Everyday multiscreening

How the simultaneous usage of multiple screens affects information processing and advertising effectiveness

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Chapter 3

Insight into Everyday Media Use with Multiple Screens

ABSTRACT

Multiscreening has been shown to affect consumers' brand attitudes and their memory of advertisements. However, little is known about the prevalence of using multiple screens simultaneously and, thus, the severity of the impact that this multiscreening phenomenon has on advertising effects. The aim of this study is to provide insight into everyday multiscreening by examining its prevalence, the composition of screens, and who is likely to multiscreen. A diary study with a representative sample of the Dutch population was conducted. In total, 2,399 participants filled in a media diary for seven consecutive days. First, the results showed that almost 60% of the participants multiscreened at least once. They multiscreened on average three days a week, mostly on Sundays, and on average more than 80 minutes per day. Second, the most prevalent screen combinations were TV-smartphone, TV-laptop, and TV-tablet. Third, multiscreeners were on average 41 years old, predominantly female, have a higher than average educ ation, and own on average more than four screens. Finally, it was found that, in general, younger participants multiscreened longer than older participants.

INTRODUCTION

How often do consumers still watch television without doing something else, such as texting a friend on their smartphone or checking e-mail on their laptop? The simultaneous usage of multiple screens, such as a TV, smartphone, laptop, and tablet, is known as multiscreening (Chinchanachokchai, Duff, & Sar, 2015; Segijn, 2016). Recent research shows that multiscreening affects consumers' ad and brand attitudes (e.g., Kazakova, Cauberghe, Hudders, & Labyt, 2016; Segijn, Voorveld, & Smit, 2016) as well as consumers' memory of advertisements (e.g., Angell, Gorton, Sauer, Bottomley, & White, 2016; Duff & Sar, 2015). However, little is known about the *prevalence* of multiscreening, which is surprising considering the growth of research on the effects of this phenomenon and the implications of its findings for practitioners. To get a better understanding of the importance of the tested effects, it is necessary to examine the prevalence of this phenomenon. Relevant questions are 1) to what extent does multiscreening occur in real life outside the lab, 2) which screens are combined, and 3) who is likely to multiscreen? Therefore, the current study aims to get a better understanding of multiscreening by looking at 1) the prevalence of multiscreening, 2) the composition of screens, and 3) the multiscreeners.

The first aim is to gain insight into the prevalence of multiscreening (*to what extent* does multiscreening occur?). Multiscreening is a form of media multitasking (i.e., the simultaneous usages of multiple media; Jeong & Hwang, 2012; Voorveld, 2011) in which multiple screens are combined simultaneously. Previous studies show that about 25-50% of people's media consumption consists of *media* multitasking (Foehr, 2006; Pilotta, Schultz, Drenik, & Rist, 2004; Voorveld & van der Goot, 2013). However, different forms of media multitasking are likely to influence prevalence, media use, and media effects (e.g., Wang, Irwin, Cooper, & Srivastrava, 2015; Xu, Wang, & David, 2016). To our knowledge, specific details about the prevalence of multiscreening are yet unknown.

The second aim of the current study is to examine the prevalence of various compositions of multiscreening (*which screens* are most often combined?). Consumers have access to a variety of screens, such as a TV, computer, laptop, smartphone, tablet and more. All these different screens can be used to multiscreen. So far it is unknown which screens are most often combined, however, this knowledge is relevant for both practitioners and scholars. It could benefit practitioners by justifying the use of specific screen media. For example, when advertisers want to advertise simultaneously on TV and a second screen, it is useful to know which screen is most often combined with TV. In addition, these results provide insights into prevalent screen compositions, and will therefore advance theory about media-related factors in a multiscreening context.

The final aim is to examine the multiscreeners themselves (*who* is likely to multiscreen?). The focus in the media multitasking literature is mostly on age, gender, education, and media ownership (Jeong & Fishbein, 2007), which is why the current study investigates these variables for multiscreening. Previous research indicates that there might be differences in user-related factors for different combinations of media. For example, previous research found that in some countries people prefer to multitask with different media than in other countries (Voorveld, Segijn, Ketelaar, & Smit, 2014). However, to our knowledge these user-related factors have not yet been examined for multiscreening. These insights are important for practitioners because they might help to develop profiles of consumers and segment target groups. Finally, the current study will build on previous work that examined user-related factors for other forms of media multitasking.

THEORETICAL BACKGROUND

Multiscreening

Multiscreening is defined as using a combination of multiple screens simultaneously without the co-occurrence of another non-media related activity (Segijn, 2016). Just like media multitasking, multiscreening includes multiple tasks that are carried out on different media with some temporal overlap (Adler & Benbunan-Fich, 2012; Benbunan-Fich, Adler, & Mavlanova, 2011; Salvucci & Taatgen, 2011). No complete temporal overlap exists between the tasks, because consumers' attention cannot simultaneously be divided among different tasks when both tasks require the same type of (visual) attention. Therefore, multiscreening entails a more interleaved strategy where one task is temporarily suspended to allocate visual attention to another task. Thus, multiscreening should be seen on a continuum that ranges from tasks that involve frequent attention switching to tasks that involve long time spans between switches (Salvucci & Taatgen, 2011).

