THE EFFECT OF PROGRAM-INDUCED ENGAGEMENT ON MEDIA MULTITASKING AND THE MODERATING ROLE OF BRAND FAMILIARITY

by

HYEJIN BANG

(Under the Direction of Karen W. King)

ABSTRACT

The purpose of this study was to investigate the effect of program-induced engagement on the amount and types of media multitasking while watching TV, to examine the effect of media multitasking on cognitive and affective evaluation of ads, and to explore the moderating role of brand familiarity. To gain insight into the media-multitasking patterns and motivations of digital natives, two focus-group interviews were conducted with ten college students. Based on findings from those interviews, two lab-based experiments were conducted to test the proposed research question and hypotheses. In the first experiment (n = 104), which relied on self-reported media-multitasking behavior, a 2 (Program Engagement: CHAH vs. CLAH) × 2 (Tasking Type: Single vs. Multiple) × 2 (Brand Familiarity: High vs. Low) mixed-subjects experiment design was used. In the second study (n = 106), to replicate the findings of the first experiment, a 2 (Program Engagement: CHAH vs. CLAH) × 2 (Brand Familiarity: High vs. Low) between-subjects design was used in the context of media multitasking. In addition, an unobtrusive eye-tracking device was used in the second experiment to observe actual amounts of media multitasking.

The findings of the two experiments were four fold. First, the findings indicate that when the programs were affectively engaging, programs with a high level of cognitive engagement led to a lower level of overall media multitasking than programs with a low level of cognitive engagement, not only during the programs but also during the commercial breaks. Second, media multitasking led to reduced ad memory, a finding that is consistent with previous studies. Third, an interaction effect between tasking type and program-induced engagement emerged. The findings indicate that even in the same media multitasking situation, people who watched a program with high cognitive engagement reported a higher level of ad memory than people who watched a program with low cognitive engagement due to the attentional spillover effect. Fourth, the findings revealed a possible moderating role of brand familiarity, indicating that brands with a high level of familiarity might reduce the memory deficit effect of media multitasking.

INDEX WORDS: Media Multitasking, Program-Induced Engagement, Limited Cognitive Capacity, Advertising Effect, Memory

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DEDICATION

I gratefully dedicate this dissertation to my parents and my loving husband.

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CHAPTER 1

INTRODUCTION

Consider the following scenario: Sarah and her brother Mike are sitting together on the couch watching a popular show, *Saturday Night Live*. As always, both of them are holding their smartphones, and their laptops and iPads are also within reach. While watching the show, Sarah receives a notification from Facebook that her best friend, who is now on vacation in Italy, uploaded new pictures on the newsfeed. To check her status and look at the pictures, Sarah opens the Facebook app on her smartphone and browses the newsfeed while trying to follow the television show. At the same time, Mike suddenly remembers that he has to book a flight to New York for his friend's upcoming wedding. To check for a good deal, he grabs his laptop and searches Expedia and Orbitz while watching the show.

This scenario represents a normal pattern of media consumption: *media multitasking* (MM), the simultaneous use of two or more media devices at a time (Duff & Sar, 2015; Ophir, Nass & Wagner, 2009; Wang & Tchernev, 2012). Responding to the pervasiveness of this phenomenon, scholars have investigated several questions associated with information processing and media effects related to MM. For instance, prior studies have found that MM resulted in diminished attention, lower quality of exposure, shallow processing, and decreased memory of messages (e.g., ads) in the media (Armstrong & Chung, 2000; Courage et al., 2015; Segijn, 2015; Shapiro & Krishnan 2000; Zhang et al., 2010). On the other hand, MM might also inhibit counter argumentation and increase enjoyment and acceptance of messages (Chinchanachokchai, Duff, & Sar, 2015; Jeong & Hwang, 2012).

While many researchers have investigated how audience factors, such as personality (Jeong & Fishbein, 2007; Sanbonmatsu, Strayer, Medeiros-Ward, & Watson, 2013), age (Carrier et al., 2009; Voorveld & Van der Goot, 2013), gender (Jeong & Fishbein, 2007), sensation seeking (Duff et al., 2014), and processing style (Duff & Sar, 2015) influence MM, the effect of situational factors, especially media factors, on MM and, subsequently, on ads has not been extensively studied. That is, even though the potentially detrimental effects of MM on advertising have been recognized, exactly when and how these effects occur is not clear. For marketers and advertisers, identifying when and how people are likely to turn their attention away from the primary screen is an issue that directly impacts media-planning decisions. Although some scholars have examined the effect of program type on MM during the program itself, the results are inconclusive (Christensen et al., 2015; Voorveld & Viswanathan, 2015; Wang et al., 2015); furthermore, little research has looked at how media context factors affect MM during *commercial breaks*. This study tries to examine whether the amount of MM during programs and commercial breaks varied with the level of program-induced engagement.

Upon closer examination, the MM behavior of Sarah and Mike indicates two different types of MM. Sarah's second screening can be categorized as more hedonic or entertaining MM, while Mike's can be regarded as more goal-oriented, utilitarian, or information-seeking MM. Yeykelis, Cummings, and Reeves (2014) identified two different motives for MM behavior: work (i.e., Word, Excel, and Powerpoint) and entertainment (i.e., web surfing). These motivations might impact the way people divide their attention between a television show and a second screen and the manner in which they interact with the two screens, and they might ultimately affect the viewing experience and how consumers process the ads delivered to them. Despite the distinctions that might exist between different kinds of MM, no advertising studies

on MM have taken these distinctions into the account when explaining the effect of MM on advertising effectiveness.

To increase understanding of this issue, the current study first examined media-related predictors of MM (e.g., program-induced engagement) and their impact on cognitive and affective evaluation of ads. Based on the cognitive engagement and the affective engagement constructs, this study proposed that program-induced engagement is a media-related situational factor that affects (a) the amount of MM in which people engage during programs and during commercial breaks, (b) the types of secondary tasks in which people engage while attending to primary media content, and (c) the impact of MM on ad evaluations. Furthermore, by examining the moderating role of brand-related cues, based on the Associative network memory model (Anderson, 1983; Keller, 1993), the current study examined how different levels of brand familiarity might attenuate the potential negative effect of MM on ad evaluations.

The contribution of this study is fourfold. Although a few studies have examined the effect of media context on MM during program viewing, the findings have been inconsistent, possibly due to the confounding effects of observational data. Furthermore, none of these studies has examined the effect of media context on MM during commercial breaks. By applying the theoretical concept of cognitive engagement and affective engagement to a carefully designed experiment, this study aims to fill this gap. Studies that have examined the effect of context on ad effectiveness are prevalent, but none of these studies has focused on multitasking. By introducing the MM variable, the current study examined how media context influences ad processing while attending to a second screen. Third, previous studies on MM have neglected the different motivations for second screening. To fill this gap, this study introduces two distinctive types of MM: *utilitarian* MM and *hedonic* MM. Finally, methodologically, a sizable number of

previous studies that examined MM in the advertising context have lacked ecological validity, manipulating MM using unrealistic or artificial tasks (e.g., remembering seven digit numbers while watching TV or pressing a key when a particular letter appears in the second window). To overcome this problem, participants in the current study were allowed to engage in MM using their own smartphone, the most frequently used second device among young consumers (Interactive Advertising Bureau [IAB], 2015). Additionally, the eye-tracking measures included in this study provide more accurate knowledge about the way consumers divide or switch their visual attention across multiple screens.

This study is structured as follows. Chapter 1 provides an overview and introduction to the research. Chapter 2 reviews existing literature on the antecedents and consequences of MM, the effect of program-induced engagement, and the role of brand familiarity. Based on the discussion of previous literature, hypotheses and research questions are proposed. Chapter 3 details the three qualitative studies conducted by the researcher. Chapter 4 presents the findings of the focus-group interviews conducted. Chapter 5 outlines the method for Experiment 1, and the results of Experiment 1 are presented in Chapter 6. Chapters 7 and 8 present the method and results of Experiment 2, respectively. Chapter 9 summarizes the findings, explains theoretical and practical implications, details limitations, and makes suggestions for future research.

CHAPTER 2

TEORETICAL FRAMEWORK AND HYPOTHESES

This chapter provides a literature review on media multitasking and proposes hypotheses and research questions. The literature review first introduces the concept of MM as a normal pattern of media consumption and discusses the importance of the phenomenon in the advertising field. Then it identifies various predictors of MM and discusses how program-induced engagement predicts the amount and types of MM in which people engage. The consequences of MM on cognitive and affective evaluations of advertising are reviewed, followed by a discussion of how brand familiarity might moderate the effect of MM.

The Prevalence of Media Multitasking

MM can be generally defined as "performing two or more tasks simultaneously, one of which involves media use" (Lang & Chrzan, 2015, p. 100). However, two different views of multitasking have emerged: sequential and concurrent. The sequential multitasking perspective assumes that people cannot encode and process more than one stimulus at a time. From this point of view, multiple tasks are sequentially performed, one at a time, through rapid attention switching between multiple stimuli (Wood et al., 2012). Other scholars see multitasking as the result of divided attention, assuming that people can process multiple stimuli concurrently instead of switching between tasks (Posner, 1990). Considering these two distinct definitions, the current study adopted the sequential multitasking perspective, defining MM as "sequential engagement in multiple media activities through rapid attention switching."

MM can be categorized into three types: (a) multitasking between a medium and a non-media activity (e.g., television and conversation), (b) multitasking between two or more media (e.g., mobile device and television), and (c) multitasking between two different tasks within a single medium (e.g., two tasks opened on a computer. The concept of engaging in other activities while consuming media (e.g., watching TV) is not new. Through in-home observation, Krugman et al. (1995) found that audiences engaged in many complementary (e.g., eating, drinking, conversation about the program) and competitive (e.g., chores and hobbies) activities while watching TV. Although most of the multitasking behavior at this time was non-media activity (Jeong & Fishbein, 2007), the number of people who concurrently consume multiple media (e.g., the second and third types of MM) is on the rise (Ophir, Nass & Wagner, 2009; Voorveld et al., 2014). This "new normal" media consumption pattern has emerged primarily because digitalization and increased portability of media devices have allowed people to possess a variety of screens and because the widespread availability of high-speed information has fueled the expectation that human cognitive systems can simultaneously process and respond to multiple sources of information.

While overall media use among U.S adults has increased by 20% over the past decade, the amount of time people spend MM has increased more than 119% over the same period (Becker, Alzahabi, & Hopwood, 2013). For instance, one study found that more than 50% of Internet users engaged with at least one other medium concurrently when they were online (Moses, 2010). A recent study conducted by IAB indicated that about 80% of U.S. adults used another device (e.g., smartphone, laptop, tablet) while watching TV, indicating that MM has become the default mode for media consumers. About 70% of smartphone owners, 54% of computer owners, and 53% of tablet owners indicated that they tended to engage in other media

activities on their devices while watching TV on a daily basis (IAB, 2015). Another recent study found that combining multiple new media (i.e., simultaneous use of laptop and mobile phone) was more common than combining two traditional media (i.e., simultaneous use of television and magazines) or one traditional medium and one new medium (i.e., simultaneous use of television and a mobile phone) (Voorveld et al., 2014).

In addition to multitasking between media (i.e., texting on a mobile device while watching TV), MM can also occur within a medium. For instance, people can have multiple screens for different tasks opened on one computer. Furthermore, the current development of highly multitasking-friendly media technology (e.g., split-screen features) has facilitated within-medium multitasking. The new "split-screen" feature in iOS9, for example, allows users to operate two iPad apps side-by-side (e.g., search information on Chrome while watching a video).

Although MM has often been considered a homogenous phenomenon, the combination of tasks or media can vary, and the effects of different forms of MM might differ (Voorveld et al., 2014; Wang et al., 2015). The occurrence and effect of *between*-MM and *within*-MM could differ in terms of task contiguity, physical proximity between tasks, and task-switching cost (Jeong & Hwang, 2016). Paying attention to these differences, the current study focused on the predictors and consequences of simultaneous consumption of multiple media (e.g., between-MM / multiscreening).

The Importance of Media Multitasking in Advertising

McGuire's model of persuasion (1972) indicates that persuasion occurs through several stages: message exposure/presentation, attention/awareness, comprehension, yielding, retention, and action. This hierarchy of effects of persuasion suggests that exposure to an advertising

message does not necessarily result in message retention or desired behavior if earlier stages, such as attention or comprehension, are interrupted by a distracter (Jeong & Fishbein, 2007; McGuire, 1972). Thus, a minimum amount of visual and cognitive attention is required for ads to begin to have an influence on consumers (Teixeira,Picard & Kaliouby, 2014).

However, IAB (2015) indicates that MM behavior has become more prevalent. Engaging in multiple media activities unavoidably creates competition for audience attention and consequently divides attention among multiple media content, for people have limited attention and cognitive resources available for mental processing (Jeong, Hwang, & Fishbein, 2010; Lang, 2000, Pashler, 1994). As MM possibly decreases not only the quantity of exposure (e.g., the actual amount of attention paid to ads) but also the quality of exposure (e.g., comprehension of a message or retention rate), the rise of the phenomenon has become a potential threat to advertising effectiveness.

Despite the ubiquity of media-multitasking and the concern of advertisers, most advertising research has assumed a *sequential* marketing communication model (i.e., monomedia consumption), according to which consumers remain a captive audience of ad messages from one medium in isolation (Bardhi, Rohm, & Sultan, 2010; Duff & Sar, 2015; Pilotta et al., 2004). That is, advertising is assumed to engage the full attention of consumers. Therefore, more scholarly attention is needed to assess the quality of ad exposure in MM situations and its effect on ad evaluation.

Predictors of Media Multitasking

Given the prevalence of MM, researchers have identified predictors that might increase or decrease the probability that one will engage in MM (Duff et al., 2014; Hwang , Kim, & Jeong,

2014; Jeong & Fishbein, 2007; Sanbonmatsu et al., 2013; Voorveld et al., 2014). The predictors of MM can be divided into audience-related factors and media-related factors.

Previous studies have focused on audience-related factors (i.e., personality traits or socio-demographic factors) as antecedents of MM. For instance, two predominant individual traits that have been widely known to affect MM are impulsivity and sensation seeking. In particular, studies have found that high sensation seekers (Jeong & Fishbein, 2007; Sanbonmatsu et al.2013) and those with high levels of attentional impulsivity (Duff et al., 2014; Sanbonmatsu et al.2013) tend to have difficulty focusing on a single task and are more likely to engage in MM. Other individual traits that have previously been found to affect MM behavior include personal control (Duff et al., 2014), perceived creativity (Duff et al., 2014), neuroticism (Poposki, Oswald, & Chen, 2009; Wang & Tchernec, 2012), and need for simplicity (Duff et al., 2014). Among demographic variables, age and race were found to have predictive power in MM (Duff et al., 2014; Jeong & Fishbein, 2007). In particular, women have been found to engage in a higher level of MM. Also, as age decreased, the tendency to multitask increased, reflecting a heavy MM pattern among digital natives.

In addition to the role of innate personality traits and individual characteristics, the effect of media-related factors (e.g., technology availability, media ownership, media type, the presence of others, and media content) on MM has recently attracted attention in the communication field (Christensen et al., 2015; Voorveld & Viswanathan, 2015; Wang et al., 2015). For instance, the number of media devices a person owns (Jeong & Fishbein, 2007) and the use of social networking sites (Zhong, Hardin, & Sun, 2011) has been found to relate positively to the frequency of MM (Jeong & Fishbein, 2007). Also, Voorveld and Viswanathan

(2015) found that when watching sports programs in the presence of others, people tend to multitask more than they do in solo-watching situations.

To identify when people shift attention from a primary screen to a second screen for MM, studies have investigated the effect of types of media content on attention (Christensen et al., 2015; Hawkins et al., 2005; Voorveld & Viswanathan, 2015), but the results have been somewhat inconsistent. Hawkins et al. (2005) found that people use different styles of attention while watching different media content (i.e., news, drama, ads, comedy). People tend to use monitoring looks, an active viewing strategy, more frequently during a drama than during a comedy, while engaged looks, which last 5.5-15 seconds, were less frequent during a drama. Although the different styles of attention are not direct indicators of MM frequency, it may suggest that different degrees of MM might occur with different programs (e.g., low possibility of MM during a comedy). A recent field study conducted by Neilson (2015) found that comedy content required more attention from audiences, resulting in less MM across digital devices; in contrast, people were highly distracted by other devices when watching information programs, such as news. However, other studies have found the opposite pattern. For instance, using ecological momentary assessment, one study found that adolescents aged between 12 and 15 year tended to engage less in both non-media activities and media activities while watching dramas and more during comedies, perhaps because people tend to be more engrossed in drama (Christensen et al., 2015). Also, using observation, Vooveld and Viswanathan (2015) found that MM was more prevalent during entertainment programs than news and reported that commercials were associated with lower levels of MM.

Such inconsistent results could be explained in two ways: (a) confounding effects associated with observational studies and (b) an overly simple classification of media content by

program genre. First, most of the studies examining the effect of TV programs on MM have relied on observational data (Hawkins et al., 2005; Neilson, 2015; Vooveld & Viswanathan, 2015). Although observation methods can increase the ecological validity of research findings, the results are likely to be biased due to either measured or unmeasured baseline characteristics (e.g., specific program content that subjects choose, forms of the second screen, the presence of others) (Austin, 2011). And although previous studies have distinguished media content primarily by program genre, different programs within the same genre might differently affect the ways people interact with second screens, for each program might call for different levels of program-induced engagement or elicit different types of emotions. Furthermore, although previous studies have examined the effect of program genre on MM during the program itself, the ways and extent to which media content affects MM during commercial breaks, despite being of high interest to advertisers, is still unknown.

To address the limitations of previous studies and fulfill the need for research that can provide more practical guidance for the media and advertising industries, the current study examined how different levels of program-induced engagement with TV programs might shape MM both during the programs themselves and during the commercial breaks that interrupt programs.

The Importance of Program-Induced Engagement on Media Multitasking

Because MM occurs in the presence of more than two media or tasks, the way, and extent to which, audiences interact with a primary medium determines resource demands and resource allocation (Wang et al., 2015). That is, the context in which audiences experience the primary medium (e.g., intensity of emotions) might predict the likelihood of MM. Engaging in another

task on another screen, in turn, is likely to affect how audiences process media content (i.e., programs and commercials).

Many studies on context effect in advertising have examined the relationship between media context, including context-induced affect (Aylesworth & MacKenzie, 1997), congruency effect (Dahle'n, 2005), media engagement (Parker & Furnham, 2007), and ad effectiveness (Moorman, Neijens, & Smit, 2007). However, none of these studies considered the presence of multiple screens in a media consumption situation. Thus, little is known about (a) whether and how different media contexts influence audience readiness to engage in MM or (b) how different levels of MM in different media contexts shape how individuals pay attention to, perceive, and retain ad content.

Among various media context variables, program-induced engagement, defined as "an active, motivated state, signifying interest and arousal induced by a television program" (Moorman, Neijens, & Smit 2007, p. 131), is known to influence cognitive processing of commercials (e.g., Attention, Ad Recognition, Ad Recall; Bryant & Comisky, 1978; Krugman, 1983; Moorman et al., 2007, 2012; Norris, Colman, & Alexo, 2003). However, the results have been inconsistent. For example, early research on the relationship between context-induced engagement and ad recall indicates that a greater level of program engagement hampered ad memory based on *cognitive deficit assumption* and *cognitive capacity theory* (Bryant & Comisky, 1978; Gunter, Furnham, & Beeson, 1997; Kennedy, 1971; Mundorf, Zillmann, & Drew, 1991; Norris & Colman, 1992). Bryant and Comisky (1978) found that the recall of a commercial was inversely associated with cognitive engagement with a program because cognitive resources tend to be preoccupied when watching a highly engaging program. Mundorf et al. (1991) found that emotionally engaging stimuli led to reduced attention and poor information acquisition of a

subsequent ad. Other researchers have reported the opposite relationship based on *attention spillover* or *the carryover hypothesis* (Lloyd & Clancy, 1991; Moorman et al., 2007; Moorman et al., 2012; Norris & Colman, 2003; Swallen, 2000). Using a semi-natural experiment, Norris and Colman (2003) found that program-induced involvement led to higher levels of ad memory (e.g., ad recall and recognition) due to ongoing experience of increased attention. Furthermore, other studies found that this positive relationship between program-induced engagement and ad memory was mediated by ad attention (Moorman et al., 2007; Moorman et al., 2012). Lastly, some studies, such as Celuch and Slama (1998), discovered that the relationship between program-involvement and ad processing depended on ad involvement, suggesting that cognitive ads are more difficult to process when they air during a cognitively involving program due to a shortage of mental resources, while affective ads are easier to process when they air during an affectively involving program due to a priming effect.

One reason the results have been inconsistent might be differences in the way program-induced engagement has been conceptualized (Gunter et al., 1997; Moorman et al., 2007). Moorman et al. (2007, 2012) and Norris and Colman (1992, 1993) conceptualized a high (low) level of program engagement as a presence (absence) of both cognitive and affective engagement. Other researchers have viewed the two types of engagements as mutually exclusive, contrasting the effects of cognitive engagement and affective engagement (i.e., Park & McClung, 1986; Celuch & Slama, 1998). Finally, some researchers conceptualized program involvement based on only one type of program involvement, either cognitive or affective. For example, Bryant and Comisky (1978) conceptualized it as cognitive involvement, while Mundorf et al. (1991) conceptualized it as affective involvement. These conceptual differences, along with methodological variety might have led to inconsistent results. Another explanation is

experimental design differences (Gunter et al., 1997; Moorman et al., 2007). While most studies indicating a positive relationship between program-induced involvement and ad recall relied on more naturalistic field observation, allowing audiences to choose their exposure to commercials (Lloyd & Clancy, 1991; Moorman et al., 2007; Moorman et al., 2012; Norris & Colman, 2003; Swallen, 2000), studies indicating a negative relationship have used laboratory settings with forced exposure (Bryant & Comisky, 1978; Gunter et al., 1997; Mundorf et al., 1991; Starr & Lowe, 1995).

Previous studies about the effect of program-induced engagement on ad recall have led to mixed results and have not directly tested any effects on MM. However, by implication, different levels of program-induced engagement are likely to affect the amount of cognitive resources devoted to programs and commercials, potentially influencing the number of secondary activities in which people can engage. Addressing disagreements about the definition of program engagement in previous studies, this dissertation used a program engagement grid that allows for four different types of program engagement (i.e., combinations of cognitive engagement (high vs. low) and affective engagement (high vs. low)). Also, considering not only the benefits of a controlled laboratory study but also the benefit of selective exposure to commercials to media consumers, this dissertation used controlled laboratory experiments that allowed participants's free exposure to commercials through MM.

Program-Induced Engagement

Program-induced engagement can be classified into two categories: cognitive program engagement and affective program engagement (Celuch & Slama, 1993). In particular, cognitive engagement refers to thought-related reactions generated by stimuli or concerns to the functional

information of communication. If people have to devote a significant amount of cognitive effort to follow a story and comprehend the details of a program, cognitive engagement can be considered "high." Affective engagement, on the other hand, can be defined as one's sense of emotional connection with the program or characters or a feeling or arousal induced by the content (Park & Young, 1983). For instance, viewers might indulge in fantasies or aesthetic thoughts through self-identification with a character, and this process can widen the emotional horizons of the program (Cohen, 2001).

Even though previous studies have conceptualized program-induced engagement as (a) the presence or absence of both cognitive and affective engagement or (b) the presence or absence of either cognitive or affective engagement, programs are more likely to engage consumers in one of four different ways, based on various combinations of cognitive and affective engagement levels. That is, similar to the FCB Grid (Vaughn, 1980), which places product and service types in one of four quadrants (X axis: Think/Feel, Y axis: Engagement level), different types of media content could be placed on a grid based on level of cognitive engagement (X axis: high [CH] vs. low [CL]) and level of affective engagement (Y axis: high [AH] vs. low [AL]), creating four different types: CHAH, CHAL, CLAH, and CLAL (see Figure 1).

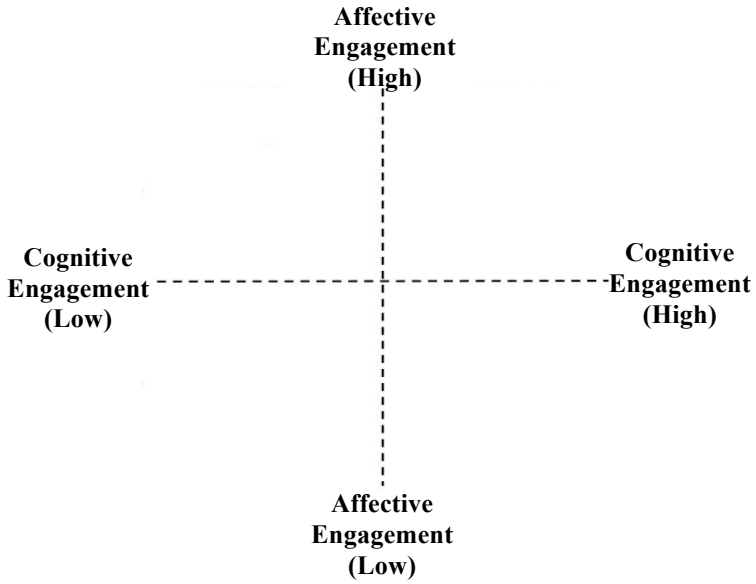


Figure 1. Program-Induced Engagement Grid

Although it is not a precise indicator, this grid could help sort programs that affect viewers in different ways. Shows that fit into the suspense, drama, and thriller genres (e.g., *Grey's Anatomy*, *The Blacklist*, and *The Walking Dead*) might be cognitively engaging due to their narrative structure and also affectively engaging due to identification with one or more characters (Christensen et al., 2015); for those viewers, these show would fit in Quadrant 1 of the grid (CHAH). Programs such as sitcoms and reality shows (e.g., *Modern Family* and *American Idol*) might be less cognitively engaging due to the more fragmented and compartmentalized structure of the show but affectively engaging due to emotional engagement with the characters or participants (Christensen et al., 2015). These types of programs would be placed in Quadrant 2 (CLAH). In this way, although program placement can vary by individual viewer, even with the same genre, any type of media content can be placed in a quadrant based on program-induced engagement. The current study focused on how media content placed in Quadrant 1 (CHAH) and

Quadrant 2 (CLAH) influences the amount of MM during programs and commercial breaks and how this behavior affects ad processing.

Effects of Program Engagement on Media Multitasking

During the Program. According to limited capacity theory (Sweller, 1988; Lang, 2000, 2006), message processing requires a certain amount of cognitive capacity. Cognitive capacity refers to the mental energy necessary for the completion of any given task, such as encoding, storing, and retrieving information. However, the theory proposes that human beings have limited cognitive capacity at any given time to allocate for encoding and processing information. Therefore, when the cognitive resources required to complete tasks exceed the total amount of resources available, the quality of task performance decreases.

From this point of view, the amount of resources available to engage in activities on a secondary device and encode secondary information depends on the cognitive resources needed to process a program on a primary screen (Wang et al., 2015; Voorveld & Viswanathan, 2015). Supporting this concept, Wang et al. (2015) found that people tended to choose MM combinations that were less cognitively taxing to avoid cognitive overload. For instance, people tend to select secondary activities that (a) have different modality from the primary task (e.g., web browsing and listening to music), (b) have a higher level of relevance (e.g., Facebook and e-mail), (c) have a higher level of contiguity (e.g., Facebook and e-mail on the same computer), (d) permit a higher level of control over information flow (e.g., web browsing and chatting), and (e) require a lower level of behavioral response (e.g., watching online videos and e-mail).

