the allocation of visual attention in simultaneous media consumption. Although the study does not necessarily predict the cognitive structures of multi-takers, it is possible that when people use laptops and television at the same time, they tend to spend comparatively more time watching the content shown on the laptop than on the television. Therefore, since people may focus more on the content shown on the laptop even they watch TV simultaneously, when television ads were consumed with simple web ads, higher recall of the web ad product was generated because simple design can be processed peripherally. Meanwhile, television ads were unable to elicit better recall even when watched with simple web ads.
Preference for laptop/computer content may not be detected by questionnaires because users do not always have accurate insight and estimation of their media consumption behaviors.

Another finding of Brasel and Gips’s study (2011) is that younger individuals switched more than they could recall, averaging more than 4 switches per minute and 120 switches over the 27.5-minute duration of the study. It could be inferred that younger people are constantly dividing their attention in simultaneous media exposure, which makes systematic processing impossible. Therefore, in a single exposure to both the television and web ads, participants may not be able to actively process product messages. If constant switches of attention can interrupt systematic processing of either the web ads or television ads, despite of the web ad designs, it is reasonable to hypothesize that users only use peripheral processing when consuming two media simultaneously. In this case, both ELM and HSM have their merits in predicting the cognitive structures of multi-takers. In other words, in simultaneous media environment, users may be distracted by both the web and the television content and therefore are unable to concentrate on any information they are exposed to unless
users have greater motivations and/or interests to view the content. However, users are sometimes unaware of the fact that they are distracted and incapable of paying attention to all presented information. Consequently, the post-experiment measures, such as product recall and attitude, however, may not capture the variances in people’s perceptions during the media consumption process. It is not entirely clear that what attributes determine the attention shift. Psychological measures, such as skin conductance, eye tracking, and heart rate measures, can be used in addition to recall and attitude measures, in order to provide a more comprehensive understanding of simultaneous media use.

Finally, in terms of purchase intention, the results showed that no significant differences were found in purchase intention toward the TV ad products between those who watched the simple web ads and those who saw the complex ads. Similarly, people who saw simple web ads were not significantly different from those who had seen complex web ads in purchase intention toward web ad products.

One possible explanation is that both products used in the experiment, Clif and Nature Valley energy bar, are existing products. Clif and Nature Valley are well-known
brands. Therefore, asking for participants purchase intentions after a single-time exposure may not capture the influence of web designs on people’s behaviors. Instead, questions might trigger people’s memories of their prior purchase experiences. Participants in the experiment are college students and energy bar products and brands may be particularly familiar to them. Accordingly, the data showed a ceiling effect. Participants generally had higher purchase intentions toward both Clif and Nature Valley energy bar, no matter which web ads they saw. In this case, it is possible that people were evaluating their prior purchase experience of Clif and Nature Valley energy bar when they answered the purchase intention questions. It is difficult to parse out the influences of web ad designs and prior experiences on people’s purchase intention. Therefore, future studies can use pseudo products or products that have not been release to the public in order to better understand the impact of web ad designs on purchase intention in simultaneous media exposure.

Also, the frequency of exposure to ads can influence people’s purchase intention (Dardis, 2009; Janiszewski & Meyvis, 2001), which may not be indicated in the current study. Generally speaking, according to previous studies,
brand attitude and purchase intention can be enhanced after multiple exposures to advocacy messages and impaired after a certain level of message repetition (Nordhielm, 2002). Some researchers examined the moderators in the relationship between repetition effects on purchase intention and exposure to ads, such as congruency in sponsorship (Dardis, 2009). Particularly, perceived congruency between brand or company and the event it sponsors mediated the effects of repeated exposure on brand attitude and purchase intention (Dardis, 2009). The current study does not manipulate exposure frequency, nor does it examine the effects of sponsorship congruency. However, if web ads are shown with a news story that is related to the product, the influence of web ad design’s purchase intention may be more salient with repetition.