Multiscreening is different than, for example, the combination of TV-radio, or newspaper-radio, on several dimensions (Segijn, 2016; Wang et al., 2015). First, one of the most distinctive characteristics of multiscreening is the concurrent visual modalities. As mentioned, this makes it difficult for consumers to process information concurrently because it requires the same type of attention opposed to a combination of purely audio and visual media (i.e., newspaper and radio). Second, the multiple – and often interactive – screens make it relatively easy to present related information on both screens. For example, this characteristic of multiscreening offers opportunities

for marketers to engage people (Vaccari, Chadwick, & O'Loughlin, 2015) or expose consumers to a brand on multiple platforms simultaneously (Segijn, 2016).

Multiscreening and Advertising Effects

The body of literature on multiscreening and advertising effectiveness is expanding. So far, there is one literature overview that describes challenges and opportunities for marketers (Segijn, 2016) based on dimensions of media multitasking (Wang et al., 2015). In addition, several effect studies are conducted on various outcomes, such as brand memory (e.g., Angell et al., 2016; Duff & Sar, 2015; Kazakova et al., 2016), brand and ad attitudes (e.g., Chinchanachokchai et al., 2015; Segijn, Voorveld, & Smit, 2016), and perceived intrusiveness of commercials (Kazakova et al., 2016). Overall, the results of these effect studies showed a decrease in memory of advertisements when people are multiscreening compared to single screening (e.g., Angell et al., 2016; Segijn et al., 2016; Kazakova et al., 2016). Furthermore, studies found positive effects of multiscreening on affective advertising outcomes (Chinchanachokchai et al., 2015; Kazakova et al., 2016). However, a study also found that this effect depends on the underlying mechanism; Multiscreening could lead to more positive brand evaluations because people are less able to resist the persuasive message when multiscreening compared to single screening. On the other hand, multiscreening could lead to less positive brand evaluations because people would recognize the brand less compared to people who only use one screen (Segijn et al., 2016). Overall, these studies showed interesting effects of multiscreening. To get a better understanding of the importance of these effects, we need to know more about the prevalence of multiscreening.

Prevalence of Multiscreening

The Nielsen Company survey of connected device owners states that about a quarter of the smartphone and tablet owners use their device daily while watching TV (Nielsen, 2013). All multiscreening studies rely on this survey to indicate the prevalence of this phenomenon. However, this Nielsen study has some shortcomings. First, Nielsen only examined smartphone and tablet use in combination with TV. In reality, consumers have access to more screens that they can use to multiscreen, such as laptop, PC or game device. Therefore, the current study includes all types of screens to get a complete picture of the whole phenomenon of multiscreening.

Second, Nielsen used a survey in which people had to answer questions about their media use in the past. This can be problematic because people have difficulty assessing their media exposure at a later point in time (de Vreese & Neijens, 2016; Slater, 2004), which makes it harder for people to accurately report their media use in

a survey (Brasel & Gips, 2011; Papper, Holmes, & Popovich, 2004; Voorveld & van der Goot, 2013). A more reliable method would be to make use of diaries, because data would be collected more closely to the moment of actual media usage (Papper et al., 2004; Voorveld & van der Goot, 2013). This will lead to less memory problems and more accurate results of media use. Therefore, the current study makes use of media diaries.

Finally, the Nielsen survey only examined smartphone and tablet owners. However, not every consumer might own the screens they use when multiscreening, such as adolescents living in a household where the parents own the screens. For a complete and correct account of the prevalence of multiscreening, these non-owners have to be taken into account as well. The current study, therefore, includes a random sample of the general population.

Thus, the Nielsen survey provides, to our knowledge, the only statistics currently available about the prevalence of multiscreening and it has several shortcomings. It is time for an update. Therefore, our first aim is to examine the prevalence of multiscreening. To this end, we formulated the following research question:

RQ1: To what extent are consumers engaging in multiscreening?

Composition

The second aim of our study is to examine which screens are most often combined. It is argued that differences in media-related factors may influence how often a screen is combined with another screen because media-related factors could influence how cognitively demanding screen combinations are. In addition, the more cognitively demanding a medium is, the less it will be combined with another medium (Wang et al., 2015). Media-related factors that could influence this are information modality, information control, behavioral responses, and time pressure. We will discuss these four media-related factors below.

Information modality is related to the different modalities within a medium. For example, TV is audiovisual while a game console is audiovisual and strongly relies on the motor modality. It is argued that more modalities imply that more cognitive resources are required to process the information. Therefore, a screen with more modalities would be more cognitively demanding (Wang et al., 2015). For this reason, a TV would require less cognitive resources, and would be easier to combine with other screens than a game console.

Differences in screen compositions can also be explained based on who has control over the pace in which information is presented. The content can be internally or

externally paced. When the content is internally paced, the user has the control over the media content (e.g., Dijkstra, Buijtels, & van Raaij, 2005; Voorveld, Neijens, & Smit, 2012). This is, for example, the case with an e-reader in which the user decides when to go to the next page and whether he needs to re-read certain information. However, TV is a mainly externally paced medium. It is decided beforehand how fast information is presented to the users and in which order (Dijkstra et al., 2005). The more people can control the pace, the less cognitively demanding the screen is (Wang et al., 2015), thus the more likely is that it is combined with other screens.