Based on this concept, the level of program-induced engagement is expected to influence the willingness and ability of an audience to multitask during the program. When watching

programs that were cognitively engaging, people tended to use a detailed analytic processing style (Celuch & Slama, 1988; Jun et al., 2012). An analytical processing style "involves a detachment of the object from its context, a tendency to focus on attributes of the object to assign it to categories, and a preference for using rules about the categories to explain and predict the object's behavior" (Nisbett et al., 2001, p. 293). Thus, people tended to pay a high level of attention to the program itself rather than other contexts to understand the details of the storyline (Celuch & Slama, 1988). Because complex or cognitively engaging tasks impose a higher likelihood of putting a heavy load on the cognitive system (Lang & Chzran, 2015; Lee, 2012), people watching a cognitively involving program are expected to engage in a lower level of MM during the program due to insufficient cognitive capacity.

According to one study, when audiences were affectively involved with a program, although a high level of emotional intensity tends to narrow attention to the emotionally involving stimulus, cognitive fatigue or processing difficulty were not as extensive as they were with a cognitively involving program (Pavelchak, Antil, & Munch, 1988). Celuch and Slama (1988) found that when programs were affectively involving, people tended to employ a holistic processing style. In another study, when people holistically processed information, they had broader eye movements with multiple objects (Ueda & Komiya, 2012). Supporting these arguments, a recent study found that holistic processors could more quickly find target information in a visually busy web page than analytic processors (Wang et al., 2012).

This study compared programs in Quadrant 1 (CHAH) and Quadrant 2 (CLAH). When a program has high affective engagement, its level of cognitive engagement should influence the amount of MM:

H1: When affective program engagement is high, CHAH programs (vs. CLAH programs) will lead to a lower level of MM on mobile phones *during the program*.

During a Commercial Break. The effect of program-induced engagement on MM during a commercial break can be explained by the *attention spillover* hypothesis. Although the results of previous studies examining the relationship between program-induced engagement and ad processing are inconsistent, studies that featured selective exposure rather than forced exposure reported a positive relationship between the two (Lloyd & Clancy, 1991; Moorman et al., 2007; Moorman et al., 2012; Norris & Colman, 2003; Swallen, 2000). With a second screen in media consumption situations, audiences have greater control over their attention to commercials.

According to the attention spillover hypothesis, when audiences are highly engaged in a program, the intensity of attention paid to the program does not immediately fade during a commercial break; rather, enhanced attentional orientation to the screen is likely to carry over to subsequent ads, facilitating ad message processing (Krugman, 1983; Lloyd & Clancy, 19991; Li & Lo, 2015). For instance, using a large telephone survey, Moorman, Neijens, and Smit (2005) reported that ads placed in blocks during a program (i.e., commercial breaks) resulted in better recall than ads placed in blocks between programs. Similarly, Li and Lo (2105) found that mid-roll video ads led to better brand recognition than pre-roll or post-roll ads due to attention spillover; that is, audiences were mentally engaged in the video to a greater extent in the middle of the video rather than before or after it. Other studies more directly tested the effect of media engagement on ad attention. For instance, a recent study that allowed for selective exposure revealed that a more involving program increased audience attention to ads, resulting in better ad recall (Moorman et al., 2007; Moorman et al., 2012).

Thus, when programs are cognitively and affectively engaging (Quadrant 1: CHAH), the probability that audiences will engage in MM is low due to attentional momentum created by a program. However, when programs are only affectively engaging (Quadrant 2: CLAH), the strength of an attention spill-over effect should decrease:

H2: When affective program engagement is high, CHAH programs (vs. CLAH programs) will lead to a lower level of MM on mobile phones *during a commercial break*.

Two Modes of Media Multitasking: Utilitarian vs. Hedonic

According to a recent report from IAB (2015), the top multi-screening activities in which people engage while watching TV include browsing the Internet, checking email, paying bills, catching up on news, social networking, watching another fun video clips, gaming, and shopping. Among those top multi-screening activities, the first four (i.e., checking email, browsing the Internet, paying bills, and catching up on news) can be defined as more goal-directed, instrumental, and utilitarian media consumption, tasks that people are more strongly motivated to accomplish. The last four (i.e., social networking, watching another fun video clips, gaming, and shopping) can be categorized as more non-directed, navigational, and hedonic media consumption, tasks that are primarily for enjoyment. That is, MM can be categorized into two distinct types: *utilitarian MM* and *hedonic MM*.

In the context of MM, one study identified two motivations for second screening: information seeking and discussion (Zúñiga, Garcia-Perdomo, & McGregor, 2015). Also, although the study was limited to online media consumption, Hoffman and Novak (1996) divided media consumption behavior into two categories (i.e., goal-directed and non-goal

directed) and delineated how the two different types of media consumption affected motivation, decision-making, and searching. When people engage in a utilitarian/goal-directed second-screen activity, such as booking a flight ticket or paying a bill, a stronger motivational activation for the task might exist, encouraging them tend to invest a significant amount of their mental resources (Wise, Kim, & Kim,2009). For example, although *Saturday Night Live* on a TV or computer screen might be the primary content, and booking a flight ticket on a smartphone a secondary activity, this primary-secondary relationship might reverse if the second screen requires a high level of motivation and cognition (Wang et al., 2015). On the other hand, if people engage in the second screen activity only to satisfy a hedonic desire or to maximize the enjoyment of media consumption, the motivational activation for the second screen activity is likely to be relatively low, requiring a relatively low level of cognitive effort. Despite such differences between utilitarian MM and hedonic MM, the nature of MM has not been taken into consideration in previous studies.

Wang et al. (2015) found that people chose MM combinations that were less cognitively challenging. For instance, while listening to radio, people tended to web browse rather than watch TV because radio and TV have a high degree of shared sensory modalities (i.e., auditory). These findings suggest that the MM types in which people engage could be influenced by the types of programs being viewed. That is, a program that demands high mental resources might increase the extent of hedonic MM, while a program that requires low mental load might increase both hedonic and utilitarian MM due to surplus of cognitive resources.

Programs that are both cognitively and affectively involving, such as suspenseful shows, might lead to fewer cognitively demanding off-task MM behaviors. On the other hand, the amount of hedonic MM and utilitarian MM are likely to be equivalent during programs that are

affectively engaging, such as comedy shows, because people are likely to have enough cognitive resources leftover. Therefore, the following research question and hypotheses were proposed.

RQ1: Do the types and the level of MM in which people engage vary depending on program type?

H3: When affective program engagement is high, high cognitive programs (vs. low cognitive programs) will lead to a lower level of utilitarian MM.

H4: When affective program engagement is high, high cognitive programs will lead to the same level of hedonic MM as low cognitive programs.

The Effect of Media Multitasking on Advertising Effectiveness

Studies have found MM to have a detrimental effect on media message processing (i.e., diminished attention, lower quality of exposure, shallow processing, and lower message recall) due to limited cognitive capacity (Armstrong & Chung, 2000; Courage et al., 2015; Segijn, 2015; Shapiro & Krishnan, 2000; Zhang et al., 2010).

According to limited cognitive capacity theory, information processing has three stages: (a) encoding, (b) storage, and (c) retrieval. In the mass communication field, many scholars have operationally equated the "encoding" process with exposure. However, to successfully encode a mediated message, people need to have their sensory receptors engaged (e.g., eyes, ears, skin; Eysenck, 1993) and select which bits of information held in sensory storage will be transformed into mental representations in working memory. That is, without sufficient cognitive resources, such encoding of information cannot occur, suggesting that mere exposure is different from "attention" or "encoding." Because people have a limited pool of attention and mental resources available for cognitive processing (Lang, 2000; Pashler, 1994), engaging in multiple media

activities inevitably creates an obstacle to encoding. For instance, if an individual searches for an airline ticket on a mobile device during a commercial break for *Saturday Night Live*, he either divides his attention or rapidly switches his attention between the airline site and the ads on the TV screen (Ponsner, 1990; Zhang, Jeong, & Fishbein, 2010).

This competition for limited cognitive resources is likely to lead to diminished attention to an ad, encoding of sensory input, and ad message recall (Courage et al., 2015; Shapiro & Krishnan, 2000; Zhang et al., 2010). In line with this concept, Armstrong and Chung (2000) found that people who watched TV programs while reading an article showed significantly lower levels of recall and recognition of the article than those who did not engage in multitasking. The effect of MM has also been found to be detrimental to advertising effectiveness, particularly ad memory (Bolls & Muehling, 2007; Duff & Sar, 2015; Kazakova, Cauberghe, Hudders, & Labyt, 2016; Segjin et al., 2016; Voorveld, 2011). In general, studies have found that people engaged in multi-screen activities had a more difficult time remembering ads aired during a program than people who used a single medium. Based on these findings, deficits in ad attention and ad memory are likely to occur when program viewing is combined with other media activities.

H5: Level of attention to commercials will be lower when people watch a program while MM (vs. engagement with a single media device).

H6: Brand recall will be lower when people watch a program while MM (vs. engagement with a single media device).

H7: Brand recognition will be lower when people watch a program while MM (vs. engagement with a single media device).

H8: Ad recollection will be lower when people watch a program while MM (vs. engagement with a single media device).

Though many previous studies have found a detrimental effect of MM on cognitive responses to advertising, some have found positive effects of MM on message effectiveness, including inhibition of counterargument, increased enjoyment, and reduced perceived intrusiveness of messages (Chinchanachokchai, Duff, & Sar, 2015; Smit et al., 2014; Jeong & Hwang, 2012; Voorveld, 2011; Yoon, Choi & Song, 2011). For instance, Jeong and Hwang (2012) found that multitasking reduced the number of counterarguments due to cognitive deficit, increasing message acceptance. A recent meta-analysis of 49 studies revealed that MM had a positive effect on attitudinal outcomes (d = .37, with a 95% confidence interval [CI] ranging from .20 to .55), such as agreement with the message (Haslett, 1976), reduced counterargument (Jueong & Hwang, 2012; Yoon et al., 2011), reduced reactance (Yoon et al., 2011), and attitude change (Eisenstadt, Leippe, & Rivers, 2003).

In the context of advertising, studies have found that MM increased task enjoyment and affective evaluation of commercials (Chinchanachokchai et al., 2015; Gunawardena & Waiguny, 2014; Segijn et al., 2016; Yoon et al., 2011). Chinchanachokchai et al. (2015) explained that MM increased advertising effectiveness because engaging with multiple devices can reduce the subjective time perception of media consumption. Compared to the single-medium group, participants in the MM condition reported that time seemed to pass faster during the commercial. Another study suggested that MM led to more favorable ad evaluation (i.e., brand attitude, ad attitude, and purchase intention) because cognitive overload decreased the number of counterarguments (Segijn et al., 2016). This study confirmed the role of counter-argumentation as a full mediator between MM and ad evaluation, suggesting that the perceived intrusiveness of a commercial block will be lower when audiences are engaged in secondary activities while watching a program. Similarly, although it did not directly test the effect of MM, Yoon et al.

(2011) found that perceived intrusiveness of explicit brand or product integration in a program was alleviated when viewers were under high cognitive load (Yoon et al., 2011; Gunawardena & Waiguny, 2014). Based on these findings, the following hypotheses were proposed:

H9: People engaged in MM will report a lower level of perceived intrusiveness of a commercial block than people who are only watching the program.

H10: People engaged in MM will report a more favorable attitude toward a commercial block than people who are only watching the program.

The Moderating Role of Program-Induced Engagement on the Effect of Media Multitasking

Although MM is likely to result in decreased encoding of ads and reduced ad memory, the extent of this information loss might depend on (a) audience-related factors (Duff & Sar, 2015), (b) ad-related factors (Kazakova et al., 2016), and (c) media-related or context-related factors (Angell et al., 2016).

Duff and Sar (2015) found that individual information processing style, an audience-related factor, moderated the effect of MM on ad recognition. In multitasking situations, people with a holistic processing style showed higher ad recognition than people with an analytic processing style because holistic processors tend to allocate visual attention more broadly. Also, based on affect-as-information theory, Duff and Sar (2015) found that individual mood moderated the detrimental effect of MM on ad recognition, for different mood states led to different processing styles. People in a positive mood employed more holistic processing, leading to a higher level of ad recognition in a MM situation, than people in a negative mood, who employed more analytic processing.

In addition, Kazakova et al. (2016) found that different types of advertising appeals influenced the effect of MM on the cognitive and affective evaluation of ads differently. The results indicate that ads focused on the desirability of the product were more likely to be remembered than ads using a feasibility appeal because a desirability appeal (i.e., emphasis on the general value of a product) does not require detailed processing. This moderating effect of ad appeal also impacted attitudinal evaluations, suggesting that the positive effect of MM on attitudinal response only occurs for ads that emphasize desirability.

Finally, Angell et al. (2016) found that the type of secondary activity and its associated level of social accountability affected ad memory (i.e., ad recognition and ad recall). Focusing on media-related factors, this study found that when people engaged in MM where secondary activity was high in social accountability (i.e., tweeting or texting about the primary content), the recall and recognition of ads embedded in the primary content increased. For instance, if people who watch a Super bowl text their friends or tweet (high social accountability) about the show (primary-associated secondary activity), the recall of ads embedded in the Super bowl is likely to be increased. These findings suggest that what people do with a second device, along with the amount of MM, can moderate the effect of MM on ad effectiveness.

Assuming different amounts and types of MM during commercial breaks across programs with different levels of engagement, product-induced engagement will likely shape the effect of MM on advertising processing. The amount of MM during a commercial break should be lower for CHAH programs than CLAH programs due to the attention spillover effect (H2). Therefore, the actual amount of information loss during a commercial break should be greater for CLAH programs, decreasing ad memory to a greater extent.

Second, building on the distinction between utilitarian MM and hedonic MM, certain modes of MM might tax processing capacity more than others, influencing the amount of information loss due to MM. The current study assumed that people watching CHAH programs would primarily engage in hedonic MM, while people watching CLAH programs would engage in both types of MM due to a surplus of cognitive resources (H3 and H4).

According to reversal theory (Apter, 1984), the motivational state of an individual can be one of two types: telic (serious-minded) or paratelic (playful-minded). People in the telic state are likely to be motivated by a goal while people in the paratelic state tend to seek enjoyment and have low goal orientation. Consistent with this concept and the classification of media consumption behavior by Hoffman and Novak (1996), utilitarian MM (e.g., information search, paying a bill) is likely to be more goal-directed and demand a higher level of processing, while hedonic MM (e.g., texting, SNS usage) imposes a relatively small cognitive load.

Therefore, people who watch CLAH programs might have difficulty processing commercials because (a) they tend to engage in a higher amount of MM and (b) the types of the MM in which they engage (i.e., both utilitarian and hedonic) impose a higher cognitive cost. On the other hand, during a CHAH program, the detrimental effect of MM on ad memory should be lower because (a) viewers tend to engage in much less MM and (b) they are likely to engage in hedonic MM. People who are only watching a program should exhibit no difference in ad memory between the two program types because their attention is exclusively on the primary screen.

H11: When MM, people who watch CHAH programs will show a higher level of ad attention (H11a), free brand recall (H11b), brand recognition (H11c), and ad recollection (H11d) than people who watch CLAH programs.

H12: When single tasking, people who watch CHAH programs will show a similar level of ad attention (H12-1) free brand recall (H12-2), brand recognition (H12-3) and ad recollection (H12-4) with those who watch CLAH programs.

The Moderating Role of Brand Familiarity

According to the associative network memory model, semantic memory or knowledge consists of a set of nodes and links (Anderson, 1983; Keller, 1993). Nodes refer to information stored in a semantic memory network connected by links that differ in strength. When external stimuli (e.g., advertising) or internal information activates a certain node, this activation spreads to other nodes linked to memory (i.e., spreading activation process).

In this way, brand knowledge can be understood as a node within a memory network where brand-related concepts, such as a target brand (Apple), its competitor (Samsung), its brand image (innovative), and its spokesperson (Tim Cook), are linked (Keller, 1993). Compared to unfamiliar or new brands, the associative network memory of an established brand (e.g., Nike, Starbucks) is likely to contain a larger set of nodes and stronger links , facilitating the spread activation process (Kent & Allen, 1994). Consumers can easily recall or recognize familiar brands when prompted, for the information can be more easily processed and coded within the brain (Brennan & Babin, 2004). When a brand has a more elaborate and stronger network of association, it can easily defend against or resist interference (Dens & De Pelsmacker, 2010; Gunawardena & Waiguny, 2014; Kent & Allen, 1994). When audiences are exposed to ads for competing brands, for example, they are likely to demonstrate higher recall of ad claims for familiar brands than unfamiliar brands because familiar brands are less affected by distractors (Kent & Allen, 1994). Another recent study found that consumers under high cognitive load

tended to demonstrate higher category recall for familiar brands (vs. unfamiliar brands) in the context of product placement (Gunawardena & Waiguny, 2014).

Consequently, although a multi-platform experience significantly reduces the amount of attention paid to advertising, even short attention or exposure to familiar brand names or familiar visual cues (e.g., brand logo) can activate a memory network, contributing to higher target brand comprehension and recall. Even in MM situations, familiar brands are likely to be encoded in the brains of audience members and subsequently recalled. On the other hand, the detrimental effect of MM on cognitive evaluation might be worse for unfamiliar brands. Förster (2009) found that familiarity enhances detail and local perception while novelty bolsters more Gestalt-like and global perception. Because the unfamiliar brand itself does not have a well-established associative memory network, exposure to it under a divided-attention condition (i.e., multitasking) might activate an advertised product category, a more abstract node, rather than the specific target brand. Furthermore, once the node for a product category (e.g., running shoes) is activated, exposure to an unfamiliar brand under a divided-attention condition might increase recall of a more familiar, competing brand (i.e., decreased accuracy) because representative brands (e.g., Nike) is much more strongly and closely linked with product category nodes than unfamiliar brands (e.g., Padders).

Based on the assumption that brand familiarity attenuates the negative effects of MM on ad memory, the current study hypothesized that the interaction effect between tasking type and program type might disappear for familiar brands. That is, although people watching a CLAH program (vs. CHAH program) are more likely to show an ad memory deficit under a MM condition (H11), this ad memory deficit during a CLAH program might be attenuated if the advertised brands are familiar enough.

H13: In the MM group, when the advertised brand is more familiar, people watching a CHAH program will show a similar level of free brand recall (H13a), brand recognition (H13b), and ad recollection (H13c) to people watching a CLAH program.

H14: In the MM group, when the advertised brand is less familiar, people watching a CHAH program will show a lower level of free brand recall (H14a), brand recognition (H14b), and ad recollection (H14c) than people watching a CLAH program.

Table 1. Summary of Hypotheses

Hypotheses	Independent Variables	Dependent Variables	Prediction
H1	Program-induced engagement (CHAH[1] vs. CLAH[2])	The amount of MM during the program	CHAH < CLAH
H2	Program-induced engagement (CHAH vs. CLAH)	The amount of MM during the commercial break	CHAH < CLAH
H3	Program-induced engagement (CHAH vs. CLAH)	The amount of utilitarian MM	CHAH < CLAH
H4	Program-induced engagement (CHAH vs. CLAH)	The amount of hedonic MM	CHAH = CLAH
H5	Tasking Type (ST[3] vs. MM[4])	Attention to commercials	ST > MM
H6	Tasking Type (ST vs. MM)	Brand recall	ST > MM
H7	Tasking Type (ST vs. MM)	Brand recognition	ST > MM
H8	Tasking Type (ST vs. MM)	Ad Recognition	ST > MM
H9	Tasking Type (ST vs. MM)	Ad Intrusiveness	ST > MM
H10	Tasking Type (ST vs. MM)	Attitude toward the commercial block	ST < MM
H11	Program-induced engagement x Tasking Type	Brand recall, Brand recognition and Ad recollection	CHAH > CLAH in MM context
H12	Program-induced engagement x Tasking Type	Brand recall, Brand recognition and Ad recollection	CHAH = CLAH in SM context
H13	Program-induced engagement x Brand Familiarity in MM context	Brand recall, Brand recognition and Ad recollection	CHAH = CLAH for familiar brands
H14	Program-induced engagement x Brand Familiarity in MM context	Brand recall, Brand recognition and Ad recollection	CHAH > CLAH for unfamiliar brands

Note:

[1] CHAH=Cognitive high, affective high program
[2] CLAH=Cognitive low, affective high program
[3] ST=Single Tasking
[4] MM=Media Multitasking

CHAPTER 3

OVERVIEW OF RESEARCH METHOD

Chapter 3 outlines the three-phase study conducted to address the hypotheses and research question: (a) a qualitative study, (b) a self-report lab experiment, and (c) an eye-tracking lab experiment. The qualitative study was designed to explore the patterns and motivations of media multitasking (MM) among college students. Based on the results of the first phase, the self-report lab experiment was designed to examine the effects of program-induced engagement on the amount and types of MM and the effects of MM on advertising effectiveness. Finally, the third phase was designed to observe actual amounts of MM using an eye-tracking device. The following sections and Figure 2 provide a summary of the method design. Please see Chapters 5 and 7 for more details about Experiment 1 (Phase 2) and Experiment 2 (Phase 3), respectively.

Phase 1: Exploration of Media Multitasking (Focus-Group Interviews)

Because little research about MM is available, focus-group interviews (FGI) were done to explore the MM behavior of college students: (a) predominant combinations of MM, (b) motivations for MM, and (c) different patterns of MM while watching different types of programs. Two separate focus groups, one male and one female, were organized. A total of six female students and four male students participated in the focus groups in exchange for a $20 Starbucks Gift card. Their ages ranged from 20 to 24 years; five participants were Caucasian/White, three were Asian/Asian American, and two were African American/ Black.

Every participant had a TV in his or her household, and everyone was an owner of a computer/laptop and smartphone. Only half of the participants owned tablets.

A moderator's guide, including the purpose of the interviews, and specific questions were developed to carry out FGI. After being briefed about the interview procedures, guidelines, and purpose of the study, participants were asked to discuss the devices they were most likely to use while watching TV, when they were most likely to media multitask, the types of secondary devices they used to media multitask, the activities in which they engaged when MM, their primary reasons for MM, etc. FGIs were face-to-face and conducted in a lab with a round-shaped table in April 2015. Each group lasted approximately 50-60 minutes and was audio-recorded and transcribed. Data collected during FGI assisted in selecting devices and programs used in the main experiments.

Phase 2: Main Experiment 1

The aim of the first main experiment was (a) to examine the effect of program engagement on the amount and types of MM, (b) to understand the impact of MM on cognitive and affective ad evaluation (i.e., free brand recall, brand recognition, ad recollection, ad intrusiveness, and attitude toward the brand [A_b]), and (c) to explore the moderating role of brand familiarity. To test the proposed hypotheses, a 2 (Program Engagement: CHAH (cognitive high, affective high) vs. CLAH (cognitive low, affective high)) × 2 (Tasking Type: Single vs. Multiple) × 2 (Brand Familiarity: High vs. Low) mixed-subjects experiment was conducted; program engagement and tasking type were the between-subjects variables, and brand familiarity was the within-subjects variable. In Experiment 1, the effect of program engagement on the

amount and type of MM and the subsequent effects of MM on advertising effectiveness were tested in a lab setting.

Phase 3: Main Experiment 2

Experiment 2 examined the effect of program type on the amount of MM using eye-tracking technology. While Experiment 1 measured the amount of MM based on self-reported behavior, Experiment 2 measured the amount of attention paid to the primary screen and frequency of attention to track the actual amount of time subjects spent watching the primary screen and the secondary screen. The experiment was performed in a research lab containing a desktop computer with a device-mounted Tobii X2-60 Eye Tracker and a separate station for the researcher. The procedures and stimuli were identical to those used in Experiment 1.

Step 1: Focus-group interviews (n = 10)

- Two separate groups, one for male participants and one for female participants
  - To explore patterns and motivations of MM behavior while watching TV programs
  - To explore potential predictors of MM behavior

Step 2: Pretests

Pretest 1 (n = 108)	**Pretest 2** (n = 81)	**Pretest 3** (n = 155)
• Program-engagement grid development • Media multitasking activities classification (Utilitarian MM vs. Hedonic MM) • Selection of product categories	• Selection of media content for each program genre ○ Cognitive/affective engagement with programs ○ Likability, relevance and interest level	• Selection of ads ○ Selection of existing familiar and unfamiliar ads ○ Ad appeal ○ Ad quality

Step 3: Experiment 1 (Self-report) (n = 104)

- 2 (Program Engagement: CHAH (cognitive high, affective high) vs. CLAH (cognitive low, affective high)) × 2 (Tasking Type: Single vs. Multiple) × 2 (Brand Familiarity: High vs. Low) mixed-subjects experiment
- DVs: Self-reported amount and types of MM, perceived amount of attention they paid to program and ads, ad recall/recognition, Ad recollection, Ad intrusiveness, and $A_{commercials}$

Step 4: Experiment 2 (Eye-tracking) (n = 106)

- 2 (Program Engagement: CHAH vs. CLAH) × 2 (Brand Familiarity: High vs. Low) between-subjects experiment (MM group only)
- Procedures and stimuli were identical to those used in Experiment 1, except that subjects were connected to eye-tracking equipment
- DVs: Visit duration and frequency of attention paid to the primary screen during program and commercial break + measures from Experiment 1

Figure 2. An Overview of the Research Process

CHAPTER 4

FINDINGS OF EXPLORATORY QUALITATIVE RESEARCH

Chapter 4 provides findings for the FGIs conducted with college students. First, findings about their predominant patterns of media multitasking (MM) are presented. Findings about the predictors of and motivations for MM follow.

Traditional TV Watching Behavior

Participating college students reported that they usually watched television content (e.g., TV shows, televised sporting events) on a laptop or a desktop, usually through streaming services such as Netflix, Hulu, and Amazon Video. They less frequently use their traditional TV set to watch live content, although some students indicated that they watched TV content on a TV set through a DVR, connected device, or streaming service (Business Insider, 2016):

> "I don't watch TV like on a TV that much. I usually watch television content on a laptop or a desktop and have my phone next to me." (Katie, Female, 21)
>
> "As everybody here, I mostly watch TV content on my computer using Netflix, Hulu, or some other streaming service." (LaShonda, Female, 22)
>
> "Most likely I'd be on the desktop just because how convenient it is, accessing Netflix and all that stuff. Next would be smartphone just because of the fact it's also convenient. You can carry it on wherever you go. As long as you have WiFi or you have some sort of Internet connection, you can access any TV content." (Nathan, Male, 24)

> "Usually I'll have a TV hooked up to Chromecast so you can watch Netflix on it. I'll have that going, and then I'll have my laptop up at the same time. If I find something on my laptop that I'd rather watch, I'll usually pause the TV and watch what's on my laptop, maybe switch back and forth." (Chris, Male, 20)

"Smartphone": The Predominant Secondary Device

All of the participants indicated that they often used other media devices while watching TV content. In particular, they reported that they usually engaged in secondary activities on their mobile devices when watching TV content on either a laptop or a desktop computer. Some participants indicated that they always had their mobile devices out, constantly engaged in texting, reading and posting content on social media, and checking their email:

> "I would say almost 100 percent of the time I'm on my laptop. I'm on my phone checking Instagram, Snapchat, and email." (Rebecca, Female, 22)
>
> "When the TV show or whatever content I'm consuming at the time can get a little boring, so my attention sways away from it, but not necessarily pausing the TV content; I'll move on to the mobile device until something exciting happens on the TV content." (Nathan, Male, 24)

When they watched TV content on a traditional TV set, the college students tended to multitask on either a mobile device or a laptop, especially when the TV content bored them. This phenomenon supports scholarly and industry research findings that MM has become a normal behavior in the contemporary media environment, especially among the younger generation (Business Insider, 2016):

"I always have something out. My attention is usually split between the two. Whether it's my cellphone or having work up on my laptop, my attention will be focused on the TV content for a minute or two. Then I'll go back and text my friends on the phone or write a few sentences." (Chris, Male, 20)

"I'll have my laptop out a lot. Most of the time, I'll have my laptop sitting there open with stuff on it. My phone is always out. If I'm sitting down on my couch watching TV, my phone's on the table. If it rings, I'm going to pick it up and reply." (Matthew, Male, 22)

Media Multitasking with Two or More Media Devices

Although MM with two devices, especially multitasking with a computer and a smartphone, is more common, when the participants watched video content or TV shows on a TV set, they reported that they sometimes engaged in simultaneous media consumption on more than two media devices:

"If I'm in the living room with my friends watching TV, I usually have my laptop to do like email, homework kind of thing, and then my phone for Snapchat. I guess that's pretty rare because I don't usually watch TV." (Rebecca, Female, 22)

"Generally, if I'm in my bed and my bed is facing directly towards the TV like this, then I'll usually have my laptop on my lap and the phone on the side." (Matthew, Male, 22)

Media Multitasking during Commercial Breaks

When asked how often they multitasked during a commercial break, most of the students indicated that they were more likely to pick up their mobile devices and engage in other activities

during commercial breaks than during a program. As eMarketer (2012) pointed out, this pattern of media consumption during commercial breaks has become a challenge to advertisers.