The lack of significant differences in attitudes and purchase intention of television ads among the control and experimental groups may be attributed to the post-questionnaire design employed by the study, which may not accurately capture participants’ allocation of attention during their simultaneous exposure to media content. Although the recall measures could test their performances of encoding given messages, information that was not
consciously processed cannot be easily indicated by responses to such measures.

Theoretical and Practical Implications

Although the results were not in accordance with the hypotheses based on salience theory; simple web ads were recalled more than complex web ads when processed with television content. The findings support the limited capacity theory. It argues that information processing could be inhibited if people were presented with too much attention-grabbing stimuli (Lang et al., 2001). Thus, for web ad designers, they might re-consider web ad campaign strategies. As media alternatives arise, people have the option to use two or more media outlets at the same time, which means they have limited mental resources for each of them. Some might still argue that attention-drawing features, such as complex designs and animations, will lead to positive outcomes. However, the current study indicates that there is a threshold in attention, which might be a direction for future studies. In addition, it is possible that users generally process content shown in different media peripherally, unless something interesting and/or relevant attracts their immediate attention. Thus, web ads intend to generate more positive brand attitude and image.
may benefit more from simultaneous media presentation if they contain more affective around peripheral cues, such as music and tones. Web ads that aim to generate higher product and brand recall may use simple designs so that viewers may not be exhausted cognitively in processing media content.

Further, the study does not provide empirical support for ELM. As discussed before, people might not process information using either central or peripheral route. The result may suggest the possibility of HSM. In addition, given the simultaneous media setting, excluding the influences individual differences in motivation and ability to process certain information, systematic processing may not even exist, because people are constantly distracted by various media stimuli. Also, a single exposure to product ads may be insufficient to detect subtle influences of web ad designs on users perceptions.

Finally, medium preference has been studied as an important variable to understand simultaneous media behaviors. The current study suggests that more micro level questions should be asked. Based on the implications of uses and gratification theory (Rubin, 2009), people use televisions and laptops/computers to fulfill different
needs. In simultaneous media environment, media preference is not a significant predicator of attitudes toward media content. Therefore, it is not entirely clear whether people use different mediums to achieve one gratification in an accumulative manner, or different mediums are exploited to fulfill different needs at the same time. The influences of media preference should be further examined in multi-tasking context.

**Future Directions**

The findings and limitations of the current study provide possibilities for future scholars to explore the effects of web ad designs on people’s cognitive and attitudinal responses in simultaneous media exposure. Firstly, the current study used existing brands and products and the influences of pre-existing attitudinal responses and purchase intentions may be overwhelming even when random assignment was used in the experimental design. Therefore, future studies can consider using fabricated brands or newly-released products as study stimuli in order to reduce the possible influences of pre-existing attitudes and purchase intent. In experimental settings, when unfamiliar products/brands are used, participants who are
exposed to both a television ad and a web ad, may be more likely to be influenced by the ads features in simultaneous media environment rather than prior exposure to the brands/products ads and purchase experiences. The advantage of using fabricated brands or unfamiliar products as experiment stimuli is that the hypotheses of the current study may have higher probabilities to be supported. Specifically, users may prefer complex web ads to simple web ads when consuming both web ads and television as simultaneously.

Secondly, the current study showed participants both the TV ad and the web ad once before gauging their responses to the TV ad brands and the web ad brands. Future studies may conduct a longitudinal study, during which participants will have multiple exposures to the same brands/products in simultaneous media environment. Repetitive exposure to media content can provide insights for scholars to learn how people respond to information shown on the television and computer in a long run. This is especially important for the "Paradoxes of Technology Theory" (Mick & Fournier, 1998; Bardin, Rohm, & Sultan, 2010), since it has not been empirically tested that whether frequent media multitasking activities would
cultivate user socialization with media and technology. For instance, by asking users to participate to the experimental sessions three to four times during a two-month period, studies can argue that repetitive exposure to product ads shown in the television and the web may change users’ responses to a particular ad format, salient ad in particular. It is also possible that participants’ purchase intention for a particular ad brand grows stronger over time since their attitudinal associations with a particular ad brand may become more formidable as exposure accumulates. Further, conducting experimental studies over time can discover the possible moderating effects of exposure frequency. Complex web ads lead to better attitude than simple ads in simultaneous media environment. However, such result may not be found when exposure frequency increases. When users get used to the complex web ad designs, the novelty and salient effects may wear off over time. In this case, television ads may lead to more positive attitude when consumed with complex web ads than with simple web ads.

