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Investigating Heterogeneous Media Multitasking Behavior: A Latent Class Analysis Approach

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Abstract

This study focuses on media multitasking (MM) tendency while accounting for the heterogeneity of the store visits and purchase behaviors of media multitaskers. We employed a latent class model to identify several consumer segments and investigate the effect of behavioral traits on segment membership. Based on the results, we identified three segments and labeled them *Apathetic*, *E-shopper*, and *E-buyer* segments. Apathetic consumers show no interest in MM, store visits, and online purchases. The E-shopper segment records the highest MM, store visit probability, and low transaction rate, while the E-buyers exhibit the opposite behavior pattern. Furthermore, the results revealed that people who frequently use the Internet or television and watch more news programs are more likely to belong to the “E-shopper” segment. We also observed that people in the “E-buyer” segment are less probable to zap and watch variety shows more frequently. These findings are helpful for marketers to understand their customers better and devise more efficient marketing strategies.

Keywords: behaviors trait, e-shop visitation, latent class model, media multitasking, online buying

1. Introduction

Media multitasking (MM) is no longer a new phenomenon but has become a part of the everyday life of most people. MM is defined as “consuming media content while simultaneously engaging in other tasks” (Duff, Yoon, Wang, & Anghelcev, 2014). Nielsen (2013) reported that over two-thirds of Japanese have MM experience. The simultaneous usage of television and other media is the most common method of MM in Japan (Nielsen, 2013). Furthermore, Pilotta, Schultz, Drenik and Rist (2004) conducted a large-scale survey and observed that 26.5% of people go online when they watch television, while 34.6% watch television when they go online. These results suggest that a combination of television and online usage is the most prevalent form of MM. Regarding online activity, Hinz, Hill and Kim (2016) indicate that over one-third of people shop online while watching television. Fossen and Schweidel (2019) confirm that MM positively influences online sales. Dissimilar to a single-media environment, media multitaskers exhibit high levels of perceived information utility and social presence, which is positively related to impulsive purchases during MM (Chang, 2017). Currently, MM has permeated the daily life of people. In addition, many people currently accomplish their shopping tasks in the context of MM. Therefore, it is an opportunity for marketers, particularly, to enhance the effectiveness of ads (Duff & Segijn, 2019).

MM has attracted scholarly attention because the effect of this behavior remains controversial, particularly the detrimental effect it exerts on human performance (Srivastava, 2013; Jeong & Hwang, 2015). A large body of literature investigates antecedents to MM. Previous studies have shown that the propensity of MM depends on audience (Jeong & Fishbein, 2007; Duff et al., 2014; Kirchberg, Roe, & Van Eerde, 2015; Kononova & Chiang, 2015; Segijn, Voorveld, Vandeberg, Pennekamp, & Smit, 2017), media (Jeong & Fishbein, 2007; Kononova & Chiang, 2015), and situational factors (Voorveld & Viswanathan, 2015; Rubenking, 2016; Brasel & Gips, 2017; Bang & King, 2021). Regarding marketing, scholars have focused on the consequences of MM, particularly e-commerce behavior and advertising effectiveness. However, the results of these previous studies appear inconsistent. A research stream suggests that those who engage in MM pay less attention to incoming commercials (Beuckels, De Jans, Cauberghe, & Hudders, 2021), have low comprehension of information (Jeong & Hwang, 2012), and poorly perform in brand recall and recognition (Kazakova, Cauberghe, Hudders, & Labyt, 2016; Segijn, Voorveld, & Smit, 2016). Hinz et al. (2016) indicate that TV consumption can lower the likelihood of online transactions, owing to reduced attention. Contrarily, other scholars argue that MM positively impacts advertising evaluation because MM weakens counterarguments (Segijn et al., 2016) and alters time perception (Chinchanachokchai, Duff, & Sar, 2015). Certain scholars have suggested that television advertising facilitates the online search and purchase behaviors of individuals (Lewis & Reiley, 2013, June; Liaukonyte, Teixeira, & Wilbur, 2015). Fossen and Schweidel (2019) and Chang (2017) find that MM leads people to engage in online shopping.

Although previous studies have examined the antecedents and consequences of MM, only a few have investigated the influence of personal traits on MM and the likelihood of online store visitation and buying of multitaskers. Chen, Shang and Kao (2009) suggest that information processing abilities and internal information filtering mechanisms vary across individuals in an information overload context. Thus, people may respond differently to ad information during MM. Hence, it is plausible to anticipate that individual factors are related to how ads induce multitaskers to perform a search and purchase instantly. Additionally, individual factors are observed to be indispensable in early studies on online shopping (Cheung, Chan, & Limayem, 2005; Zhou, Dai, & Zhang, 2007) and online product information searches (Wen-Chin & Hung-Ru, 2010). Extending the findings of previous studies, the current study examines MM and its e-commerce behavior (i.e., online store visitation and purchase) by considering behavioral traits.

