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**DOI**

[10.1080/15213269.2013.872038](https://doi.org/10.1080/15213269.2013.872038)

**Publication date**

2015

**Document Version**

Final published version

**Published in**

Media Psychology

[Link to publication](#)

**Citation for published version (APA):**

Voorveld, H. A. M., & Viswanathan, V. (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. <https://doi.org/10.1080/15213269.2013.872038>

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# **An Observational Study on How Situational Factors Influence Media Multitasking With TV: The Role of Genres, Dayparts, and Social Viewing**

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*This study responds to the need for research on individuals' media multitasking behavior using observational data. Media multitasking can have a profound impact on media processing and effects. However, we have little knowledge on when people are likely to engage in media multitasking and, consequently, when these effects are likely to occur. This study examines how three important situational factors—television genres, dayparts, and social viewing—influence the amount of media multitasking. Granular observational data obtained by directly monitoring and recording media consumption behaviors of a large panel at 10-second intervals are used for the analysis. The study reveals that media multitasking with television is most prevalent when people watch sports or engage in channel surfing and less prevalent with commercials, news, and entertainment. Furthermore, the extent of media multitasking is greater in the morning and afternoon than in the evening, and also greater when individuals watch television alone than in the presence of others. Daypart differences are*

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Both authors contributed equally to this work.

The authors would like to thank the Council for Research Excellence (<http://www.researchexcellence.com>) for making the data available for the analysis. The authors would also like to thank Michael Holmes for his inputs as well as Prof. Dr. Peter Neijens and Claire Segijn for their comments on an earlier version of this manuscript. Finally, they would like to thank three anonymous reviewers and the editor for their helpful suggestions.

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*larger for genres associated with incidental viewing (commercials and channel surfing) than for genres associated with intentional viewing (news, entertainment, and sports). Sports is the only genre that is associated with higher amounts of media multitasking when watching television with others.*

In today's media environment, people have access to numerous media platforms and often engage with more than one medium at a time. Simultaneous engagement with multiple media at a particular instance of time is referred to as media multitasking (e.g., Foehr, 2006; Jeong & Hwang, 2012; Pilotta & Schultz, 2005; Voorveld, 2011; Voorveld & Van der Goot, 2013; Wang & Tchernev, 2012). For example, an individual might browse the Internet while watching a reality show on television, or watch sports on television and simultaneously check scores for other games on his or her mobile device. Previous research has found that media multitasking is prevalent among both youth and adults, especially when using television and computers (Carrier, Cheever, Rosen, Benitez, & Chang, 2009; Roberts & Foehr, 2008; Voorveld & Van der Goot, 2013).

The prevalence of media multitasking has raised several important questions related to information processing and media effects. Prior studies have shown that multitasking might result in a lower quality of exposure, more superficial processing of messages in the media (Jeong & Fishbein, 2007; Jeong, Hwang, & Fishbein, 2010), and lower critical information processing because it inhibits counterarguments (Jeong & Hwang, 2012). However, we do not yet know when these effects are likely to occur as we have little knowledge of when people are likely to engage in media multitasking. Investigating situational factors is important because these factors strongly influence media usage (Wonneberger, Schoenbach, & Van Meurs, 2011) and may, therefore, also influence the extent of media multitasking. This study provides insights on how three important situational factors, namely, television genre, daypart, and social viewing, influence the extent to which individuals engage in media multitasking, and makes four important contributions to on-going work on media multitasking.

First, we have little knowledge of whether the extent of media multitasking varies with certain forms of media content. For instance, a popular notion is that people engage with other media during commercial blocks on television (Bardhi, Rohm, & Sultan, 2010; Pilotta, Schultz, Drenik, & Rist, 2004), but this notion has not been examined or supported empirically. Similarly, there is no work that has examined whether media multitasking occurs with other forms of television content such as news and entertainment. In line with previous studies (e.g., Atkin, 1985; Hawkins et al., 2001), this study examines television genres such as news, entertainment, sports, and commercials, and also channel surfing, which is a different form of television

use. The conceptual framework of the study combines intentional exposure theory, notions of limited capacity theory, and decision theory to test the idea that the extent of media multitasking varies across genres.

Second, the study examines whether media multitasking occurs throughout the day or is more prevalent for certain dayparts. Media usage peaks at certain times of the day and, as a result, media multitasking might also differ across dayparts. This issue has important implications for media effects theories because it provides insight on how the extent of media multitasking varies at different dayparts. Also, practitioners can benefit from knowledge of when media multitasking is prevalent and can accordingly make decisions related to media planning and integrated marketing communications.

Third, the study investigates the role of social viewing, an important situational factor that influences media use (Wonneberger et al., 2011). Family members and friends often watch television together as the process facilitates interpersonal communication. However, the presence of other individuals could change the way people view television (Webster & Wakshlag, 1983), and presumably the amount of media multitasking.

Finally, previous studies on the extent of media multitasking suffer from an important methodological limitation. Virtually all studies rely on surveys or diaries in which media use is self-reported. However, self-reported media use is severely limited because it is often trivial and easily forgotten (e.g., Jordan, Trentacoste, Henderson, Manganello, & Fishbein, 2007; Kiel & Layton, 1981; Mitchell, Macklin, & Paxman, 2007). Furthermore, it might be even harder for people to report accurately on a complex form of media usage such as media multitasking (Brasel & Gips, 2011; Papper, Holmes, & Popovich, 2004). Therefore, insights on media multitasking gained from survey and diary research may not necessarily reflect naturalistic viewing patterns that occur in the home environment (Brasel & Gips, 2011; Jayasinghe & Ritson, 2013; Potts, Dedmon, & Halford, 1996). As a result, there is an increasing need for research that observes people's natural media multitasking behavior (Brasel & Gips, 2011). Hence, a fourth contribution of this study is the examination of the prevalence of media multitasking using observational data with accurate measurements of media multitasking at small time intervals throughout the course of a day. Employing a unique and large-scale observational study of media usage enables this study to overcome the limitations of traditional survey research.

## BACKGROUND

### Conceptualization and Prevalence of Media Multitasking

In this study, media multitasking is studied at a behavioral level and defined as “multiple exposures to various media forms at a single point in time for

the same media consumer” (Pilotta et al., 2004, p. 285). Previous studies on media multitasking among adults (e.g., Papper et al., 2004; Pilotta et al., 2004; Pilotta & Schultz, 2005; Schultz, Block, & Raman, 2012) have shown that multitasking is common and approximately a quarter of one’s media day involves media multitasking (Papper et al., 2004). However, it seems that there exist variations in the combinations of media used. People are more likely to multitask with television, computers, the Internet, and cell phones, and less likely to multitask with games (Papper et al., 2004; Roberts & Foehr, 2008). Unfortunately, most of these findings are based on survey research that suffers from the limitations mentioned earlier. Therefore, before delving into media multitasking with television, it would be interesting to exploit the observational nature of the data and understand the extent of media multitasking for different media. Consequently, our first research question states, using observational data, what is the total amount of (a) media multitasking in total and (b) across media (television, video, music, online, computer, phone, print, and games) (Research Question 1)?