The number of behavioral responses that are required of the media user could also impact the prevalence of screen composition. Screens can be distinguished into lean back and lean forward media. Lean back media include media that do not require many behavioral responses of the media user, such as TV. To the contrary, many behavioral responses are required when using a game console, a lean forward medium. More behavioral response means more interaction and is therefore more cognitively demanding (Wang et al., 2015). Thus, it is less likely that a game console will be combined with other screens than a TV based on the number of behavioral responses.

A final media-related factor that could influence the composition of screens is time pressure. This is the (a)synchronicity of the medium (Wang et al., 2015). In other words, is it important that the media user responds immediately (i.e., synchronous) or is it possible to wait for the response (i.e., asynchronous). For example, a video game requires immediate response to certain cues, whereas checking email on a PC allows for a time lag-delay. It is argued that less time pressure is less cognitively demanding and a screen with this characteristic is therefore more easily combined with other screens.

These media-related factors described above indicate that some combination of screens might be easier to use and to combine with other screens than others. In addition to media related factors, screen ownership as a user-related factor could also be important in the prevalence of screen compositions. Some screens are more prevalent than others. Recent numbers showed, for example, that almost everyone (96.8%) has access to a TV, but almost half (46.9%) of the Dutch population has access to a desktop PC (SKO, 2016). Therefore, it could be expected that the TV is more often combined with another screen than a desktop PC. We formulated the following research question to examine which screens are most often combined when multiscreening:

RQ2: Which screens are most often combined when multiscreening?

The Multiscreeners

The third aim of this study is to examine who is likely to multiscreen. Therefore, we have to examine certain user-related factors, namely age, gender, education, and screen ownership. These user-related factors are most often examined factors in media multitasking literature (Jeong & Fishbein, 2007), but not yet for multiscreening. To build on previous research, we test their relationship to multiscreening.

Age has proven to be a universal predictor of media multitasking across countries (Voorveld et al., 2014). Although it is often found that all age groups and generations engage in media multitasking, the studies are consistent in the finding that younger people are more likely to multitask than older people (e.g., Carrier et al., 2009; Duff et al., 2014; Hwang, Kim, & Jeong, 2014; Voorveld et al., 2014; Voorveld & van der Goot 2013; Voorveld & Viswanathan, 2014). An explanation for this finding could be that adoption rates of media vary among generations (Brasel & Gips, 2011; van der Goot, Rozendaal, Opree, Ketelaar, & Smit, 2016). Results showed that it is more likely that age groups use the medium of their generation. For example, people between 54-81 years old are more likely to use a newspaper, whereas younger people (17-34) are more likely to use new media (van der Goot, et al., 2016). New media have characteristics (e.g., ease of switching, multiple screens/apps on one device, pop-ups) that stimulate media multitasking (Voorveld et al., 2014). Thus, it is argued that differences in adoption rates of different media could also explain the differences in media multitasking (Carrier et al., 2009; Voorveld & van der Goot, 2013). Another explanation could be that older people have more difficulties with media multitasking because with age, people become less cognitively flexible (Brasel & Gips, 2011). Older people have more difficulties with rapidly switching between tasks (Clapp, Rubens, Sabharwal, & Gazzaley, 2011) and, therefore, it is less likely that they engage in media multitasking.

Second, research on gender related to media multitasking has shown mixed results. Some studies have found that women are more likely to engage in media multitasking than men (Duff et al., 2014; Hwang et al., 2014; Jeong & Fishbein, 2007; Voorveld & Viswanathan, 2014), whereas other studies did not find significant gender differences across multitaskers (Christensen, Bickham, Ross, & Rich, 2015; Kononova, 2013; Voorveld et al., 2014). Although gender is sometimes assumed and found to be related to media multitasking, it is unclear why there would be gender differences. Some argue that women have greater neurological capacities for multitasking (Fisher, 1999, in Christensen et al., 2015). However, the *ability* to multitask does not necessarily relate to the *preference* to multitask or the actual *behavior* (König & Waller, 2010; Poposki & Oswald, 2010).

A third user-related factor is the level of education. Although some studies on media multitasking take education into account as predictor, no theoretical

explanation is provided why education might predict media multitasking. So far, there have been mixed results. In the study of Voorveld et al. (2014), education level was found to be a negative predictor of media multitasking, showing that people with lower education levels were less likely to engage in multitasking. However, educational level was found to be a positive predictor in the study of Hwang et al. (2014), whereas the study of Foehr (2006) showed no significant relation.

Finally, media ownership, in this case screen ownership, could be related to multiscreening. It is reasonable to assume that the more screens a consumer owns, the more access they have to the screens, the more likely it is that they will multiscreen. So far, it was found that the more media someone owns, the more likely they will engage in media multitasking (Jeong & Fishbein, 2007; Kononova, 2013; Voorveld & Viswanathan, 2014).

The results described above result from media multitasking research. However, how these user-related factors are related to multiscreening has not yet been examined. To this end, we formulated the following research question:

RQ3: Who is likely to multiscreen in terms of age, gender, education, and screen ownership?