Customer segmentation plays an important role in the success of electronic commerce (Bhatnagar & Ghose, 2004). Hence, we first identify segments based on individual MM, store visits, and conversion behaviors. Subsequently, we profile these segments based on behavioral traits. In detail, we examine how the segment membership is affected by individual Internet usage time, television viewing time, zapping frequency, prime-time viewing frequency, and specific program-viewing frequency (i.e., comedy, news, and variety shows). We employ a latent class model of MM, online store visitation, and online purchase rates and apply this model to actual data on TV viewing and internet access behavior of 1,158 individuals over 7 months. According to the results, we categorize three customer segments and named them *Apathetic*, *E-shopper*, and *E-buyer*.

This study provides several contributions to the existing literature. First, this study reveals that each segment exhibits its own MM pattern and e-commerce behavior in the context of MM. Certain viewers are more inclined to visit online stores but less likely to make a purchase decision while engaging in MM. However, others exhibit frequent purchase behavior, yet they exhibit a low propensity to visit online shops while watching television. Although previous studies have investigated how individual traits predict MM behavior, only a few of them have examined proceeding activities in the context of MM. Second, to fill the gap in the literature, this study focuses on MM and attempts to understand how behavioral traits affect individual store visits and purchase behaviors during MM engagement. In particular, understanding the e-commerce behaviors of viewers is helpful for advertisers to forecast who would positively respond to television ads, which will improve ad effectiveness. Furthermore, these results may help e-retailers to identify their target customers and efficiently craft a strategy to enhance the cross-media effect.

2. Conceptual Background and Hypotheses

Previous studies have examined several individual traits correlated to MM tendency, such as sensation seeking (SS) (Jeong & Fishbein, 2007; Duff et al., 2014). Regarding online purchases, perceived risk (Forsythe & Shi, 2003; Ariffin, Mohan, & Goh, 2018) and perceived ease of use (Pavlou, 2003; Wu & Ke, 2015) are typically selected as customer factors to predict individual e-shopping intention. Additionally, Bosnjak, Galesic, and Tuten (2007) indicate that the need for cognition (NFC) is negatively related to online buying intention and conjecture that this trait may be positively related to online searching. As previously mentioned, MM has changed traditional shopping environments. Ads have become another trigger for online buying in the MM era (Lewis & Reiley, 2013, June; Liaukonyte et al., 2015). Thus, we speculate that individual ad perception may influence online store visitation and purchase behavior of multitaskers. Notably, we did not directly investigate these individual traits in our study. Therefore, we use certain observable variables to infer these constructs to predict the membership of viewers in each segment. We use Internet usage time as a proxy for perceived risk and ease of use. Television viewing-related constructs (i.e., television-viewing time, zapping frequency, and prime-time viewing frequency) are used as indicators of ads perception. Finally, we include specific program genres (i.e., comedy, news programs, and variety programs) to describe SS and the NFC. Figure 1 illustrates the conceptual model of this study.

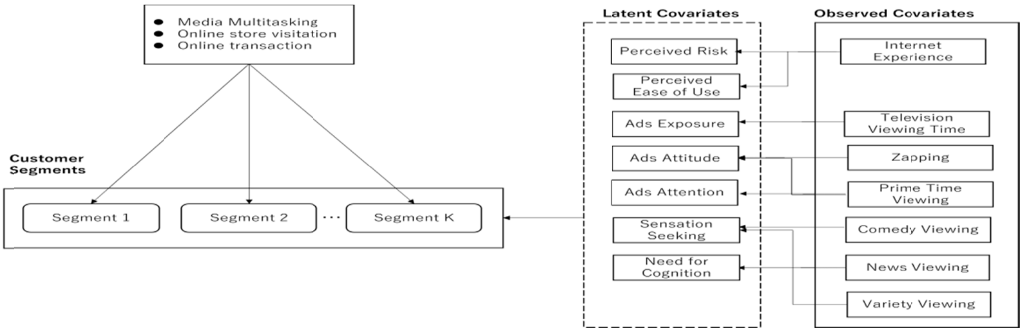

Figure 1. Conceptual model

2.1 Internet Usage Time

Internet experience is defined as the "experience of visiting several websites and using various value-added services offered on a broad range of websites" (Nysveen & Pedersen, 2004). Zhou et al. (2007) divide internet experience into three domains, including WWW apprehensiveness, frequency of internet usage, and comfort with the Internet. Thus, we use internet usage time as an indicator of internet experience in this study.