### Factors Influencing Media Multitasking

Webster, Phalen, and Lichtly (2000) suggest that two factors broadly explain media use: audience factors and media factors. Audience factors are characteristics of individuals such as sociodemographic factors and psychological factors (Jeong & Fishbein, 2007). For example, studies have investigated whether younger individuals more frequently engage in media multitasking than older individuals (Carrier et al., 2009; Voorveld & Van der Goot, 2013) and found that, contrary to popular belief, age differences are quite small. In addition, earlier research has found that females are more likely than males to combine media usage with non-media activities, and that sensation seeking (Jeong & Fishbein, 2007) and impulsivity (Jeong & Fishbein, 2007; Sanbonmatsu, Strayer, Medeiros-Ward, & Watson, 2013) are positively related to multitasking.

Media factors (Webster et al., 2000) comprise of structural media factors (e.g., media market) and individual media factors (e.g., media ownership). Some studies refer to media factors as situational factors (Cooper & Tang, 2009; Wonneberger et al., 2011) and suggest that these factors influence media usage to a greater extent than audience factors (Webster & Wakshlag, 1983; Wonneberger et al., 2011). Important situational factors include media content and ownership (Webster & Wakshlag, 1983), availability at different times of the day (Taneja, Webster, Malthouse, & Ksiazek, 2012; Webster & Wakshlag, 1983) and social viewing (Lull, 1980). An earlier study that examines how media usage is combined with non-media activities found that media ownership significantly influences multitasking with media (Jeong & Fishbein, 2007). To summarize, it seems that situational factors play a significant role in influencing not only media usage but also multitasking

with media. Therefore, a key contribution of this study is that it examines how situational factors such as television genre, dayparts, and social viewing influence the extent of media multitasking.

### Genre Differences in Media Multitasking

To explain genre differences in media multitasking, we build on previous work pertaining to exposure, information processing, cognitive systems, and decision making. We, first, briefly discuss these theories and then discuss each genre in detail. First, intentional exposure theory suggests that it is important to distinguish between editorial and noneditorial content. This theory was developed by Lord and Putrevu (1993) and states that consumers usually watch television to expose themselves to editorial content rather than to advertising (Gupta & Lord, 1998; Lord & Putrevu, 1993; Van Reijmersdal, Neijens, & Smit, 2010). In other words, editorial content is usually watched intentionally while advertising is generally watched incidentally. Typically, consumers are 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). Since incidental viewing is associated with lower levels of attention and, thus, lower motivation to process the particular content, individuals can engage in other activities. Therefore, the extent of media multitasking might be greater with television content that is watched incidentally than with television content that is watched intentionally.

Second, limited capacity theory (Lang, 2000; Lang, Bradley, Park, Shin, & Chung, 2006) argues that humans' information processing capacities are limited and that people should allocate their resources accordingly between tasks. For instance, some tasks can be performed automatically and need fewer resources, while other tasks require more elaborate processing and therefore require more resources (Lang & Chzran, 2013). Consistent with this theory, Wang, Irwin, Cooper, and Srivastava (2013) show in a naturalistic environment that people are more likely to select media multitasking combinations that are less cognitively demanding. Thus, genres that require only few cognitive resources might be associated with a high amount of media multitasking.

Third, decision theory suggests that people only multitask when they expect to benefit from it (Sanbonmatsu et al., 2013). In other words, people engage with other media when watching a particular genre if they believe they would benefit from simultaneously using another medium.

Below, we discuss the four types of content and one special form of television viewing central to our study, one by one. We apply all the three theories discussed above and develop our hypothesis based on (a) whether people watch a genre intentionally or incidentally, and thus, are motivated to process the actual content; (b) whether it is likely that there are capac-

ity constraints; and (c) whether it is likely that additional benefits such as social gratifications are obtained. We believe that the interaction of these three dimensions can help explain the amount of media multitasking with a certain genre. We propose that people generally prefer to reserve cognitive resources by avoiding situations involving high cognitive demands (Wang et al., 2013), and, therefore, refrain from media multitasking when a certain content requires a lot of cognitive resources. However, people are willing to use their cognitive resources when they are motivated to process content and hence intentionally expose themselves to such content, or when media multitasking is likely to result in additional benefits.

*News.* News can be characterized as a genre that is watched intentionally and, therefore, already likely to be associated with a low amount of media multitasking. Limited capacity theory also helps explaining the extent of media multitasking with news. As the term “news” suggests, it usually consists of information that is new to television viewers. Current newscasts are fast paced, and have tabloid-style production features (Grabe, Zhou, Lang, & Bolls, 2000), thus making interpreting television news a highly complex and cognitively demanding process (Schaap, Renckstorf, & Wester, 2005). Also, cognitive load theory suggests that new and complex tasks impose a higher likelihood of putting heavy load on the cognitive system (Lang & Chzran, 2013; Lee, 2012). Thus, watching news is likely to induce a heavy cognitive load (Grabe et al., 2000) and combining it with another medium simultaneously could even result in cognitive overload. Furthermore, media multitasking with news is likely to result in lower processing of the news content. This is supported by earlier empirical research which has found that multitasking with media results in lower levels of cognitive task performance, such as learning, comprehension, and memory (e.g., Bowman, Levine, Waite, & Gendron, 2010; Ophir, Nass, & Wagner, 2009; Pool, Koolstra, & van der Voort, 2003). Consequently, it is unlikely that intentional viewers of news obtain any additional benefits when media multitasking with news. We, therefore, hypothesize that news is associated with low levels of media multitasking (Hypothesis 1a).

*Entertainment.* The genre entertainment can be characterized as a form of intentional viewing. Based on limited capacity models, one could argue that watching entertainment requires less careful attention than watching news (Hawkins et al., 2001) and as such should result in lower cognitive overload or capacity restrictions and, therefore, in a higher likelihood to engage in media multitasking. However, based on decision theory, the opposite could be expected. It seems that media multitasking would limit the enjoyment experience with entertainment (Jeong & Fishbein, 2007). This is because several psychological processes such as transportation, narrative engagement, and parasocial interaction that contribute to the experience compete with other mental processes for cognitive and emotional resources (Bilandzic & Busselle, 2008). It is also important to note that distraction disrupts these

processes (Busselle & Bilandzic, 2009; Green, Brock, & Kaufman, 2004). Therefore, cognitive overload is likely to occur with media multitasking and the enjoyable experience gained from watching entertainment is diminished (Buijzen, Van Reijmersdal, & Owen, 2010; Lang, 2000). Since individuals generally watch entertainment intentionally, and are not likely to benefit from media multitasking because cognitive overload would occur and the entertainment experience would be diminished, we hypothesize that the entertainment genre is associated with low levels of media multitasking (Hypothesis 1b).