Future studies can also take advantage of other research methods besides experiment, such as anthropography and observational studies. As simultaneous media use
becomes more prevalent, users are more comfortable using multiple media at the same time. Therefore, experimental setting may not be an ideal environment for studying simultaneous media use since users are constantly aware of the existence of the researchers. Future research can situate in a natural setting in which users can feel free to use any media and shift their focus of attention anytime. In this case, researchers may better predict whether specific ad features can influence users’ attention, attitudes, and purchase intention toward a brand or product.

Future studies can also use more advanced measures to assess participants psychophysiological responses to media content in simultaneous media environment. For instance, electrocardiogram (ECG), skin conductance response, electroencelphalogram (EEG), and electrooculogram (EOG) can be used as supplement measures to questionnaires, in order to better capture any unconscious reactions to information shown on different media.

To conclude, the current study aims to determine if salient features in web advertising can influence people’s allocation of attention to different media during simultaneous media use. The major finding of the study is
that exposure to simple design web ads and television ads at the same time can have a significantly better product recall of web ads than exposure to complex design web ads and television ads at the same time. In addition, although not significant, participants who saw complex web ads evaluated the products slightly more favorable than those who saw simple web ads, when watching television at the same time. The findings and implications of the study can inspire studies in the effects of web ad features on users’ simultaneous media use experience. The lack of significant relationships in testing hypotheses provides insights of users’ simultaneous media behaviors and preferences. It is unclear that if the distinctions between different media have become obscure once young people grow to be skilled multitaskers. More research should be conducted to better understand how younger users perceive media platforms and media content in simultaneous media environment.
Chapter 6: Conclusions

Recent years have witnessed a rapid change in how individuals are selecting to use and consume their media. An increasing population of users in America watch television while using their computers to browse Internet content. According to a recent study, television and computer consumption has become a popular form of media multitasking for individuals under 18 years old (Roberts & Foehr, 2004). More and more users indicate that almost half of their television and Internet usage occurs simultaneously (Brasel & Gips, 2011).

On one hand, changes in media consumption provide a great opportunity for researchers to explore the relationship between media users, media content, and context environment. On the other hand, limited research has provided insight to how users attend to multiple screens. Many experimental studies still focused on examining the effects of single medium in design. Although much needed, research in the area of simultaneous media use is descriptive in general and unable to detect why and how users interact with multiple media platforms.

Inspired by previous studies using survey and observational methods, the current study used an
experimental design, aiming to determine if salient features in web advertising can command attention during simultaneous media use. The study used salience theory (Kardes, 2002), visual complexity (Berlyne, 1960), and the Elaboration Likelihood Model of Persuasion (Petty & Cacioppo, 1986) frameworks to predict users’ allocation of attention, product evaluations and purchase intention.

Specifically, salience theory predicts that salient stimuli, defined as information standing out from a particular setting or context, can capture users’ involuntary attention and are more likely to be selected during the message-encoding phase (Kardes, 2002). Empirical study also suggested that banner ads, as an example of salient stimuli, draw people’s attention during exposure (Clifford, 2008). Visual complexity in simple background constitutes salience. Berlyne has contributed considerably to theoretical development and empirical studies in the early 1960s. The characteristics of visual complexity that Berlyne (1958b) identified were used extensively by later research for stimuli development and further study (e.g., Areni & Cox, 1994; Hung, 2000; Furnham, Gunter, & Richardson, 2002).
Complex web ads, compared to simple web ads, attract users' attention in simultaneous media exposure. According to the theoretical implications of ELM (Petty & Cacioppo, 1986; Petty & Wegener, 1999; Petty, Priester, & Briñol, 2002), when users consume television and laptop simultaneously, complex web ads are more likely to generate systematic processing than simple web ads; television ads are more likely to generate systematic processing when consumed with simple web ads than with complex web ads.