Hammond, McWilliam and Diaz (1998) point out that the value of internet information is highly evaluated by heavy Internet users. Experienced web users are more inclined to engage in online searches, compared with novices (Klein & Ford, 2003; Richard & Chandra, 2005; Cheema & Papatla, 2010). Moreover, previous studies have suggested that internet experience diminishes the perceived risk of online shopping (Miyazaki & Fernandez, 2001; Chen & He, 2003; Montoya-Weiss, Voss, & Grewal, 2003) and is positively related to the perceived ease of use of internet shopping (Bigne‐Alcaniz, Ruiz‐Mafe, Aldas‐Manzano, & Sanz‐Blas, 2008). Furthermore, online transaction intention is correlated with perceived risk (Forsythe & Shi, 2003; Ariffin et al., 2018) and perceived ease of use (Pavlou, 2003). Additionally, Soto-Acosta, Molina-Castillo, Lopez-Nicolas and Colomo-Palacios (2014) observe a positive association between information overload and customer purchase intention. This relationship is reinforced by individual internet experience (Soto-Acosta et al., 2014). MM is always viewed as a state of being overwhelmed by the amount of information. Therefore, we anticipate that people with a high level of internet experience tended to search for product information and engage in online shopping during MM. We propose the following hypothesis:

Hypothesis 1: People who are more likely to use the Internet are more likely to belong to a segment with high store-visit and purchase propensities during media multitasking.

2.2 Television-Viewing Time

Intuitively, those who spend more time viewing television are more likely to be exposed to a great amount of television advertising. The extent of exposure to television commercials is positively related to the objective knowledge of the product or category features and consumer benefits (Joo, Wilbur, Cowgill, & Zhu, 2014). People with a high level of knowledge are more likely to search online (Brucks, 1985; Joo et al., 2014). Liang (2012) provides empirical evidence that individual impulsive purchase tendency is positively affected by product knowledge. Additionally, those with low product knowledge are more highly concerned with security when buying online (Nepomuceno, Laroche, & Richard, 2014).

On the other hand, the brand awareness of consumers has been confirmed to be influenced by advertising, particularly television commercials (Domazet, Đokić, & Milovanov, 2017). A high level of brand recognition triggers a frequent online search for said brands (Dotson, Fan, Feit, Oldham, & Yeh, 2017). Furthermore, brand awareness is observed to be an important premise in the individual decision-making process (Macdonald & Sharp, 2000). Individuals who view a lot of television would have more product knowledge and high brand awareness. Thus, we expect that prolonged television viewing is positively related to individual product information search and purchase behavior. Thus, we propose the following hypothesis:

Hypothesis 2: People who watch television more are more likely to belong to a segment with high store-visit and purchase propensities during media multitasking.

2.3 Zapping

Zapping refers to channel switching during commercials (Cronin, 1995). It is a type of television advertisement avoidance behavior (Speck & Elliott, 1997). The extent to which customers engage in advertisement avoidance might be related to their attitudes toward advertising (Lee & Lumpkin, 1992; Speck & Elliott, 1997; Prendergast, Cheung, & West, 2010). In particular, heavy television-commercials avoiders appear to exhibit more negative attitudes toward television ads (Lee & Lumpkin, 1992). Thus, we use zapping frequency as a behavioral proxy of attitude toward television commercials in this study. The attitude toward advertising is defined as a "predisposition to respond favorably or unfavorably to a particular advertising stimulus during a particular exposure occasion" (Lutz, 1985). Sallam and Algammash (2016) suggest that the attitude toward advertisement positively affects individual purchase intention.

Lewis and Reiley (2013) discovered that television commercials during the Super Bowl prompted product information search behavior of viewers immediately. Consistent with these findings, Liaukonyte et al. (2015) provide empirical evidence that television commercials enhance online shopping behavior. Summarily, MM provides an opportunity for individuals to instantly respond to ads that induce their interests. Hence, we expect that people who adopt a positive stance on commercials would respond more positively to advertising. The following hypotheses incorporate our expectations:

Hypothesis 3: People who are less likely to zap the commercials are more likely to belong to a segment with high store-visit and purchase propensities during media multitasking.

2.4 Prime-Time Television Viewing

Prime-time viewing refers to television-watching behavior from 7 to 11 p.m. Rubin (1981) indicates that individual viewing behavior is motivated by the specific needs of individuals. However, Rosenstein and Grant (1997) argue that viewing behavior becomes a habit when it becomes regular, no matter what factor leads the individuals to view at the beginning. Thus, individual regular viewing behavior is mainly attributed to habitual reasons. Therefore, we anticipate that the degree to which people engaged in prime-time television viewing is related to habitual reasons. This can be attributed to the fact that these people always watch television during the same period. Rubin (1984) defines ritualistic viewing as "habitual, frequent, and indicates a high regard for television as a medium" (Rubin, 1984, p. 75). Individuals whose viewing behaviors are driven by ritualistic motives are less involved in television content and demonstrate high selectivity during exposure (Perse, 1990). Additionally, they are more likely to engage in distracting activities (e.g., housework and conversation with other people) when their viewing behavior is associated with ritualistic motives (Perse, 1990). Hence, we speculate that these people pay less attention to television commercials and are less likely to be irritated by incoming commercials. However, Kazakova et al. (2016) show that viewers show a positive attitude toward television advertising when their attention is divided by other tasks because cognitive load causes a debilitating effect on the ability to counterargue a persuasive message. Similarly, it is more likely that people will form a positive attitude toward commercials if their viewing behavior is led by ritualistic motives. Thus, they are less likely to be attracted by television ads to search for product information, but they might purchase because of their positive dispositions.