> "The entire commercial break. I am focused even more on my phone than I was before." (Catherine, Female, 21)
>
> "Pretty much always during the commercial break." (Chris, Male, 20)
>
> "During the commercial break, I'd either be on my device or be doing something like going to the bathroom or getting something to eat." (Matthew, Male, 22)

However, participants indicated that when commercials were entertaining, interesting, or unique, they could regain their attention from secondary devices. These ideas are consistent with the theory that stimuli that are novel or unexpected can attract attention (Lang, 2006):

> "If they're entertaining and have funny scenarios going on, then I actually watch the advertisements. Let's say I was watching a show and the commercial pops up. It would take maybe one to two seconds to fully grab my attention before I move onto the secondary devices. If they don't catch me within those two seconds, I will just go onto the other devices like my cell phone." (Nathan, Male, 24)
>
> "It has to be a pretty entertaining and unique commercial to get me away from my phone, usually. There's got to be something that catches my ear that will make me look up and look at the screen. That usually doesn't happen." (Chris, Male, 20)

Program-Induced Engagement and Program Novelty: Predictors of Media Multitasking

Although previous studies have found that personality traits (e.g., impulsivity, sensation seeking) and socio-demographic factors (e.g., gender, age) predicted MM, participants reported that program characteristics (e.g., engaging content, novelty) greatly influenced how often they

turned to a second device. Students mentioned that programs in which they became "involved," "engaged," and "engrossed," such as *Grey's Anatomy* and *How to Get Away with Murder*, kept their attention and made them less likely to pick up other devices. On the other hand, when they watched programs such as *The Bachelor*, *The Office*, or *Bob's Burgers*, they usually checked social media and email, texted with friends, or played games on their phones:

> "I feel like there are certain shows that are like turn-off-your-brain kind of shows. I'm not going to be focusing too much of my attention to a show like *Family Guy*, as opposed to maybe like *Game of Thrones* or *House of Cards*, things that require a lot more attention." (Chris, Male, 20)
>
> "I would have almost my fully undivided attention to especially thrillers, suspense, drama, that kind of things." (Nathan, Male, 24)
>
> "Well, I guess it just depends on the show. The *Bachelor* is one of my favorite shows, but most of it is irrelevant fluff, so I don't feel like I just need to be completely engrossed. A lot of times, I'll follow other bachelors and bachelorettes' Twitter, and they're live tweeting the show. Then I'll pay attention to the show when the important stuff happens. Then there are shows like, every Thursday night, it's *Grey's*, *Scandal*, *How to Get Away with Murder*, and it's like three hours of you have to pay attention. If you don't pay attention, especially like *How to Get Away With Murder*, you don't know what is going on, so you have to pay attention. I typically don't pick up my phone until the commercials." (LaShonda, Female, 22)
>
> "I am very unlikely to use my phone during *Grey's Anatomy*, except during commercials. That's my 45 minutes." (Christin, Female, 21)

Along with the "program engagement" factor, some of the students indicated that the "novelty" factor, whether the program is a live show or simply new to them, is an important determinant of MM behavior. This novelty factor is in line with Lang's argument that novel stimuli, which are new or unusual, can provoke strong orienting responses, an automatic allocation of mental resources (Lang, 2000).

> "I have noticed that when it's a live show on TV, like the Grammys or something, I'll be a lot more engaged and not multitasking as much because I know I don't have the ability to rewind it. It's like I'm more engaged in things that I know I can only see one time." (LaShonda, Female, 22)
>
> "I think for me it depends on how new the TV content is. Usually, when I'm watching at night, it's a rerun of a something I've seen, so to me, it's more like background noise while I'm doing work. If I'm watching a movie I've never seen before, and even if I have my laptop on, I'm usually more engaged in the movie because I've never seen it before." (Matthew, Male, 22)

Based on these responses, not only audience-related factors but also media-context factors, especially program engagement, determined the amount of attention required to process a TV program and subsequently the amount of MM in which the participants engaged. Programs such as *Grey's Anatomy*, *Game of Thrones*, and *How to Get Away with Murder*, which have more complex narrative structures and strong emotional components, led to lower amounts of MM. On the other hand, programs such as *The Office*, *Bob's Burgers*, and *Family Guy*, which have more fragmented and easy-to-follow storylines and a higher degree of humor, led to greater amounts of MM.

What Young Audiences Seek from Media Multitasking: Communication, Entertainment, and Information

Uses and Gratification (U&G) theory (Katz, Blumler, & Gurevitch, 1973; Rubin, 2009) suggests that media usage is driven by motivations and needs defined by active media users and that their media consumption is intended to fulfill those needs and feel gratified. According to previous studies, media user needs fit into four basic categories: emotional, cognitive, social, and habitual (i.e., background noise) (e.g., Katz, Haas, & Gurevitch, 1973; Ruggiero, 2000; Wang & Tchernev, 2012). Findings from the FGIs suggest that the primary motivations for MM among the participants were primarily social and emotional, followed by cognitive.

Although Wang and Tcherney (2012) found that MM was driven by cognitive needs rather that emotional or social needs, participants in the current study indicated that their primary reasons for multitasking were a desire not to lose their connection with friends or the world and a desire to be stimulated and entertained. Accordingly, many students reported that their primary MM activities were "Snapchatting," "texting," and "social networking." This prevalent use of social media and texting apps indicates that the participants had an emotional need to be connected, entertained, and relaxed. They seemed to obtain emotional gratification and seek social comfort from their MM:

> "To have some entertainment and to keep up with people. When I'm on my laptop, I'm always on my phone checking Instagram and Snapchat." (Rebecca, Female, 22)
>
> "It's more communication and entertainment. For instance, I would consider Snapchat a form of entertainment and communication." (Jessica, Female, 22)
>
> "I play a mobile game like Solitaire on my phone for fun." (Katie, Female, 21)

"We like to be constantly stimulated, and one thing isn't enough." (LaShonda, Female, 22)

In addition, in line with Wang and Tcherney (2012), information seeking was found to be a dominant motivation for MM. Some students indicated that they looked up show-related information, such as the music soundtrack or actors/actresses, on secondary devices. Students reported that this program-related information search occurred especially when they were engaged in the show or when they enjoyed the show:

"I am watching a show, and I am purposely looking for certain information of that show specifically. I usually like not to have divided attention when it comes to shows that I do like. I like to pay attention to details, whether it be the composer of the music background or set of actors, actresses, voice actors, what kind of backgrounds they've been using." (Nathan, Male, 24)

"If I'm watching something fun, I see an actor, and I wonder what else they've been in, then I might look up what else they've been in, and that might lead me to watch a clip of them in a different show or movie. In a way, it is entertainment, and it can be information seeking. Sometimes I'll check my email throughout a show, every 30 minutes or so." (Alex, Male, 20)

However, when they were not interested or engaged enough in the show, they tended to engage in information-seeking activities that were not related to the show, such as email checking, news reading, and shopping, which might distract them from watching the show to a greater extent. These two different types of information-seeking activities are likely to affect how they process shows or commercials in different ways.

"Information seeking. It can be something not related to what I'm watching. It can be me shopping something on Amazon." (Matthew, Male, 22)

"It's usually just social media, homework, checking my email, sometimes news. I like reading news, or random articles that might pop up on Reddit or something that looks interesting." (Chris, Male, 20)

"Probably browsing the internet, social media, and I follow a lot of publications on social media so they have interesting articles." (LaShonda, Female, 22)

Summary

The FGI findings provided insight into the MM patterns, motivations, and reasons among digital natives. Specifically, FGI showed that digital natives simultaneously used multiple screens, especially the combination of laptop or desktop computer with a mobile device. Students indicated that they media multitasked for three main reasons: communication, entertainment, and information seeking. The first two might qualify as hedonic MM, fulfilling emotional and social desires and maximizing enjoyment, while information seeking activities can be understood as utilitarian MM, through which people attempt to accomplish a specific goal (e.g., searching for airline tickets). Interestingly, FGI also indicated that program-induced engagement level might be a determinant of MM behavior, suggesting a potential helpful guideline for media planners and advertisers.

However, because the interviews were conducted with only a small number of college students, further examination and validation might increase understanding the MM pattern of digital natives. Thus, to delve more into the effect of program-induced engagement on the amount and types of MM in a more controlled experimental setting, two lab-based experiments

were designed. Furthermore, following the common MM patterns reported during FGI, participants watched a TV program on a computer screen either with (i.e., multitasking group) or without (i.e., TV-only group) access to their smartphones.

CHAPTER 5

MAIN EXPERIMENT 1: METHOD

This chapter presents the research design, a series of pre-tests conducted to choose stimulus material, a sample composition, the exact details of experiment procedure, and the measurement items for dependent variables.

Overview of the Research Design

This study used a 2 (Program Engagement: CHAH vs. CLAH) × 2 (Tasking Type: Single vs. Multiple) × 2 (Brand Familiarity: High vs. Low) mixed-subjects experiment design; program engagement and tasking type were the between-subjects variables, and brand familiarity as the within-subjects variable. A self-report was used to measure the amount and type of media multitasking (MM), cognitive evaluation of ads (i.e., ad attention, free brand recall, brand recognition, ad recollection), and affective evaluations of ads (i.e., intrusiveness of the commercial block and attitude toward the commercial block). Prior to Experiment 1, three pretests were designed (a) to develop a program engagement grid, (b) to classify different types of MM activities into two categories (hedonic MM vs. utilitarian MM), (c) to select target-relevant product categories for a commercial break, (d) to select relevant TV programs, and (e) to choose existing TV commercials to embed in the middle of the programs as commercial breaks.

Pretest 1: Program-Engagement Grid Development and MM Activity Classification

The first pretest was conducted (a) to develop a program-engagement grid based on cognitive and affective engagement, (b) to categorize MM activities into two different motivations, (c) to select appropriate product categories for eight ads embedded in the middle of the programs (i.e., four ads in each of two commercial breaks), and (d) to confirm the predominant pattern of MM while watching a TV program. A total of 108 college students participated in the first pretest for extra course credit (M_{age} = 20.90 years (SD = 1.03), 79.6% female; see Table 2).

Table 2. Sample Composition

	Pretest1	Pretest2	Pretest3	Study1	Study2
Sample N	108	81	155	104	106
Mean age	20.9	21.0	23.5	21.6	21.3
Gender (%)					
Male	20.4	30.9	39.4	21.0	26.4
Female	79.6	69.1	60.6	79.0	73.6
Ethnicity (%)					
Caucasian/White	81.5	75.0	69.0	67.0	82.1
Black American	3.7	3.6	8.4	10.0	6.6
Asian American	9.3	5.4	9.0	16.0	5.7
Latino/Hispanic	3.7	8.9	7.1	2.0	1.9
Native American	0	1.8	.6	0	.9
Others (i.e., Multiracial, Pacific Islander)	1.9	5.4	5.8	5.0	2.8

First, to outline the cognitive and affective engagement of nine different types of programs (i.e., Drama, Sitcom, Talk show, News, Reality show, Documentary, Thriller, Suspense/Mystery, Comedy/Variety), participants were asked to indicate their overall levels of both cognitive and affective engagement with four randomly selected program types. Cognitive engagement with a program was measured using a six-item scale, and affective engagement with

a program was measured using a five-item scale adopted from Norris and Colman (1993), Perse (1998), and Rubin and Perse (1987) (see Table 9). The program engagement grid developed based on the results of Pretest 1 is depicted in Figure 3 and Table 3. Although each TV show in a given genre could be placed in a different quadrant based on individual levels of interest or program content, the genres tend to fall into consistent quadrants: (a) drama, thriller, documentary, and sports in Quadrant 1, (b) comedy and sitcom in Quadrant 2, (c) talk show and reality show in Quadrant 3, and (d) news in Quadrant 4. Also, to investigate program consumption patterns, participants were asked to indicate the total number of hours they watched each TV program genre per week. More than 40% of students indicated that they either never or rarely watched (i.e., fewer than 30 minutes per a week) any of the program types except dramas and sitcoms. On the other hand, the number of students who never or rarely watched dramas or sitcoms was relatively low, and more than 60% of the participants indicated that they watched those program genres between one hour and eleven hours per a week (see Table 4). Based on the quadrants in which each genre is placed and the popularity of the program genre among the research subjects, two different programs, one from the drama genre (Quadrant 1: CHAH) and one from the sitcom genre (Quadrant 2: CLAH), were selected. The specific procedure for program selection is discussed in detail in the section for Pretest 2

Table 3. Pretest 1: Program Engagement Grid

	N	Cognitive Engagement	SD	Affective Engagement	SD	Quadrant #
News	93	4.75	1.05	3.58	1.13	4
Drama	49	5.33	1.07	5.34	.79	1
Talk	35	3.32	1.19	3.59	1.03	3
Thriller	29	5.40	1.08	4.96	0.86	1
Comedy	39	3.80	1.47	4.96	0.94	2
Documentary	37	5.60	0.94	5.08	0.90	1
Reality	49	3.33	1.33	3.72	1.43	3
Sports	42	4.32	1.37	4.36	1.28	1

Sitcom	54	3.90	1.53	5.00	1.43	2

Note: Cognitive Engagement and Affective Engagement were measured on on a 7-point scale

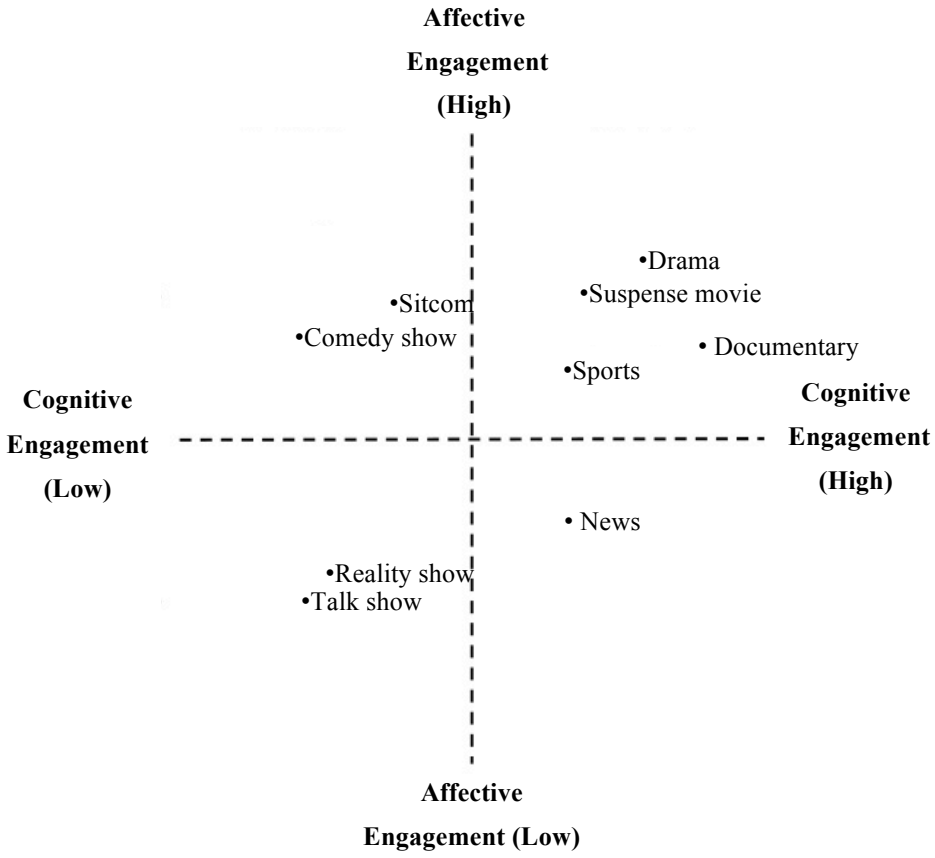


Figure 3. Pretest 1: Program Engagement Grid

Table 1. Summary of Hypotheses

Hypotheses	Independent Variables	Dependent Variables	Prediction
H1	Program-induced engagement (CHAH[1] vs. CLAH[2])	The amount of MM during the program	CHAH < CLAH
H2	Program-induced engagement (CHAH vs. CLAH)	The amount of MM during the commercial break	CHAH < CLAH
H3	Program-induced engagement (CHAH vs. CLAH)	The amount of utilitarian MM	CHAH < CLAH
H4	Program-induced engagement (CHAH vs. CLAH)	The amount of hedonic MM	CHAH = CLAH
H5	Tasking Type (ST[3] vs. MM[4])	Attention to commercials	ST > MM
H6	Tasking Type (ST vs. MM)	Brand recall	ST > MM
H7	Tasking Type (ST vs. MM)	Brand recognition	ST > MM
H8	Tasking Type (ST vs. MM)	Ad Recognition	ST > MM
H9	Tasking Type (ST vs. MM)	Ad Intrusiveness	ST > MM
H10	Tasking Type (ST vs. MM)	Attitude toward the commercial block	ST < MM
H11	Program-induced engagement x Tasking Type	Brand recall, Brand recognition and Ad recollection	CHAH > CLAH in MM context
H12	Program-induced engagement x Tasking Type	Brand recall, Brand recognition and Ad recollection	CHAH = CLAH in SM context
H13	Program-induced engagement x Brand Familiarity in MM context	Brand recall, Brand recognition and Ad recollection	CHAH = CLAH for familiar brands
H14	Program-induced engagement x Brand Familiarity in MM context	Brand recall, Brand recognition and Ad recollection	CHAH > CLAH for unfamiliar brands

Note:

[1] CHAH=Cognitive high, affective high program
[2] CLAH=Cognitive low, affective high program
[3] ST=Single Tasking
[4] MM=Media Multitasking

Second, to categorize different types of MM activities into two categories (i.e., hedonic MM vs. utilitarian MM), participants were asked to indicate their primary motivations for the top eleven multi-screening activities reported by IAB (2015) on a 7-point scale (1: information seeking, 7: entertainment seeking). The one-sample *t*-test, with a test value of 4, indicates that information seeking activities included checking email, catching up on the news, paying bills searching information about a show and entertainment seeking activities included texting, browsing the Internet, social networking, watching other fun video clips, gaming, online shopping, tweeting/posting about the show on social networks (See table 5).

Table 5. Pretest 1: Classification of Media Multitasking Activities

Types of Media Multitasking	Mean	SD	*t*	p
Checking Emails	2.28	1.60	-11.19	<.05
Catching up on News	2.88	1.45	-8.02	<.05
Paying Bills	1.87	1.18	-18.68	<.05
Searching Information about A Show	3.29	1.74	-4.20	<.05
Texting	5.36	1.31	10.76	<.05
Browsing The Internet	5.04	1.45	7.50	<.05
Social Networking	5.92	1.22	16.38	<.05
Watching Other Fun Video Clips	5.81	1.46	12.89	<.05
Gaming	5.27	1.89	6.70	<.05
Online Shopping	5.09	1.69	6.70	<.05
Tweeting/Posting About The Show On Social Networks	4.71	1.46	5.08	<.05

Note: Motivations of Media Multitasking Activities were measured on a 7-point scale (1: Information Seeking, 7: Entertainment seeking).

Selecting appropriate product categories for the commercial breaks was a two-step process. First, fifteen product categories that college students frequently purchase were selected

based on MRI data (Index > 100; see Table 6). Then, following the FGB Grid, "product involvement" and "think-feel dimension" for each category were measured through a survey. Product category involvement was measured using a three-item, seven-point Likert scale adapted from Zaichkowsky (1985), and the think-feel dimension was measured using five-item, seven-point Likert scale (Ratchford, 1987). Based on the measures, a total of eight products with high, moderate, and low involvement were selected. The high-involvement products included laptop ($M_{involvement}$ = 6.80), toothbrush ($M_{involvement}$ = 6.34), and headphones ($M_{involvement}$ = 6.07), the moderate-involvement products included nutrition/energy bars ($M_{involvement}$ = 4.70), watch ($M_{involvement}$ = 4.22), and chewing gum ($M_{involvement}$ = 4.16), and the low-involvement products included iced tea ($M_{involvement}$ = 3.33) and instant coffee ($M_{involvement}$ = 3.01) (See table 6). The selected products were either think products (Laptop, Toothbrush, Headphones, and Nutrition bar) or feel products (Watch, Chewing gum, Iced tea, and Instant coffee), and this think-feel dimension was considered in the ad selection process (see Pretest 3).

Finally, to confirm the predominant type of second screen for MM, students were asked to indicate how often they generally used each of four different media devices (i.e., Smartphone, Laptop, Desktop, and Tablet) while watching TV content either live, recorded, or streaming on a five-point scale (1:Never, 5: Always). The results indicate that smartphones (M = 4.40, SD = .59) were the most predominant type for MM, followed by laptops (M = 3.85, SD = .59). Although few studies have investigated the use of smartphones in the MM context, based on the pretest, the current study investigated the simultaneous consumption of TV programs on a computer screen and other media content on a smartphone.

Table 6. Pretest 2: Selection of Product Category

Product category	MRI	Involvement	Think	Feel
Laptop	124	6.80 (.48)	6.28 (.81)	5.01 (1.27)
Tooth Brush	106	6.34 (1.03)	6.12 (.89)	4.74 (1.65)
Headphones	149	6.07 (.98)	5.94 (.94)	5.00 (1.05)
Body wash/ Shower gel	125	5.77 (1.25)	5.05 (1.14)	5.73 (1.19)
Shampoo	101	5.65 (1.37)	5.40 (1.08)	5.78 (.92)
Athlete Shoes	124	5.38 (1.31)	4.94 (1.25)	5.56 (1.01)
Non-sparkling bottled water	125	4.95 (1.98)	5.04 (1.74)	4.41 (1.49)
Fresheners	128	4.91 (1.53)	4.83 (1.21)	5.08 (.95)
Nutrition/ Energy Bars	113	4.70 (1.39)	5.82 (1.17)	4.09 (1.42)
Watches	115	4.22 (1.35)	4.25(1.14)	5.56 (1.43)
Chewing Gum	132	4.16 (1.49)	4.25 (1.49)	4.99 (1.68)
Sport Drink	160	4.10 (1.26)	4.38 (1.37)	4.73 (.79)
Iced Tea	125	3.73 (1.71)	3.68 (1.40)	4.85 (.93)
Instant Coffee	129	3.01 (2.12)	4.02 (1.63)	4.75 (.91)
Energy Drink	213	2.26 (1.43)	3.93 (1.59)	4.19 (.91)

Note: Product Involvement and Think-Feel Dimension of each product category were measured on a 7-point scale.

Pretest 2. Program Selection

A second pretest was conducted to select two programs with different levels of cognitive and affective engagement (CHAH and CLAH). In this second pretest, a total of 137 college students participated for extra course credit (M_{age} = 21.00, SD = 1.41, 69.1% female)

First, based on the program engagement grid developed in Pretest 1, programs in two program genres (i.e., drama and sitcom) were considered because (a) they are on the first (CHAH) and second (CLAH) quadrants, respectively, and (b) students indicated that they frequently watched these two program types. To develop a pool of programs to consider, a total of 64

sitcoms and dramas that aired between 2007 and 2016 were identified. First, the popularity of the programs among the target sample group was considered. Through a pre-survey, 56 students were asked whether they watched more than ten episodes of each program within the previous year (April 2015–April 2016) in order to identify programs that had a high level of pre-exposure. Programs with very high exposure were not included because pre-exposure to programs could affect the way participants watch the program in the main experiment. Programs with low exposure were excluded because they were unlikely to be watched by college students in an actual media consumption situation. Program ratings by 18-49 years olds were also considered, and programs with a rating over 3.0 were excluded to prevent the possibility of direct/indirect pre-exposure (e.g., through media or word-of-mouth). Finally, programs that contained too excessively sexual, violent, or vulgar elements were excluded (e.g., *Lucky Louie*). These procedures narrowed the pool to four dramas (i.e., *The Blacklist*, *Luther*, *Chicago Fire*, and *24*) and three sitcoms (i.e., *2 Broke Girls*, *Hot in Cleveland*, and *Last Man Standing*).

To check whether the programs induced the proper level of cognitive and affective engagement, another short survey was conducted with 81 college students. In this survey, participants were asked to watch 20 minutes of one of the seven programs selected and to indicate the degree of cognitive engagement and affective engagement they experienced with the program (see Table 9 for each item). The results indicate that *The Blacklist* ($M_{cognitive}$ = 5.73, $M_{affective}$ = 4.92), *Luther* ($M_{cognitive}$ = 5.38, $M_{affective}$ = 4.88), *Chicago Fire* ($M_{cognitive}$ = 4.59, $M_{affective}$ = 4.6490), *24* ($M_{cognitive}$ = 4.81, $M_{affective}$ = 4.31) were placed in the Quadrant 1, having high levels of both cognitive engagement and affective engagement (CHAH). *Hot in Cleveland* ($M_{cognitive}$ = 3.66, $M_{affective}$ = 4.73) and *2 Broke Girls* ($M_{cognitive}$ = 3.63, $M_{affective}$ = 4.85) were placed in Quadrant 2, having low levels of cognitive engagement and moderate to high levels of affective

engagement (CLAH). Although *Last Man Standing* is categorized as sitcoms, survey results placed them in Quadrant 4, having low levels of both cognitive engagement and affective engagement ($M_{cognitive}$ = 3.32, $M_{affective}$ = 3.66) (See Table 7). Based on the results for Experiment 1, *The Blacklist* was selected as the CHAH program, and *Hot in Cleveland* was selected as the CLAH program. To increase the generalizability of the findings, two different programs, *Luther* (CHAH) and *2 Broke Girls* (CLAH) were used for Experiment 2.

Table 7. Pretest 2: Program Selection

	Cognitive Engagement		Affective Engagement		Quadrant
	Mean	SD	Mean	SD	
The Blacklist	5.73	.59	4.92	.75	1
Luther	5.38	.93	4.88	.82	1
Chicago Fire	4.59	1.37	4.64	1.61	1
24	4.81	.73	4.31	1.22	1
Hot in Cleveland	3.66	1.55	4.73	1.45	2
2Broke Girls	3.63	1.36	4.85	1.35	2
Last Man Standing	3.32	1.33	3.66	1.55	4

Note: Shaded columns indicated the selected programs

Pretest 3. Ad Selection and Brand Familiarity

The third pretest was conducted with 115 college students (a) to select eight appropriate commercials to embed in two commercial breaks and (b) to check familiarity with brands that would appear in the ads. Participants were given extra course credit for evaluating the ads.