*Sports.* The genre sports is generally watched intentionally and, therefore, one would argue that it may be associated with a low amount of media multitasking. From a limited capacity perspective, several salient dimensions of the media genre (e.g., arousing content, fast pacing or high structural complexity, high information density) would make sports cognitively demanding (e.g., see Lang, Park, Sanders, Wilson, & Wang, 2007; Wang, Lang, & Busemeyer, 2012) and, therefore, also likely to be associated with a low amount of media multitasking.

However, one would expect based on decision theory that sports is associated with a higher amount of media multitasking as media multitasking could enhance the experience obtained while watching this genre (Brown-Smith, Willis, Irwin, & Quilliam, 2013). This is further substantiated by previous research, which has found that sports viewers are quite active while viewing and that they are more likely to communicate with others compared to other television content and more likely to check media sources for follow-up information (Bardhi et al., 2010; Eastman & Land, 1997; Gantz, 1981; Gantz, Wang, Paul, & Potter, 2006; Raney, 2006; Wenner & Gantz, 1998). Therefore, it is reasonable to assume that sports viewers find it rewarding to watch sports and concurrently send text messages to friends or check game statistics online. Thus, while on one hand, the sports genre is usually watched intentionally and is cognitively demanding, on the other hand, sports viewers can benefit from media multitasking. Therefore, we expect that this genre is associated with moderate levels of media multitasking (Hypothesis 1c).

*Commercials.* Watching commercials is generally characterized as a form of incidental viewing. People usually watch television for the editorial content and not to see commercials (Gupta & Lord, 1998; Putrevu & Lord, 1993; Van Reijmersdal et al., 2010). Commercials are typically consumed as background noise and some people even actively avoid advertising (Smit, 1999). Since people are generally not motivated to thoroughly process the content of commercials, it can be expected that they have sufficient cognitive capacity to engage with additional media. Based on decision theory, it can be argued that media multitasking during commercials can make watching disruptive commercials a more enjoyable experience (Bardhi et al., 2010; Sanbonmatsu et al., 2013; Wang & Tchernev, 2012). Therefore, we expect

that commercials are associated with high levels of media multitasking (Hypothesis 1d).

*Channel surfing.* We argue that channel surfing is an incidental form of viewing since people generally zap through channels without paying attention to programming content (Van Meurs, 1998). Therefore, channel surfing might be associated with automatic processing rather than with controlled or elaborate forms of processing (Buijzen et al., 2011). Based on the notion of limited capacity, channel surfing might, therefore, leave sufficient mental capacity or resources to engage in concurrent media usage. The use of other media can also result in additional benefits, such as fulfillment of surveillance motivations, which are generally important when people engage in channel surfing (Stafford & Stafford, 1996). Thus, we expect that channel surfing is associated with high levels of media multitasking (Hypothesis 1e).

### Daypart Differences

Watching television is a popular way to pass time in the United States. Americans watch television for almost 3 hours each day, which is part of their daily leisure time (Bureau of Labor Statistics, 2012). Time-use surveys show that people engage in higher amounts of media usage, and in particular television viewing, during evenings than during mornings or afternoons (Pew Research Center, 2013; SPOT, 2012). Moreover, studies also suggest that television viewing is a more central activity during the evening than other times of the day (Vandebosch, Roe, & Van den Bulck, 2006; Van der Goot, Beentjes, & Van Selm, 2011). It, therefore, seems that television viewing in the evening is a form of intentional viewing rather than incidental viewing as people are glued to their television sets during this daypart. Consequently, it is also reasonable to assume that during the evening hours, individuals have limited cognitive resources to engage with other media concurrently and see little benefit in doing so. Thus, after controlling for the time available to watch television, we claim that media multitasking occurs to a lower extent in the evening than in other dayparts. Therefore, we expect that watching television is associated with higher levels of media multitasking during the morning or afternoon than during the evening (Hypothesis 2).

Furthermore, it would be interesting to explore whether there are any significant interactions between genres and dayparts. Since people are glued to the television screen in the evening (Vandebosch et al., 2006), it is possible that media multitasking with commercials and channel surfing is less prevalent during evenings than during mornings or afternoons, while multitasking with intentionally watched genres such as news does not differ across the course of the day. To explore these interactions, we examine whether there exists a significant interaction effect between genres and dayparts in the amount of media multitasking (Research Question 2)?

## Social Viewing

Television viewing is often a social event. Family members and friends watch television together as it facilitates interpersonal communication and provides opportunities to entertain guests and “contributes to structuring of the day” (Lull, 1980, p. 202). Watching television together with someone transforms television content choices from a decision driven by individual preferences into a “socially negotiated choice” (Bjur, 2009, p. 33; Taneja & Viswanathan, 2013). Therefore, when watching television with others, an individual may watch content that others prefer even if it is not consistent with the individual’s preferences (Webster & Wakshlag, 1983). Importantly, these people continue to watch television because the time they spend together is more relevant to them than the content they watch (Webster & Wang, 1992; Wonneberger et al., 2011). From a limited capacity perspective, the social nature of television viewing makes it less likely for individuals to have sufficient cognitive resources (Wang et al., 2013) to engage with other media simultaneously. From a decision theory perspective, too, individuals who watch television with others perhaps have little to benefit from engaging in using another medium simultaneously. Therefore, we hypothesize that social viewing is associated with lower levels of media multitasking than watching television alone (Hypothesis 3).

Finally, we are interested in whether the effect of social viewing is dependent on the type of content that is consumed. As described before, watching television together with someone transforms program choices from individual to “socially negotiated” decisions (Bjur, 2009, p. 33; Taneja & Viswanathan, 2013). Since it is possible that the content viewed is preferred by only a subgroup of the television audience, it is reasonable to assume that uninterested individuals concurrently engage with other media while watching television with the rest of the group. On the other hand, consistent with our theoretical rationale for the main effects for television genres, it is possible that social negotiations and interactions that naturally occur with social viewing leave little cognitive and emotional resources to concurrently multitask with certain television genres. Therefore, social viewing can result in lower levels of media multitasking. In such cases, media multitasking would occur only if the benefits obtained from multitasking outweigh its cost. To explore the interaction between social viewing and television genres, we formulate the research question, is there a significant interaction effect between genres and social viewing in the amount of media multitasking (Research Question 3)?

## METHOD

### Data

This article is the result of collaboration between academia and industry. The Council for Research Excellence (CRE) (<http://www.researchexcellence.com>)

is an independent group of research professionals that have conducted a host of studies on media consumption behaviors. For the analysis, we use data from the Video Consumer Mapping (VCM) study conducted from March 26, 2008 to July 24, 2008 (also see Taneja et al., 2012). Nielsen initially provided CRE a list of former participants from their Peoplemeter panel. From this list, 495 U.S. adults were recruited from six designated market areas (DMAs), specifically Dallas, Philadelphia, Atlanta, Seattle, Chicago, and Indianapolis, and were observed for an entire day.