The major finding of the current study is that exposure to simple design web ads and television ads leads to a significantly better product recall of web ads than exposure to complex design web ads and television ads. In other words, for people who use computer and television simultaneously, simple and clear web ad designs have higher probability to be remembered. It is possible that simple web ads communicate persuasive messages directly and thus do not require great amount of cognitive resources to process. Especially compared to television programs and ads, simple-designed web content can provide a “mental-break” for users in navigation between television and computer content. Web ads that intent to generate a higher
recall, new product for instance, may benefit more from simple designs in simultaneous ads presentation.

Additionally, the results showed the trend that when watching television content, people who saw complex web ads evaluated the products slightly more favorable than those who saw simple web ads. The study applied ELM in the simultaneous media use context and argued that complex web ads would trigger more central processing and users were more likely to have negative attitudes toward the television ad product because people can be persuaded easily when distracted (Strack & Deutsch, 2004). The finding suggested otherwise, indicating that participants either were unable to elucidate their genuine evaluations in response to questionnaires or they did not process complex web ads centrally.

Intuitively, favorable attitudes toward complex web ad products can be interpreted as the result of attraction to visual novelty. Besides stimulating attention, visual complexity is also curiosity arousing (Berlyne, 1958a, 1958b). Users may find complex web ads interesting and novel, and therefore rated higher than simple web ads. When asking participants about their evaluations of web ad products directly, complex designs and/or interesting
images may be retrieved from their memory of simultaneous media exposure. If less obtrusive measures are used, such as the Implicit Association Test (IAT) (Greenwald, McGhee, & Schwartz, 1998), as the theory predicts, users may show less positive attitudes toward complex web ad products. Such possibility reveals the drawback of studies using self-report measures. Especially for simultaneous media studies, accurate measurement of media multitasking is limited other than self-report studies. Combining experimental and observational methods and using unobtrusive measures may help us better understand users’ media consumption and responses.

It is not yet clear that whether favorable attitudes toward complex web ad products could lead to higher purchase intention. However, according to the findings of the study, web ads that aim to elicit more positive attitudes could use more complex designs. Additionally, the findings of the study suggest a paradox in web advertising: better product recall and more favorable product evaluation cannot be achieved using the same design. Such instances can be found in our everyday interaction with product promotions. For instance, I was driving on the highway one day and saw a billboard with a cute baby’s face on it. The
baby looked surprised and a word “What?!” was shown in big, bold, and headline fonts. I am sure it was an outdoor ad and the baby was trying to “sell” something. But since I was driving and could not see neither the brand nor other words/sentences on the board clearly, I only remembered the picture of a cute baby and the big “What?!”. I probably will not evaluate the product/brand positively even if I get to see other information on the billboard, because the ad is too simple to effectively communicate with viewers. Thus, when cognitive resources are scare, either because of time strength or multiple media content competing for attention, simple ad designs may lead to better recalls but not positive attitudes. Complex designs may take more time and effort to process, but more visual components may be particularly attracted to younger users.

Advertisers may be satisfied as long as the design can generate more favorable attitudes. However, positive attitudes may not necessarily lead to actual purchase. In most studies, the attitude measures were distributed immediately after participants’ interaction with both media. As time passes by, when participants are facing the choice of which brand of energy bar to buy, it may not be
so wise to predict that they will choose the one that they can barely remember.

Therefore, the paradox poses a new challenge for advertisers to effectively communicate with their consumers. Traditionally, when consumers only use one media at a time, advertisers may be mainly concerned about preventing ad avoidance and generating a more positive brand image. The advent of simultaneous media use energizes competition for attention among product ads. In a particular scenario, avoidance of a product ad on television may encourage consumers to view an ad on the Internet promoting a competing brand, just like Natural Valley and Clif. If when displayed simultaneously, the Natural Valley ad leads to more positive attitudes than Clif, it would be more difficult for Clif to prevail in later competition with Natural Valley.