Three considerations guided ad selection; ad appeal, participant familiarity, and ad characteristics. First, studies have shown that when ad appeal (e.g., utilitarian vs. hedonic) is congruent with the think-feel dimension of the product category, greater persuasion occurs. This matching strategy is prominent in advertising. When the product category is value-expressive

and affective (utilitarian/cognitive), a hedonic/affective (utilitarian) appeal is more effective because consumers experience a greater level of self-congruity (functional congruity) (Johar & Sirgy, 1991). Thus, the match between product category and ad appeal was considered during ad selection. Level of familiarity with brands was also considered. Because this study aimed to explore whether and how brand familiarity moderated the effect of MM on the cognitive evaluation of ads, four brands with a high familiarity score and another four brands with a low familiarity score were selected. Finally, to select ads that were consistent in overall ad characteristics, the following factors were considered: attractiveness, credibility, and perceived ad quality.

An initial set of fifteen ads across eight product categories were tested. In the pretest, participants were first asked to indicate their familiarity with each of the fifteen brands. Then they were shown a 30-second commercial for one of the brands and asked about the type of ad appeal (utilitarian vs. hedonic), attractiveness, credibility, and overall quality of the ad. Based on the pretest, a total of eight 30-second commercials (four familiar and four unfamiliar) that had (a) a high level of congruency between ad appeal and product category and (b) were consistent in overall ad characteristics were selected. The four ads selected for high brand familiarity included Extra (Chewing gum), Microsoft (Laptop), Oral-B (Toothbrush), and Swatch (Watch). The four ads selected for low brand familiarity included Dilmah (Iced tea), NOCS (Headphones), Jacobs (Instant coffee), and GoMacro (Nutrition/Energy bar) (see Table 8).

Table 8. Pretest 3: Ad Selection

Brand Name	Product Category	PI [1]	T-F [2]	Familiarity Mean (SD)	Familiarity Level (*t*)	CA [3] Mean (SD)	AA [4] Mean (SD)	Attr [5] Mean (SD)	Cred [6] Mean (SD)	Ad quality Mean (SD)
Microsoft	Laptop	H	T	5.71 (1.53)	H (2.08*[7])	6.30 (.72)	5.54 (.61)	6.33 (.96)	6.03 (1.03)	6.53 (.78)
Dell	Laptop	H	T	4.51 (1.88)	H (8.58*)	4.91 (.99)	5.03 (.76)	5.79 (1.11)	5.93 (1.10)	6.07 (1.13)
Colgate	Tooth Brush	H	T	6.72 (.61)	H (22.16*)	4.83 (.72)	5.12 (.94)	5.15 (1.68)	5.23 (1.09)	5.46 (1.56)
OralB	Tooth Brush	H	T	6.08 (1.15)	H (9.03*)	5.58 (.84)	4.87 (.86)	5.53 (1.07)	5.90 (1.11)	5.93 (1.06)
BOSE	Headphones	H	T	6.04 (1.81)	H (5.62*)	5.65 (.74)	5.82 (.87)	5.35 (1.02)	5.53 (.89)	5.69 (1.12)
NOCS	Headphones	H	T	2.32 (2.06)	L (-4.09*)	6.19 (.57)	4.73 (.76)	5.33 (1.33)	4.83 (1.65)	5.44 (1.04)
Kind	Nutrition Bars	M	T	4.02 (2.26)	M (.06)	5.51 (.99)	5.56 (.86)	5.79 (.98)	5.93 (1.41)	6.17 (1.00)
GoMacro	Nutrition Bars	M	T	1.83 (1.50)	L (-11.12*)	6.01 (.90)	5.46 (.75)	5.73 (1.28)	5.43 (1.33)	5.63 (1.40)
Swatch	Watches	M	F	5.48 (1.65)	H (5.01*)	3.90 (1.40)	5.30 (.85)	5.88 (2.30)	5.63 (1.60)	5.88 (2.03)
Timex	Watches	M	F	4.90 (1.83)	H (2.75*)	4.69 (.75)	5.57 (.42)	6.46 (.66)	4.62 (1.04)	6.15 (.80)
Trident	Chewing Gum	M	F	6.35 (.88)	H (14.94*)	4.44 (.78)	5.36 (.73)	6.12 (1.05)	5.24 (1.30)	5.82 (1.19)
Extra	Chewing Gum	M	F	6.26 (.96)	H (13.03*)	4.48 (.58)	5.48 (.65)	6.56 (.78)	5.33 (1.41)	6.56 (.70)
Jacobs	Instant Coffee	L	F	2.55 (2.21)	L (4.89*)	3.61 (1.06)	5.31 (.53)	6.08 (1.04)	5.29 (1.65)	5.77 (1.09)
Fuze	Iced Tea	L	F	4.74 (2.16)	H (7.14*)	3.91 (.94)	5.54 (.69)	5.83 (.99)	4.06 (1.35)	5.28 (1.41)
Dilmah	Iced Tea	L	F	1.48 (1.00)	L (12.54*)	3.89 (.81)	5.39 (.51)	5.49 (1.33)	5.29 (1.70)	5.47 (1.33)
GoldPeak	Iced Tea	L	F	5.58 (1.23)	H (1.91*)	3.89 (.1.01)	5.19 (.73)	5.41 (.64)	5.59 (1.32)	5.54 (.96)

Note: Shaded columns indicated the selected ads

[1]PI=Product Involvement

[2]T-F: Think-Feel Dimension of Product

[3]CA=Cognitive Appeal; measured on a 7-point scale

[4]AA=Affective Appeal; measured on a 7-point scale

[5]Attr=Ad Attractiveness; measured on a 7-point scale

[6]Cred=Ad Credibility; measured on a 7-point scale

[7]Statistically significant at $p<.05$

Development of Stimulus Material

Based on the selection of programs and commercials, stimulus materials were developed. Two commercial pods with four commercials each (two familiar and two unfamiliar) were inserted after the first third (6minutes 30 seconds) and second third (13minutes), respectively, of a 20-minute clip of *The Blacklist* and *Hot in Cleveland*. The order of the commercials was counterbalanced, creating a total of eight different sets for each video clip.

Manipulation

Program-Induced Engagement. The level of program-induced cognitive and affective engagement was manipulated by showing participants one of the two different programs selected after the pretests. In the CHAH condition, participants were shown a suspenseful crime drama, *The Blacklist*. Participants in the CLAH condition watched a sitcom, *Hot in Cleveland*.

Tasking Type. Tasking type was manipulated according to the number of media devices that participants used during the experiment. In the single-task group, participants were asked to watch a TV show on a computer screen without any other media devices on hand. Thus, their attention could be solely devoted to the content on the computer screen. Participants in the MM condition had simultaneous access to two media devices, a computer and a smartphone. Participants were asked to bring their own mobile phones to the lab and were allowed to use their mobile phones anytime while they were watching the video if they were assigned to the multitasking group.

Brand Familiarity. Participants were exposed to two blocks of commercial pods, each of which included two familiar brands and two unfamiliar brands (e.g., Block 1: Extra, Microsoft,

NOCS and Dilmah; Block 2: OralB, Apple, Jacobs, and GoMacro). The order of the commercials was counterbalanced.

Sample and Experiment Procedure

A total of 104 students enrolled in undergraduate courses at a large southeastern public university in the United States participated in the experiment in exchange for course credit (79% female; 19 to 30 years old [M = 21.56, SD = 1.64]). Each student signed up for an individual 60-minute lab session. Research participation took place in a small research laboratory equipped with a participant computer station and a researcher desk. When the participants signed up, they were asked to bring their mobile phone the day of the experiment. Among the participants in the MM condition (n = 58), 91.4% of them reported that they used an Apple iPhone (5, 5s, 6, 6+, or 7); the rest reported using a Samsung Galaxy (6 or S7).

Upon arrival, participants were seated in the lab in front of a 27-inch iMac computer and given an informed consent form. Once participants agreed to take part in the study, the researcher explained the overall procedure of the experiment. Then, participants were given a pre-survey to assess their familiarity with a list of sixteen brands. Among the sixteen brands, eight were presented in the commercial breaks, while the other eight brands were foils included to minimize bias from pre-survey. Upon completion of the pre-survey, participants were instructed to select one of the two available programs they would like to watch for 20 minutes (i.e., *The Blacklist* or *Hot in Cleveland*) because people tend to more motivated to process content that is watched intentionally than content that is watched incidentally (Gupta & Lord, 1998; Lord & Putrevu, 1993; Van Reijmersdal et al., 2010). Once the participants selected a program, they were randomly assigned to one of the tasking type conditions (single task vs.

multitasking). The selected video appeared on the screen. The MM participants were granted free use of their mobile phone to perform any media task they wanted while watching the program, except phone calls. The single-task participants were asked to put their cell phones away. Then, participants were instructed to watch the program from beginning to end. Once the video had started, the researcher left the room to encourage the participants to behave more naturally in their media consumption. When the participants had finished the program, the researcher returned to the lab and gave the participants a questionnaire. Once the participants completed the questionnaire, the experimenter debriefed them.

Dependent Measures

A total of ten dependent variables were measured to assess the effect of program-induced engagement on MM and the effect of MM on ad evaluations. The dependent variables related to MM included (a) the amount of MM during the program, (b) the amount of MM during the commercial breaks, and (c) the types of MM. Ad-related dependent variables included (a) ad attention, (b) free brand recall, (c) brand recognition, (d) ad recall, (e) intrusiveness of commercial break, (f) attitude toward the commercial block, and (g) attitude toward the brand.

The scale for the amount of MM was adopted from Collins (2008), directly asking participants what percentage of the time they used their mobile devices during the program and commercial breaks, respectively. The types of MM activities in which the participants engaged were measured by asking them to list all of the mobile phone tasks they performed while watching the program and commercials, respectively. To increase the accuracy of their memory, a list of eleven prominent MM activities reported by IAB were given as examples, and they were allowed to look through the browser history on their mobile phones (See Table 9 and Appendix).

Cognitive evaluations of ads were measured by ad attention, free brand recall, brand recognition, and ad recollection. Ad attention was measured using two seven-point Likert items adopted from Chaffee and Schleuder (1986). To assess free brand recall, which measures the retrieval stage of cognitive processing (Lang, 2000), participants were instructed to write down as many brands as they could remember from the commercials. Then, brand recognition and recollection were measured. Brand recognition is a good indicator of encoded exposure and initial stage of memory encoding because it largely indexes one's familiarity with objects (Kazakova et al., 2016; Leigh, Zinkhan, & Swaminathan, 2006). However, recollection is more contextual recognition, for it taps more into associative details, such as physical attributes or source information (Squire, Wixted, & Clark, 2007). For example, when people recollect a certain event, they can remember where it was held and what they experienced; recognition is limited to mere familiarity with the event. Recollection is considered a more qualitative and contextual form of memory and is important to advertisers who want to create associations between brands and desirable images. Recollection memory is also known to be more sensitive to divided attention (Duff & Sar, 2015; Gardiner & Parkin, 1990; Yonelinas, 2002). Considering these differences, the current study not only measured explicit brand recognition but also measured associative recollection memory. Brand recognition was measured by providing a list of brand names, included the eight target brands and sixteen filler brands. The filler brands were chosen from the same product categories as the target brands and included both familiar and unfamiliar brands. The participants were asked to choose all of the brands they remembered seeing during the commercial breaks (Voorvelrd, 2011; Segjin et al., 2016). Then, to measure ad recollection, a brand-scene matching task asked participants to match a given brand name with the correct scene from its ad (Duff & Sar, 2015). For this brand-scene matching test, a single

frame from each of the eight ads was captured. Care was taken to make sure that the brand logo or product did not appear in the captured frame.

Affective evaluations of ads were measured by perceived intrusiveness of commercial breaks, attitude toward the commercial block, and attitude toward each brand. The intrusiveness of the commercial block was measured using six seven-point Likert items adopted from Cho and Cheon (2004) and Speck and Elliot (1997). Attitude toward the commercial block was measured using a four-item, seven-point semantic differential scale adopted from Gorn, Pham, and Sin (2001). Attitude toward the brand was measured using a two-item, seven-point semantic differential scale adopted from Duff and Faber (2011). The scale for each construct and Cronbach's α are reported in Table 9.

Table 9. Measurement Items

Construct	Measurement Items	Source
Product involvement (.98)[1]	To me, (product category) is… (seven-point semantic differential items) • Important-Unimportant • Relevant-Irrelevant • Means nothing-Means a lot to me	Zaichkowsky (1985)
Product Think Dimension (Think) (.88)	When I purchase (product category)... (1=Strongly disagree, 7=Strongly agree) • My decision is mainly logical or objective • My decision is based mainly on functional facts	Ratchford (1987)
Product Feel Dimension (.81)	When I purchase _____, (1=Strongly disagree, 7=Strongly agree) • My decision expresses my personality • My decision is based on a lot of feeling • My decision is based on looks, taste, touch, smell or sound	Ratchford (1987)
Media Multitasking Motivation	• Information seeking-Entertainment seeking	

Media Multitasking Index	In general, how do you watch a television program while at the same time using each of the following media or device? (1=never, 7-always) •Laptop •Cell phone or smart phone •Printed Newspaper •Magazine •Radio or MP3 Player •Book	Collin (2008) Srivastava (2013)
Cogniive Ad Appeal (.82)	(1=Strongly disagree, 7=Strongly agree) • This ad appeals to my rationality • This ad provides a lot of information about the brand • The commercial did not teach me what to look for when buying (this product) • If they had to, the company could provide evidence to suppport the claims made in this commercial. • This commercial reminded me of some important facts about this brand	Yoo and MacInnis (2005).
Affective Ad Appeal (.80)	(1=Strongly disagree, 7=Strongly agree) • This ad puts me in positive moods • This ad creates a positive mood • This commercial leaves me with a good feeling about using this brand. • Using this brand makes me feel good about myself • This commercial did not remind me of any experiences or feelings I've had in my own life.	Yoo and MacInnis (2005).
Ad Credibility (.87)	The ad was … (seven-point semantic differential items) •Convincing-Unconvincing •Credible-Not credible	Beltramini (1982) MacKenzie and Lutz (1989)
Ad Attractiveness	The ad was … (seven-point semantic differential items) •Not appealing-Appealing	Pham and Avnet (2004)
Ad Quality	The ad had … (seven-point semantic differential items) •Poor quality- Good quality	Biehal, Stephens and Curlo (1992)
Amount of Media Multitasking	While watching the program (i.e. Blacklist), about what percentage (%) of the time did you use your mobile devices?	Collins, 2008

Program-induced Cognitive Engagement (E1[2]: .89; E2[3]: .92)	While I was watching the (program)... (1=Strongly disagree, 7=Strongly agree) • I thought it was thought-provoking • I paid close attention to the program • I watched it carefully to follow the story • I thought about what happened and what will happen next in the program • I thought about the characters in the program • The program was cognitively engaging	Norris and Colman (1993) Perse (1999) Rubin and Perse (1987)
Program-induced Affective Engagement (E1: .79; E2: .75)	While I was watching the (program)... (1=Strongly disagree, 7=Strongly agree) • I experienced emotions (e.g., happy/sad/angry/amused etc.) • I felt that the characters in the program were acting out what I feel at times • I thought that the program was personal and intimate to me • I thought that the program was attractive to me • This program was emotionally engaging	Norris and Colman (1993) Perse (1999) Rubin and Perse (1987)
Brand Familiarity	The brand seems... (seven-point semantic differential items) Familiar to me-Unfamiliar to me	Shen (2001)
Ad Attention (E1:.91)	(1=Strongly disagree, 7=Strongly agree) • How much attention did you pay to the commercials while watching the Blacklist? • How much did you focus on the commercials embedded in the Blacklist?	Chaffee and Schleuder (1986)
Ad Recall	Please write down any brand names you can remember from the commercial breaks. If you did not see any brand names, or can't remember them, please leave this box blank. **See Appendix G & H**	Duff and Sar (2016)
Ad Recognition	While watching the program, did you see any advertisements for following brands? Please tick the relevant box for all advertisers you remember seeing. **See Appendix G & H**	Voorvelrd, 2011 Segjin et al., 2016
Ad Recollection	**See Appendix G & H**	Duff and Sar (2016)

Ad Intrusiveness (E1: .83)	I thought the commercials appeared in the TV program were, (1=Strongly disagree, 7=Strongly agree) • Distracting • Disturbing • Interfering • Intrusive • Invasive • Obtrusive	Cho and Cheon (2004) Speck and Elliot (1997) Edwards, Li and Lee (2002)
Attitude toward the commercial block (E1: 92)	I thought the commercials appeared in the TV program was… (seven-point semantic differential items) •Bad-Good •Positive- Negative •Favorable-Unfavorable	Gorn, Pham, and Sin (2001)
Perceived Pleasantness (E1: .89, E2: .86)	While I was watching the program, I was… (seven-point semantic differential items) •Unhappy- Happy •Annoyed-Pleased •Unsatisfied-Satisfied	Mehrabian & Russell, 1974

Note.

[1]Values in parentheses indicate Cronbach's alpha.

[2] E1= Experiment 1

[3] E2= Experiment 2

CHAPTER 6

MAIN EXPERIMENT 1: RESULTS

Manipulation checks and the results of Experiment 1 are reported in this chapter. Following the manipulation check, the results are presented for each hypothesis and the research question developed in Chapter 2. To address the proposed hypotheses and research question, a series of independent *t*-tests and Multivariate Analysis of Covariance (MANCOVA) tests were conducted. This chapter describes the found effects of program-induced engagement on media multitasking (MM), and its subsequent effects on ad evaluations. Finally, the moderating role of brand familiarity is detailed.

Manipulation Checks

Program-induced engagement and brand familiarity were measured using the main-study sample (n = 104). Based on program-induced engagement ratings, *The Blacklist* was placed in Quadrant 1 of the program engagement grid ($M_{cognitive}$ = 5.94, SD = .82; $M_{affective}$ = 5.15, SD = .87), while *Hot in Cleveland* was placed in Quadrant 2 ($M_{cognitive}$ = 3.91, SD = 1.26; $M_{affective}$ = 4.85, SD = 1.32). An independent sample *t*-test indicated that the level of cognitive engagement of the two programs was significantly different (t = 9.72, df = 91.7, p < .001), while the difference in affective program engagement was not statistically significant (t = 1.36, df = 94.1, p > .05). A one-sample *t*-test with a test value of 4 indicates that Microsoft ($M_{familiarity}$ = 6.63, SD = .78, t = 34.60, p < .001), Oral-B ($M_{familiarity}$ = 5.50, SD = 1.70, t = 8.96, p < .001), Swatch ($M_{familiarity}$ = 5.01, SD = 1.70, t = 6.06, p < .001), and Extra ($M_{familiarity}$ = 5.40, SD = 1.94, t = 7.39,

$p < .001$) were perceived as familiar, while NOCS ($M_{familiarity} = 1.13$, $SD = .59$, $t = -49.35$, $p < .001$), GoMacro ($M_{familiarity} = 1.26$, $SD = .86$, $t = -32.54$, $p < .001$), Dilmah ($M_{familiarity} = 1.13$, $SD = .52$, $t = -56.87$, $p < .001$), and Jacobs ($M_{familiarity} = 1.14$, $SD = .70$, $t = -41.45$, $p < .001$) were perceived as unfamiliar. Thus, the manipulation checks were consistent with those of Pretests 2 and 3, indicating that manipulations functioned as intended.

Table 10-1. Manipulation Checks: Program Engagement

	Cognitive Engagement		Affective Engagement	
	Mean	SD	Mean	SD
CHAH program (*The Blacklist*)	5.94	.82	5.15	.87
CLAH program (*Hot in Cleveland*)	3.91	1.26	4.85	1.32
Difference Between Programs	t=9.72***		t=1.36 (NS)	

Note: Statistically significant at ***p<.001 or NS (not significant)

Table 10-2. Manipulation Checks: Brand Familiarity

	Brand	Mean	SD	t
	Microsoft	6.63	.78	34.60***
High BF*	Oral-B	5.50	1.70	8.96***
	Swatch	5.01	1.70	6.06***
	Extra	5.40	1.94	7.39***
	NOCS	1.13	.59	-49.35***
	GoMacro	1.26	.86	-32.54***
Low BF*	Dilmah	1.13	.52	-56.87***
	Jacobs	1.14	.70	-41.45***

Note: -BF: Brand Familiarity
- Brand Familiarity was measured on a 7-point scale
- A one-sample t-test with a test value of 4
- Statistically significant at p<.05

Hypotheses Testing

Effects of Program-Induced Engagement on Media Multitasking

To test the effects of program-induced engagement on the amount of MM in which people engage, several independent sample *t*-tests were conducted. The results indicate that people who watched the CHAH program (i.e., *The Blacklist*) tended to engage in less MM not only during the show (M_{CHAH} = 22.00 vs. M_{CLAH} = 39.55, t = -3.31, $p < .05$) but also during the commercial break (M_{CHAH} = 45.31 vs. M_{CLAH} = 65.00, t = -2.49, $p < .05$) than those who watched the CLAH program (i.e., *Hot in Cleveland*) (See Table 11). Thus, H1 and H2 were supported. Additional paired-sample *t*-tests revealed that people tended to engage in a greater level of MM during the commercial break ($M_{commercial\_break}$ = 55.16, SD = 31.49) than during the show ($M_{program}$ = 30.78, SD = 21.880) (t = 5.52, $p < .001$)

Table 11. Result of Independent T-Test (H1 and H2)

	Mean	SD	*t*
During the program			
CHAH program (*The Blacklist*)	22.00	15.67	-3.31*
CLAH program (*Hot in Clevelend*)	39.55	23.87	
During the commercial break			
CHAH program (*The Blacklist*)	45.31	31.34	-2.49*
CLAH program (*Hot in Clevelend*)	65.00	28.9	

Note: The amount of media multitasking was measured on 1-100 (%) scale.
Statistically significant at $p<.05$

To test whether different levels of program-induced engagement influenced the type of MM activities in which participants engaged, independent sample *t*-tests were conducted. This study posited that the degree to which people engage in utilitarian MM would vary with

program-induced engagement, for the amount of cognitive resources leftover for secondary activities differ. As expected, participants who watched the CLAH program (i.e., *Hot in Cleveland*) tended to engage in a higher level of utilitarian MM (e.g., checking email, catching up on the news) than those who watched the CHAH program (i.e., *The Blacklist*), not only during the program (M_{CHAH} = .41, *SD* = .63 vs. M_{CLAH} = 1.03, *SD* = .73, *t* = -3.47, *p* < .01) but also during the commercial break (M_{CHAH} = .48, *SD* = .73 vs. M_{CLAH} = 1.00, *SD* = .76, *t* = -2.93, *p* < .01). However, the amount of hedonic MM was not significantly different between the two programs (during the program: M_{CHAH} = 1.66, *SD* = .90 vs. M_{CLAH} = 1.93, *SD* = .88, *t* = -1.18, *p* > .05; during the commercial break: M_{CHAH} = 2.17, *SD* = .89 vs. M_{CLAH} = 2.28, *SD* = .75, *t* = -.48, *p* > .05). Thus, H3 and H4 were supported.

Table 12. Result of Independent T-Test (H3 and H4)

	Utilitarian Media Multitasking				Hedonic Media Multitasking			
	Mean	SD	*t*	p	Mean	SD	*t*	p
During the program								
CHAH program (*The Blacklist*)	.41	.63	-3.47	<.01	1.66	.90	-1.18	>.05
CLAH program (*Hot in Clevelend*)	1.03	.73			1.93	.88		
During the commercial break								
CHAH program (*The Blacklist*)	.48	.73	-2.93	<.01	2.17	.89	-0.48	>.05
CLAH program (*Hot in Clevelend*)	1.00	.76			2.28	.75		

Effects of Tasking Type on Ad Evaluations

To examine the effects of MM on consumers' cognitive and affective evaluations of the ads, several independent sample *t*-tests were conducted. H5 through H8 predicted detrimental effects of MM on ad attention and ad memory. Using a self-report measure, whether tasking type

changed the amount of attention paid to the commercial breaks was examined. As expected, people who used two media devices simultaneously tended to pay a lower level of attention to commercials than those who only watched the TV program ($M_{multitasking}$ = 4.59, SD = 1.39 vs. $M_{single\text{-}task}$ = 3.08, SD = 1.81; t = 4.80, p < .001). In terms of cognitive evaluation, participants who freely used their smartphones while watching a TV program on a computer showed a significantly lower level of free brand recall ($M_{multitasking}$ = 2.16, SD = 1.54 vs. $M_{single\text{-}task}$ = 3.24, SD = 1.22; t = 3.98, p < .001), brand recognition ($M_{multitasking}$ = 4.34, SD = 2.41 vs. $M_{single\text{-}task}$ = 6.02, SD = 1.45; t = 4.39, p < .001), and ad recollection ($M_{multitasking}$ = 5.53, SD = 2.10 vs. $M_{single\text{-}task}$ = 7.00, SD = 1.21; t = 4.47, p < .001) than those in the single-task condition. Thus, H5, H6, H7, and H8 were supported.

Table 13. Result of Independent T-Test (H5, H6, H7, and H8))

	MM[1]		ST[2]		
Dependent Variable	Mean	SD	Mean	SD	t
Ad Attention	3.08	.81	4.59	1.39	4.80***
Free Ad Recall	2.16	1.54	3.24	1.22	3.98***
Ad Recognition	4.34	2.41	6.02	1.45	4.39***
Ad Recollection	5.53	2.10	7.00	1.21	4.47***

Note: - MM: Media Multitasking
- ST: Single Tasking
- Statistically significant at *p<.05, **p<.01, or ***p<.001

However, no positive effects of MM on the attitudinal evaluation of ads were detected. H8 and H9 predicted that engaging in MM would result in a lower level of perceived intrusiveness of ads, improving attitude toward the commercial block. The results of a series of independent sample t-tests indicate no significant differences between the single-task group and the multitasking group in terms of ad intrusiveness ($M_{multitasking}$ = 3.07, SD = 1.17 vs. $M_{single\text{-}task}$ =

3.07, *SD* = 1.01; *t* = .03, *p* > .05) and attitude toward the commercial block ($M_{multitasking}$ = 5.04, *SD* = 1.35 vs. $M_{single\text{-}task}$ = 5.26, *SD* = 1.12; *t* = .89, *p* > .05). Thus, H9 and H10 were rejected.

Table 14. Result of Independent T-Test (H9 and H10)

	MM[1]		ST[2]			
Dependent Variable	Mean	SD	Mean	SD	t	p
Ad Intrusiveness	3.07	1.17	3.07	1.01	.03	>.05
$A_{commercial\ block}$	5.04	1.35	5.26	1.12	.89	>.05

Note: -$A_{commercial\ block}$: Attitude toward the commercial block
-Ad Intrusiveness and $A_{commercial\ block}$ were measured on a 7-point scale

The Moderating Role of Program-Induced Engagement

To test whether and how program-induced engagement attenuated or aggravated the detrimental effects of MM on the cognitive evaluation of ads, a two-way MANCOVA was performed using ad attention, free brand recall, brand recognition, and ad recollection as dependent variables. The pleasantness of the program was included as a covariate.