CRE took on the responsibility of training observers and providing them with smart keyboards and custom software. Training was a 3-day process addressing attitudinal, cognitive, and behavioral learning outcomes and included formative (quizzes and exercises) and summative (reliability) assessments. Each observer had to reach adequate agreement with the expected codes for a one-hour video that included a wide variety of media exposures. Due to time constraints and cost control, CRE was unable to do in-the-field reliability assessments, or test reliability on every subcategory of the extensive category system. However, at an aggregate level, the observed levels of exposure to television, computer screens, and mobile devices were almost exactly the same as Nielsen's published three-screen-report measures for the same markets in the same time period. The AlphaSmart portable smart keyboard, which ran the Palm operating system, was used as a data recording device as it had a better battery life than its competitors at the time of the study. Custom software on the device presented a hierarchical menu system for coding the categories and activities. These tools helped the observer to record the use of various media including concurrent media usage at granular intervals of 10 seconds. Specifically, concurrent usage is said to occur when a participant uses two or more media simultaneously. Observers used visual and situational cues such as eye gaze, device interaction, and conversation with others to flag the medium that appeared to have the participant's primary attention. This medium is termed as the primary medium.

Observers worked in 8 hours shifts, and two shifts were sufficient to record a participant's activities over the course of the day. The time frame sampled over the course of the study was as follows. While 4 of the 5 days in March were sampled, observations were made on every day in April and May. Observations were made on 26 days in June and 10 days in July. Observations were also spaced more or less equally between different days of the week. While 24% of the observations were made on weekends (i.e., Saturdays and Sundays), the remaining 76% were made on weekdays. A follow-up survey was also conducted to obtain information on participants' sociodemographic profiles and background information. For the second part of the study, in which we analyze how media multitasking differs across television genres and dayparts and investigate the role of social viewing, we included only those observations for the analysis where an individual watched television

between 6 a.m. and 11 p.m. The final sample for the analysis consists of 134,987 observations pertaining to 273 participants.

### Independent Variables

*Genres.* Observers from CRE recorded the genres that participants viewed on television. All programs were coded under one of four genres—news, sports, entertainment, commercials or program promotion—and the special form of viewing: channel surfing. News includes local newscasts, CNN, *60 Minutes*, etc. Sports comprises of game broadcasts, ESPN, NFL Network, etc. Entertainment includes sitcoms, documentaries, reality TV, etc. Commercials include ad breaks and promotions for upcoming shows. Finally, channel surfing is defined as multiple channel changes in a 10-second period. Around 15% of the observations were related to watching news, 10% to sports, 55% to entertainment, 19% to commercials, and 1% to channel surfing. Here, it is important to note that CRE took extreme care to ensure high intercoder reliability among observers while coding genres. Observers were provided with a handheld device that was preprogrammed such that viewing content could be coded under only one genre. For instance, the popular show *The Colbert Report* was coded as an entertainment program.

*Dayparts.* Television viewing through the course of the day was divided into three dayparts. Television viewing from 6 a.m. to 12 p.m. was classified as morning, 12 p.m. to 6 p.m. as afternoon, and 6 p.m. to 11 p.m. as evening. There were very few instances of individuals viewing television after 11 p.m. and late night television viewing was, therefore, not included in this study. Morning television viewing comprised around 18% of the total observations, afternoon television comprised of 36%, and evening television comprised of the remaining 46%.

*Social viewing.* This variable was operationalized based on whether individuals watched television alone or in the company of others. Observers flagged the presence of other individuals when the participant is viewing television. This variable is coded as 1 when a participant watches television in the presence of others, and as 0 when viewing television alone. In our data, social viewing occurred 36% of the time participants watched television.

### Dependent Variable

*Media multitasking.* Observers recorded the use of television and the concurrent use of six other media, if any. The six other media are video, audio, phone, print, gaming, and others. Video media included time-shifted television (i.e., DVR, TiVo) and video on digital devices such as DVDs, web streaming, and mobile. Audio media included traditional broadcast radio as

well as digital audio formats such as CDs, satellite, web streaming, and mobile. Computing media involved using the web for search, social networks, shopping, as well as the use of computer software and e-mail. Phone media encompassed landline and mobile phone conversations. Gaming included online and offline games as well as portable games. Finally, the others category included use of GPS devices and watching movies in a cinema. We excluded the final media category of others since there were very few observations pertaining to the use of this medium in our data.

To operationalize our measure of media multitasking, we counted the number of different media platforms used concurrently with television as the primary medium at each observation point, that is, at 10-second intervals. For example, an individual who watches an entertainment program on television and simultaneously checks her email on the computer at a certain instance of time has a media multitasking measure of 2 ( $M = 1.16$ ;  $SD = 0.41$ ) at that observation instance. In our data, around 84% of the observations have a media multitasking measure of exactly 1, denoting that there was no media multitasking, and 20,994 observations constituting the remaining 16% have a media multitasking measure of 2 or more.

### Control Variables

*Viewer demographics.* We included gender (operationalized as a dummy with male = 1), education (college or higher = 1 else 0), age, and income levels (coded 1–4, with 1 representing the lowest income group and 4 representing the highest) as measures of individual demographics. Around 41% of the participants are male and 36% have at least a college education. The average age of the sample is around 49 years ( $SD = 17.25$ ) with a minimum age of 19 years and a maximum age of 88 years. Finally, 33% of the sample has an income of less than US \$30K per annum, 16% has an income greater than US \$100K per annum, and the remaining 50% are in between.

*Structural factors.* We included three structural variables that could also influence media multitasking. Jeong and Fishbein (2007) suggest that media ownership influences the extent of multitasking among youth. To measure media ownership we included participants' responses to whether they have Internet at home and whether they own a cellphone. Each variable is coded as 1 if the participant indicated owning that medium and 0 otherwise. Nearly 77% of the participants indicated having Internet at home and 80% reported owning a cellphone.

Availability is another important structural factor that drives media exposure. Previous studies (Heeter, 1985; Yuan & Webster, 2006) suggest that audiences with higher availability use more media. In this study, we used the time that participants spent at home awake as a measure of their availability (Taneja et al., 2012). The average time spent at home for our sample is approximately 193 minutes ( $SD = 123.36$ ).

Finally, since people who spend more time on a certain medium can be expected to multitask to a greater extent with that genre in absolute terms, we also consider the time participants spend with a certain genre.

## RESULTS

### Amount of Media Multitasking Across Media

To estimate the extent of media multitasking in total and across media, we used information on seven media. We excluded visiting cinemas and using GPS devices as there were very few observations with these platforms. For each medium, we determined the frequency with which it was either used alone or concurrently with some other medium (or media) (see Table 1). The extreme right column in the table represents the total number of observations for each medium. We can observe that media multitasking occurs in approximately 50% of the observations across the seven primary media. Thus, a fair amount of media multitasking occurs even at small ten second intervals.