METHOD

A secondary analysis was performed on data collected collectively by the official audience measurement institutes for television, radio, print internet, and the government agency 'The Netherlands Institute for Social Research'. This study was intended to provide insight into the everyday media use of the Dutch population across all media platforms and devices. The study was conducted between the last three weeks of September and the first 2 weeks of October 2013. This period is considered to be relatively neutral given the absence of seasonal effects on media use from either summer or winter.

Sample

Participants were recruited from the sample of the national print study, which used a randomly selected sample of addresses to recruit participants. The aim of the national print study is to determine the reach of print publication. Participants of the national print study are randomly selected twice a year from a database containing all private postal delivery points in the Netherlands (excluding companies, shops, etc.). Each selected household receives a letter announcing the study and, if necessary,

a reminder letter. In each household the person whose birthday is closest in time is asked to participate. In total 8,200 participants are recruited every year. The current study used a randomly selected sample of participants who participated in the national print study in the two years prior to this research and had indicated to be willing to participate in future research. A maximum of three attempts were made to contact a participant: first by telephone, then by e-mail, and finally by mail. 13,380 people were initially approached of which 54.3% (n = 7,268) were reached. These people were asked to participate in a diary study and 63.8% (n = 4,638) agreed to fill in the media diaries. Eventually, 2,399 people completed the media diaries for seven consecutive days. This is 17.9% of the 13,380 people who were initially approached and 51.7% of the 4,638 people who agreed to participate in the study. Participants received a gift card worth 30 euro for participating.The final sample (n = 2,399) had a mean age of 42.22 (SD = 15.55), owned on average 4.21 screens (SD = 1.46), and consisted of 59.4% females. The sample is diverse and reflects a representative sample of the Dutch population (see Table 3.1 for an overview).

Procedure

Participants were sent instructions for the online diary (Figure 3.1) which showed them how they could login and how they could navigate through the diary. Also, it explained what the respondents needed to record in the diary and how they should record it. Furthermore, they received a document explaining all the categories used for different activities, and a paper diary they could use to make notes of their time use during the day. Also, they received a link to the online diary in which they filled in their media use. They could report their media use at any given moment during the day up until two days after the final day. Before filling in the media diary for the first time, participants completed an online questionnaire in which their age, gender, education, and screen ownership was recorded.

Participants were randomly assigned a start day for recording their activities and were asked to keep a diary for seven consecutive days. In the diary, participants recorded their activities for every ten minutes. They were asked to report any activity that lasted five minutes or longer. They were instructed to make a distinction between main activities (e.g., working, sleeping, media use, etc.) and media activities (e.g., watching TV, listening to music, etc.). For each time slot, participants had to fill in one main activity, accompanied by the opportunity to fill in three simultaneous media activities (Figure 3.1). For media activities participants recorded both the type of activity as well as the device used. For example, participants could report eating as a main activity and watching TV and reading newspaper as two specific media activities. To reduce

missing data when submitting a day in the diary, the software checked whether every ten-minute interval included a main activity and if all media activities always included both an activity and a device. The participant could not continue submitting the diary of a certain day until all necessary fields were completed. To improve data quality we checked the diaries on unusual behavior. A day was flagged if the diary was sent in

Table 3.1 Descriptive statistics in sample (n = 2,399) and general population of the Netherlands.

Demographic variable		Sample %	Population %
Gender			
	Female	59.4	50.7
	Male	40.6	49.3
Age groups			
	13-19	6.8	9.9
	20-34	27.8	21.7
	35-49	32.3	26.5
	50-64	23.3	24.2
	65+	9.7	17.7
Education			
	1 No/basic education	0.8	4.7
	2	7.3	17.1
	3	9.3	7.0
	4	23.3	34.7
	5	10.9	6.0
	6	33.6	21.1
	7 Graduate level or higher	14.2	9.5
Region			
	North	9.0	10.3
	East	19.8	20.9
	South	20.9	24
	West	50.2	44.8

either 12 hours before the end of the day or 48 hours after. Days were also flagged if the number of main activities recorded was three standard deviations either above or below the mean (i.e., less than one or more than sixteen main activities on one day). Participant who received flags for responding too early or too late on one or more days and who recorded too little main activities on more than one day were excluded from the data, this was the case for 39 participants.

Measures

Prevalence. To calculate the amount of time people engaged in multiscreening, we first selected all responses in which the main activity was 'media use'. In addition, we identified the amount of ten-minute time slots that participants indicated the use of two or three screens simultaneously. People could indicate from a list to have used the following screens: television, laptop, smartphone, desktop PC, tablet, e-reader, and game device (this includes both game consoles and portable game devices). The amount of time people combined two or three of these screens was calculated in minutes.

Composition. Composition was calculated by selecting every time a participant used two screens simultaneously when 'media use' was chosen by the participant as the main activity. For every participant, we checked for each possible composition if the participant had used (1) or not used (0) this combination of screens in the week of filling in the diary.