With the advanced development of social media and interactivity functions in the online environment, the quality of web ads increases tremendously (Morgan, Richards, & VanNess, 2010). Comparing to TV ads, web ads are more economical and context-dependent. Particularly, many web ads use narratives to promote products and services (Hong & Park, 2011). For instance, a series of
YouTube ads for Mercedes Benz have been released and shared by many online users. Instead of bragging about the Mercedes’s high quality and luxury user experience, the YouTube ad told a story about a young man traveling in Europe with his brand new Mercedes. The ad lasts about 9 minutes and it is also impossible to be shown on TV for budget concerns. From the YouTube ad example, it may be inferred that web ads can be powerful. In simultaneous media consumption, web ads effects should be more thoroughly examined using both qualitative and quantitative approaches.

The lack of significant relationships in testing hypotheses also provides insights of individuals’ (especially young generation) simultaneous media behaviors and preferences. Firstly, the results of the laboratory study showed that media preference is not a significant predicator of product recall and attitudes toward the products. Secondly, participants who saw television ads with simple design web ads had a better recall of the web ad products than those who watched the same television ads with complex web ads. Finally, the study showed lack of significant differences in purchase intention toward the TV ad products between those who watched the simple web ads
and those who saw the complex ads. Similarly, people who saw simple web ads were not significantly different from those who saw complex web ads in purchase intention toward web ad products. The lack of significant findings especially for television ads can be understood from the perspective of paradoxes of technology theory (Mick & Fournier, 1998; Bardin, Rohm, & Sultan, 2010).

The paradoxes of technology theory proposed that media multitasking has both positive and negative effects on young users. On one hand, studies showed that multitasking could result in decreased comprehension and performances (Chowdhury, Finn, & Olsen, 2007). On the other hand, researchers argued that frequent use of simultaneous media consumption might ritualize multitasking activities (Johnson, et al., 2008). Users can become more effective in attending and processing media content (Johnson, et al., 2008). The benefits and costs of simultaneous media use in the context of media consumption broaden our viewpoints of young people's media uses today and tomorrow. As active and energetic learners, adolescents continue to sharpen their skills to master new media technologies. Looking around, it is not difficult to find toddlers swiping their fingers on iPad screens nowadays. While avid educators are fascinated
with the idea of using new technologies in today’s classrooms, more studies should be conducted to understand how young people use and learn with technology and identify short- and long-term effects (Madhavi, 2012).

Once young people become skilled multitaskers, the distinctions between different media may also obscure. It is a wonderful thing to imagine that in the near future, users will probably perceive media content as “floating” information; they may not care about which media they selected but rather what content really interests them. Media scholars may cast their worries, citing Neil Postman’s long-stand critique (1994) that technology is a dazzling distraction. Constant switch of attention can possibly make it harder for users to concentrate on anything; they constantly feel the need to multitask. If they only use one media outlet at a time, they may perceive their work as inefficient. Advertisers are also anxious to change their strategies to communicate with their audiences. Using web platform, advertisers may consider ad designs, interactivity, context messages, etc. in order to maximize the persuasive effects. Using television platform, advertisers may take advantage of advanced technology to make their ads more personalized and salient.
Therefore, the current study contributes to the existing literature in simultaneous media use. It reveals numerous possibilities and challenges in this area. As discussed earlier, how do web advertisers refine their ad designs to generate higher recall and better product evaluation in multi-media consumption? For experienced multitakers, what features of web ads, beside salience, have a better chance to be encoded? What makes television ads salient? All these questions need to be answered by future research. In the meantime, simultaneous media use remains a fascinating topic for both researchers and practitioners. The current study strived to explain how users process salient web ads in simultaneous media environment. More work needs to be done to better understand users’ interactions with multiple media and content using more advanced measures and methods.
References


Appendix A: Questionnaire

Hello!
Please answer the following questions (only 4 screen-pages!)
Your answers will remain completely confidential.