Table 1 also provides insight on the extent of media multitasking across each primary medium. When television is the primary medium, around 15% of television viewing, comprising 21,783 observations, is accompanied by use of an additional medium. Television viewing is accompanied to a large extent by audio and computing media and to a lower extent by phone and print

**TABLE 1** Frequency and Proportion of Media Multitasking (MMT) With Different Media

Primary medium	Only primary medium <sup>a</sup>	Additional media <sup>b</sup>							Total MMT	Total
		TV	Video	Audio	Computing	Phone	Print	Gaming		
TV	124,305 <i>85.1%</i>	0 <i>0.0%</i>	742 <i>0.5%</i>	9,316 <i>6.4%</i>	6,082 <i>4.2%</i>	1,590 <i>1.1%</i>	2,420 <i>1.7%</i>	352 <i>0.2%</i>	21,783 <i>14.9%</i>	146,088
Video	29,755 <i>87.4%</i>	927 <i>2.7%</i>	58 <sup>c</sup> <i>0.2%</i>	264 <i>0.8%</i>	4,098 <i>12.0%</i>	126 <i>0.4%</i>	163 <i>0.5%</i>	0 <i>0.0%</i>	4,276 <i>12.6%</i>	34,031
Audio	49,047 <i>83.0%</i>	6,128 <i>10.4%</i>	81 <i>0.1%</i>	1,009 <sup>c</sup> <i>1.7%</i>	2,874 <i>4.9%</i>	171 <i>0.3%</i>	255 <i>0.4%</i>	60 <i>0.1%</i>	10,066 <i>17.0%</i>	59,113
Computing	40,834 <i>23.8%</i>	42,878 <i>25.0%</i>	8,812 <i>5.1%</i>	52,394 <i>30.6%</i>	73,230 <sup>c</sup> <i>42.7%</i>	3,660 <i>2.1%</i>	2,142 <i>1.3%</i>	161 <i>0.1%</i>	130,480 <i>76.2%</i>	171,314
Phone	18,498 <i>20.3%</i>	33,135 <i>36.4%</i>	4,178 <i>4.6%</i>	18,835 <i>20.7%</i>	37,285 <i>41.0%</i>	1,403 <sup>c</sup> <i>1.5%</i>	1,386 <i>1.5%</i>	373 <i>0.4%</i>	72,502 <i>79.7%</i>	91,000
Print	15,681 <i>32.2%</i>	19,903 <i>40.9%</i>	1,764 <i>3.6%</i>	8,830 <i>18.2%</i>	4,081 <i>8.4%</i>	242 <i>0.5%</i>	183 <sup>c</sup> <i>0.4%</i>	182 <i>0.4%</i>	32,969 <i>67.8%</i>	48,650
Gaming	4,001 <i>66.6%</i>	1,707 <i>28.4%</i>	0 <i>0.0%</i>	837 <i>13.9%</i>	251 <i>4.2%</i>	25 <i>0.4%</i>	1 <i>0.0%</i>	2 <sup>c</sup> <i>0.0%</i>	2,007 <i>33.4%</i>	6,008

<sup>a</sup>This column presents the frequency and proportion of observations (in italics) when only one medium is consumed.

<sup>b</sup>These columns exhibit the frequency and proportion of additional media consumed concurrently with each primary medium.

<sup>c</sup>These cells display the frequency and proportion of observations when two or more media of the same nature are consumed simultaneously. Examples include watching videos on both DVD and web streaming, listening to audio on both broadcast radio and CD on computer, and engaging simultaneously on web search and instant messaging on the computer.

media. There is a high likelihood of media multitasking when the primary medium is computers, phone, or print, so-called retrieval media in which consumers have the control over the moment and speed of information transfer (Dijkstra, Buijtsels, & Van Raaij, 2005; Wang et al., 2013). Computing is likely to be accompanied by television or audio media and even other computing activities (e.g., web search and e-mail, which is also seen as multitasking; Pratt, Willoughby, & Swick, 2011). Similarly, with phone or print as the primary medium, concurrent use of television, audio, or computing media is likely. Gaming is accompanied to a large extent by audio media. Smaller proportions of video viewing and audio listening are accompanied by use of other media.

### Hypothesis Testing

To test the hypotheses we used a univariate analysis of covariance (ANCOVA) with genre (5), dayparts (3), and social viewing (2) as independent variables and the number of media consumed simultaneously as dependent variable. We used the Hochberg's GT2 correction to correct for unequal cell sizes and included gender, age, education, income, media ownership, availability, and the time spent on watching the five different genres as control variables. Overall, the model was significant. Significant effects are reported at the 99% confidence interval (i.e.,  $p < 0.01$ ) because of the large number of observations.

We first discuss the effects of the control variables pertaining to demographic variables and structural factors. The ANCOVA results in Table 2 suggest that gender, college education, income, and age differences between participants have a significant effect on media multitasking. Results reveal that females ( $M = 1.19$ ,  $SE = 0.004$ ) significantly multitask with more media concurrently than males ( $M = 1.18$ ,  $SE = 0.004$ ). Younger individuals<sup>1</sup> multitask to a greater extent ( $M = 1.15$ ,  $SE = 0.002$ ) than older individuals ( $M = 1.12$ ,  $SE = 0.00$ ). Individuals with at least a college education ( $M = 1.19$ ,  $SE = 0.004$ ) significantly multitask with more media concurrently than those without ( $M = 1.16$ ,  $SE = 0.004$ ). There is a main effect for income as well. Individuals earning less than US\$30K per annum multitask to a greater extent than others ( $M = 1.22$ ,  $SE = 0.004$ ). They are followed by individuals earning between \$60K and \$100K per annum ( $M = 1.19$ ,  $SE = 0.004$ ) and then by individuals earning more than \$100K per annum ( $M = 1.16$ ,  $SE = 0.005$ ) and finally by individuals earning between \$30K and \$60K per annum ( $M = 1.13$ ,  $SE = 0.004$ ).