The two-way MANCOVA results indicate significant interaction effects (Wilks' Lamda = .94, *p* < .05) for ad attention (*F* (1,99) = 4.19, *p* < .05, η^2 = .04) and free brand recall (*F* (1,99) = 4.07, *p* < .05, η^2 = .04); the interaction effect for brand recognition was significant at the .10 level (*F* (1,99) = 3.40, *p* = .07, η^2 = .03). However, no significant interaction effect emerged for ad recollection (*F* (1,99) = 1.21, *p* = .28, η^2 = .01). To investigate the interaction effect further, subsequent contrast tests were run for each tasking group. Because the four separate planned contrast tests increased the number of Type I errors, the Bonferroni correction procedure was used (Bland and Altman 1995). Consequently, an adjusted alpha level of .01 (overall α/number of tests = .05/4 = .0125) was used for hypotheses testing.

In the MM group, when participants watched *The Blacklist*, they showed a greater level of attention to commercials than those who watched *Hot in Cleveland* (M_{CHAH} = 3.67, *SD* = 1.98 vs. M_{CLAH} = 2.48, *SD* = 1.43, *F* (1,56) = 6.89, *p* = .01). As hypothesized, participants who watched *The Blacklist* showed a higher level of free brand recall (M_{CHAH} = 2.78, *SD* = 1.50 vs. M_{CLAH} = 1.55, *SD* = 1.33, *F* (1,56) = 10.77, *p* = .00), brand recognition (M_{CHAH} = 5.14, *SD* = 2.46 vs. M_{CLAH} = 3.55, *SD* = 2.11, *F* (1,56) = 6.93, *p* = .01), and ad recollection (M_{CHAH} = 6.21, *SD* = 1.74 vs. M_{CLAH} = 4.86, *SD* = 2.23, *F* (1,56) = 6.55, *p* = .01). Thus, H11a, H11b, H11c, and H11d were supported.

In the single-task group, as expected, no significant difference emerged for attention or ad memory between the two programs (Ad attention: M_{CHAH} = 4.53, *SD* = 1.23 vs. M_{CLAH} = 4.63, *SD* = 1.53, *F* (1,44) = .07, *p* > .05); free brand recall: M_{CHAH} = 3.33, *SD* = 1.23 vs. M_{CLAH} = 3.17, *SD* = 1.23, *F* (1,44) = .17, *p* > .05); brand recognition: M_{CHAH} = 6.10, SD = 1.33 vs. M_{CLAH} = 5.96, *SD* = 1.56, *F* (1,44) = .10, *p* > .05); ad recollection: M_{CHAH} = 7.35, SD = .75 vs. M_{CLAH} = 6.73, *SD* = 1.43, *F* (1,44) = 3.09, *p* > .05)). Thus, H12 was supported.

Table 15. Result of Planned Contrast Test (H12)

	Single tasking			Media Multitasking		
	CHAH	CLAH	F value	CHAH	CLAH	F value
Attention	4.53 (1.23)	4.63 (1.53)	.07	3.67 (1.98)	2.48(1.43)	6.89*
Ad Recall	3.33 (1.23)	3.17(1.23)	.17	2.78 (1.50)	1.55 (1.33)	10.77**
Ad Recognition	6.10 (1.33)	5.96 (1.56)	.10	5.14 (2.46)	3.55 (2.11)	6.93*
Ad Recollection	7.35 (.75)	6.73 (1.44)	3.09	6.21 (1.74)	4.86 (2.23)	6.55*

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

The Moderating Role of Brand Familiarity

To examine whether brand familiarity moderated the interplay between program-induced engagement and MM on ad effectiveness, a three-way repeated measure MANCOVA was conducted. First, the result of MANCOVA was significant for free brand recall (Wilks' Lamda = .96, p = .07) at .10 level but not for brand recognition (Wilks' Lamda = .99, p = .67) or ad recollection (Wilks' Lamda = .99, p = .25). To investigate the role of brand familiarity further, separate planned contrast tests were conducted for familiar and unfamiliar brands at an adjusted alpha level of .02 following the Bonferroni correction procedure (overall α/number of tests = .05/3) (Bland and Altman 1995).

When the brands were unfamiliar, the planned contrast test revealed that brand unfamiliarity intensified the negative effect of MM. In the MM condition, participants who watched the CLAH program demonstrated a significantly lower level of free brand recall than those assigned to the CHAH program (M_{CHAH} = .74, SD = .86 vs. M_{CLAH} = .24, SD = .53, F (1,56) = 7.09, p = .01), brand recognition (M_{CHAH} = 2.34, SD = 1.45 vs. M_{CLAH} = 1.45, SD = 1.12, F (1,56) = 6.96, p = .01), and ad recollection (M_{CHAH} = 3.10, SD = 1.11 vs. M_{CLAH} = 2.31, SD = 1.20, F (1,56) = 6.82, p = .01). However, in the single-task condition, the level of ad memory for unfamiliar brands was equivalent for both program types (free brand recall: M_{CHAH} = .85, SD = .92 vs. M_{CLAH} = .87, SD = .73, F (1,44) = .01, p = .95; brand recognition: M_{CHAH} = 2.45, SD = .1.15 vs. M_{CLAH} = 2.54, SD = 1.07, F (1,44) = .07, p = .79; ad recollection: M_{CHAH} = 3.55, SD = .60 vs. M_{CLAH} = 3.31, SD = .97, F (1,44) = .96, p = .33). When the brands are familiar, though, the further planned contrast test indicated that people assigned to watch either of the two program types reported a similar level of ad memory both in a single tasking and a media

multitasking condition. Thus, H13 and H14 were supported, suggesting that brand familiarity played a moderating role.

Table 16. Result of Planned Contrast Test for Unfamiliar Brand (H13 and H14)

	Single tasking			Media Multitasking		
	CHAH	CLAH	F value	CHAH	CLAH	F value
Ad recall	.85 (.92)	.87 (.73)	.01	.74 (.86)	.24 (.53)	7.09**
Ad recognition	2.45 (1.15)	2.54 (1.07)	.07	2.34 (1.45)	1.45 (1.12)	6.96**
Ad recollection	3.55 (.60)	3.31 (.97)	.96	3.10 (1.11)	2.31 (1.20)	6.82**

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

CHAPTER 7

MAIN EXPERIMENT 2: METHOD

Providing an overview of an eye-tracking research method for main experiment 2, this chapter presents the research design, development of stimulus material, manipulation, sample composition, the exact details of the eye-tracking experiment, and measurement items for the dependent variables.

Overview of the Research Design

Because the effect of tasking type (single vs. multiple) on ad processing has been reported in many studies and was confirmed in Experiment 1 of the current study, Experiment 2 examined the effect of program type on the amount of MM and the moderating role of brand familiarity using eye-tracking technology. In the context of media multitasking (MM), this study used a 2 (Cognitive Engagement: High vs. Low) × 2 (Brand Familiarity: High vs. Low) between-subjects experiment design. While Experiment 1 measured the amount of MM based on self-reporting, Experiment 2 measured the absolute attention and frequency of attention paid to the primary screen as an indicator of MM by tracking the amount of time subjects spent watching the primary screen and the secondary screen. Cognitive evaluation of ads (i.e., ad attention, free brand recall, brand recognition, and ad recollection) and affective evaluation of ads (i.e., intrusiveness of the commercial block and attitude toward the commercial block) were also measured. The experiment was performed in a research lab, which contained a desktop computer with a device-mounted Tobii X2-60 Eye Tracker and a separate station for the researcher. While

different TV programs were selected to manipulate the level of program-induced engagement, the procedures were identical to those used in Experiment 1.

Development of Stimulus Material

Based on the selection of programs and commercials from the pretests, stimulus materials were developed. One commercial pod containing four commercials (either a set for familiar brands or a set for unfamiliar brands) was embedded in the second third (6 minutes and 30 seconds) of a 10-minute clip of *Luther* and *2 Broke Girls*. The order of the commercials was counterbalanced.

Manipulation

Program-Induced Engagement. The level of program-induced cognitive and affective engagement was manipulated by showing participants one of the two programs selected after the pretests: *Luther* or *2 Broke Girls*. In the CHAH condition, participants were shown a suspenseful crime drama, *Luther*. Participants in the CLAH condition watched a sitcom, *2 Broke Girls.*

Brand Familiarity. Brand familiarity was manipulated using two different sets of commercials, one for familiar brands and one for unfamiliar brands. Participants in the high brand familiarity condition were exposed to four 30second commercials for Extra, Microsoft, Swatch, and Oral-B. Participants assigned to the low brand familiarity condition were shown a commercial pod for NOCS, Dilmah, Jacobs, and GoMacro.

Sample and Experiment Procedure

A total of 106 students enrolled in undergraduate courses at a large southeastern public university in the United States participated in the experiment in exchange for extra course credit (73.6% female; 19 to 26 years old [M = 21.26, SD = 1.20]). Students signed up for individual 30-minute lab sessions, and research participation took place in a small research laboratory equipped with a participant computer station and a researcher desk. When participants signed up, they were asked to complete a pre-questionnaire about their familiarity with the sixteen brands, four of which were in the commercial test blocks, MM index, and the type of mobile devices they used. After completing the pre-questionnaire, participants were asked to bring their mobile phones to the experiment. 92.5% of participants (n=99) reported that they used an Apple iPhone (5, 5s, 6, 6+, or 7); the rest reported using a Samsung Galaxy (6 or S7).

Upon arrival to the lab, participants were seated in front of a 25-inch desktop computer monitor. To record their eye-movement, a Tobii X2-60 Eye Tracker, which records pupil fixations at a sampling rate of 60 Hz (i.e., 60 gaze points per second), was mounted on the bottom edge of the computer screen. As recommended by Tobii Technology (2010), the distance between the eye tracker and the eyes of the subjects was kept in the range of 50-80 cm. Once participants had read the informed consent form and agreed to take part in the study, researchers explained the overall procedure of the experiment. Prior to the experiment, each participant was taken through a calibration procedure using 9 stimulus points to calculate the gaze data. If the calibration was unsuccessful (e.g., the offset between the center of the calibration dot and the sampled gaze point captured), participants were taken through a re-calibration. Participants were then instructed to watch a 10-minute clip of one of the two programs (i.e., *Luther* and *2 Broke Girls*), and they were granted free use of their mobile phone to perform any media task they

wanted while watching the program, except phone calls. The subsequent steps were identical to those followed in Experiment 1.

Dependent Measures

Two different sets of dependent variables were measured in Experiment 2: (a) amount of MM and (b) cognitive processing of ads. First, the amount of MM was assessed using two different indicators: self-reported data and eye-tracking data. The self-reported amount of MM was measured using items adopted from Collins (2008), which directly asked participants what percentage of the time they used their mobile devices during the program and commercial breaks, respectively. To capture the exact amount of attention divided between the two media devices, (a) visit count and (b) total visit duration were measured using the eye-tracking device. Visit count refers to the frequency of attention on the area of interest (AOI), potentially indicating the number of switches between media tasks (Yeykelis, Cummings, & Reeves, 2014). Visit duration is defined as the total amount of time in which the user paid attention to a specific AOI .

To measure cognitive processing of ads, (a) free brand recall, (b) brand recognition, and (c) ad recollection were assessed using the self-report measures used in Experiment 1.

CHAPTER 8

MAIN EXPERIMENT 2: RESULTS

Manipulation checks and results of Experiment 2 are reported in this chapter. In Chapter 6, the results of a series of independent t-tests, one-way ANOVAs and MANCOVAs were reported. Chapter 8 replicates the findings of Experiment 1 using eye-tracking data.

Manipulation Checks

Before testing the proposed hypotheses, manipulation checks for program-induced engagement and brand familiarity were conducted using the responses from the experiment 2 (n = 106). The manipulation for program-induced engagement was successful. *Luther* was placed in Quadrant 1 of the grid (CHAH) ($M_{cognitive}$ = 5.75, SD = 1.01; $M_{affective}$ = 4.77, SD = .97), and *2 Broke Girls* was placed in Quadrant 2 of the grid (CLAH) ($M_{cognitive}$ = 3.92, SD = 1.20; $M_{affective}$ = 4.88, SD = 1.15). An independent sample t-test confirmed that *Luther* had a significantly higher level of cognitive engagement than *2 Broke Girls* (t = 8.51, df = 104, p < .001), while the difference in affective engagement was not statistically significant (t = -.52, df = 100.87, p > .05).

As a manipulation check for brand familiarity, one-sample t-test, using a test value of 4, was conducted. Consistent with Experiment 1, the results indicate that Microsoft ($M_{familiarity}$ = 6.36, SD = 1.04, t = 22.67, p < .001), Oral-B ($M_{familiarity}$ = 5.43, SD = 1.74, t = 8.24, p < .001), Swatch ($M_{familiarity}$ = 5.53, SD = 1.87, t = 8.25, p < .001), and Extra ($M_{familiarity}$ = 5.78, SD = 1.58, t = 11.35, p < .001) were perceived as familiar, while NOCS ($M_{familiarity}$ = 1.17, SD = .87, t = -32.61, p < .001), GoMacro ($M_{familiarity}$ = 1.47, SD = 1.40, t = -18.14, p < .001), Dilmah ($M_{familiarity}$

= 1.15, *SD* = .68, *t* = -41.90, *p* < .001), and Jacobs ($M_{familiarity}$ = 1.19, *SD* = .88, *t* = -32.12, *p* < .001) were perceived as unfamiliar. Thus, the manipulations worked as intended

Table 17-1. Manipulation Checks: Program Engagement

	Cognitive Engagement		Affective Engagement	
	Mean	SD	Mean	SD
CHAH program (*Luther*)	5.75	1.01	4.77	.97
CLAH program (*2 Broke Girls*)	3.92	1.20	4.88	1.15
Difference Between Programs	*t*=8.51***		*t*=.52 (NS)	

Note: Statistically significant at ***p<.001 or NS (not significant)

Table 17-2. Manipulation Checks: Brand Familiarity

	Brand	Mean	SD	t
High BF*	Microsoft	6.36	1.04	22.67***
	Oral-B	5.43	1.74	8.24***
	Swatch	5.53	1.87	8.25***
	Extra	5.78	1.58	11.35***
Low BF*	NOCS	1.17	.87	-32.61***
	GoMacro	1.47	1.40	-18.14***
	Dilmah	1.15	.68	-41.90***
	Jacobs	1.19	.88	-32.12***

Note: -BF: Brand Familiarity
- Brand Familiarity was measured on a 7-point scale
- A one-sample t-test with a test value of 4
- Statistically significant at p<.05

Hypotheses Testing

Effects of Program-Induced Engagement on Media Multitasking

To test the effect of program-induced engagement on the amount of MM in which the participants engaged, several independent sample *t*-tests were conducted. First, the self-reported data about MM behavior indicate that when participants watched *Luther*, they tended to engage in a lower level of MM during the program (M_{CHAH} = 26.92, *SD* = 18.77 vs. M_{CLAH} = 34.74, *SD* = 20.29, t = -2.06, $p < .05$) and during the commercial break (M_{CHAH} = 45.43, *SD* = 34.80 vs. M_{CLAH} = 57.85, *SD* = 29.26, t = -1.99, $p < .05$) than participants who watched *2 Broke Girls*. This result is consistent with the findings of Experiment 1.

To capture the exact amount of MM in which the participants engaged between the computer and a mobile device, the number of switches, and gaze duration were analyzed using independent sample *t*-tests. Participants switched their physical attention between the two media devices more frequently when watching *2 Broke Girls* (M_{visit_count} = 125.64, *SD* = 61.84) than when watching *Luther* (M_{visit_count} = 99.49, *SD* = 52.06) (t = -2.33, $p < .01$). This result indicates that participants watching the CLAH program switched an average of 12.6 times per minute, while participants watching the CHAH program switched an average of 9.9 times per minute. In terms of total gaze duration on the computer screen, participants watching the CHAH program ($M_{visit\_duration}$ = 580.89 seconds, *SD* = 134.09) paid more attention to the TV screen than participants watching the CLAH program ($M_{visit\_duration}$ = 521.04 seconds, *SD* = 124.32) (t = 2.35, $p < .05$). This result suggests that people who watched the CHAH program pay much less attention on their mobile devices than those who watch CLAH program. Consistent with the self-reported data, this result indicates that participants physically divided more attention while watching the CLAH program.

A similar pattern emerged during the commercial break. During the commercial break in the *Luther* clip, participants paid attention to ads longer than ($M_{visit\_duration}$ = 74.79 seconds, *SD* = 28.90) than participants in the CLAH group ($M_{visit\_duration}$ = 61.62 seconds, *SD* = 34.06, *t* = 2.11, $p < .05$). However, participants who watched the *Luther* clip switched their visual attention between the two media devices (M_{visit_count} = 11.63, *SD* = 8.47) similar to participants who whatched the CLAH program (M_{visit_count} = 10.96, *SD* = 8.87, *t* = .39, $p > .05$).

Table 18. Result of Independent T-Test (H1 and H2)

	Self-reported Mean (SD)	*t*	Visit count (SD)	*t*	Visit duration (SD)	*t*
During the program						
CHAH program (*Luther*)	26.92 (18.77)	-2.06*	99.49 (52.06)	-2.33*	580.89 (134.09)	2.35*
CLAH program (*2Broke Girls*)	34.74 (20.29)		125.64 (61.84)		521.04 (124.32)	
During the commercial break						
CHAH program (*Luther*)	45.43 (34.80)	-1.99*	11.63 (8.47)	.39 (NS)	74.79	2.11*
CLAH program (*2Broke Girls*)	57.85 (29.26)		10.96 (8.87)		61.62	

Note. The amount of media multitasking was measured on 1-100 (%) scale.
Statistically significant at *p<.05, **<.01, ***p<.001 or NS (not significant)

The Effect Program-Induced Engagement on Ad Memory in MM context

To test how program-induced engagement attenuated or aggravated the detrimental effects of MM on cognitive evaluation of ads, Independent t-tests were performed on free brand recall, brand recognition, and ad recollection.

The results of the Independent t-tests indicate that even in the same MM tasking group, the level of ad processing varied with program-induced engagement. Participants who watched *Luther* consistently showed a higher level of free brand recall (M_{CHAH} = 1.36, *SD* = 1.30 vs. M_{CLAH} = .85, *SD* = 1.10, *t* = 2.18, *p* < .05), brand recognition (M_{CHAH} = 2.17, *SD* = 1.22 vs. M_{CLAH} = 1.66, *SD* = 1.22, *t* = 2.15, *p* < .05) and ad recollection (M_{CHAH} = 3.30, *SD* = 1.01 vs. M_{CLAH} = 2.89, *SD* = .97, *t* = 2.15, *p* < .05) than participants who watched *2 Broke Girls*. These results support H11, confirming the findings of Experiment 1.

Table 19. Result of Independent t-tests (H11)

	Media Multitasking		
	CHAH	CLAH	t value
Ad Recall	1.36 (1.30)	.85 (1.10)	2.18*
Ad Recognition	2.17 (1.22)	1.66 (1.22)	2.15*
Ad Recollection	3.30 (1.01)	2.89 (.97)	2.15*

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

The Moderating Role of Brand Familiarity

To examine how brand familiarity moderated the effect of program-induced engagement and MM on ad effectiveness, two-way MANCOVAs were conducted, controlling for perceived pleasantness of the show. The results of the MANCOVAs (Wilks' Lamda = .96, *p* > .05) were statistically not significant: free brand recall (*F* (1, 101) = .06, *p* = .80, η^2 = .00), brand recognition (*F* (1, 101) = 1.08, *p* < .18, η^2 = .02), and ad recollection (*F* (1, 101) = .85, *p* < .36, η^2 = .01). To further investigate the role of brand familiarity, planned contrast tests were conducted at an adjusted alpha level of .02 following the Bonferroni correction procedure (overall α/ number of test= .05/3) (Bland and Altman 1995).

A subsequent planned contrast test indicates that when the brands had a high level of familiarity, participants in the CLAH group and CHAH group tended to have similar levels of free brand recall (M_{CHAH} = 2.00, SD = 1.33 vs. M_{CLAH} = 1.46, SD = 1.21, F (1,51) = 2.38, p = .13), brand recognition (M_{CHAH} = 2.67, SD = 1.11 vs. M_{CLAH} = 2.46, SD = .95, F (1,51) = .52, p = .47), and ad recollection (M_{CHAH} = 3.30, SD = 1.10 vs. M_{CLAH} = 3.04, SD = .82, F (1,51) = .92, p = .34).

When the brands were unfamiliar, the planned contrast test indicates that brand unfamiliarity intensified the negative effect of MM, especially in the CLAH group. In a MM situation, participants who watched the CLAH program showed a significantly lower level of free brand recall (M_{CHAH} = .69, SD = .88 vs. M_{CLAH} = .26, SD = .53, F (1,51) = 4.74, p = .03), brand recognition (M_{CHAH} = 1.65, SD = 1.13 vs. M_{CLAH} = .89, SD = .93, F (1,51) = 7.25, p = .01) and ad recollection (M_{CHAH} = 3.31, SD = .93 vs. M_{CLAH} = 2.74, SD = 1.10, F (1,51) = 4.12, p = .05) than participants who watched the CHAH program. Although ad recall and ad recollection was not significant at the adjusted alpha level of .02, both were significant at .05 indicating the similar pattern of results shown in the first experiment. Thus, H13 was supported while H14 was partially supported, suggesting the possible moderating role of brand familiarity.

Table 20. Result of Planned Contrast Test (H13 and H14)

	Familiar Brands			Unfamiliar Brands		
	CHAH	CLAH	F value	CHAH	CLAH	F value
Ad recall	2.00 (1.33)	1.46 (1.21)	2.38	.69 (.88)	.26 (.53)	4.74*
Ad recognition	2.67 (1.11)	2.46 (.95)	.52	1.65 (1.13)	.89 (.93)	7.25**
Ad recollection	3.30 (1.10)	3.04 (.82)	.92	3.31 (.93)	2.74 (1.10)	4.12*

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

Table 21. A Summary of the Results

Hypotheses	Independent Variables	Dependent Variables	Types of Analysis	Results
H1 (S[1])	Program-induced engagement (CHAH vs. CLAH[)]	The amount of MM during the program	Independent t-test	CHAH < CLAH
H2 (S)	Program-induced engagement (CHAH vs. CLAH)	The amount of MM during the commercial break	Independent t-test	CHAH < CLAH
H3 (S)	Program-induced engagement (CHAH vs. CLAH)	The amount of utilitarian MM	Independent t-test	CHAH < CLAH
H4 (S)	Program-induced engagement (CHAH vs. CLAH)	The amount of hedonic MM	Independent t-test	CHAH = CLAH
H5 (S)	Tasking type (ST vs. MM)	Attention to commercials	Independent t-test	ST > MM
H6 (S)	Tasking type (ST vs. MM)	Brand recall	Independent t-test	ST > MM
H7 (S)	Tasking type (ST vs. MM)	Brand recognition	Independent t-test	ST > MM
H8 (S)	Tasking type (ST vs. MM)	Ad Recognition	Independent t-test	ST > MM
H9 (NS[2])	Tasking type (ST vs. MM)	Ad Intrusiveness	Independent t-test	ST = MM
H10 (NS)	Tasking type (ST vs. MM)	Attitude toward the commercial block	Independent t-test	ST = MM
H11(S)	Program-induced engagement x Tasking type	Ad attention, Brand recall, Brand recognition and Ad recollection	MANCOVA	CHAH >CLAH in MM
H12 (S)	Program-induced engagement x Tasking type	Ad attention, Brand recall, Brand recognition and Ad recollection	MANCOVA	CHAH = CLAH in SM
H13(S)	Program-induced engagement x Brand familiarity in MM context	Brand recall, Brand recognition and Ad recollection	MANCOVA	CHAH = CLAH for familiar brands
H14 (S in E1[4], PS[3] in E2[5])	Program-induced engagement x Brand familiarity in MM context	Brand recall, Brand recognition and Ad recollection	MANCOVA	CHAH > CLAH for unfamiliar brands

Note:

[1] S= Supported

[2] NS= Not Supported

[3] PS=Partially Supported

[4] E1=Main Experiment 1

[5] E2=Main Experiment 2

CHAPTER 9

DISCUSSION

The major findings of this study are summarized in this chapter. Subsequent sections discuss the importance and implications of the findings. Then, limitations of the research design are presented, followed by suggestions for future research.

Summary of Findings

The purpose of this study was to examine the effect of a program-related factor (i.e., program-induced engagement) and a brand-related factor (i.e., brand familiarity) on the media multitasking (MM) behavior of college students and the impact of that behavior on ad processing. This study first presented the findings of focus group interviews, which delved into the predominant patterns of and motivations for MM among the participants. The findings indicate that the combination of computer (laptop or desktop) and smartphone was the predominant pattern of MM for college students and that college students engaged in both hedonic MM and utilitarian MM for three different reasons: communication, entertainment, and information seeking. Furthermore, college students indicated that their MM behavior was determined by program-related factors, such as "program engagement" and "novelty."

With a focus on program-engagement, which was identified as an antecedent for MM behavior through the focus groups, two main experiments tested (a) whether program-induced engagement influenced the amount and type of MM, (b) whether different types of program-induced engagement moderated the effect of MM on cognitive ad processing (i.e., attention and

memory), and (c) whether brand familiarity attenuated the detrimental effect of MM on cognitive ad processing.

The findings of the two main experiments show that when programs were affectively engaging (e.g., sitcoms, drama, thriller), programs with a high level of cognitive engagement (CHAH) led to lower levels of MM not only during the program but also during the commercial break than programs with a low level of cognitive engagement (CLAH). The eye-tracking study also found that participants watching the CLAH program switched attention between the two media devices (e.g., computer and smartphone) more frequently and spent less time fixated on the computer screen during the program and the commercial break. Furthermore, the findings indicate that people who watched the CLAH programs engaged in a higher level of utilitarian MM, hindering their cognitive processing of ads to a greater extent, than those who watched the CHAH programs.

Consistent with previous findings, the current study found a detrimental effect of MM on ad memory. When the computer and mobile device were simultaneously accessible, participants consistently showed a lower level of ad recall, ad recognition, and ad recollection than participants in the single-task group (i.e., computer only). However, the results revealed that program-induced engagement influenced the amount of attentional capacity, thus changing the viewers' ability to process ad-related information. In line with the idea that cognitively engaging programs lower the amount of MM and lead viewers to carry their enhanced attentional orientation over to commercial breaks, participants who watched the CHAH program showed a higher level of free brand recall, brand recognition, and ad recollection than participants who watched the CLAH program. These differences in ad memory between the two program types

did not emerge in the single-task group, suggesting the importance of media context in understanding the effects of MM.

Finally, this study found that brand familiarity moderates the interplay between program-induced engagement and MM on ad processing. When brands had a high level of familiarity, the negative effect of MM on ad processing was attenuated. In particular, ad memory was not as low, even for the multitasking participants who watched the CLAH program, when they were familiar with the brands.

Theoretical and Methodological Implications of Research Findings

Now that MM has become a normal pattern of media consumption for younger generations, its impact on advertising have recently attracted the attention of advertisers (Duff & Sar, 2015; Kazakova et al., 2016; Segjin et al., 2016). Despite a large number of studies on the effect of MM on advertising, whether and how media-related factors or different situations predict MM behavior and how that behavior affects ad processing is still unknown. Building on limited cognitive capacity theory (Sweller, 1988; Lang, 2000, 2006), the current study explore whether media context might be a situational antecedent of MM behavior and whether different levels of engagement might affect how consumers process ads under MM conditions.

Across two experiments, participants who watched the CLAH program showed a higher level of MM both during the program and during commercial breaks and a lower amount of encoding of ad content than participants who watched the CHAH program. Previous studies have relied on the limited cognitive capacity framework to explain how MM hampers the processing of information either on first or second screen (Jeong & Hwang, 2012; Wang et al., 2015), but findings from the current study suggest that the limited cognitive capacity framework can also

shed light on why people engage in MM more frequently in particular situations or media contexts. More specifically, the findings of this study suggest that program-induced engagement determines the amount of cognitive capacity left over for MM.