Hypothesis 4: People who are more likely to engage in prime-time television viewing are more likely to belong to a segment with low store-visit and high purchase propensities during media multitasking.

2.5 Program Genres

Previous studies have demonstrated that media content preference corresponds to the personalities of viewers (Weaver III, 1991). Preston and Clair (1994) suggest that individual program preference is consistent with their self-perception. Therefore, the content that viewers select may reflect their traits.

SS refers to "the seeking of varied, novel, complex, and intense sensations and experiences, and the willingness to take physical, social, legal, and financial risks for the sake of such experiences" (Zuckerman, 1994). SS predicts individual media content selection (Perse, 1996). The author points out that high sensation seekers prefer to choose stimulating and arousing content rather than placid and boring content. Certain scholars observe that SS is related to comedy preference (Potts, Dedmon, & Halford, 1996; Hall, 2005).

Perse (1996) suggests that high sensation seekers are more likely to engage in channel surfing to relieve boredom than low sensation seekers. Thus, they are less likely to be exposed to commercials because television advertisements are usually regarded as unpleasant stimuli (Perse, 1996). Oppositely, previous studies indicate that SS has a strong affinity for impulsiveness (Eysenck & Eysenck, 1977). Moreover, impulsiveness is viewed as a predominant predictor of online purchase behavior (Zhang, Prybutok, & Koh, 2006). Therefore, we anticipate that those who prefer watching comedy shows are less likely to spontaneously perform product information searches but more likely to purchase impulsively.

Hypothesis 5: People who watch more comedy programs are more likely to belong to a segment with low store-visit and high purchase propensities during media multitasking.

Perse (1992) implies that the personality trait of NFC is positively related to utilitarian local news viewing. Similar to this finding, Tuten and Bosnjak (2001) indicate that those scoring high in NFC frequently use the web for current events and news. NFC portrays "the tendency for an individual to engage in and enjoy thinking" (Cacioppo & Petty, 1982). The extent to which people engage in online information searches is positively related to NFC (Tuten & Bosnjak, 2001; Das, Echambadi, McCardle, & Luckett, 2003). Information processing is contingent on individual NFC (Bailey, 1997). Bailey (1997) provides evidence that those high in NFC are more thorough when making decisions than those low in NFC. Haugtvedt, Petty and Cacioppo (1992) suggest that individuals with high NFC are more inclined to spontaneously evaluate the product claims of advertisements than individuals with low NFC. Furthermore, they point out that the attitudes of low-NFC individuals are more likely to be influenced by the attractiveness of endorsers than the attitudes of those with high NFC. We anticipate that those low in NFC do not actively search for information, but their purchase decision is more easily affected by the stimuli in an MM environment, which results in purchase behavior. Furthermore, Bosnjak, Galesic, and Tuten (2007) confirm that a high NFC inhibits an individual's intention to shop online.

Hypothesis 6: People who watch more news programs are more likely to belong to a segment with high search and low purchase propensities during media multitasking.

Regarding variety shows, only a few studies have explored their relationship with individual traits. A variety show is "an entertainment program genre incorporating more than one type of content (Koga, 2013, p. 68, cited in Sasamoto, O'Hagan, & Doherty, 2017), and it is one of the most important entertaining televised content in Japan, for example, the program named "Why did you come to Japan?" Relevant studies have provided evidence that high sensation seekers are more likely to watch music videos, daytime talk shows, stand-up comedy, documentaries, and animated cartoons (Potts et al., 1996). Hence, we anticipate that those with high SS scores would prefer this kind of entertainment content. Given the same reasoning as in the hypothesis with comedy programs, we propose the following hypothesis:

Hypothesis 7: People who watch more variety shows are more likely to belong to a segment with low search and high purchase propensities during media multitasking.

3. Method

3.1 Data Description

The datasets contain television viewing and clickstream data provided by the Joint Association Study Group of Management Science in Japan. The television-viewing dataset includes the viewing history of 1,158 individuals recorded from April 2017 to March 2018. Each record of this dataset comprises subject ID, viewing date, start and finish times, program code, and station code. The clickstream dataset contains the records of the internet log information of 1,158 individuals from September 2017 to March 2018. Each record in the clickstream dataset includes subject ID, date, time, device usage, uniform resource locator (URL), domain, subdomain, referrer, referrer domain, page title, and visit duration. We use both datasets to test the proposed hypotheses.