Session ID:
N C

Your ID:
A B

1. I use more than two media at the same time.
Never Seldom Sometimes Often Always

2. I multitask with media when I am at home.
Never Seldom Sometimes Often Always

3. I use different media at the same time because they help me learn things about myself and others.
Strongly Disagree Disagree Neither Agree nor Disagree Agree Strongly Agree

4. I use different media at the same time so I can talk with others.
Strongly Disagree Disagree Neither Agree nor Disagree Agree Strongly Agree

5. I use different media at the same time because they amuse me.
Strongly Disagree Disagree Neither Agree nor Disagree Agree Strongly Agree

6. I use different media at the same time because they are available.
Strongly Disagree Disagree Neither Agree nor Disagree Agree Strongly Agree
7. I use different media at the same time because it passes the time away, particularly when I am bored.

Strongly Disagree Disagree Neither Agree nor Agree Strongly Agree

8. I use different media at the same time because it is a habit, just something I do.

Strongly Disagree Disagree Neither Agree nor Agree Strongly Agree

9. I use different media at the same time because a single medium cannot satisfy my needs.

Strongly Disagree Disagree Neither Agree nor Agree Strongly Agree

10. I use different media at the same time just because I can access all of them easily.

Strongly Disagree Disagree Neither Agree nor Agree Strongly Agree

11. I use different media at the same time because my friends do.

Strongly Disagree Disagree Neither Agree nor Agree Strongly Agree

12. I am more likely to use different media at the same time when I am in the same room with friends/family.

Strongly Disagree Disagree Neither Agree nor Agree Strongly Agree

13. I am more likely to use different media at the same time when I am alone.

Strongly Disagree Disagree Neither Agree nor Agree Strongly Agree
14. My use of different media at the same time depends on the time of day.
   Strongly Disagree  Disagree  Neither Agree nor Disagree Agree Strongly Agree

15. My use of different media at the same time depends on the accessible of media.
   Strongly Disagree  Disagree  Neither Agree nor Disagree Agree Strongly Agree

16. I prefer watching TV than using Computer/Laptop in general.
   Strongly Disagree  Disagree  Neither Agree nor Disagree Agree Strongly Agree

17. I prefer using Computer/Laptop than watching TV in general.
   Strongly Disagree  Disagree  Neither Agree nor Disagree Agree Strongly Agree

18. When I multitasking, TV is always involved in my media combination.
   Strongly Disagree  Disagree  Neither Agree nor Disagree Agree Strongly Agree

19. When I multitasking, Computer/Laptop (with Internet connection) is always involved in my media combination.
   Strongly Disagree  Disagree  Neither Agree nor Disagree Agree Strongly Agree

20. I do a better job if I focus on one thing at a time.
   Strongly Disagree  Disagree  Neither Agree nor Disagree Agree Strongly Agree
21. I like the TV shows I just watched.

Strongly
Disagree
Disagree
Neither
Agree nor
Disagree
Agree
Strongly
Agree

22. I enjoyed reading the news that was appeared in my laptop screen.

Strongly
Disagree
Disagree
Neither
Agree nor
Disagree
Agree
Strongly
Agree

23. I paid more attention to the TV commercial than the web ad, which I just saw.

Strongly
Disagree
Disagree
Neither
Agree nor
Disagree
Agree
Strongly
Agree

24. I paid more attention to the web ad than the TV commercial, which I just saw.

Strongly
Disagree
Disagree
Neither
Agree nor
Disagree
Agree
Strongly
Agree

25. Generally speaking, I paid more attention to what was showing on TV just now.

Strongly
Disagree
Disagree
Neither
Agree nor
Disagree
Agree
Strongly
Agree

26. Generally speaking, I paid more attention to what was showing on the laptop just now.

Strongly
Disagree
Disagree
Neither
Agree nor
Disagree
Agree
Strongly
Agree

27. The product that was shown on TV advertisement is about:

Beauty product
Household Cleaning
Product Snack Drink
× Don't Know

144
28. The product that was shown on web is about:

<table>
<thead>
<tr>
<th>Beauty Product</th>
<th>Household Cleaning</th>
<th>Snack</th>
<th>Drink</th>
<th>Don't Know</th>
</tr>
</thead>
</table>

29. The name of the product that was shown on TV advertisement is:

<table>
<thead>
<tr>
<th>Nature Valley Bar</th>
<th>Hershey’s Kisses</th>
<th>Clif Energy Bar</th>
<th>Dove Chocolate</th>
<th>Don't Know</th>
</tr>
</thead>
</table>

30. The name of the product that was shown on web ads I just saw is:

<table>
<thead>
<tr>
<th>Nature Valley Bar</th>
<th>Hershey’s Kisses</th>
<th>Clif Energy Bar</th>
<th>Dove Chocolate</th>
<th>Don't Know</th>
</tr>
</thead>
</table>

31. I would intend to buy the product that was in the TV commercial.

<table>
<thead>
<tr>
<th>Definitely intended to buy</th>
<th>Might not to buy</th>
<th>Not sure</th>
<th>Might to buy</th>
<th>Definitely intended to buy</th>
</tr>
</thead>
</table>

32. I would intend to buy the product that was in the web ad.

<table>
<thead>
<tr>
<th>Definitely intended to buy</th>
<th>Might not to buy</th>
<th>Not sure</th>
<th>Might to buy</th>
<th>Definitely intended to buy</th>
</tr>
</thead>
</table>

33. “I think Nature Valley Bar is...”

<table>
<thead>
<tr>
<th>good</th>
<th>pleasant</th>
<th>valuable</th>
<th>favorable</th>
<th>acceptable</th>
<th>nice</th>
<th>wonderful</th>
<th>excellent</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>bad</th>
<th>unpleasant</th>
<th>worthless</th>
<th>unfavorable</th>
<th>unacceptable</th>
<th>awful</th>
<th>horrible</th>
<th>poor</th>
</tr>
</thead>
</table>

145
34. “I think Clif energy bar is...”
   - good [ ] [ ] [ ] [ ] bad [ ]
   - pleasant [ ] [ ] [ ] [ ] unpleasant [ ]
   - valuable [ ] [ ] [ ] [ ] worthless [ ]
   - favorable [ ] [ ] [ ] [ ] unfavorable [ ]
   - acceptable [ ] [ ] [ ] [ ] unacceptable [ ]
   - nice [ ] [ ] [ ] [ ] awful [ ]
   - wonderful [ ] [ ] [ ] [ ] horrible [ ]
   - excellent [ ] [ ] [ ] [ ] poor [ ]

35. I think the design of the web ad I just saw was:
   - simple [ ] [ ] [ ] [ ] complex [ ]

36. Gender:
   - Male [ ]
   - Female [ ]

37. Ethnicity
   - Caucasian or
   - Asian or Pacific Islander [ ]
   - African American [ ]
   - Indian or Alaska Native [ ]
   - Hispanic [ ]
   - Other [ ]

38. Age:

39. What TV commercial you just saw?
   - Nature Valley Bar [ ]
   - Clif Energy Bar [ ]
Appendix B: Ohio University Consent Form

Hi, you are being asked to participate in research. For you to be able to decide whether you want to participate in this project, you should understand what the project is about, as well as the possible risks and benefits in order to make an informed decision. This process is known as informed consent. This process describes the purpose, procedures, possible benefits, and risks. It also explains how your personal information will be used and protected. Before participating in the experiment, make sure you understand this form and your questions about the study are answered. Responses to the survey indicates your consent for use of the answers you supply. You must be 18 years of age or older to complete the experiment. You are encouraged to write down all the information you need, as well as the researcher’s contact information.