Previous studies that have examined the effect of program-induced engagement on ad processing in single-medium situations have reported inconsistent findings, some finding a positive relationship between program-induced engagement and ad memory and others finding a negative relationship (Bryant & Comisky, 1978; Gunter, Furnham, & Beeson, 1997; Kennedy, 1971; Mundorf et al., 1991; Norris & Colman, 1992). The current study suggests that the relationship between program-induced engagement and ad processing and memory is likely to be positive due to attention spill over (Krugman, 1983), especially when consumers are MM. An additional analysis indicates that visit duration for the show and visit duration for the commercial breaks were positively related ($r = .31$, $p < .01$), supporting the attention spill-over hypothesis. However, because the current study is only the first attempt to explore this relationship in the MM context, more research is necessary to confirm the findings.

Consistent with findings from previous studies that MM led to reduced ad memory (Duff & Sar, 2015; Kazakova et al., 2016; Segjin et al., 2016), the current study found that MM lowered free brand recall, brand recognition, and ad recollection. Adding to previous findings, however, the current study found that MM increased false brand memory under certain conditions. False memory refers to a recollection of events that never occurred or a recollection of events or objects that differ from actuality (Roediger & McDermott, 1995). In the current study, when participants were asked to recall the names of brands presented during commercial breaks, many participants in the MM condition recalled market-leading brands within the product category advertised, especially when the brands were unfamiliar. When participants

simultaneously used two different media devices, some participants indicated that they saw commercials for Lipton and BOSE, although they had actually been exposed to commercials for Dilmah (Iced tea) and NOCS (Headphones). This result suggests that (a) the divided attention caused by MM decreased the amount of information encoded and (b) the poorly established associative network for unfamiliar brands made network activation difficult during the encoding and retrieval stages.

In addition to its theoretical contributions, this study has important methodological implications. First, this study increased the ecological validity of the experiments by creating a more natural MM environment. Although previous studies have investigated the effect of MM on advertising and MM has been examined in many different forms (e.g., TV screen + Tablet: Segjin et al., 2016; Multitasking on a single computer: Duff & Sar, 2015; Kazakova et al., 2016), few studies have investigated this issue in light of the most predominant pattern of MM among college students (i.e., computer/laptop + mobile device; Yume, 2014). To fill this gap, the current study investigated the simultaneous use of computers and mobile devices in a realistic setting. Moreover, participants in most previous studies were asked to perform a particular secondary activity (e.g., browsing a specific website; Segjin et al., 2016, Kazakova et al., 2016) on a secondary media device (e.g., tablet) prepared by the researchers. By permitting participants to use their own mobile devices to engage in any activity they wanted (expect phone calls), the current study minimized feelings of restriction or discomfort during the experiments. The current study suggests that people are more likely to engage in hedonic or entertaining MM (e.g., texting, SNS, gaming) than utilitarian or information-seeking MM (e.g., catching up on the news, searching information). When researchers assign specific secondary tasks to participants to manipulate MM, this result should be considered.

Practical Implications

The findings of the current study could be useful to advertising practitioners and marketers. As the number of people who engage in MM has increased, this behavior has been perceived as a threat to ad effectiveness, challenging advertising practitioners and marketers to devise new strategies to reach younger generations. However, the current study suggests that the detrimental effects of MM depend on the media context and the status of the brand in the market place.

First, although previous studies have found that MM resulted in decreased ad processing and memory, the current study found that when ads were placed in CHAH programs, participants were less likely to switch their attention to another media device. Thus, if advertisers want to increase ad recognition and memory, they should consider placing their commercials in the middle of programs such as *Luther*, *The Blacklist*, *Grey's Anatomy*, and *The Walking Dead*, which increase the likelihood of the attention spillover effect. On the other hand, the current study found that participants were more likely to engage in MM while watching CLAH programs, such as sitcoms, sports, and music shows. Thus, people who watch programs such as sitcoms are likely to experience difficulty encoding information from commercials, consequently reducing ad memory. Thus, when placing advertisements in such programs, advertisers should consider ad strategies that enhance the encoding and storage process. For instance, Lang (2006) suggested that novel or unexpected advertisements elicit an orienting response, which improves the encoding of information and might eventually improve ad memory. Personalization might play a significant role in attracting consumer attention to advertisements that they might otherwise miss or ignore during MM. According to previous studies on personalization, personally relevant information, such as person's own name, have attentional salience (Bang & Wojdynski, 2016)

and tend to increase behavioral engagement (e.g.,Purchase: Tam, & Ho, 2005). Also, desirability message framing might be processed and remembered better than feasibility message framing because the former minimizes elaborate cognitive processing (Kazakova et al., 2016).

Second, the current study found that advertising effectiveness for brands that are high in status (i.e., brand familiarity) was not hampered by MM as much as advertising practitioners might think. However, when advertisers launch new brands or when brands are relatively unfamiliar to consumers, the detrimental effect of MM on ad recognition and memory is more likely. Therefore, advertisers should be aware that exposure to ads for unfamiliar brands during MM might increase false recall of market-leading or competing brands. To counter this tendency, advertisers should consider ad strategies that enhance the encoding process (e.g., ad repetition) or consider media consumption situations when people are less likely to engage in multitasking (e.g., CHAH programs).

Finally, the current study suggests that cross-platform advertising might be an effective strategy. Because audience attention often moves back and forth between two or more different devices during media consumption, the integration of campaigns across multiple screens could increase audience reach (Fulgoni, 2015). To do so, media planners must accurately predict which media devices their target audiences use simultaneously and which kinds of content they tend to consume simultaneously (Lin, Venkataraman, & Jap, 2013). For instance, the current study found that college students were likely to use laptops (computers) and smartphones simultaneously. Also, they were likely to divide their attention between the two devices when watching a CLAH program (e.g., sitcom). Thus, when targeting younger audiences, advertisers should consider cross-platform campaigns (e.g., Internet and mobile apps) when programs such as *Two and a Half Men*, *Friends*, or *The Office* air.

Limitations and Recommendations for Future Study

Although the current study has meaningful theoretical and practical implications, the findings should be cautiously interpreted due to several limitations. First, the findings are limited to college students aged 20-30 years due to the samples used in the study. Although computers and mobile devices were reported as the most predominant MM combination among college students, other age groups might exhibit different patterns of MM (e.g., TV + mobile device). Although the student sample used in the current study is justifiable because this age group tends to engage in MM more than other age groups, future studies might consider the behavior of other age groups that constitute important targets of advertising. In addition, although individual differences were not considered in the current study, personal characteristics (e.g., attachment style or need for closure) might affect the amount and type of MM behavior in which individuals engage.

Second, although the natural setting used in the current study was provided to increase ecological validity, it might also have generated some confounding effects. In the two main experiments, participants in the MM group were allowed to engage in any secondary activity (except phone call) on their mobile devices. However, as reported, each participant engaged in several different secondary activities (e.g., checking email, SNS, checking up on the news); in doing so, they might have encountered online ads or mobile ads that were not controlled in the experiment. Future studies might consider asking participants about their exposure to other ads during secondary activities.

Third, the experimental setting used in the current study might have influenced the results. For instance, participants in the current study were seated alone in a lab while engaging in media consumption. However, previous studies have indicated that social viewing influences media

multitasking behavior (Voorveld & Viswanathan, 2015). Moreover, even though the current study attempted to provide a natural setting by allowing participants to use their own mobile devices, the experimental environment itself might have influenced or biased their media consumption choices. Also, participants in the MM condition in the current study simultaneously used two different media devices (i.e., computer and mobile device), but people could use more than two devices (e.g., TV, laptop, and mobile device) to engage in more than two tasks (e.g., checking email, searching for information, and watching a video), potentially affecting attention and information processing in a different way. Hence, future research should consider how social interaction or experimental setting might influence MM behavior and consider using methods other than FGI or lab experiment.

The findings of this study did not support H9 or H10, proposed that MM would improve attitudinal responses toward the ads. Previous studies have found that MM improved attitude toward the ad and the brand because it decreased the number of counterarguments (Segijm et al., 2016) and because it decreased the subjective time perception of commercial viewing (Chinchanachokchai et al., 2015). One reason for these unsupported hypotheses might be because of the different types of primary tasks used in the current study and previous studies. Although participants in the current study were exposed to commercial breaks in the middle of programs that participants reported to have a high level of affective engagement and enjoyment, participants who reported a positive effect in previous studies were exposed either to commercials without a media context (Chinchanachokchai et al., 2015) or to a commercial block between two different programs (i.e., shoulder block; Segjin et al., 2016). Thus, the intensity of interruption in the flow of content and audience engagement in the media content at the point of interruption might have been different in the current study, affecting the role of MM in

alleviating negative feelings about commercials. Future studies should consider whether ad location moderates the relationship between MM and attitudinal responses to ads.

The current study focused only on Quadrants 1 and 2 of the proposed program-induced engagement grid to compare the effects of program-induced engagement on MM and subsequent ad processing. When affective engagement was high, CHAH programs (Quadrant 1) led to lower amounts of MM and higher levels of ad memory than CLAH programs (Quadrant 2); however, this pattern might be different for programs with a low level of affective engagement (Quadrants 3 and 4). Furthermore, although the program-induced engagement grid proposed in this study did not consider valence, affective engagement could be either positive (high vs. low) or negative (high vs. low). Previous studies have found that people in positive (vs. negative) mood states tend to process information better during MM (Duff & Sar, 2016), so the valence of affective engagement should be considered in future studies.

An eye-tracking device was used in the current study to measure the amount of MM in which people engaged between the computer and a mobile device. Because the eye tracker was mounted on the bottom of the computer screen rather than the mobile device, the experiment did not track what participants actually did when they were not looking at the computer screen. Although the participants were assumed to be using their mobile devices when their visual attention was not on the computer screen, they might have looking at other objects in the laboratory (e.g., bookshelves or the door). Thus, the eye-tracking data should be cautiously interpreted, despite its consistency with the self-reported MM data.

Finally, although the current study found (a) that media context was an antecedent of MM and its effects on ad processing and (b) that brand familiarity moderated this relationship, future studies should address how advertisers can turn consumer attention back to their

advertisements or how cross-media advertising might be successfully executed to minimize the detrimental effects of MM and maximize its benefits.

REFERENCES

Anderson, John R. (1983), "A spreading activation theory of memory," *Journal of Verbal Learning and Verbal Behavior,* 22(3), 261-295.

Angell, Robert, Matthew Gorton, Johannes Sauer, Paul Bottomley, and John White. (2016), "Don't distract me when I'm media multitasking: Toward a theory for raising advertising recall and recognition," *Journal of Advertising*, 45(2),198-210.

Apter, Michael J. (1984), "Reversal theory and personality: A review," *Journal of Research in Personality*, 18(3), 265-288.

Armstrong, G. Blake, and Leeva Chung. (2000), "Background Television and Reading Memory in Context Assessing TV Interference and Facilitative Context Effects on Encoding Versus Retrieval Processes," *Communication Research*, 27(3),327-352.

Austin, Peter C.(2011), "An introduction to propensity score methods for reducing the effects of confounding in observational studies.," *Multivariate Behavioral Research*, 46,(3), 399-424.

Aylesworth, Andrew B., and Scott B. MacKenzie. (1998), "Context is key: The effect of program-induced mood on thoughts about the ad," *Journal of Advertising*, 27(2), 17-31.

Bang, Hyejin, and Bartosz W. Wojdynski. (2016), "Tracking users' visual attention and responses to personalized advertising based on task cognitive demand," *Computers in Human Behavior*, 55, 867-876.

Bardhi, Fleura, Andrew J. Rohm, and Fareena Sultan.(2010), "Tuning in and tuning out: media multitasking among young consumers," *Journal of Consumer Behaviour*, 9(4), 316-332.

Becker, Mark W., Reem Alzahabi, and Christopher J. Hopwood. (2013), "Media multitasking is associated with symptoms of depression and social anxiety," *Cyberpsychology, Behavior, and Social Networking*, 16 (2),132-135.

Bland, J. Martin, and Douglas G. Altman. (1995), "Multiple significance tests: the Bonferroni method," *BMJ*, *310*, 170.

Bolls, Paul D., and Darrel D. Muehling. (2007), "The effects of dual-task processing on consumers' responses to high-and low-imagery radio advertisements," *Journal of Advertising*, 36(4), 35-47.

Brennan, Ian, and Laurie A. Babin. (2004), "Brand placement recognition: The influence of presentation mode and brand familiarity," *Journal of Promotion Management*, 10(1-2), 185-202.

Bryant, Jennings, and Paul W. Comisky.(1978), "The effect of positioning a message within differentially cognitively involving portions of a television segment on recall of the message," *Human Communication Research*, 5(1), 63-75.

Carrier, L. Mark, Nancy A. Cheever, Larry D. Rosen, Sandra Benitez, and Jennifer Chang. (2009), "Multitasking across generations: Multitasking choices and difficulty ratings in three generations of Americans," *Computers in Human Behavior*, 25(2), 483-489.

Celuch, Kevin G., and Mark Slama. (1998) "The effects of cognitive and affective program involvement on cognitive and affective ad involvement," *Journal of Business and Psychology*, 13(1), 115-126.

Chaffee, Steven H., and Joan Schleuder. (1986), "Measurement and effects of attention to media news," *Human Communication Research*, 13(1),76-107.

Chinchanachokchai, Sydney, Brittany RL Duff, and Sela Sar. (2015), "The effect of multitasking on time perception, enjoyment, and ad evaluation," *Computers in Human Behavior*, 45, 185-191.

Cho, Chang-Hoan, Hongsik J. Cheon. (2004), "Why Do People Avoid Advertising on the Internet?," *Journal of Advertising*, 33(4), 89-99.

Christensen, Claire G., David Bickham, Craig S. Ross, and Michael Rich. (2015), "Multitasking with television among adolescents," *Journal of Broadcasting & Electronic Media*, 59 (1), 130-148.

Cohen, Jonathan. (2001), "Defining identification: A theoretical look at the identification of audiences with media characters," *Mass Communication & Society*, 4(3), 245-264.

Collins, Rebecca L. (2008), "Media multitasking: Issues posed in measuring the effects of television sexual content exposure," *Communication Methods and Measures*, 2(1-2), 65-79.

Courage, Mary L., Aishah Bakhtiar, Cheryll Fitzpatrick, Sophie Kenny, and Katie Brandeau. (2015), "Growing up multitasking: The costs and benefits for cognitive development," *Developmental Review*, 35, 5-41.

Dahlén, Micael. (2005), "The medium as a contextual cue: Effects of creative media choice," *Journal of Advertising*, 34(3), 89-98.

Dens, Nathalie, and Patrick De Pelsmacker. (2010), "Consumer response to different advertising appeals for new products: The moderating influence of branding strategy and product category involvement," *Journal of Brand Management*, 18(1), 50-65.

Duff, Brittany R-L., and Sela Sar. (2015), "Seeing the big picture: Multitasking and perceptual processing influences on ad recognition," *Journal of Advertising*, 44(3), 173-184.

Duff, Brittany R-L., Gunwoo Yoon, Zongyuan Wang, and George Anghelcev. (2014), "Doing it all: An exploratory study of predictors of media multitasking," *Journal of Interactive Advertising*, 14(1), 11-23.

Duff, Brittany RL, and Ronald J. Faber. (2011), "Missing the mark," *Journal of Advertising*, 40(2), 51-62.

Eisenstadt, Donna, Michael R. Leippe, Jennifer A. Rivers, and Mark Stambush. (2003), "Counterattitudinal Advocacy on a Matter of Prejudice: Effects of Distraction, Commitment, and Personal Importance," *Journal of Applied Social Psychology*, 33(10), 2123-2152.

Elizabeth M. Perse. (1990), "Media involvement and local news effects," *Journal of Broadcasting & Electronic Media*, 34(1), 17-36.

eMarketer (2012). "Media Multitasking Brings Challenges and Opportunities for Marketers," March 12, https://www.emarketer.com/Article/Media-Multitasking-Brings-Challenges-Opportunities-Marketers/1008924

Förster, Jens. (2009), "Relations between perceptual and conceptual scope: how global versus local processing fits a focus on similarity versus dissimilarity," *Journal of Experimental Psychology*, 138 (1), 88-111.

Fulgoni, Gian M. (2015), "Is the GRP Really Dead In a Cross-Platform Ecosystem?," *Journal of Advertising Research*, 55(4), 358-361.

Gardiner, John M., and Alan J. Parkin (1990), "Attention and recollective experience in recognition memory," *Memory & Cognition*, 18(6), 579-583.

Gil de Zúñiga, Homero, Victor Garcia-Perdomo, and Shannon C. McGregor. (2015), "What is second screening? Exploring motivations of second screen use and its effect on online political participation," *Journal of Communication*, 65(5), 793-815.

Gorn, Gerald, Michel Tuan Pham, and Leo Yatming Sin. (2001), "When arousal influences ad evaluation and valence does not (and vice versa)," *Journal of Consumer Psychology*, 11(1), 43-55.

Gunawardena, Thuthi, and Martin KJ Waiguny. (2014), "So many things to do! How multitasking affects memory and attitude for product and brand placements," *Australasian Marketing Journal*, 22(4), 288-295.

Gunter, Barrie, Adrian Furnham, and Christopher Beeson. (1997), "Recall of television advertisements as a function of program evaluation," *The Journal of Psychology*, 131(5), 541-553.

Gupta, Pola B., and Kenneth R. Lord. (1998), "Product placement in movies: The effect of prominence and mode on audience recall," *Journal of Current Issues & Research in Advertising*, 20(1), 47-59.

Hawkins, Robert P., Suzanne Pingree, Jacqueline Hitchon, Barry Radler, Bradley W. Gorham, Leeann Kahlor, and Eilleen Gilligan. (2005), "What produces television attention and attention style?," *Human Communication Research*, 31(1), 162-187.

Hoffman, Donna L., and Thomas P. Novak. (1996), "Marketing in hypermedia computer-mediated environments: Conceptual foundations," *The Journal of Marketing*, 60(3), 50-68.

Hwang, Yoori, HyoungJee Kim, and Se-Hoon Jeong. (2014), "Why do media users multitask?: Motives for general, medium-specific, and content-specific types of multitasking," *Computers in Human Behavior*, 36, 542-548.

Jeong, Se-Hoon, and Martin Fishbein. (2007), "Predictors of multitasking with media: Media factors and audience factors," *Media Psychology*, 10(3), 364-384.

Jeong, Se-Hoon, and Yoori Hwang. (2015), "Multitasking and persuasion: The role of structural interference," *Media Psychology*, 18(4), 451-474.

Jeong, Se-Hoon, Yoori Hwang, and Martin Fishbein. (2010), "Effects of exposure to sexual content in the media on adolescent sexual behaviors: The moderating role of multitasking with media," *Media Psychology*, 13(3), 222-242.

Jeong, Se-Hoon, and Yoori Hwang. (2012), "Does multitasking increase or decrease persuasion? Effects of multitasking on comprehension and counterarguing," *Journal of Communication*, 62(4), 571-587.

Johar, Jotindar S., and M. Joseph Sirgy. (1991), "Value-expressive versus utilitarian advertising appeals: When and why to use which appeal," *Journal of Advertising*, 20(3), 23-33.

Katz, Elihu, Jay G. Blumler, and Michael Gurevitch. (1973), "Uses and gratifications research," *The Public Opinion Quarterly*, 37(4), 509-523.

Kazakova, Snezhanka, Verolien Cauberghe, Liselot Hudders, and Christophe Labyt. (2016), "The Impact of Media Multitasking on the Cognitive and Attitudinal Responses to Television Commercials: The Moderating Role of Type of Advertising Appeal," *Journal of Advertising*, 45(4), 403-416.

Keller, Kevin Lane. (1993), "Conceptualizing, measuring, and managing customer-based brand equity," *Journal of Marketing*, 57(1), 1-22.

Kennedy, John R. (1971), "How program environment affects TV commercials," *Journal of Advertising Research, 11(1),* 33-38.

Kent, Robert J., and Chris T. Allen.(1994), "Competitive interference effects in consumer memory for advertising: the role of brand familiarity," *Journal of Marketing*, 58(3), 97-105.

Krugman, Dean M., Glen T. Cameron, and Candace McKearney White. (1995), "Visual attention to programming and commercials: The use of in-home observations," *Journal of Advertising*, 24(1), 1-12.

Krugman, Herbert E. (1983), "Television Program Interest and Commercial Interruption," Journal of Advertising Research, 23 (1), 21–23.

Lang, Annie, and Jasmin Chrzan. (2015), "Media Multitasking: Good, Bad, or Ugly?," *Annals of the International Communication Association*, 39(1), 99-128.

Lang, Annie. (2000), "The limited capacity model of mediated message processing," *Journal of Communication*, 50(1), 46-70.

Lang, Annie. (2006), "Using the limited capacity model of motivated mediated message processing to design effective cancer communication messages," *Journal of Communication*, 56(1), S57-S80.

Lee, Angela Y., and Jennifer L. Aaker. (2004), "Bringing the frame into focus: the influence of regulatory fit on processing fluency and persuasion," *Journal of Personality and Social Psychology*, 86(2), 205-218.

Leigh, James H., George M. Zinkhan, and Vanitha Swaminathan. (2006), "Dimensional relationships of recall and recognition measures with selected cognitive and affective aspects of print ads," *Journal of Advertising*, 35(1), 105-122.

Li, Hao, and Hui-Yi Lo. (2015), "Do you recognize its brand? The effectiveness of online in-stream video advertisements," *Journal of Advertising*, 44(3), 208-218.

Lin, Chen, Sriram Venkataraman, and Sandy D. Jap.(2013), "Media multiplexing behavior: Implications for targeting and media planning," *Marketing Science*, 32(2), 310-324.

Lloyd, David W., and Kevin J. Clancy.(1991), "Television program involvement and advertising response: Some unsettling implications for copy research,"*Journal of Consumer Marketing,* 8(4), 61-74.

Lord, Kenneth R., and Sanjay Putrevu. (1993), "Advertising and publicity: An information processing perspective," *Journal of Economic Psychology*, 14(1), 57-84.

MacKenzie, Scott B., and Richard J. Lutz. (1989), "An empirical examination of the structural antecedents of attitude toward the ad in an advertising pretesting context," *Journal of Marketing*, 53(2), 48-65.

Mehrabian, Albert, and James A. Russell. (1974), "An approach to environmental psychology," the MIT Press.

Moorman, Marjolein, Peter C. Neijens, and Edith G. Smit.(2005), "The effects of program responses on the processing of commercials placed at various positions in the program and the block," *Journal of Advertising Research*, 45(1), 49-59.

Moorman, Marjolein, Lotte M. Willemsen, Peter C. Neijens, and Edith G. Smit. (2012), "Program-involvement effects on commercial attention and recall of successive and embedded advertising," *Journal of Advertising*, 41(2), 25-38.

Moorman, Marjolein, Peter C. Neijens, and Edith G. Smit. (2007), "The effects of program involvement on commercial exposure and recall in a naturalistic setting*," Journal of Advertising*, 36(1), 121-137.

Moses, Lucia. (2010), "Media Multitaskers Abound," Adweek, September 8, http://www.adweek.com/news/television/media-multitaskers-abound- 103228.

Mundorf, Norbert, Dolf Zillmann, and Dan Drew. (1991), "Effects of disturbing televised events on the acquisition of information from subsequently presented commercials," *Journal of Advertising*, 20(1), 46-53.

Nisbett, Richard E., Kaiping Peng, Incheol Choi, and Ara Norenzayan.(2001), "Culture and systems of thought: holistic versus analytic cognition," *Psychological Review*, 108(2), 291-310.

Norris, Claire E., and Andrew M. Colman.(1992), "Context effects on recall and recognition of magazine advertisements," *Journal of Advertising*, 21(3), 37-46.

Norris, Claire E., Andrew M. Colman, and Paulo A. Aleixo. (2003), "Selective exposure to television programmes and advertising effectiveness," *Applied Cognitive Psychology*, 17(5), 593-606.

Ophir, Eyal, Clifford Nass, and Anthony D. Wagner. (2009), "Cognitive control in media multitaskers," *Proceedings of the National Academy of Sciences*, 106(37), 15583-15587.

Park, C. Whan, and Gordon W. McClung. (1986), "The effect of TV program involvement on involvement with commercials," *Advances in Consumer Research*, 13, 544-548.

Parker, Ellie, and Adrian Furnham. (2007), "Does sex sell? The effect of sexual programme content on the recall of sexual and non-sexual advertisements," *Applied Cognitive Psychology*, 21(9), 1217-1228.

Pashler, Harold. (1994), "Dual-task interference in simple tasks: data and theory," *Psychological bulletin*, 116(2), 220-244.

Pavelchak, Mark A., John H. Antil, and James M. Munch. (1988), "The Super Bowl: An investigation into the relationship among program context, emotional experience, and ad recall," *Journal of Consumer Research*, 15(3), 360-367.

Perse, Elizabeth M. (1998), "Implications of cognitive and affective involvement for channel changing," *Journal of Communication*, 48(3), 49-68.

Perse, Elizabeth M. (1990), "Involvement with local television news cognitive and emotional dimensions," *Human Communication Research*, 16(4), 556-581.

Pham, Michel Tuan, and Tamar Avne. (2004), "Ideals and oughts and the reliance on affect versus substance in persuasion," *Journal of Consumer Research*, *30*(4), 503-518.

Pilotta, Joseph J., Don E. Schultz, Gary Drenik, and Philip Rist. (2004), "Simultaneous media usage: A critical consumer orientation to media planning," *Journal of Consumer Behavior*, 3(3), 285–292.

Poposki, Elizabeth M., Frederick L. Oswald, and Hubert T. Chen. (200), "Neuroticism negatively affects multitasking performance through state anxiety," Technical report for Navy Personnel Research, Studies, and Technology (NPRST-TN-09-3). Millington, TN.

Posner, Michael I. (1990), "Hierarchical distributed networks in the neuropsychology of selective attention. *Cognitive neuropsychology and Neurolinguistics: Advances in Models of Cognitive Function and Impairment*, 187-210.

Ratchford, Brian T. (1987), "New insights about the FCB grid," *Journal of Advertising Research*, 27(4), 24-38.

Roediger, Henry L., and Kathleen B. McDermott. (1995), "Creating false memories: Remembering words not presented in lists," *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 21(4), 803-814.

Rubin, Alan M. (2009), "Uses and gratifications," The SAGE handbook of media processes and effects, Sage.

Rubin, Alan M., and Elizabeth M. Perse. (1987), "Audience activity and soap opera involvement a uses and effects investigation," *Human Communication Research*, 14(2), 246-268.

Ruggiero, Thomas E. (2000), "Uses and gratifications theory in the 21st century," *Mass Communication & Society*, 3(1), 3-37.

Russell, Cristel Antonia, and Christopher P. Puto. (1999), "Rethinking television audience measures: An exploration into the construct of audience connectedness," *Marketing Letters*, 10(4), 393-407.

Sanbonmatsu, David M., David L. Strayer, Nathan Medeiros-Ward, and Jason M. Watson. (2013), "Who multi-tasks and why? Multi-tasking ability, perceived multi-tasking ability, impulsivity, and sensation seeking," *PloS ONE*, 8(1), e54402.

Segijn, Claire M. (2015), "Multitasking with second screen media: The persuasive effect and underlying mechanisms of multiscreening," *Proceedings of American Academy of Advertising*, 114.

Segijn, Claire M., Hilde AM Voorveld, and Edith G. Smit. (2016), "The underlying mechanisms of multiscreening effects," *Journal of Advertising*, 45(4), 391-402.