User-related factors. The predictors of interest were measured in a questionnaire, which participants filled in before using the online media diaries. Age was recorded

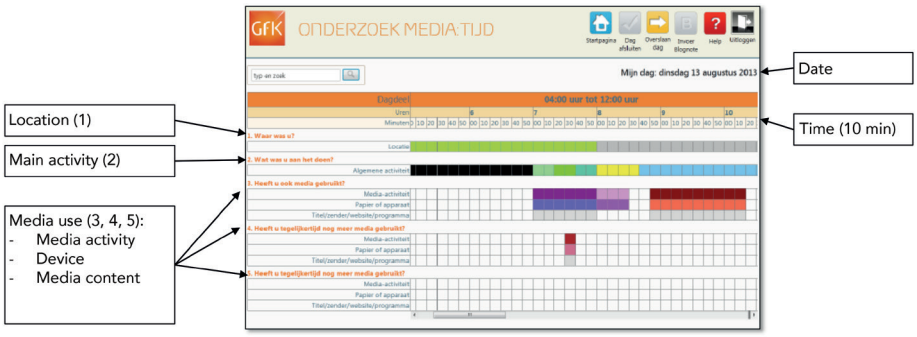

Figure 3.1 Online Media Diary (Source: GfK).

by asking the participants date of birth; gender could be indicated by checking 'male' or 'female'; level of education could be indicated by selecting one of seven categories ranging from 1 'no/basic education' to 7 'Graduate level or higher'. For screen ownership we asked participants to indicate which of the following devices they owned: television, laptop, smartphone, desktop PC, tablet, e-reader, and game device. A sum score was calculated for amount of screens owned per participant.

RESULTS

RQ1: Prevalence of Multiscreening

In total, 59.3% of the participants (n = 1,423) indicated to have used multiple screens simultaneously at least once in the diary measurement week. These 'multiscreeners' spent 239.76 minutes (almost four hours) multiscreening on average in the measured week (SD = 355.10). This is about 30 minutes per day (M = 34.25, SD = 50.73). Furthermore, multiscreeners multiscreen on average 2.86 days a week (SD = 1.82, range 1-7). This is equally spread over the week. On each day, about 40% of the multiscreeners multiscreen at least once. When zooming in to this specific group of the multiscreeners, the results show that they multiscreen between 77 and 96 minutes per day (Table 3.2). To put this into perspective, the total multiscreening time is 16.8% of the total time multiscreeners spent using media[1]. In addition, 83.3% of all media multitasking consists of using of multiple screens simultaneously (Figure 3.2).

Furthermore, there was no significant difference in the amount of multiscreening between an average week day (M = 33.85, SD = 52.07) and a weekend day (M = 35.25, SD = 66.41), t (1422) = -0.954, p = .340. However, when comparing the seven days, results showed a difference between Sundays and Fridays (p = .006), and between Sundays and Saturdays (p = .004), F (6, 1422) = 3.61, p = .001, η^2 = .003. On Sundays people multiscreened the most (Table 3.2).

[1] This doesn't include media use in combination with a non-media activity (e.g., eating and watching TV).

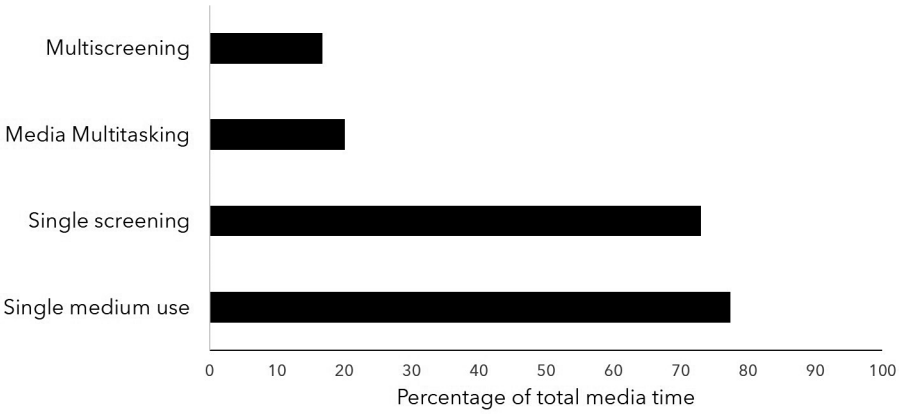

Figure 3.2 Percentage media use of total media time among multiscreeners.
Note. The figure indicates the percentage of the total media time. Total media time includes all media use indicated as the main activity. This does not include media use combined with a non-media activity (e.g., eating, working, etc.).

Table 3.2 Percentage of multiscreeners and the amount of multiscreening per day.

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
% multiscreening	42.4%	42.%	43.1%	40.7%	40.0%	36.4%	41.3%
Multiscreening in minutes							
All multiscreeners[1]	35.57 [ab]	33.92 [ab]	34.57 [ab]	34.10 [ab]	31.10 [b]	30.72 [b]	39.78 [a]
	(73.15)	(74.02)	(71.01)	(78.50)	(67.88)	(67.99)	(91.69)
Multiscreeners per day[2]	83.94	80.58	80.11	83.82	77.77	84.38	96.44
	(92.59)	(96.25)	(89.68)	(104.81)	(88.88)	(90.44)	(122.18)

Note. The table presents 1) the percentage of multiscreeners who multiscreen on a certain day and 2) the average amount of multiscreening in minutes with the standard deviation in parentheses. Different superscripts indicate significant differences between days. Multiscreening in minutes is presented for all multiscreeners[1] (*n* = 1,423) and for the percentage of multiscreeners that multiscreen on that specific day[2] (*n* varies per day, see % multiscreening).