Looking at the results for the control variables pertaining to structural factors, we find that participants with access to the Internet significantly multitask with more media concurrently ( $M = 1.20$ ,  $SE = 0.004$ ) than those without ( $M = 1.15$ ,  $SE = 0.004$ ). Similarly, we also find that participants with access to a cellphone multitask to a greater extent with media ( $M =$

**TABLE 2** Effects of Genre, Daypart, and Social Viewing on Mean Number of Media Consumed Simultaneously (ANCOVA)

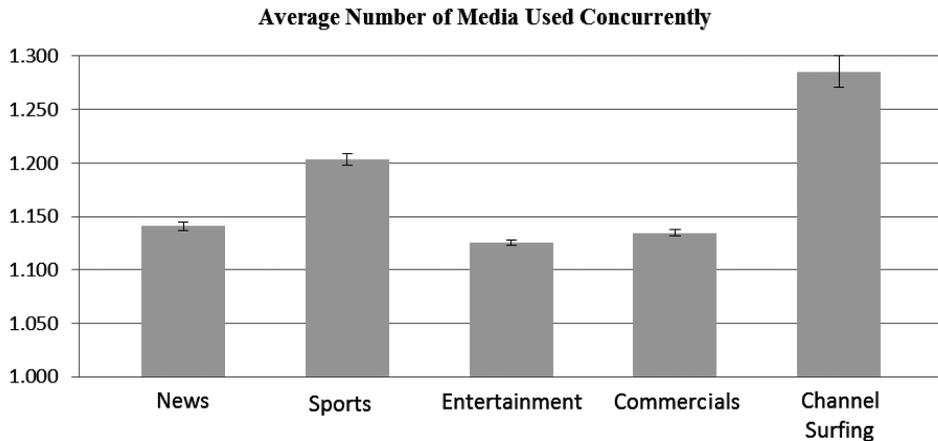
Variable	<i>df</i>	Type III sum of squares	<i>F</i>	<i>p</i>
Genre	4	46.91	72.52	<.0001
Daypart	2	15.31	47.34	<.0001
Social viewing	1	19.43	120.14	<.0001
Genre × daypart	8	7.519	5.81	<.0001
Genre × social viewing	4	178.80	276.41	<.0001
Gender	1	8.43	52.12	<.0001
Education	1	16.36	101.19	<.0001
Income	3	112.80	232.51	<.0001
Age	1	2.742	16.95	<.0001
Internet ownership	1	36.20	223.85	<.0001
Cellphone ownership	1	14.39	88.85	<.0001
Time with news	1	8.62	53.31	<.0001
Time with sports	1	0.62	3.83	.05
Time with entertainment	1	17.23	106.53	<.0001
Time with commercials	1	225.00	1391.37	<.0001
Time channel surfing	1	96.01	593.68	<.0001
Availability	1	22.86	141.34	<.0001

Note. Overall model:  $F(33, 134957) = 357.46, p < 0.01$ .

1.19,  $SE = 0.004$ ) than those without ( $M = 1.16, SE = 0.004$ ) and that differences in availability between subjects has a significant effect on the extent of media multitasking. Finally, time spent with all genres other than sports has a significant effect on media multitasking.

### Differences Across Genres

The ANCOVA results find that genre has a significant effect on media multitasking. Figure 1 provides a visual depiction of the mean scores for each genre (Table 3), and reveals that among the genres watched intentionally, entertainment is associated with the least amount of media multitasking. The extent of media multitasking is significantly smaller ( $p < 0.01$ ) while viewing entertainment ( $M = 1.13, SE = 0.002$ ) than while watching news ( $M = 1.14, SE = 0.004$ ) or sports ( $M = 1.20, SE = 0.005$ ). We also find that the extent of media multitasking while viewing sports is significantly greater ( $p < 0.01$ ) than while watching news, entertainment, or commercials ( $M = 1.13, SE = 0.003$ ). Contrary to our expectations, commercials are associated with lower levels of media multitasking. Finally, as hypothesized we observe that the extent of media multitasking is the greatest with channel surfing ( $M = 1.29, SE = 0.015$ ). Thus, the results support our expectations for news (Hypothesis 1a), sports (Hypothesis 1b), entertainment (Hypothesis 1c), and channel surfing (Hypothesis 1e), but not for commercials (Hypothesis 1d).



**FIGURE 1** Average number of media used while watching different television genres (with SE bars).

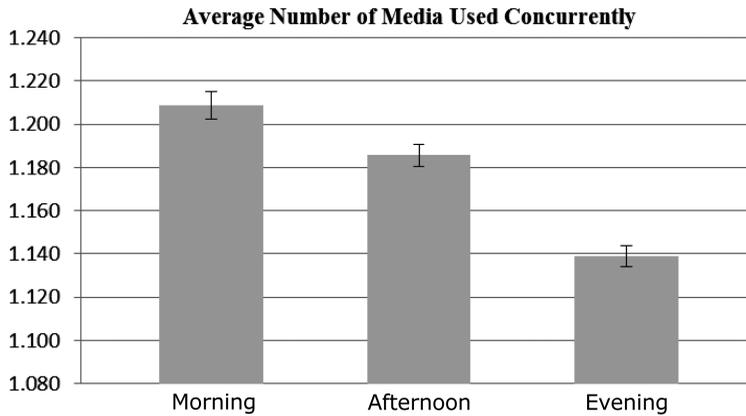
### Differences Across Dayparts

Results also reveal a significant main effect of dayparts on media multitasking (see Table 2). The mean scores for each daypart are reported in Table 3 and displayed in Figure 2. The results suggest that the extent of media multitasking is the greatest in the morning ( $M = 1.21$ ,  $SE = 0.006$ ) and then in the afternoon ( $M = 1.19$ ,  $SE = 0.005$ ) with a significant difference between the two ( $p < 0.01$ ). The extent of media multitasking in the evening ( $M = 1.14$ ,  $SE = 0.005$ ) is significantly lower ( $p < 0.01$ ) than in the morning or afternoon. Therefore, Hypothesis 2 is supported.

**TABLE 3** Mean Scores for Genre, Daypart, and Social Viewing

Genre	Overall	Daypart			Social viewing	
		Morning	Afternoon	Evening	Without	With
Overall	n.a.	1.201 (0.006)	1.181 (0.005)	1.132 (0.005)	1.212 (0.000)	1.144 (0.001)
News	1.141 (0.004)	1.169 (0.006)	1.131 (0.006)	1.122 (0.005)	1.169 (0.004)	1.112 (0.006)
Sports	1.203 (0.006)	1.207 (0.011)	1.218 (0.006)	1.184 (0.006)	1.124 (0.006)	1.282 (0.007)
Entertainment	1.125 (0.002)	1.148 (0.004)	1.127 (0.003)	1.100 (0.003)	1.173 (0.002)	1.077 (0.003)
Commercials	1.135 (0.003)	1.160 (0.007)	1.149 (0.005)	1.096 (0.004)	1.152 (0.004)	1.118 (0.005)
Channel surfing	1.286 (0.015)	1.360 (0.028)	1.303 (0.023)	1.193 (0.022)	1.441 (0.017)	1.130 (0.024)

*Note.* Standard errors in parentheses.