Shapiro, Stewart, and H. Shanker Krishnan. (2001), "Memory-Based Measures for Assessing Advertising Effects: A Comparison of Explicit and Implicit Memory Effects," *Journal of Advertising*, 30(3), 1–1

Shen, Fuyuan.(2001), "Effects of violence and brand familiarity on responses to television commercials," *International Journal of Advertising*, 20(3), 381-397.

Speck, Paul Surgi, and Michael T. Elliott.(1997), "Predictors of advertising avoidance in print and broadcast media," *Journal of Advertising*, 26(3), 61-76.

Squire, Larry R., John T. Wixted, and Robert E. Clark. (2007), "Recognition memory and the medial temporal lobe: a new perspective," *Nature Reviews Neuroscience*, 8(11), 872-883.

Srivastava, Jatin. (2013), "Media multitasking performance: Role of message relevance and formatting cues in online environments," *Computers in Human Behavior*, 29(3), 888-895.

Starr, Valerie, and Charles A. Lowe. (1995), "The influence of program context and order of ad presentation on immediate and delayed responses to television advertisements," *Advances in Consumer Research*, 22,184-190.

Sweller, John.(1988), "Cognitive load during problem solving: Effects on learning," *Cognitive Science*, 12(2), 257-285.

Tam, Kar Yan, and Shuk Ying Ho. (2005), "Web personalization as a persuasion strategy: An elaboration likelihood model perspective," Information systems research, 16(3), 271-291.

Teixeira, Thales, Rosalind Picard, and Rana El Kaliouby. (2014), "Why, when, and how much to entertain consumers in advertisements? A web-based facial tracking field study," *Marketing Science*, 33(6), 809-827.

Ueda, Yoshiyuki, and Asuka Komiya. (2012), "Cultural adaptation of visual attention: Calibration of the oculomotor control system in accordance with cultural scenes," *PloS ONE*, 7(11), e50282.

Van Reijmersdal, Eva A., Jeroen Jansz, Oscar Peters, and Guda Van Noort.(2010), "The effects of interactive brand placements in online games on children's cognitive, affective, and conative brand responses," *Computers in Human Behavior*, 26(6), 1787-1794.

Vaughn, Richard. (1980), "How advertising works: A planning model," *Journal of Advertising Research*, 20(5), 27-33.

Viswanathan, Vijay, and Hilde Voorveld. (2015), "Media Multitasking with Television News: The Interaction of Content and Audience Factors," *Advances in Advertising Research*, 5, 129-141.

Voorveld, Hilde A.M. (2011), "Media Multitasking and the Effectiveness of Combining Online and Radio Advertising," *Computers in Human Behavior*, 27 (6), 2200–2206.

Voorveld, Hilde AM, and Margot van der Goot. (2013), "Age differences in media multitasking: A diary study," *Journal of Broadcasting & Electronic Media*, 57(3), 392-408.

Voorveld, Hilde AM, and Vijay Viswanathan. (2015), "An observational study on how situational factors influence media multitasking with TV: The role of genres, dayparts, and social viewing," *Media Psychology*, 18(4), 499-526.

Voorveld, Hilde AM, Claire M. Segijn, Paul E. Ketelaar, and Edith G. Smit. (2014), "Investigating the prevalence and predictors of media multitasking across countries," *International Journal of Communication*, 8, 2755-2777.

Wang, Zheng, and John M. Tchernev. (2012), "The "myth" of media multitasking: Reciprocal dynamics of media multitasking, personal needs, and gratifications," *Journal of Communication*, 62(3), 493-513.

Wang, Zheng, Matthew Irwin, Cody Cooper, and Jatin Srivastava. (2015), ""Multidimensions of media multitasking and adaptive media selection," *Human Communication Research*, 41(1), 102-127.

Wise, Kevin, Hyo Jung Kim, and Jeesum Kim. (2009), "The effect of searching versus surfing on cognitive and emotional responses to online news," *Journal of Media Psychology*, 21(2), 49-59.

Yeykelis, Leo, James J. Cummings, and Byron Reeves. (2014), "Multitasking on a single device: Arousal and the frequency, anticipation, and prediction of switching between media content on a computer," *Journal of Communication*, 64(1), 167-192.

Yonelinas, Andrew P. (2002), "The nature of recollection and familiarity: A review of 30 years of research," *Journal of Memory and Language*, 46(3), 441-517.

Yoo, Changjo, and Deborah MacInnis. (2005), "The brand attitude formation process of emotional and informational ads," *Journal of Business Research*, 58(10), 1397-1406.

Yoon, Sukki, Yung Kyun Choi, and Sujin Song. (2011), "When intrusive can be likable," *Journal of Advertising*, 40(2), 63-76.

Zaichkowsky, Judith Lynne. (1985), "Measuring the involvement construct," *Journal of Consumer Research*, 12(3), 341-352.

Zhang, Weiyu, Se-Hoon Jeong, and Martin Fishbein. (2010), "Effects of multitasking and arousal on television content recall and secondary task performance," *Journal of Media Psychology*, 22, 2-13.

Zhong, Bu, Marie Hardin, and Tao Sun. (2011), "Less effortful thinking leads to more social networking? The associations between the use of social network sites and personality traits," *Computers in Human Behavior*, 27(3), 1265-1271.

APPENDIX A

QUESTIONNAIRE: PRETEST 1

You are invited to participate in a research study that aims to understand college students' media use and perceptions about different product categories. Your participation will involve answering questions about your use of different types of media and product categories. It should take about 15-20 minutes.

PART 1. PROGRAM-ENGAGEMENT GRID DEVELOPMENT

Q. When you watch TV content either live, recorded or streamed online on a television set or other device (i.e., smartphone, laptop, Netflex, Hulu, DVR and etc.), how many hours do you watch each of the following TV program genre per a week? On the scale ranging from never to more than 11 hours, please mark the point that best describes your media use in the average week.

	Never (1)	Less than 30 minutes (2)	30 minutes to less than an hour (3)	1 hour to less than 3 hours (4)	3 hours to less than 5 hours (5)	5 hours to less than 7 hours (6)	7 hours to less than 9 hours (7)	9 hours to less than 11 hours (8)	More than 11 hours (9)
News	❍	❍	❍	❍	❍	❍	❍	❍	❍
Drama	❍	❍	❍	❍	❍	❍	❍	❍	❍
Sitcom	❍	❍	❍	❍	❍	❍	❍	❍	❍
Talk show	❍	❍	❍	❍	❍	❍	❍	❍	❍
Reality show	❍	❍	❍	❍	❍	❍	❍	❍	❍
Documentary	❍	❍	❍	❍	❍	❍	❍	❍	❍
Thriller/ Suspense/Mystery	❍	❍	❍	❍	❍	❍	❍	❍	❍
Sports	❍	❍	❍	❍	❍	❍	❍	❍	❍
Comedy show	❍	❍	❍	❍	❍	❍	❍	❍	❍

Q. When I watch **News**…

<Cognitive Engagement>

- It tends to be thought provoking
- I tend to put a lot of mental effort into watching the program
- I tend to watch carefully to follow the program
- I tend to pay close attention to the program
- I tend to think about what happened and what will happen in the program

- I tend to think about the characters in the program

<Affective Engagement>

- I tend to experience emotions (e.g., happy/sad/angry/amused etc.)
- I tend to feel that the characters in the program are acting out what I feel at times
- I tend to feel as though I am right there in the program
- The program is personal and intimate
- Aspects of the program are attractive to me

All items above are measured on a 7-point, Likert-type item (1:Strongly disagree; 7: Strongly agree):

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

Note: These questions were asked for nine different program genre, including News, Drama, Sitcom, Talk show, Reality show, Documentary, Thriller/Suspense/Mystery, Sports, and Comedy show

PART 2. SELECTION OF PRODUCT CATEGORIES

The next few sets of questions ask your perceptions about different product categories you may purchase. Please select a point that marks your opinion.

<Product Category Involvement>

1. Athletic Shoes

Q. To me, athletic shoes are…

Unimportant 1 2 3 4 5 6 7 Important

Irrelevant 1 2 3 4 5 6 7 Relevant

Means nothing 1 2 3 4 5 6 7 Means a lot

Note: These questions were asked for fifteen different product categories, including Athletic Shoes, Laptop, Toothbrush, Headphones, Body wash/ Shower gel/ Shampoo/ Non-sparkling bottled water, Fresheners, Nutrition/ Energy Bars, Watches, Chewing Gum, Sport Drink, Iced Tea, Instant Coffee, and Energy Drink.

<Product Think-Feel Dimension>

1. Athletic Shoes

Q. When I purchase athletic shoes,

- My decision is mainly logical or objective
- My decision is based mainly on functional facts
- My decision expresses my personality
- My decision is based on my feelings about the product
- My decision is based on looks, taste, touch, smell or sound of the product

All items above are measured on a 7-point, Likert-type item (1:Strongly disagree; 7: Strongly agree):

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

Note: These questions were asked for fifteen different product categories, including Athletic Shoes, Laptop, Toothbrush, Headphones, Body wash/ Shower gel/ Shampoo/ Non-sparkling bottled water, Fresheners, Nutrition/ Energy Bars, Watches, Chewing Gum, Sport Drink, Iced Tea, Instant Coffee, and Energy Drink.

PART 3. MEDIA MULTITASKING CATEGORIZATION

Now, the questions below ask about your media use. Reminder: In this survey, the term "watching TV content" includes many different forms of TV watching. One may watch TV content live on a television set or recorded on a DVR, and others may watch TV content streamed on Netflix or Hulu.

Q. Some people use more than two media devices (TV, smartphone, laptop, desktop, iPad and etc.) at the same time, also known as media multitasking (e.g., smartphone while watching TV content). How often do you use other media devices at the same time as you are watching TV content (either live, recorded or streaming)? (e.g., use laptop computer or smartphone while watching TV content)

Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)

Q. Please indicate how often you generally use each of the following media devices at the same time as you are watching TV content (either live, recorded or streaming).

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)
Smartphone	❍	❍	❍	❍	❍
Laptop	❍	❍	❍	❍	❍
Desktop	❍	❍	❍	❍	❍
Tablet (e.g., iPad)	❍	❍	❍	❍	❍
Others (if have any)	❍	❍	❍	❍	❍

Q. Some people use media primarily for entertainment while others use it primarily for information. Some people use it for both. Below is a list of tasks that some people do on a second media device (e.g., smartphone or tablet) while watching television content on another device. This is called media-multitasking. Please indicate on the scale below whether you do the following for information-seeking or entertainment-seeking while watching television content.

- Checking email
- Texting friends
- Catching up on news
- Browsing the internet
- Social networking (e.g., Facebook, Instagram,Twitter)
- Watching other fun video clips
- Gaming
- Online Shopping
- Paying bills
- Searching information about the show you are watching
- Tweeting/posting about the show on social networks

All items above are measured on a 7-point, Likert-type item (1:Information seeking; 7: Entertainment seeking):

Information seeking (1)	(2)	(3)	(4)	(5)	(6)	Entertainment seeking (7)

Q. Please indicate how often you engage in each of the following activities on an additional device (e.g., smartphone, laptop or iPad) at the same time as you are watching TV content.

- Checking email
- Texting friends
- Catching up on news
- Browsing the internet
- Social networking (e.g., Facebook, Instagram,Twitter)

- Watching other fun video clips
- Gaming
- Online Shopping
- Paying bills
- Searching information about the show you are watching
- Tweeting/posting about the show on social networks

All items above are measured on a 5-point, Likert-type item (1:Never; 5: Very Frequently):

Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Very frequently (5)

PART4. DEMOGRAPHICS

Q. What is your gender?

1) Male
2) Female

Q. What is your age? _____

Q. What year are you in college?

1) Freshman
2) Sophomore
3) Junior
4) Senior
5) Graduate student

Q. Your ethnicity?

1) Caucasian/White
2) African American/Black
3) Asian/Asian American
4) Latino/Hispanic
5) Native American/Pacific Islander
6) Multiracial
7) Others _____

APPENDIX B

QUESTIONNAIRE: PRETEST 2

Technical requirements
1. Laptop, computer or tablet must be used.
2. Computer audio must be functional.

You are invited to participate in a research study that aims to understand college students' perception about television programs. In this survey, you may watch a short video clip. Please make sure that your speakers are working properly. It should take about **30 minutes**.

1) I turned the sound on.
2) Speakers are NOT available right now. (If selected, then skip to end of survey)

Q. Which device are you using to take this survey?
1) Laptop or Computer
2) Tablet
3) Smartphone (If selected, then skip to end of survey)

PART1. In the first section, you will watch 20 minutes of TV content. After watching the video, you will be asked to answer questions.

Q. Please tell us how many episodes of a sitcom "*2Broke Girls*" you have watched before: _____ episodes

Q. Have you watched more than ten episodes of the sitcom "*2Broke Girls*" within the past one year?
1) Yes
2) No

Q. On the next page, you will watch 10 minutes of video clip from the sitcom "*2Broke Girls*." Please read a brief background storyline of the show before you advance to the video.

Street-wise Max (Kat Dennings) doesn't expect much from the new waitress at her night job, a rich girl who has reluctantly joined the food service industry after a string of bad luck. But to her surprise, Caroline (Beth Behrs) is a woman of substance and just may be her ticket to success. The two strike up an unlikely friendship after Caroline discovers that Max can bake a mean cupcake, and the women decide if they can just wrangle up the start-up cash, they may have found their big break. Their co-workers at the diner are boss Han Lee, cook Oleg and cashier Earl.

Now, please watch the "*2Broke Girls*" by clicking the play button. Then, please click the NEXT button at the bottom to advance to the questions.

Note: It is impossible to skip past the video if you are participating. The screen will not advance until 10 minutes have passed. Please fully watch the video. You will be asked about this video in the survey.

<Video Inserted>

Q. The questions below ask you about your thoughts and feelings about the video you just watched. Please rate your agreement level with each statement on a seven-point scale.

<Cognitive engagement>

While I was watching the sitcom "*2Broke Girls*,"

<Cognitive Engagement>

- It tends to be thought provoking
- I tend to put a lot of mental effort into watching the program
- I tend to watch carefully to follow the program
- I tend to pay close attention to the program
- I tend to think about what happened and what will happen in the program
- I tend to think about the characters in the program

<Affective Engagement>

- I tend to experience emotions (e.g., happy/sad/angry/amused etc.)
- I tend to feel that the characters in the program are acting out what I feel at times
- I tend to feel as though I am right there in the program
- The program is personal and intimate
- Aspects of the program are attractive to me

All items above are measured on a 7-point, Likert-type item (1:Strongly disagree; 7: Strongly agree):

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

Note: These sets of questions were asked for 7 different TV programs, including *The Blackist*, *Luther*, *Chicago Fire*, *24*, *Hot in Cleveland*, *2Broke Girls*, and *Last Man Standing*.

PART2. DEMOGRAPHICS

Q. What is your gender?

1) Male
2) Female

Q. What is your age? _____

Q. What year are you in college?

1) Freshman
2) Sophomore
3) Junior
4) Senior
5) Graduate student

Q. Your ethnicity?

1) Caucasian/White
2) African American/Black
3) Asian/Asian American
4) Latino/Hispanic
5) Native American/Pacific Islander
6) Multiracial
7) Others _____

APPENDIX C

QUESTIONNAIRE: PRETEST 3

Technical requirements
1. Laptop, computer or tablet must be used.
2. Computer audio must be functional.

You are invited to participate in a research study that aims to understand your perception about several brands and advertisements. In this survey, you may watch short video clips. Please make sure that your speakers are working properly. It should take about **15 minutes**.

3) I turned the sound on.
4) Speakers are NOT available right now. (If selected, then skip to end of survey)

Q. Which device are you using to take this survey?
4) Laptop or Computer
5) Tablet
6) Smartphone (If selected, then skip to end of survey)

PART 1. Brand Familiarity

Now, please indicate your familiarity with each brand below.

	Very unfamiliar to me (1)	(2)	(3)	(4)	(5)	(6)	Very familiar to me (7)
Microsoft							
Dell							
Colgate							
OralB							
BOSE							
NOCS							
Kind							
GoMacro							
Swatch							
Timex							
Trident							
Extra							
Jacobs							
Fuze							
Dilmah							
GoldPeak							

PART2. Ad Selections

In the next section, you will watch three 30-seconds advertisements. After each ad, you will be asked to answer questions about the ad.

Advertisement 1. Please watch the commercial below by clicking the play button. Then, please click the NEXT button at the bottom to advance to the questions.

<Ad Inserted>

Q. Please rate your agreement level with each statement on a seven-point scale (1: strongly disagree - 7:strongly agree).

<Cognitive Ad Appeal>

- This ad tries to put me in positive moods
- This ad tries to create a positive mood
- This commercial tries to leave me with a good feeling about using this brand.
- Using this brand makes me feel good about myself
- This commercial did not remind me of any experiences or feelings I've had in my own life

<Affective Ad Appeal>

- This ad appeals to my rationality
- This ad provides a lot of information about the brand
- The commercial did not teach me what to look for when buying (this product)
- If they had to, the company could provide evidence to suppport the claims made in this commercial.
- This commercial reminded me of some important facts about this brand

All items above are measured on a 7-point, Likert-type item (1:Strongly disagree; 7: Strongly agree):

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

<Ad Credibility>

Q. The ad was...

Not Credible 1 2 3 4 5 6 7 Credible
Unconvincing 1 2 3 4 5 6 7 Convincing

<Ad Attractiveness>

Q. The ad was...

Unattractive 1 2 3 4 5 6 7 Attractive

<Ad Quality>

Q.I think the quality of the ad was…

Bad 1 2 3 4 5 6 7 Good

<Attitude toward the ad>

Q. The ad was…

Bad 1 2 3 4 5 6 7 Good
Unpleasant 1 2 3 4 5 6 7 Pleasant
Unfavorable 1 2 3 4 5 6 7 Favorable

Q. Have you ever seen this ad before?

1) Yes
2) No

Note: These sets of questions were asked for sixteen different ads, including Microsoft, Dell, Colgate, Oral-B, BOSE, NOCS, Kind, GoMacro, Swatch, Timex, Trident, Extra, Jacobs, FUZE, Dilmah, and Gold Peak.

PART3. DEMOGRAPHICS

Q. What is your gender?

1) Male
2) Female

Q. What is your age? _____

Q. What year are you in college?

1) Freshman
2) Sophomore
3) Junior
4) Senior
5) Graduate student

Q. Your ethnicity?

1) Caucasian/White
2) African American/Black
3) Asian/Asian American
4) Latino/Hispanic
5) Native American/Pacific Islander
6) Multiracial
7) Others _____

APPENDIX D

PRE-QUESTIONNAIR (EXPERIMENT 1 & 2)

Q. Please write down your full name.

_____

Q. What is your mobile phone device? (e.g., Iphone 6, Iphone 6 plus, Samsung Galaxy3)

_____

Q. On a typical day, how much time do you spend using your mobile phone? Please indicate your answer in hours (e.g., 3 hours, 4.5 hours).

_____ Hours

Q. Please indicate your familiarity about several brands below. Please indicate your opinion below.

	Very Unfamiliar (1)	(2)	(3)	(4)	(5)	(6)	Very Familiar (7)
BOSE	❍	❍	❍	❍	❍	❍	❍
ASUS	❍	❍	❍	❍	❍	❍	❍
Dilmah	❍	❍	❍	❍	❍	❍	❍
Oral-B	❍	❍	❍	❍	❍	❍	❍
Philips	❍	❍	❍	❍	❍	❍	❍
Lipton	❍	❍	❍	❍	❍	❍	❍
Cliff	❍	❍	❍	❍	❍	❍	❍
Extra	❍	❍	❍	❍	❍	❍	❍
Microsoft	❍	❍	❍	❍	❍	❍	❍
Doublemint	❍	❍	❍	❍	❍	❍	❍
Casio	❍	❍	❍	❍	❍	❍	❍
Jacobs Coffee	❍	❍	❍	❍	❍	❍	❍
NOCS	❍	❍	❍	❍	❍	❍	❍
Swatch	❍	❍	❍	❍	❍	❍	❍
GoMacro	❍	❍	❍	❍	❍	❍	❍
Maxwell	❍	❍	❍	❍	❍	❍	❍

Q. Please indicate how often you generally use each of the following media devices at the same time as you are watching TV content (either live, recorded or streaming).

	Never (1)	(2)	(3)	(4)	(5)	(6)	Always (7)
Smartphone	❍	❍	❍	❍	❍	❍	❍
Laptop	❍	❍	❍	❍	❍	❍	❍
Desktop	❍	❍	❍	❍	❍	❍	❍
Tablet	❍	❍	❍	❍	❍	❍	❍
Printed Newspaper	❍	❍	❍	❍	❍	❍	❍
Magazine	❍	❍	❍	❍	❍	❍	❍
Radio or MP3 player	❍	❍	❍	❍	❍	❍	❍
Book	❍	❍	❍	❍	❍	❍	❍

APPENDIX E

QUESTIONNAIRE: EXPERIMENT 1

1. SINGLE TASKING CONDITION

PART 1. Cognitive Ad Responses

The questions below ask you about what you remember about the commercials appeared in the video you just watched. Please provide your thoughts and opinion.

<Brand Recall>

Q. Please write down any brand names you can remember from the commercial break. If you did not see any brand names, or can't remember them, please leave this box blank.

_____
_____
_____
_____
_____

<Ad Recognition>

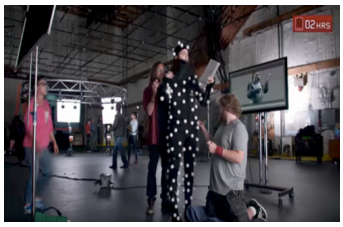
Q. While watching the program, did you see any advertisements for following brands? Please tick the relevant box for all advertisers you remember seeing.

- ❑ BOSE
- ❑ ASUS
- ❑ Trident
- ❑ Dilmah
- ❑ Oral B
- ❑ Ultrasone
- ❑ Philips
- ❑ Lipton
- ❑ Jacobs Coffee
- ❑ Vega One
- ❑ Colgate
- ❑ Extra
- ❑ New Leaf
- ❑ Microsoft
- ❑ Dirol
- ❑ Casio
- ❑ Titan
- ❑ Café Bustelo
- ❑ NOCS
- ❑ Swatch
- ❑ KIND
- ❑ GoMacro
- ❑ Maxwell House
- ❑ Samsung

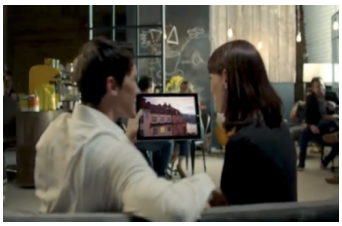
<Ad Recollection>

Q. Based on your memory, please match following eight brand names with a scene from its ad.

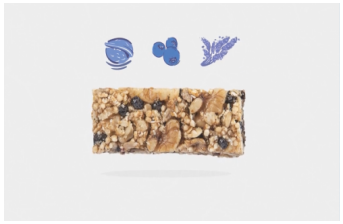
1) Microsoft







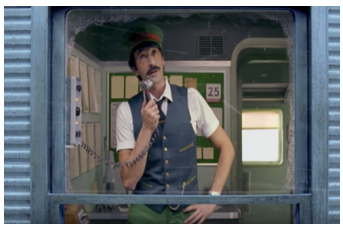

2) GoMacro



3) Swatch







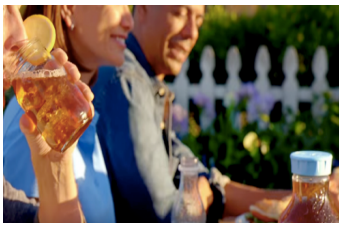
4) Jacobs Coffee



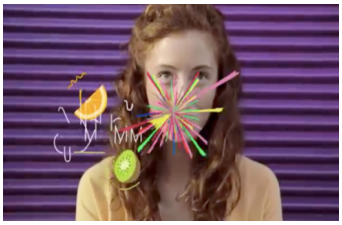


5) Dilmah






6) Extra





7) NOCS

8) Oral-B

< Ad Attention>

Q. How much attention did you pay to the commercials while watching the video clip?
Q. How much did you focus on the commercials embedded in the video clip?

The items above are measured on a 7-point, Likert-type item (1:A little; 7: A lot):

A little (1)	(2)	(3)	(4)	(5)	(6)	A lot (7)

PART2. Affective Ad Responses

The questions below ask you about your thoughts and feelings about the commercials that appeared in the video you just watched. Please rate your opinion

<Attitude toward the Commercial break>

Q. I thought the commercials appeared in the TV program was,

Bad 1 2 3 4 5 6 7 Good
Unpleasant 1 2 3 4 5 6 7 Pleasant
Negative 1 2 3 4 5 6 7 Positive

<Ad Intrusiveness>

Q. I thought the commercials appeared in the TV program was,

- Distracting
- Disturbing
- Interfering
- Intrusive
- Invasive
- Obtrusive

All items above are measured on a 7-point, Likert-type item (1:Strongly disagree; 7: Strongly agree):

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

<Attitude toward the brand; A_b>

1) Microsoft

For me, the brand Microsoft is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

2) GoMacro

For me, the brand GoMacro is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

3) Swatch

For me, the brand Swatch is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

4) Jacobs Coffee

For me, the brand Jacobs Coffee is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

5) Dilmah

For me, the brand Dilmah is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

6) Extra

For me, the brand Extra is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

7) NOCS
For me, the brand NOCS is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

8) Oral-B

For me, the brand Oral-B is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

Q. Among the eight advertisements you have watched during the commercial breaks, have you seen any of the advertisements prior to this experiment? If yes, please mark ALL below.

- o Dilmah ad
- o Oral-B ad
- o NOCS ad
- o Extra ad
- o Jabobs ad
- o Swatch ad
- o GoMacro ad
- o Microsoft ad

PART3. PROGRAM-INDUCED ENGAGEMENT

The questions below ask you about your thoughts and feelings about the video you just watched. Please rate your agreement level with each statement on a seven-point scale.