RQ2: Composition of Screens

Second, we wanted to examine which screens are most often combined. The most prevalent combinations of screens are 1) TV–smartphone (39.6%), 2) TV–laptop (39%), and 3) TV–tablet (30.8%), see Table 3.3, column 3. Thus, 39.6% of the multiscreeners indicated to have used the combination of a TV and smartphone at least once in the measured week.

However, not every multiscreener also owns all screens (Table 3.4). The multiscreeners own on average 4.37 screens (*SD* = 1.38). Almost every multiscreener owns a TV (96.3%), but only one-fifth owns an e-reader (18.3%). Therefore, we conducted the same analyses to examine the prevalence of combination of screens, but this time only for the multiscreeners who indicated that they own the specific combination of screens. In this case, the most prevalent combinations of screens are 1) TV-tablet (53.1%), 2) TV-smartphone (49.6%), and 3) TV-laptop (46.8%) (Table 3.3, column 5). Thus, 53.1% of the multiscreeners who own a TV and a tablet indicated to have used this combination of screens at least once in the measured week.

There is an interesting difference in the TV-tablet combination compared to all multiscreeners Table 3.3, column 3 with the multiscreeners who own these two screens Table 3.3, column 5. This indicates that the tablet is not a screen that every multiscreener owns. However, when they do own a tablet, more than half of them use this screen simultaneously while watching TV. Table 3.3 also shows that the TV is the most often combined screen, followed by the smartphone. An e-reader and a game device are the least often combined with another screen.

Table 3.3 Prevalence of screen composition among multiscreeners and screen owners.

		Multiscreeners (n = 1,423)	Multiscreeners who own the combination of screens	
		prevalence [a]	screen ownership [b]	prevalence [c]
Combination of screens		%	n	%
TV	Smartphone	39.6%	1,038	49.6%
TV	Laptop	39.0%	1,116	46.8%
TV	Tablet	30.8%	772	53.1%
Laptop	Smartphone	16.2%	905	23.3%
TV	PC	16.0%	790	25.6%
PC	Smartphone	9.8%	607	14.2%
Tablet	Smartphone	6.4%	641	12.0%
Tablet	Laptop	3.6%	652	7.1%
Laptop	PC	2.5%	581	4.1%
Tablet	PC	2.4%	495	6.1%

Table continues on next page.

Table 3.3 (Continued) Prevalence of screen composition among multiscreeners and screen owners.

		Multiscreeners (*n* = 1,423)	Multiscreeners who own the combination of screens	
		prevalence [a]	screen ownership [b]	prevalence [c]
Combination of screens		%	*n*	%
Smartphone	Game	1.5%	112	1.8%
Laptop	Game	1.0%	112	0.9%
TV	E-reader	0.9%	254	4.3%
TV	Game	0.9%	112	0.9%
E-reader	Smartphone	0.6%	211	2.8%
PC	Game	0.5%	112	0.9%
Tablet	Game	0.4%	112	0.9%
E-reader	PC	0.2%	158	1.9%
Tablet	E-reader	0.1%	165	0%
E-reader	laptop	0%	220	0%
E-reader	Game	0%	112	0%

Note. The percentage indicates the percentage of multiscreeners that combined the two screens at least once in the diary measurement week. No distinction could be made between primary and secondary screen in terms of attention.

[a] The third column shows the percentage of multiscreeners who indicated to use a certain combination of screens. For example. 39.6% of the multiscreeners indicated to use a TV and smartphone simultaneously and only 2.4% of the multiscreeners indicated to use a tablet and PC simultaneously.

[b] The fourth column shows the number of multiscreeners who indicated to own the combination of screens. For example, 1,038 participants indicated to multiscreen, to own a TV, and to own a smartphone.

[c] In the fifth column the percentage of screen owners is presented who actual use the specific combination to multiscreen. For example, almost half of the participants (49.6%) who multiscreen, own a TV, and own a smartphone, also use this combination to multiscreen.

Table 3.4 Screen ownership.

	% of multiscreeners
TV	96.3%
Laptop	81.5%
Smartphone	75.8%
PC	57.2%
Tablet	55.5%
Game console	39.4%
E-reader	18.3%
n	1,423

Table 3.5 Descriptive statistics for each subsample.

	All participants	Multiscreeners	TV-Smartphone	TV-laptop	TV-tablet
Age	42.22 (15.55)	40.59 (14.70)	34.89 (13.02)	41.37 (13.88)	42.79 (12.86)
Gender (female)	59.4%	60.9%	66.3%	66.1%	59.6%
Education	4.95 (1.52)	4.99 (1.48)	5.07 (1.37)	4.86 (1.50)	5.09 (1.47)
Screen ownership	4.21 (1.46)	4.37 (1.38)	4.55 (1.27)	4.26 (1.34)	4.91 (1.22)

RQ3: The Multiscreeners

To examine the group of multiscreeners we first looked at the descriptive statistics of all participants, the multiscreeners, and the users of the top three combination of screens (i.e., TV-smartphone, TV-laptop, and TV-tablet). Multiscreeners are on average 40.59 years old (*SD* = 14.70), predominantly female (60.9%), have a higher than average education (*M* = 4.99, *SD* = 1.48), and own on average 4.37 screens (*SD* = 1.38). Generally, the same pattern was observed in the subsamples of the top three combination of screens with some small differences (Table 3.5).