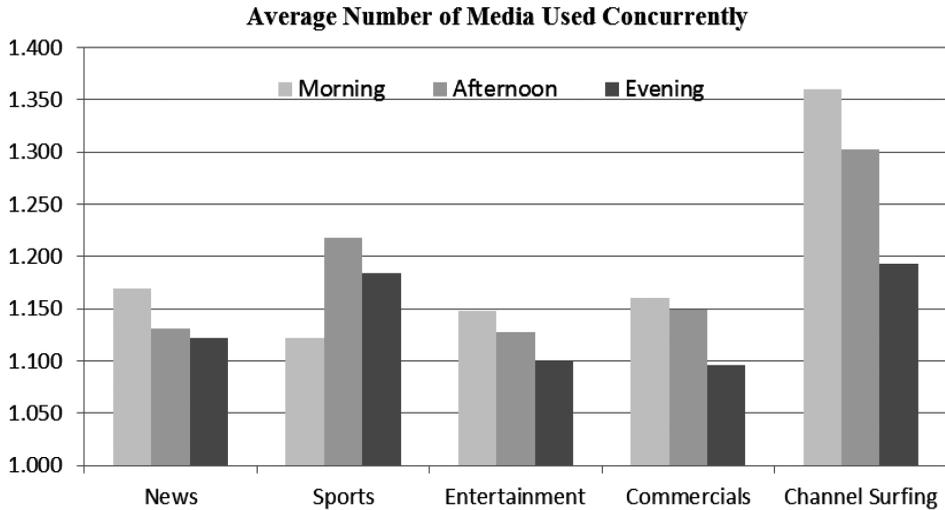
**FIGURE 2** Average number of media used at different dayparts (with SE bars).

### Differences With Social Viewing

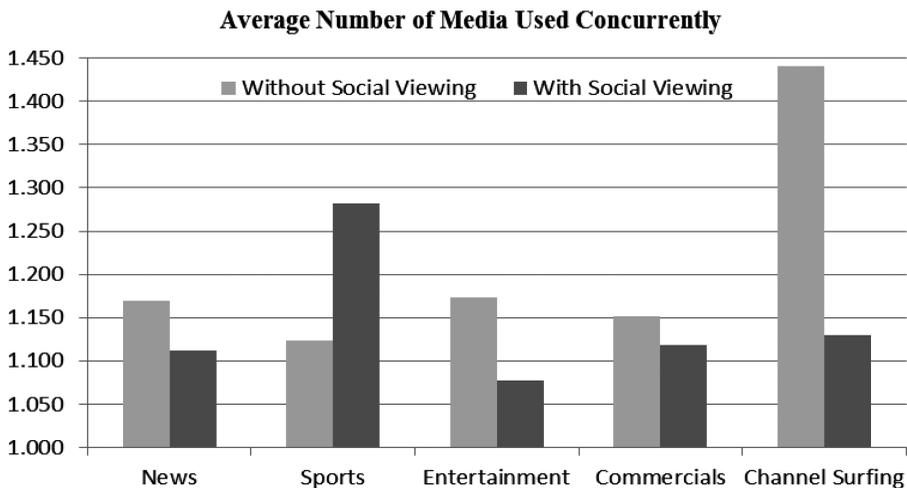
Results show that social viewing has a significant effect on media multitasking. Table 3 reveals that the average number of media used concurrently is significantly lower ( $p < 0.01$ ) when an individual views television in the presence of others ( $M = 1.21$ ,  $SE = 0.00$ ) than when he or she views television alone ( $M = 1.14$ ,  $SE = 0.00$ ). Therefore Hypothesis 3 is supported.

### Interaction of Genre With Dayparts and Social Viewing

The ANCOVA also reveals significant interactions between genres and dayparts and between genres and social viewing. Figures 3 and 4 provide a visual representation of these interaction effects. We find that for all genres, the extent of media multitasking during evening is significantly lower than during earlier dayparts. Furthermore, the decline in the extent of media multitasking in the evening compared to the morning and afternoon is larger for genres identified with incidental viewing (i.e., commercials and channel surfing), than for genres identified with intentional viewing (i.e., news, entertainment, and sports). Media multitasking with sports is even prevalent throughout the day. Thus, media multitasking with incidental viewing is relatively less prevalent during the evening than during the day while this difference is much smaller for intentional viewing. Regarding the interaction effect of genre and social viewing, we find that the extent of media multitasking decreases when television is viewed in the presence of others for most genres. However, viewing sports in the presence of others results in a significant increase in the number of media used concurrently.



**FIGURE 3** Average number of media used while watching different television genres at different dayparts.



**FIGURE 4** Average number of media used while watching different television genres without and with social viewing.

## DISCUSSION

The current study had four objectives. First, we examined media multitasking with television to test whether there are differences between genres. We found that entertainment, news, and commercials are associated with low levels of media multitasking, sports with a moderate level, and channel surf-

ing with a high level of media multitasking. Second, we examined whether the extent of media multitasking when viewing television varies for different dayparts and found that it is the lowest in the evening. Furthermore, we found that there is a larger drop in media multitasking with incidental viewing than with intentional viewing in the evening hours. Third, we examined whether media multitasking occurs to a lower extent when people watch television together, and found that this holds true for all genres except sports. Finally, using data on actual media consumption behavior helped us overcome the limitations of studies that use survey or self-reported media usage data. Using this data, we showed that media multitasking constitutes around 50% of total media consumption. Media multitasking is prevalent when using computing, print, and phone media and in an absolute sense also when watching television.

The current study found several interesting differences in the amount of media multitasking across different forms of television content. A particularly interesting finding is that commercials are associated with relatively low levels of media multitasking. To avoid commercials in the natural setting of the living room, people might not combine commercials with other media but with other additional activities, such as talking with a family member (Jayasinghe & Ritson, 2013) or performing household activities. Unfortunately, our study does not include such activities because it focuses on the simultaneous use of two media. Moreover, participants engaged in a wide range of non-media activities, and dimension-reduction techniques such as factor analysis were unsuccessful in reducing the number to a manageable few. Moreover, the study revealed that the genre sports is associated with relatively high levels of media multitasking. It seems that sports viewers are not hindered by the high cognitive demands of media multitasking with sports, and might even benefit from simultaneously consuming other media. This idea is supported by the interaction effects, too. Media multitasking with sports is prevalent throughout the day, while media multitasking for other genres is less prevalent in the evening than during the morning or afternoon. We also found that sports is the only genre that is associated with higher amount of media multitasking when watching with others, while social viewing results in lower amounts of media multitasking for all other genres.

The study also showed that daypart differences are larger for genres associated with incidental viewing (i.e., commercials and channel surfing) and smaller for genres associated with intentional viewing (i.e., entertainment, news, and sports). This may be explained by the fact that people are glued to their television sets in the evening (Vandebosch et al., 2006; Van der Goot et al., 2011) and, therefore, also view commercials or zap channels without using other media simultaneously in the evening.

The observational nature of the data also provides unique insights on the amount of media multitasking in general. A fair proportion of media

multitasking occurs when observations are recorded at ten second intervals. As reported earlier, we found that media multitasking constitutes nearly 50% of total media consumption. This is considerably higher than reported in studies based on diary research (12% in Papper et al., 2004; 22% in Voorveld & Van der Goot, 2013). It, therefore, seems that people severely underestimate the extent to which they engage in media multitasking and thus emphasizes the need for observational research using precise measures and recording behavior at small time intervals (Brasel & Gips, 2011). Furthermore, the study's unique methodological approach is also a direct answer to the call of Rubin (1984) and Ruggiero (2000) to add observational data when studying media use.