Explanation of Study

The purpose of this research is to explore different media platforms’ effects on audiences in the simultaneous media environment. This experiment takes approximately 20 minutes to complete. Your replies will be kept confidentially; do not tell me your name. You may choose to not answer any question and simply say I don’t want to answer it. You may end participation in this survey at any point. You must be 18 years of age or older to complete the experiment.

Risks and Discomforts

No risks or discomforts are anticipated.

Benefits

This study studies media effects in simultaneous media environment. By understanding effects of different media platforms when using media at the same time, media can be more precise when it tries to convey its message to targeted audiences.
Confidentiality and Records

Only the researcher will have access to any information collected. All recorded data will be confidentially collected and stored.

Additionally, while every effort will be made to keep your study-related information confidential, there may be circumstances where this information must be shared with:
* Federal agencies, for example the Office of Human Research Protections, whose responsibility is to protect human subjects in research;
* Representatives of Ohio University (OU), including the Institutional Review Board, a committee that oversees the research at OU;

Contact Information

If you have any questions regarding this study, please contact Shanshan Lou, sl174009@ohio.edu or (740) 590-8591. If you have any questions regarding your rights as a research participant, please contact Jo Ellen Sherow, Director of Research Compliance, Ohio University, (740)593-0664.

By signing below, you are agreeing that:
* you have read this consent form (or it has been read to you) and have been given the opportunity to ask questions
* known risks to you have been explained to your satisfaction.
* you understand Ohio University has no policy or plan to pay for any injuries you might receive as a result of participating in this research protocol
* you are 18 years of age or older
* your participation in this research is given voluntarily
* you may change your mind and stop participation at any time without penalty or loss of any benefits to which you may otherwise be entitled.

Signature____________________ Date__________________

Printed Name________________________
Appendix C: Experimental Protocol

1) "Hello, my name’s (researcher). Today I’m going to ask you to participate in a study examining the effects of media. However, before you can participate, I must ask you to please read these forms telling you about your rights as research participants. Please take a minute to look over and sign these forms, and then please hand them back to me when you are done."

> Give Consent Form to Participants <

2) "Thank you very much. Are there any questions?"

> Take/Answer Questions <

3) “Thanks again. Throughout today’s session, I’ll need to read this protocol in order to maintain the study’s integrity. First, we’re going to pick some ID numbers from a bag, and you will write these ID numbers on any questionnaires you might fill out during today’s session. So, please keep a hold of them. It’s fine to look at your ID as soon as you pick it, but please do not tell me or anyone else what it is. Thank you.”

> Hand around bag, and let participants pick out a number <

4) "OK, now please open the Web link on the desktop with the name that matches the first letter of your ID number. We’re going to look at a piece of news article shown on three consecutive screen pages. At the mean time, a documentary will be displayed on the front screen. Please read the news story while watching the video clip as you would normally do and according to your own pace. Please do not look at other participants’ laptop screens when you are either reading the news or watching the video.

5) “Okay, you may start now”

6) "Thanks again. Now I am going to ask you to fill out some questionnaires. Please open the SURVEY document on your desktop. Copy and paste the link to your web browser. Please correctly indicate the session ID and your own ID on
the questionnaire. Just raise your hands when you’re done, OK?"

> Wait until all hands are raised <

7) “Thank you very much for your help. The intent of this research is to find whether the web ad design, particularly complex versus simple design, can have differential effects in simultaneous media use environment. In two groups, participants may have seen a complex web ad or a simple one. I did this so I can see whether viewing ads with different levels of attention makes a difference. The answers you and other provide will be used to communicate ad production and placement knowledge and suggestions to advertisers and other communication researchers. As I said earlier, your answers will remain completely anonymous. Thanks again for your help, and are there any questions?”

> Take/Answer Questions <

8) “Okay, thanks again. Now, in order to maintain the integrity of this research, PLEASE DO NOT TALK TO ANY OTHER OHIO UNIVERSITY STUDENTS about this study until your professor talks about it in class, okay? Doing so could make the results of the study invalid. Thank you very much for your help—I really appreciate it.”