Some variations can be observed for age. The boxplot presented in Figure 3.3 provides more detailed information about the age differences per subsample. The boxplot shows that multiscreening is for all ages (range 14-82 years old), but that small differences per subsample are present. For example, the TV-smartphone users are younger compared to the other subgroups. Fifty percent of the TV-smartphone users

is 33 years or younger, whereas in the other groups the median is around 41 years. Also the age range differs per subsample. Whereas the minimum age range is relatively constant over the subsamples (varying between 13-15 years old), the maximum age varies between 72-82 years old depending on the combination of screens used (Figure 3.3).

It should be noted that these descriptive statistics presented in Table 3.5 are about the multiscreeners who indicated that they multiscreened at least once, and it does not take duration of multiscreening into account. To further examine this, multiple regressions were conducted for each subsample including all the user-related factors as independent variables and the amount of multiscreening in minutes as dependent variable (Table 3.6). Overall, the regressions showed that the younger people are the more minutes they spent multiscreening. In addition, men appeared to multiscreen longer than women but only in the multiscreening and TV-smartphone subsample. Finally, screen ownership only affects amount of multiscreening when looking at all participants. Thus, the analyses showed that age is the most important user-related factor for multiscreening, followed by gender.

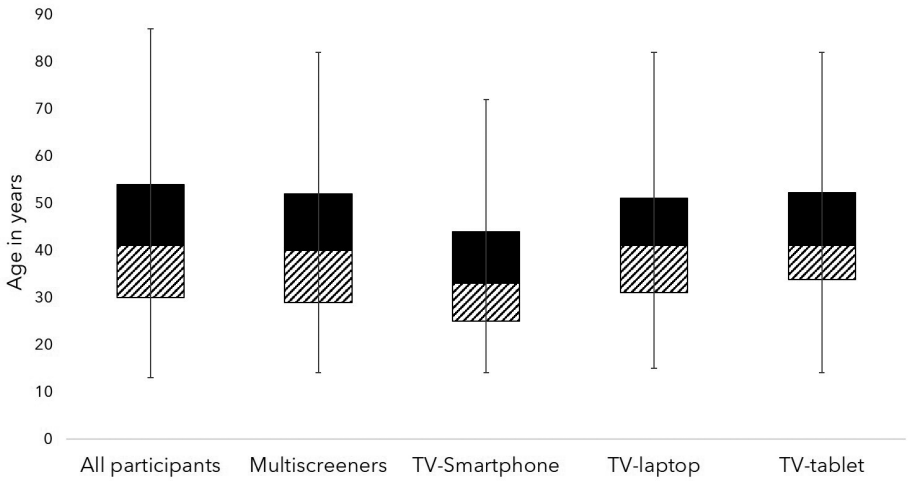

Figure 3.3 Boxplot on age per subsample.

Table 3.6 Multiple regression of multiscreening and the user-related factors.

	All participants	Multiscreeners	TV-Smartphone	TV-laptop	TV-tablet
Age	-.140***	-.130***	-.154***	-.039	-.069
Gender (female)	-.030	-.055*	-.090*	-.070	-.023
Education	-.010	-.041	-.062	-.010	-.088
Screen ownership	.059**	-.031	.050	.017	.000
R^2	.027	.021	.039	.006	.012
n	2,381[a]	1,410[a]	558	552	435

[a] Not every participant filled in their educational level ($n = 18$). *** $p < .001$, ** $p < .01$, * $p < .05$.

CONCLUSION AND DISCUSSION

The aim of this study was to provide insight into the phenomenon of multiscreening by examining its prevalence, the composition of screens, and the multiscreeners. This study is innovative as it examines 1) the prevalence of this specific form of media multitasking by means of media diaries, 2) different screen compositions, and 3) who is likely to multiscreen for different combinations of screens. Furthermore, a strength of the study is that it makes use of a representative sample of the Dutch population. Therefore, the external validity of the results is high. However, future research is necessary to provide further validation of the study's results and generalizability to the Dutch population.

First, the results of the study showed that almost 60% of the participants multiscreened at least once in the diary measurement week. These multiscreeners multiscreen on average three days a week and when they do, it is between 77 and 96 minutes per day. It should be noted that multiscreening entails only the use of multiple screens *without* the co-occurrence of a non-media related tasks. Thus, more than half of the participants used on average more than 80 minutes a day multiple screens simultaneously besides the time that they were sleeping, eating, working, commuting, etc. This also does not include the times the participants are single screening or when they use screens in combination with other media, such as a radio or newspaper.

Second, the results of the study show that the screens that are most often combined are: TV-laptop, TV-smartphone, and TV-tablet. This is the case for all multiscreeners, both for screen owners and non-owners. In general, the TV is the screen that is most often used in combination with any other screen, and the e-reader and game device

are the least often combined. One explanation can be found in media-related factors. The lean backward nature of the medium TV makes it less cognitively demanding and therefore easier to combine with another screen (Wang et al., 2015). The e-reader and game device are least often combined with another screen. A game device is harder to combine with another screen because it demands a lot of cognitive capacities since it involves multiple modalities, requires a lot of behavioral responses, and time pressure is experienced (Wang et al., 2015). However, the e-reader is only visual, is internally paced, doesn't require a lot of behavioral responses, and no time pressure is experienced. Perhaps a more plausible explanation is screen ownership. The e-reader and game device are screens that are least owned. Conversely, almost every participant indicated to own a TV. Thus, it is important to also take screen ownership into account in future research.