Table 1 shows the demographic information of the sample in this study. Roughly half of the participants (54%) are male, and most of them (65.72%) are aged between 36 and 55 years old. Approximately 76.34% of the participants have an income of over 5 million JPY per annum. Here, 86.96% of these audiences have two or fewer children.

Table 1. Demographic information of the sample

Demographic variables	Frequency	Percentage (%)
Gender		
Male	625	53.97
Female	533	46.03
Age		
16–25	8	0.69
26–35	211	18.22
36–45	380	32.82
46–55	381	32.90
>55	178	15.37
Annual Income (JPY million)		
<5	274	23.66
>=5 and <10	634	54.75
>=10 and <15	201	17.36
>=15 and <20	33	2.85
>=20 and <30	11	0.95
>30	5	0.43
Number of children		
1	502	43.35
2	505	43.61
3	119	10.28
4	24	2.07
>5	8	0.69

3.2 Variable Measurement

3.2.1 Dependent Variables: MM, Online Store Visit, and Conversion

Herein, a session is defined as a set of single or plural records with continuous television viewing. We observed the occurrence of MM, store visits, and conversion of each session. In detail, we created a binary variable referring to if a session engaged in MM by merging the television-viewing and clickstream datasets. Thereafter, we coded 29,072 subdomains of the website to create another binary variable indicating if a store visit occurred during a session. We referred to the method by Montgomery, Li, Srinivasan, and Liechty (2004) to discriminate e-commerce site pages based on specific keywords (e.g., cart, account, and payment) and created the final binary variable indicating if a session had purchase behavior. Notably, we considered the account login and shopping cart pages because we anticipated that individuals were more likely to make a purchase if they logged in or used the shopping basket. Finally, we summed the number of MM sessions, store visits, and conversion, then calculated the possibility of the behaviors of each viewer during the 9 months. We used the ratio of store visit/MM occurrence and conversion/store visit ratio as variables named store visit and online purchase, respectively.

3.2.2 Independent Variables

As discussed, we did not survey individual traits. Instead, we used the observed behavior as proxies for the latent traits. We aggregated the internet usage time by second unit and television time by minute second of each viewer to capture their media use patterns. We normalized these two variables as internet and tv times. Regarding zapping, we first created a binary indicator of the occurrence of individual zaps in a session. Thereafter, we used the cumulative number of sessions with zapping behavior as a variable named zapping frequency. The prime-time viewing variable indicates the number of sessions that occurred between 7 and 11 p.m. Finally, to capture individual television program viewing preferences, we observed the genres of programs viewers watched in each session and used the number of sessions of each televised program watched per individual as the program genre variable. Here, we selected three typical program genres (i.e., comedy drama/film, news, and variety show) as study objects. Table 2 describes the operationalization of these variables.

Table 2. Variable description

Variable	Description
Dependent Variables	
MM	Possibility of engaging in media multitasking
Store Visit	Possibility of store visiting
Purchase	Possibility of making a purchase
Independent Variables	
Internet Time ($Itime$)	Normalization of the amount of time of internet usage (excluding the time spent on the Internet while engaging in MM)
TV Time ($TVtime$)	Normalization of the amount of time for television viewing
Zapping ($Zapfreq$)	Number of sessions reported for zapping
Prime Time ($Ptfreq$)	Number of sessions that occurred during the prime time
Comedy ($Ncomedy$)	Number of sessions occupied with comedy viewing
News ($Nnews$)	Number of sessions occupied with news viewing
Variety ($Nvariety$)	Number of sessions occupied with variety-show viewing

3.3 Latent Class Model

We assume that there are K latent segments underlying the different viewer behavioral patterns of MM occurrences, store visits, and online purchases. Each viewer is denoted by $i(i = 1,2,\dots,n)$. We use X_i to represent the viewer segments, Y_i^j to describe the viewer i's probability of MM occurrence ($j = 1$), store visit ($j = 2$), and online purchase ($j = 3$). Here, we assume y_i^j follows a lognormal distribution with mean μ_k^j and variance $(\sigma^2)_k^j$ and donated $\boldsymbol{y}_i^j = (y_i^1, y_i^2, y_i^3)'$. Thus, we specify the likelihood of $\boldsymbol{Y_i}$ as follows:

$$P\ (Y_i = \ y\ ) = \sum_{k=1}^{K} p_{ik} \prod_{j=1}^{3} P\ (Y_i^j = y^j \mid X_i = k)\ . \tag{1}$$

Here, $P\ (Y_i^j = y^j \mid X_i = k)$ captures the probability of individual MM occurrences, store visits, and online purchases, condition on viewer i belonged to segment k, and p_{ik} is the probability of viewer i belonging to segment k,

$$p_{ik} = \frac{\exp(z_{ik})}{1+\sum_{l=2}^{K}\exp(z_{il})} \tag{2}$$

where

$z_{ik} = \lambda_{0k} + \lambda_{1k} Itime_i + \lambda_{2k} TVtime_i + \lambda_{3k} Zapfreq_i \lambda_{2k} + \lambda_{4k} Ptfreq_i + \lambda_{5k} Ncomedy_i + \lambda_{6k} Nnews_i + \lambda_{7k} Nvariety_i$.