Q. When I was watching the *Blacklist* (or *Hot in Cleveland*),

<Cognitive Engagement>

- It tends to be thought provoking
- I tend to put a lot of mental effort into watching the program
- I tend to watch carefully to follow the program
- I tend to pay close attention to the program
- I tend to think about what happened and what will happen in the program
- I tend to think about the characters in the program

<Affective Engagement>

- I tend to experience emotions (e.g., happy/sad/angry/amused etc.)
- I tend to feel that the characters in the program are acting out what I feel at times
- I tend to feel as though I am right there in the program
- The program is personal and intimate
- Aspects of the program are attractive to me

All items above are measured on a 7-point, Likert-type item (1:Strongly disagree; 7: Strongly agree):

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

<Program Enjoyment>

Q. When I was watching the *Blacklist* (or *Hot in Cleveland*),

- I found this episode boring
- I found the program entertaining
- I enjoyed watching the program.
- The content of the TV program was relevant to my interests

All items above are measured on a 7-point, Likert-type item (1:Strongly disagree; 7: Strongly agree):

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

Q. While I was watching the program, I was…

Unhappy 1 2 3 4 5 6 7 Happy
Annoyed 1 2 3 4 5 6 7 Pleased
Unsatisfied 1 2 3 4 5 6 7 Satisfied

Q. Have you seen this particular episode prior to today?

1) Yes (How long? About what months ago?) _____
2) No

PART4. DEMOGRAPHICS

Q. What is your gender?

1) Male
2) Female

Q. What is your age? _____

Q. What year are you in college?

1) Freshman
2) Sophomore
3) Junior
4) Senior
5) Graduate student

Q. Your ethnicity?

1) Caucasian/White
2) African American/Black
3) Asian/Asian American
4) Latino/Hispanic
5) Native American/Pacific Islander
6) Multiracial
7) Others _____

Q. The environment I watched the TV program was similar to what I would have in my real life.

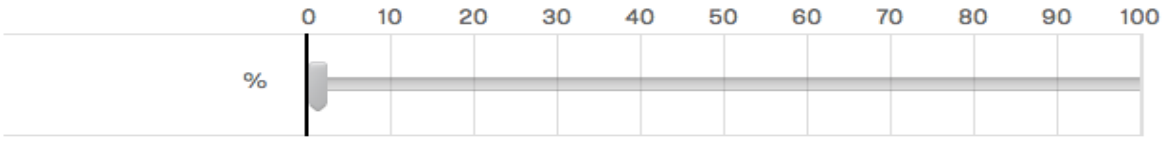
Not similar at all (1)	(2)	(3)	(4)	(5)	(6)	Very similar (7)
❍	❍	❍	❍	❍	❍	❍

2. MULTI TASKING CONDITION

PART1. MEDIA MUTITASKING

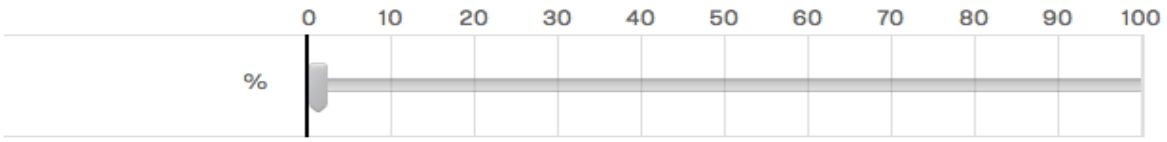
<The Amount of Media Multitasking During the Program>

Q. While watching the program, what percentage (%) of the time did you use your mobile devices? Please drag the bar below to indicate your opinion.



<The Amount of Media Multitasking During the Commercial Break>

Q. While watching the commercial breaks, what percentage (%) of the time did you use your mobile devices? Please drag the bar below to indicate your opinion.



< The Types of Media Multitasking>

Q. Please drag and drop all the activities you engaged on your smartphone **during the program (not during the commercial break).** If you want, you can check the history on your mobile phone for accurate responses. Examples of activities are given below. Please note that your answers do not need to be limited to those examples. If you have engaged in other activities, please write that down.

a) Checking email
b) Paying bills
c) Catching up on news
d) Social networking (Facebook, Instagram, Twitter and etc.)
e) Gaming
f) Online Shopping
g) Texting friends
h) Searching information about a show
i) Others (Please write down as specific as possible)

Activities engaged on smartphone during *the program*

Q. Please drag and drop all the activities you engaged on your smartphone **during commercials.** If you want, you can check the history on your mobile phone for accurate responses. Examples of activities are given below. Please note that your answers do not need to be limited to those examples. If you have engaged in other activities, please write that down.

a) Checking email
b) Paying bills
c) Catching up on news
d) Social networking (Facebook, Instagram, Twitter and etc.)
e) Gaming
f) Online Shopping

g) Texting friends
h) Searching information about a show
i) Others (Please write down as specific as possible)

Activities engaged on smartphone during *the commercials*

PART 2. Cognitive Ad Responses

The questions below ask you about what you remember about the commercials appeared in the video you just watched. Please provide your thoughts and opinion.

<Brand Recall>

Q. Please write down any brand names you can remember from the commercial break. If you did not see any brand names, or can't remember them, please leave this box blank.

_____
_____
_____
_____

<Ad Recognition>

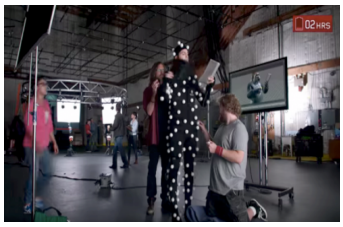
Q. While watching the program, did you see any advertisements for following brands? Please tick the relevant box for all advertisers you remember seeing.

- ❑ BOSE
- ❑ ASUS
- ❑ Trident
- ❑ Dilmah
- ❑ Oral B
- ❑ Ultrasone
- ❑ Philips
- ❑ Lipton
- ❑ Jacobs Coffee
- ❑ Vega One
- ❑ Colgate
- ❑ Extra
- ❑ New Leaf
- ❑ Microsoft
- ❑ Dirol
- ❑ Casio
- ❑ Titan
- ❑ Café Bustelo
- ❑ NOCS
- ❑ Swatch
- ❑ KIND
- ❑ GoMacro
- ❑ Maxwell House
- ❑ Samsung

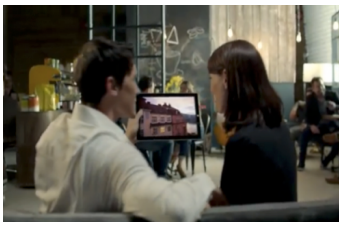
<Ad Recollection>

Q. Based on your memory, please match following eight brand names with a scene from its ad.

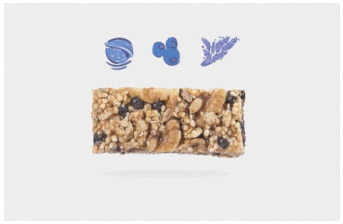
1) Microsoft







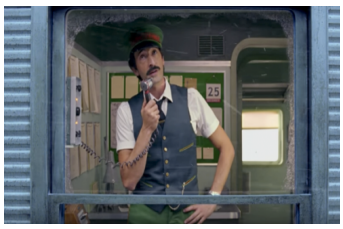

2) GoMacro



3) Swatch







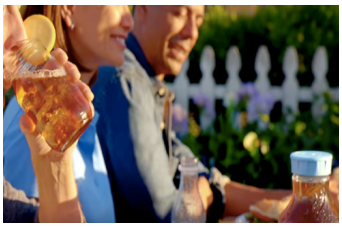
4) Jacobs Coffee



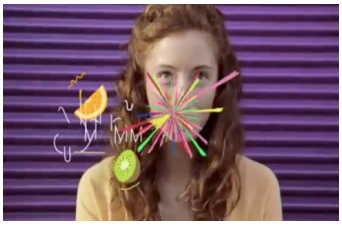


5) Dilmah






6) Extra





7) NOCS

8) Oral-B

< Ad Attention>

Q. How much attention did you pay to the commercials while watching the video clip?
Q. How much did you focus on the commercials embedded in the video clip?

The items above are measured on a 7-point, Likert-type item (1:A little; 7: A lot):

A little (1)	(2)	(3)	(4)	(5)	(6)	A lot (7)

PART3. Affective Ad Responses

The questions below ask you about your thoughts and feelings about the commercials that appeared in the video you just watched. Please rate your opinion

<Attitude toward the Commercial break>

Q. I thought the commercials appeared in the TV program was,

Bad 1 2 3 4 5 6 7 Good
Unpleasant 1 2 3 4 5 6 7 Pleasant
Negative 1 2 3 4 5 6 7 Positive

<Ad Intrusiveness>

Q. I thought the commercials appeared in the TV program was,

- Distracting
- Disturbing
- Interfering
- Intrusive
- Invasive
- Obtrusive

All items above are measured on a 7-point, Likert-type item (1:Strongly disagree; 7: Strongly agree):

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

<Attitude toward the brand; A_b>

1) Microsoft

For me, the brand Microsoft is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

2) GoMacro

For me, the brand GoMacro is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

3) Swatch

For me, the brand Swatch is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

4) Jacobs Coffee

For me, the brand Jacobs Coffee is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

5) Dilmah

For me, the brand Dilmah is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

6) Extra

For me, the brand Extra is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

7) NOCS
For me, the brand NOCS is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

8) Oral-B

For me, the brand Oral-B is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

Q. Among the eight advertisements you have watched during the commercial breaks, have you seen any of the advertisements prior to this experiment? If yes, please mark ALL below.

- o Dilmah ad
- o Oral-B ad
- o NOCS ad
- o Extra ad
- o Jabobs ad
- o Swatch ad
- o GoMacro ad
- o Microsoft ad

PART4. PROGRAM-INDUCED ENGAGEMENT

The questions below ask you about your thoughts and feelings about the video you just watched. Please rate your agreement level with each statement on a seven-point scale.

Q. When I was watching the *Blacklist* (or *Hot in Cleveland*),

<Cognitive Engagement>

- It tends to be thought provoking
- I tend to put a lot of mental effort into watching the program
- I tend to watch carefully to follow the program
- I tend to pay close attention to the program
- I tend to think about what happened and what will happen in the program
- I tend to think about the characters in the program

<Affective Engagement>

- I tend to experience emotions (e.g., happy/sad/angry/amused etc.)
- I tend to feel that the characters in the program are acting out what I feel at times
- I tend to feel as though I am right there in the program
- The program is personal and intimate
- Aspects of the program are attractive to me

All items above are measured on a 7-point, Likert-type item (1:Strongly disagree; 7: Strongly agree):

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

<Program Enjoyment>

Q. When I was watching the *Blacklist* (or *Hot in Cleveland*),

- I found this episode boring
- I found the program entertaining
- I enjoyed watching the program.
- The content of the TV program was relevant to my interests

All items above are measured on a 7-point, Likert-type item (1:Strongly disagree; 7: Strongly agree):

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

Q. While I was watching the program, I was…

Unhappy 1 2 3 4 5 6 7 Happy
Annoyed 1 2 3 4 5 6 7 Pleased
Unsatisfied 1 2 3 4 5 6 7 Satisfied

Q. Have you seen this particular episode prior to today?

3) Yes (How long? About what months ago?) _____
4) No

PART5. DEMOGRAPHICS

Q. What is your gender?

1) Male
2) Female

Q. What is your age? _____

Q. What year are you in college?

1) Freshman
2) Sophomore
3) Junior
4) Senior
5) Graduate student

Q. Your ethnicity?

1) Caucasian/White
2) African American/Black
3) Asian/Asian American
4) Latino/Hispanic
5) Native American/Pacific Islander
6) Multiracial
7) Others _____

Q. The environment I watched the TV program was similar to what I would have in my real life.

Not similar at all (1)	(2)	(3)	(4)	(5)	(6)	Very similar (7)
❍	❍	❍	❍	❍	❍	❍

APPENDIX F

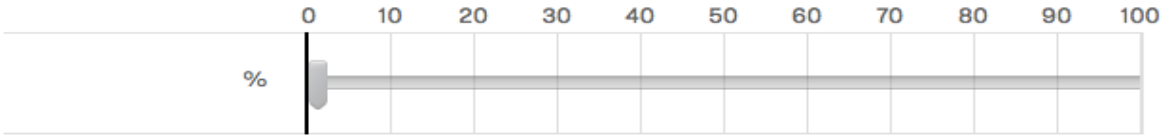
QUESTIONNAIRE: EXPERIMENT 2

1. MEDIA MULTITASKING × FAMILIARITY HIGH CONDITION

PART1. MEDIA MUTITASKING

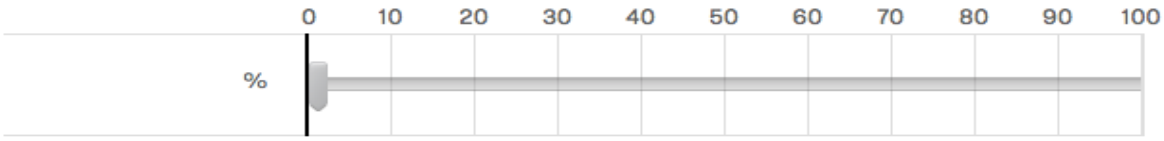
<The Amount of Media Multitasking During the Program>

Q. While watching the program, what percentage (%) of the time did you use your mobile devices? Please drag the bar below to indicate your opinion.



<The Amount of Media Multitasking During the Commercial Break>

Q. While watching the commercial breaks, what percentage (%) of the time did you use your mobile devices? Please drag the bar below to indicate your opinion.



< The Types of Media Multitasking>

Q. Please drag and drop all the activities you engaged on your smartphone **during the program (not during the commercial break).** If you want, you can check the history on your mobile phone for accurate responses. Examples of activities are given below. Please note that your answers do not need to be limited to those examples. If you have engaged in other activities, please write that down.

j) Checking email k) Paying bills l) Catching up on news m) Social networking (Facebook, Instagram, Twitter and etc.) n) Gaming o) Online Shopping p) Texting friends q) Searching information about a show **r)** Others (Please write down as specific as possible)

Activities engaged on smartphone during *the program*

Q. Please drag and drop all the activities you engaged on your smartphone **during commercials.** If you want, you can check the history on your mobile phone for accurate responses. Examples of activities are given below. Please note that your answers do not need to be limited to those examples. If you have engaged in other activities, please write that down.

j) Checking email
k) Paying bills
l) Catching up on news
m) Social networking (Facebook, Instagram, Twitter and etc.)
n) Gaming
o) Online Shopping
p) Texting friends
q) Searching information about a show
r) Others (Please write down as specific as possible)

Activities engaged on smartphone during *the commercials*

PART 2. Cognitive Ad Responses

The questions below ask you about what you remember about the commercials appeared in the video you just watched. Please provide your thoughts and opinion.

<Brand Recall>

Q. Please write down any brand names you can remember from the commercial break. If you did not see any brand names, or can't remember them, please leave this box blank.

_____
_____
_____
_____

<Ad Recognition>

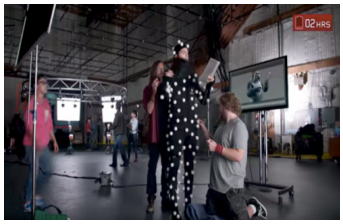
Q. While watching the program, did you see any advertisements for following brands? Please tick the relevant box for all advertisers you remember seeing.

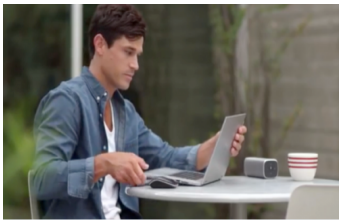
- ❑ BOSE
- ❑ ASUS
- ❑ Trident
- ❑ Dilmah
- ❑ Oral B
- ❑ Ultrasone
- ❑ Philips
- ❑ Lipton
- ❑ Jacobs Coffee
- ❑ Vega One
- ❑ Colgate
- ❑ Extra
- ❑ New Leaf
- ❑ Microsoft
- ❑ Dirol
- ❑ Casio
- ❑ Titan
- ❑ Café Bustelo
- ❑ NOCS
- ❑ Swatch
- ❑ KIND
- ❑ GoMacro
- ❑ Maxwell House
- ❑ Samsung

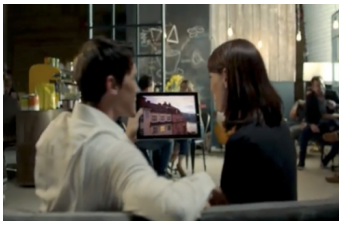
<Ad Recollection>

Q. Based on your memory, please match following eight brand names with a scene from its ad.

1) Microsoft





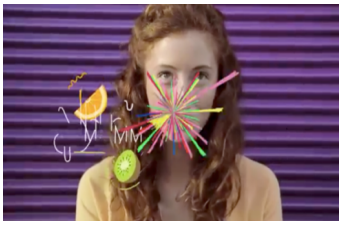



2) Swatch





3) Extra





4) Oral-B



< Ad Attention>

Q. How much attention did you pay to the commercials while watching the video clip?
Q. How much did you focus on the commercials embedded in the video clip?

The items above are measured on a 7-point, Likert-type item (1:A little; 7: A lot):

A little (1)	(2)	(3)	(4)	(5)	(6)	A lot (7)

PART3. Affective Ad Responses

The questions below ask you about your thoughts and feelings about the commercials that appeared in the video you just watched. Please rate your opinion

<Attitude toward the Commercial break>

Q. I thought the commercials appeared in the TV program was,

Bad 1 2 3 4 5 6 7 Good
Unpleasant 1 2 3 4 5 6 7 Pleasant
Negative 1 2 3 4 5 6 7 Positive

<Ad Intrusiveness>

Q. I thought the commercials appeared in the TV program was,

- Distracting
- Disturbing
- Interfering
- Intrusive
- Invasive
- Obtrusive

All items above are measured on a 7-point, Likert-type item (1:Strongly disagree; 7: Strongly agree):

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

<Attitude toward the brand; A_b>

1) Microsoft

For me, the brand Microsoft is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

2) Swatch

For me, the brand Swatch is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

3) Extra

For me, the brand Extra is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

4) Oral-B

For me, the brand Oral-B is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

Q. Among the eight advertisements you have watched during the commercial breaks, have you seen any of the advertisements prior to this experiment? If yes, please mark ALL below.

- o Oral-B ad
- o Extra ad
- o Swatch ad
- o Microsoft ad

PART4. PROGRAM-INDUCED ENGAGEMENT

The questions below ask you about your thoughts and feelings about the video you just watched. Please rate your agreement level with each statement on a seven-point scale.

Q. When I was watching *Luther* (or *2Broke Girls*),

<Cognitive Engagement>

- It tends to be thought provoking
- I tend to put a lot of mental effort into watching the program
- I tend to watch carefully to follow the program
- I tend to pay close attention to the program
- I tend to think about what happened and what will happen in the program
- I tend to think about the characters in the program

<Affective Engagement>

- I tend to experience emotions (e.g., happy/sad/angry/amused etc.)
- I tend to feel that the characters in the program are acting out what I feel at times
- I tend to feel as though I am right there in the program
- The program is personal and intimate
- Aspects of the program are attractive to me

All items above are measured on a 7-point, Likert-type item (1:Strongly disagree; 7: Strongly agree):

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

<Program Enjoyment>

Q. When I was watching *Luther*,

- I found this episode boring
- I found the program entertaining
- I enjoyed watching the program.
- The content of the TV program was relevant to my interests

All items above are measured on a 7-point, Likert-type item (1:Strongly disagree; 7: Strongly agree):

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

Q. While I was watching the program, I was…

Unhappy 1 2 3 4 5 6 7 Happy
Annoyed 1 2 3 4 5 6 7 Pleased
Unsatisfied 1 2 3 4 5 6 7 Satisfied

Q. Have you seen this particular episode prior to today?

5) Yes (How long? About what months ago?) _____
6) No

PART5. DEMOGRAPHICS

Q. What is your gender?

1) Male
2) Female

Q. What is your age? _____

Q. What year are you in college?

1) Freshman
2) Sophomore
3) Junior
4) Senior
5) Graduate student

Q. Your ethnicity?

1) Caucasian/White
2) African American/Black
3) Asian/Asian American
4) Latino/Hispanic
5) Native American/Pacific Islander
6) Multiracial
7) Others _____

Q. The environment I watched the TV program was similar to what I would have in my real life.

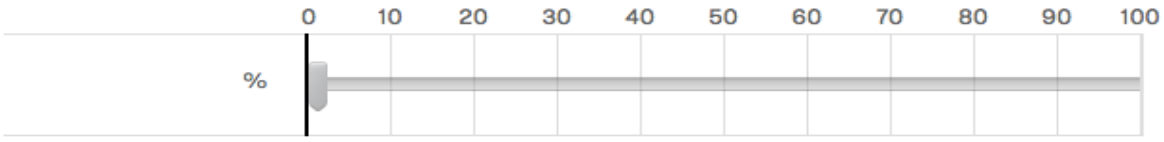
Not similar at all (1)	(2)	(3)	(4)	(5)	(6)	Very similar (7)
❍	❍	❍	❍	❍	❍	❍

2. MEDIA MULTITASKING × FAMILIARITY LOW CONDITION

PART1. MEDIA MUTITASKING

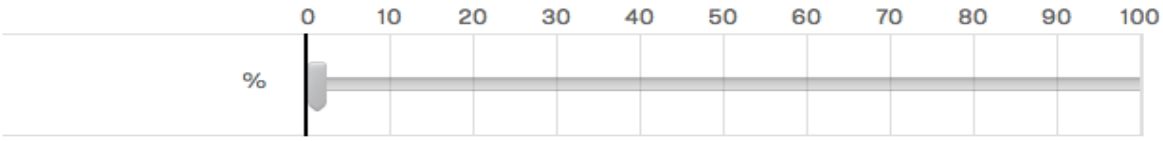
<The Amount of Media Multitasking During the Program>

Q. While watching the program, what percentage (%) of the time did you use your mobile devices? Please drag the bar below to indicate your opinion.



<The Amount of Media Multitasking During the Commercial Break>

Q. While watching the commercial breaks, what percentage (%) of the time did you use your mobile devices? Please drag the bar below to indicate your opinion.



< The Types of Media Multitasking>

Q. Please drag and drop all the activities you engaged on your smartphone **during the program (not during the commercial break).** If you want, you can check the history on your mobile phone for accurate responses. Examples of activities are given below. Please note that your answers do not need to be limited to those examples. If you have engaged in other activities, please write that down.

s) Checking email
t) Paying bills
u) Catching up on news
v) Social networking (Facebook, Instagram, Twitter and etc.)
w) Gaming
x) Online Shopping
y) Texting friends
z) Searching information about a show
aa) Others (Please write down as specific as possible)

Activities engaged on smartphone during *the program*

Q. Please drag and drop all the activities you engaged on your smartphone **during commercials.** If you want, you can check the history on your mobile phone for accurate responses. Examples of activities are given below. Please note that your answers do not need to be limited to those examples. If you have engaged in other activities, please write that down.

s) Checking email
t) Paying bills
u) Catching up on news
v) Social networking (Facebook, Instagram, Twitter and etc.)
w) Gaming
x) Online Shopping
y) Texting friends
z) Searching information about a show
aa) Others (Please write down as specific as possible)

Activities engaged on smartphone during *the commercials*

PART 2. Cognitive Ad Responses

The questions below ask you about what you remember about the commercials appeared in the video you just watched. Please provide your thoughts and opinion.

<Brand Recall>

Q. Please write down any brand names you can remember from the commercial break. If you did not see any brand names, or can't remember them, please leave this box blank.

_____
_____
_____
_____

<Ad Recognition>

Q. While watching the program, did you see any advertisements for following brands? Please tick the relevant box for all advertisers you remember seeing.

- ❑ BOSE
- ❑ ASUS
- ❑ Trident
- ❑ Dilmah
- ❑ Oral B
- ❑ Ultrasone
- ❑ Philips
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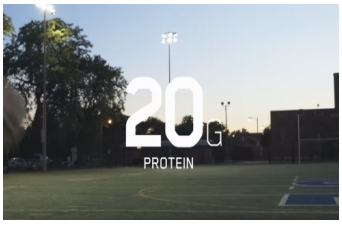
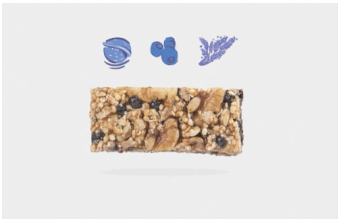
- ❑ Jacobs Coffee
- ❑ Vega One
- ❑ Colgate
- ❑ Extra
- ❑ New Leaf
- ❑ Microsoft
- ❑ Dirol
- ❑ Casio
- ❑ Titan
- ❑ Café Bustelo
- ❑ NOCS
- ❑ Swatch
- ❑ KIND
- ❑ GoMacro
- ❑ Maxwell House
- ❑ Samsung

<Ad Recollection>

Q. Based on your memory, please match following eight brand names with a scene from its ad.

1) GoMacro





2) Jacobs Coffee

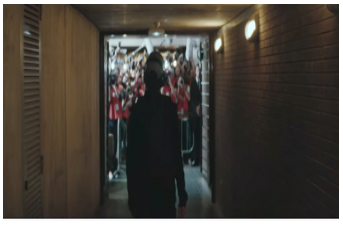
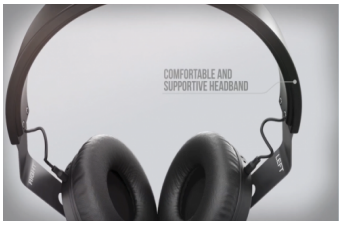




3) Dilmah




4) NOCS

< Ad Attention>

Q. How much attention did you pay to the commercials while watching the video clip?
Q. How much did you focus on the commercials embedded in the video clip?

The items above are measured on a 7-point, Likert-type item (1:A little; 7: A lot):

A little (1)	(2)	(3)	(4)	(5)	(6)	A lot (7)

PART3. Affective Ad Responses

The questions below ask you about your thoughts and feelings about the commercials that appeared in the video you just watched. Please rate your opinion

<Attitude toward the Commercial break>

Q. I thought the commercials appeared in the TV program was,

Bad 1 2 3 4 5 6 7 Good
Unpleasant 1 2 3 4 5 6 7 Pleasant
Negative 1 2 3 4 5 6 7 Positive

<Ad Intrusiveness>

Q. I thought the commercials appeared in the TV program was,

- Distracting
- Disturbing
- Interfering
- Intrusive
- Invasive
- Obtrusive

All items above are measured on a 7-point, Likert-type item (1:Strongly disagree; 7: Strongly agree):

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

<Attitude toward the brand; A_b>

1) GoMacro

For me, the brand GoMacro is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

2) Jacobs Coffee

For me, the brand Jacobs Coffee is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

3) Dilmah

For me, the brand Dilmah is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

4) NOCS
For me, the brand NOCS is...

Unfavorable 1 2 3 4 5 6 7 Favorable
Dislikable 1 2 3 4 5 6 7 Likable

Q. Among the eight advertisements you have watched during the commercial breaks, have you seen any of the advertisements prior to this experiment? If yes, please mark ALL below.

- o Dilmah ad
- o NOCS ad
- o Jabobs ad
- o GoMacro ad

PART4. PROGRAM-INDUCED ENGAGEMENT

The questions below ask you about your thoughts and feelings about the video you just watched. Please rate your agreement level with each statement on a seven-point scale.

Q. When I was watching the *Luther* (or *2Broke Girls*),

<Cognitive Engagement>

- It tends to be thought provoking
- I tend to put a lot of mental effort into watching the program
- I tend to watch carefully to follow the program
- I tend to pay close attention to the program
- I tend to think about what happened and what will happen in the program
- I tend to think about the characters in the program

<Affective Engagement>

- I tend to experience emotions (e.g., happy/sad/angry/amused etc.)
- I tend to feel that the characters in the program are acting out what I feel at times
- I tend to feel as though I am right there in the program
- The program is personal and intimate
- Aspects of the program are attractive to me

All items above are measured on a 7-point, Likert-type item (1:Strongly disagree; 7: Strongly agree):

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

<Program Enjoyment>

Q. When I was watching *Luther* (or *2Broke Girls*)

- I found this episode boring
- I found the program entertaining
- I enjoyed watching the program.
- The content of the TV program was relevant to my interests

All items above are measured on a 7-point, Likert-type item (1:Strongly disagree; 7: Strongly agree):

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)

Q. While I was watching the program, I was…

Unhappy 1 2 3 4 5 6 7 Happy
Annoyed 1 2 3 4 5 6 7 Pleased
Unsatisfied 1 2 3 4 5 6 7 Satisfied

Q. Have you seen this particular episode prior to today?

1) Yes (How long? About what months ago?) _____
2) No

PART5. DEMOGRAPHICS

Q. What is your gender?

1) Male
2) Female

Q. What is your age? _____

Q. What year are you in college?
1) Freshman
2) Sophomore
3) Junior
4) Senior
5) Graduate student

Q. Your ethnicity?
1) Caucasian/White
2) African American/Black
3) Asian/Asian American
4) Latino/Hispanic
5) Native American/Pacific Islander
6) Multiracial
7) Others _____

Q. The environment I watched the TV program was similar to what I would have in my real life.

Not similar at all (1)	(2)	(3)	(4)	(5)	(6)	Very similar (7)
❍	❍	❍	❍	❍	❍	❍