Third, the results of the study provide insight into who is likely to multiscreen. The results show that multiscreeners are on average 40.59 years old, predominantly female, have a higher than average education, and own on average 4.37 screens. However, these results include everyone who indicated that they multiscreen at least once, and it does not take duration of multiscreening into account. Looking at the amount of multiscreening in minutes, the results show that in general the younger people are, the longer they will multiscreen.

Similar to media multitasking research, age is found to be a predictor of amount of multiscreening. The explanation that older people would not engage in multiscreening because they would be less cognitively flexible does not hold, because the results show that multiscreening is for all ages. The previous explanation of the media generations is more plausible as indicated by the lower age range for TV-smartphone users. However, this assumption does not apply to the TV-tablet users. An alternative explanation might be that certain media-related factors are more preferred by certain age groups because these factors accommodate some age-related limitations. For example, a tablet has a relatively large screen size, buttons are easy to select accurately, it involves intuitive usage, and it involves easy hand-eye coordination. These media-related factors make the tablet easy to use for all age groups (Caprani, O'Connor, & Gurrin, 2012).

Implications

The results of the study have major theoretical and practical implications. First of all, these results will advance multiscreening research by providing a baseline number for the prevalence of this phenomenon. In addition, these results support the importance of this phenomenon and justify further research, for example, into how multiscreening

affects advertising effectiveness. Therefore, it may encourage researchers to continue examining the consequences of this behavior. It also shows that practitioners have to start recognizing that multiscreening should not be underestimated.

Second, the results show differences in screen compositions. The results show that the TV is most often combined with other screens, especially smartphones, laptops, and tablets. Therefore, it is important to not neglect these screens when designing a study into multiscreening. Furthermore, the results indicate that practitioners should focus on these screens to stimulate interactions and engagement with TV content, for example, by developing applications to play along with TV shows or get additional information of broadcasted brands/products on a second screen. However, the results provide information about the prevalence and not about the impact of the screen compositions. Further research is necessary to examine the impact of the different screen compositions on advertising effects.

Third, this study contributes to the literature by examining the multiscreeners. Therefore, this study contributes to the understanding of who is likely to multiscreen and with which screens. Examining the user-related factors in combination with the specific screen compositions is relevant information for advertisers. This will help them find their target audience and advise them as to which combination of screens are useful to invest in. For example, the target group will be younger when aiming at TV-smartphone users compared to TV-tablet or TV-laptop users.

Limitations

Despite the important contributions, this study also has some limitations. First, we expect that the amount of multiscreening in minutes will be even higher in reality, since participants were asked to only report activities that had a duration of five minutes or longer. Thus, activities such as texting a friend on your smartphone with the TV in the background may be excluded when it involved a short act. Although diary data is a better method to capture people's media behavior than a survey, it still relies on self-reported measures (de Vreese & Neijens, 2016). It is possible that participants were sometimes not aware of the fact that they were multiscreening, since using multiple screens simultaneously may lead to more superficial attention to the different screens. For example, when the primary task was to work on a laptop, but the TV was on in the background, it is possible that participants would only report their primary task and forgot about the background screen. Therefore, the results of this study should be seen as a baseline of multiscreening and it is expected to be even higher in reality. Also, the exclusion of activities shorter than 5 minutes could have consequences for some other findings. For example, the results showed that men multiscreen longer

than women. Therefore, it is possible that some multiscreening activities of women are lost because the methodology did not capture events less than 5 minutes.

Second, the media diaries included information about screen use (e.g., TV, tablet, etc.) and media activities (e.g., watching TV, texting, etc.) but not on media content. The differentiation between screens and media activities is a strength of the study because media activities are no longer restricted to just one medium. For example, people can watch TV (i.e., media activity) on different devices. However, the missing information about the media content is seen as a limitation of the study. Because of this, it is not possible to make assumptions about the type of media content. For example, it is not possible to distinguish between screen use during editorial and advertising content. In addition, we were not able to conclude whether media activities across screens were related or unrelated to each other. This information might be very useful to advertisers because relatedness could influence how well advertisements are processed when multiscreening (Jeong & Hwang, 2016). Therefore, it is important that future research should also take relatedness of the tasks into account.

Finally, to further understand who is multiscreening it is necessary that future research also includes psychological user-related factors of multiscreening behavior, such as the need for cognition, sensation seeking, or neuroticism. These psychological factors have been examined for multitasking in general. However, it is not clear whether they are also related to multiscreening. For example, sensation seeking was found to be a predictor of media multitasking in general (Jeong & Fishbein, 2007), but not for media multitasking with smartphones (Lim & Shim, 2016). Future research could extent this work by examining psychological user-related factors in relation to multiscreening. Also, the results of the current study do not provide information about how the examined user-related factors could influence advertising effects. This is also something that future research should investigate. In any case, the results show that multiscreening is for all ages and that it is important to not neglect the TV.