We have discussed the behavioral trait variable in the previous section. Furthermore, parameter λ indicates the effects of these behavior traits on the probability of segment membership. Thus, the log-likelihood function is given by

$\ln \ell_i = \sum_i^n \ln P\ (Y_i = y) = \sum_i^n \ln(\sum_{k=1}^{K} p_{ik} \prod_{j=1}^{3} P\ (Y_i^j = y^j \mid X_i = k)\ )$.

Finally, we use the expectation-maximum algorithm to estimate the parameters.

4. Results

4.1 Model Selection

Prior to the analysis, we did not know the number of viewer segments. We estimated multiple models imposing a different number of segments. Table 3 shows three criteria Akaike's information criterion (AIC), Bayesian information criterion (BIC), and the log of the marginal likelihood of each model. However, both models with four and five segments did not converge after 20,000 iterations. The model with three segments outperforms the other specifications.

Table 3. Model comparison

Number of Segments	AIC	BIC	Log of Marginal Likelihood
2	−24589.57	−24488.48	12314.79
3	**−25155.54**	**−24983.69**	**12611.77**
4	−29333.31	−29090.7	14714.66
5	−29477.39	−29164.02	14800.70
6	−29349.06	−29035.68	14736.53

Note. The model with the best performance is represented in bold typeface.

4.2 Segmentation Interpretation

Herein, we report the estimation results of the MM occurrence, store visit, and purchase model (Table 4). Segment 1 has a membership of 621 people, which is the largest (53.6%). However, the probability of MM occurrences, store visits, and purchases in this segment are the lowest in the population. The people in segment 1 are least likely to engage in MM, exhibit the lowest interest in store visiting, and rarely make purchases while watching television. Thus, we name this segment "apathetic." There are 273 viewers (24.1%) in segment 2, which has the highest propensity for MM occurrences and store visits. Although they are more likely to frequently visit online stores, they are less likely to make a purchase, compared with the people in segment 3. Hence, we label this segment "E-shopper," which indicates a higher preference for shopping than purchasing. Segment 3 has a membership of 264 people (22.3%) who appear to be less likely to engage in MM and visit e-shops. However, they have the highest propensity to make a purchase than other segments. Consequently, we label the third segment as "E-buyer."

Table 4. Estimation results of the MM occurrence, store visit, and purchase model

	MM occurrence		Store visitation		Purchase	
	Coefficients	SD	Coefficients	SD	Coefficients	SD
Segment 1 (n = 621)	−4.368	2.007	−3.669	2.263	−3.332	0.000
Segment 2 (n = 273)	−0.480	1.129	−0.450	0.921	−0.526	0.868
Segment 3 (n = 264)	−2.669	0.994	−0.596	1.363	0.239	1.589

4.3 Segment Membership and Hypothesis Testing

After identifying these three segments, we examine how behavioral traits affect the possibility of segment membership and discuss if the results support the hypothesis. Table 5 shows the estimation results of the parameters. The coefficient of internet time is positive and significant ($\lambda_{21} = 1.675, p < 0.01$), suggesting that people who frequently use the Internet are more likely to belong to segment 2. They tend to engage in MM and visit e-shops, but they seldom made a purchase. Therefore, this result partially supports H1, which posits that people who frequently use the Internet are more likely to visit e-shops and make a purchase while watching television. Similar to the effect of internet usage time, those who frequently watch television are more likely to appertain to segment 2 ($\lambda_{22} = .430, p < 0.01$), which also partially supports H2. Furthermore, we investigate the effect of zapping frequency on the likelihood of segment membership and observe that the zapping frequency has a significant but negative effect ($\lambda_{33} = -.020, p < 0.01$) on the membership of segment 3. This result implies that viewers who are less likely to zap are more inclined to make a purchase although they are less likely to visit an e-shop, thereby partially supporting H3. Nevertheless, we observe that neither prime-time viewing ($\lambda_{42} = .000, p = .943; \lambda_{43} = .003, p = .186$) or comedy ($\lambda_{52} = .017, p = .733$; $\lambda_{53} = -.022, p = .616$) significantly influences the possibility of the segment membership. Thus, we know that the prime-time viewing behavior and comedy viewing frequency are not related to individual MM engagement and their e-commerce behavior. Thus, H4 and H5 are rejected. Regarding television program genres, we observe the effect of two other genres: news and variety shows. Although the estimate of news is positive and significant in segments 2 and 3 ($\lambda_{62} = .00523, p < 0.1$; $\lambda_{63} = .00517, p < 0.05$), the coefficient of segment 2 slightly exceeds that of segment 3. Individuals who frequently watch news programs are more likely to belong to segment 2 than 3. Therefore, this result supports H6. Similarly, the variety show frequency has a significantly positive effect on segments 2 and 3 ($\lambda_{72} = .005, p < 0.1$; $\lambda_{73} = .006, p < 0.01$), whereas its effect is opposite that of the news program. Variety show-viewing leads to a high membership probability in segment 3. Notwithstanding a few e-store visitations, viewers who frequently watch variety shows tend to purchase online while watching television. Table 6 summarizes the results of the previously proposed hypothesis.