### Theoretical Implications

This study extends theory on media multitasking in multiple ways. Overall, our study underscores that situational factors must be incorporated along with individual factors when studying media multitasking. More specifically, the study is the first to show that the amount of media multitasking varies for different forms of media content. Therefore, an important theoretical implication from the findings is the need to include the type of content or genre in theories on media multitasking. By showing significant genre differences in media multitasking, the study also underscores the applicability of intentional exposure theory (Lord & Putrevu, 1993), the limited capacity theory (Lang, 2000), and decision theory (Sanbonmatsu et al., 2013) to media multitasking. The distinction between intentional and incidental viewing (Gupta & Lord, 1998; Lord & Putrevu, 1993) helps us understand that genres watched intentionally are associated with a lower extent of media multitasking than genres associated with incidental viewing. Decision theory, which posits that people multitask only when it would be beneficial or at least not detrimental to them, can help us understand why people engage in relatively high amounts of media multitasking when watching sports. Limited capacity theory is pertinent as it effectively explains how genres which require more cognitive resources are associated with lower amounts of media multitasking. Whether certain genres actually use fewer cognitive resources than others is an interesting topic for future experimental research. The study also showed that the interaction of these theories is important to understanding media multitasking, in line with the recent work of Wang et al. (2013). It seems that in a naturalistic setting, people are less likely to engage in media multitasking when a situation is cognitively demanding, except when benefits such as the fulfilment of social gratifications can be expected from media multitasking.

The study was also the first to show that multitasking differs across dayparts. The study provides empirical support for the idea that people are glued to their television sets to a greater extent in the evening than during

other parts of the day and, therefore, engage in less media multitasking in the evening than during other parts of the day. The amount of media multitasking is also dependent on the social situation in which people view television. When people view television with others, they are less likely to use other media simultaneously. This emphasizes the notion that television viewing is a social event (Lull, 1980), where the social nature of watching television together is more important than watching content that is preferred by individuals (Webster & Wang, 1992; Wonneberger et al., 2011).

The study also has important implications for media effects research and theories. By showing that not all forms of media content are associated with the same amount of media multitasking, it emphasizes the need to include specific measures of media multitasking in media effects research. Knowledge of the amount of media multitasking with the form of media content that is studied is important because people have only limited cognitive resources to process media messages (Lang, 2000), and attention must be divided across media used simultaneously. Such divided attention subsequently influences message processing and effects (Jeong & Fishbein, 2007; Jeong & Hwang, 2012). In the communication literature, two main views exist on how media multitasking influences message processing and effects. The first view posits a negative influence of media multitasking, namely, that media multitasking hinders systematic processing and results in persuasion based on superficial cues, based on the heuristic-systematic model (Chen & Chaiken, 1999) and the elaboration likelihood model (Petty & Cacioppo, 1986; e.g., Jeong & Fishbein, 2007; Voorveld, 2011). The second view posits that media multitasking can also result in enhanced effects because media multitasking can result in fewer counter-arguments and lower levels of critical thinking about a message (Collins, 2006; Jeong & Hwang, 2012). Based on the theory on low attention processing (Heath, 2000) and the explicit/implicit model (Schacter, 1987), it seems that media multitasking can result in the automatic processing of media content, or in other words individuals are influenced without being consciously aware. Thus, media multitasking is a contextual factor of contemporary media exposure that can have a profound impact on media processing and therefore merits more examination in media effects research. Using precise media multitasking measures is important to build knowledge on how the effects of media multitasking differ for different forms of media content.

### Future Research and Limitations

This study is an ideal stepping stone for future research on multitasking that occurs with other media platforms. Our study suggests that a fair amount of media multitasking occurs with retrieval media such as computing, print, and phone (Dijkstra et al., 2005). Future work could examine whether the differences between genres, dayparts, and between social versus individual

viewing found in this study can be extended to these media. Future studies could use data captured by alternate methods such as eye trackers that measure gaze duration and provide information on how people allocate attention across multiple media (Brasel & Gips, 2011) and how this influences information processing (e.g., Jeong & Hwang, 2012).

We acknowledge that the study is not without its limitations. A theoretical framework that would be useful in discussing genre differences would be the uses and gratifications framework. Wang and Tchernev (2012) applied the uses and gratifications framework to test the reciprocal influence of multitasking (both media and non-media activities), needs, and gratifications over time. They found that while certain needs drive multitasking, these needs are not always gratified by multitasking. Ideally, we would like to have measures of gratifications sought and obtained at every viewing moment, say every ten seconds. Unfortunately such data are not available and obtaining such a measure could be a problem for survey data as well (e.g., Hawkins et al., 2001). Also, only 24% of individuals contacted agreed to participate in the study. The moderate response rate is understandable given that this is a high involvement study. The response rate is similar to that of most survey research.

In line with earlier research investigating television genres (Hall, 2005; Shim & Paul, 2007), the current study included only a limited amount of genres. Some might suggest that these genres are too broad because they could each encompass a variety of subgenres. For example, a program like *60 Minutes* and a local news program are both coded as news, although there is considerable difference between the two. However, “genre refers to a systematic categorization of various television programs, based on the formulas and characteristics that a group of programs share” (Shim & Paul, 2007, p. 301). Based on this definition, the five broad genres used in the current study seem appropriate. Future research focusing solely on media multitasking with television could zoom into more specific subgenres. Due to observer burden, it was not possible to code specific programs or specific subgenres in the current study. Future research that considers the actual media content used can focus on other dimensions that are expected to influence the amount of media multitasking. For example, it would be very interesting to study factors like the degree of shared sensory modalities or the degree to which the tasks involved in media multitasking serve closely related goals (Wang et al., 2013). To conduct such research, we need detailed information on not only the media content that is processed but also on the nature of the additional tasks.

Finally, the observational nature of the study can raise concerns on whether participants only engaged in activities that were socially desirable. From the point of view of this study, we believe that the institution responsible for data collection, that is, CRE, was aware of these issues and undertook several steps to alleviate these concerns. For instance, participants were ex-

Nielsen panelists who were used to surveillance, observers were well trained and had little time to interact with the participants, participants' behavior was not linked to expectations or incentives, and use of a large panel limited the influence of systematic behavioral changes if any. Nevertheless, future research can attempt to use less intrusive methods and technologies to capture actual media consumption behaviors and, thus, further our understanding of media multitasking.

In conclusion, our study provides important insights on when media multitasking is most likely to occur. It can be concluded that practitioners should in particular be aware of the possible consequences of media multitasking on information processing and media effects when their audience engages in channel surfing or in watching sports, when they watch television in the morning or afternoon, and when they watch television together with others.

#### NOTE

1. Individuals whose age  $<$  (mean age  $- 0.5 \times$  standard deviation) were considered young; those whose age  $>$  (mean  $+ 0.5 \times$  standard deviation) were considered old.

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