Table 5. Estimation results of segment membership parameters

	Seg1		Seg2		Seg3	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	0	Fixed	−1.452***	0.000	−1.429***	0.000
Internet Time	0	Fixed	1.675***	0.000	0.181	0.358
TV Time	0	Fixed	0.430***	0.003	0.254*	0.050
Zapping	0	Fixed	−0.011	0.161	−0.020***	0.008
Prime Time	0	Fixed	0.000	0.943	0.003	0.186
Comedy	0	Fixed	0.017	0.733	−0.022	0.616
News	0	Fixed	0.005*	0.086	0.005**	0.046
Variety	0	Fixed	0.005*	0.053	0.006***	0.008

Note. ***p < 0.01, **p < 0.05, and *p < 0.1. The parameters in segment 1 were normalized to 0 for identification purposes.

Table 6. Summary of hypothesis-testing results

Hypothesis	Variables	Predicted effect		Observed effect		Results
		Store visit	Purchase	Store visit	Purchase	
Hypothesis 1	Internet time	(+)	(+)	(+)	(−)	Partially supported
Hypothesis 2	Tv time	(+)	(+)	(+)	(−)	Partially supported
Hypothesis 3	Zapping frequency	(−)	(−)	(+)	(−)	Partially supported
Hypothesis 4	Prime time	(−)	(+)	n.s.	n.s.	Not supported
Hypothesis 5	Comedy	(−)	(+)	n.s.	n.s.	Not supported
Hypothesis 6	News	(+)	(−)	(+)	(−)	Supported
Hypothesis 7	Variety show	(−)	(+)	(−)	(+)	Supported

5. Discussion and Implications

5.1 Discussion

Dissimilar to previous studies that only investigated individual differences in MM behavior, we studied MM occurrence and e-commerce behavior during MM concurrently by considering customer heterogeneity. Furthermore, we inspected how different behavioral patterns were related to individual traits. First, the results uncovered three behavioral patterns in terms of MM occurrences, store visits, and purchase decisions. In detail, certain viewers (Segment 1) are least likely to engage in second-screen activities (e.g., online surfing) while watching television. Additionally, they hardly visit e-shops and made purchases. This finding is consistent with previous studies, which indicate that light media multitaskers are less likely to be influenced by ads than heavy media multitaskers (Beuckels, Kazakova, Cauberghe, Hudders, & De Pelsmacker, 2019). They demonstrate that light media multitaskers exhibit low purchase propensity, compared with that of heavy media multitaskers. Interestingly, we discovered that those who most frequently engage in MM (Segment 2) are less likely to make a purchase (vs Segment 3), although they report the most frequent store visits. Several previous studies indicate that heavy media multitaskers perceive a high utility of incoming ads during MM because of their decreasing ability to filter irrelevant information (Duff, et al., 2014; Chang, 2017). Additionally, Chang (2017) indicates that habitual media multitaskers have a higher demand for information. These might be why heavy media multitaskers are more inclined to visit e-shops for product information. Ophir, Nass, and Wagner (2009) suggest that light media multitaskers (vs. heavy media multitaskers) efficiently allocate their attention. Hinz et al. (2016) show that limited attention could diminish online auctions. Arguably, although heavy media multitaskers are more susceptible to ads while watching television, they are less likely to move on to the next step (i.e., make a purchase) because of their distracted attention.

Second, we investigated the relationship between the probability of segment membership and individual behavioral traits. Dissimilar to previous studies, which focused on demographic factors, this study adopted individual traits to profile the segments. We observed that internet experience (i.e., internet usage time) and television-viewing time are positively related to MM and store visits but negatively affect purchase decisions, which corresponds to Lin, Kononova, and Chiang (2020)'s findings that MM is positively correlated with the level of screen device usage. As mentioned, internet experience reduces the risk perception (e.g., Miyazaki & Fernandez, 2001) and enhances the perceived ease of use (Bigne et al., 2008), while frequent television viewing leads to a high level of advertising exposure. These findings imply that people who use more Internet or television may have been more likely to visit e-shops and make online purchases. However, we did not observe the positive effect of internet usage and television viewing on purchase decisions during MM. Based on an extensive survey of extant studies, Zhou et al. (2007) indicate that internet experience is insignificant in predicting online shopping behavior lately, although it has been observed to be positively related to shopping intention in early studies. They explain that the effect of internet experience is less pronounced because of the popularization of the Internet. We conjecture that internet users would be optimistic regarding the Internet, which may encourage them to use the Internet, for example, for information search. However, internet experience is not the determining factor in individual online purchase decisions during MM. Regarding television viewing, the results show that it only positively triggers e-shop visits. Kamaruddin and Mokhlis (2003) suggest that television commercials are positively associated with brand consciousness. However, brand consciousness is negatively related to online purchases (Donthu & Garcia, 1999). This may be why viewers who frequently watch television are less likely to make an online purchase. Furthermore, we discovered that viewers who hold a positive attitude toward television commercials (i.e., low zapping frequency) tend to purchase online during MM. Nevertheless, they are less likely to engage in MM and visit e-shops without purchase. Those who adopt a positive stance on television ads tend to purchase rather than nonpurchase searching. Donthu and Garcia (1999)'s findings indicate that internet shoppers exhibit a more favorable attitude toward commercials than nonshoppers. Oppositely, although a previous study acknowledges that perceived ad utility is positively correlated with MM (Duff et al., 2014), it remains unclear if the attitude toward ads could predict nonpurchase information searching. The results of this study show that prime-time viewing does not impact MM, store visits, or purchase decisions. This might have been because the viewing patterns of people differed during prime time. Certain people are reported to exhibit a low level of multitasking in the evening (Voorveld & Viswanathan, 2015), while others use the television as a background in the evening (e.g., television viewing during a family meal).

Regarding television program genres, we did not observe a significant effect of comedy viewing on segment membership probability. Dissimilar to previous studies, we used comedy film and drama as comedy viewing variables. It is probably not precise to predict SS traits. Finally, we confirmed that people who watch more news programs are more likely to belong to segment 2, while those who favor variety shows are more likely to be in segment 3. The result of the present study parallels previous findings. Verplanken, Hazenberg, and Palenewen (1992) suggest that NFC motivates individuals to search for more information. Regarding SS, heavy sensation seekers report high impulsivity (Blackburn, 1969). Moreover, impulsivity, particularly impulse-buying tendency (IBT), directly influences individual impulsive purchases during MM (Chang, 2017). He also reveals that MM triggers impulsive purchases through the median effect of a perceived information utility for those with a high IBT.

5.2 Implications

Traditionally, MM was studied in information technology and then widely researched in human activity (Burgess, 2000). Recently, MM has attracted the interest of scholars in the marketing area, particularly the advertising aspect, yet the impact of MM remains an open question. To extend the limitations of previous studies, this study attempted to recognize the heterogeneity of the store visits and online purchase behaviors of media multitaskers using the segmentation method. In addition to MM occurrence, the results of the present study reveal the discrepancy in the e-commerce behaviors of media multitaskers. As discussed, those who belong to segment 3 are more likely to purchase, although they did not frequently visit e-shops. For marketers, it appears to be the most profitable segment. We did not observe a high purchase rate in segment 2; it is still the potential group because of its highest MM occurrence and store visit propensity. It can be anticipated that these people would soon make a purchase.

Furthermore, we provide insight into how individual traits correlate with heterogeneous behavioral patterns. The results indicate that people who frequently use the Internet or television and prefer to watch news programs tend to engage in MM and visit online shops. We also observed that viewers who zap less and view variety shows more are prone to make an online purchase, although they rarely visit e-shops. These findings can help marketers recognize their target customers and deeply understand their behavior and needs. In addition, marketers can deliver a more efficient and relevant message to each group by accounting for their characteristics. The people in segment 2 exhibit a high motivation for information searching. Thus, they are more easily moved by television ads. They may be highly concerned with the utilitarian value (e.g., information availability and selection), which is directly related to purchasing intention (To, Liao, & Lin, 2007). Online retailers can devise marketing strategies to entice people to make purchases. Online retailers must consider how to change these potential customers into purchasers. The remaining half of the viewers (segment 1) demonstrate low interest in e-shop visits and online purchases during MM. It is important to adopt marketing communication to trigger interest, although this segment lacks attractiveness at this stage.

6. Limitations and Future Research

Although this study provides a novel view into understanding the behaviors of media multitaskers, a few limitations were identified. First, we did not directly survey psychological characteristics, such as ad perception and NFC. We acknowledge inadequacies in this aspect, although we provided evidence of a strong relationship between behavioral indicators and these traits. Second, we observed the information search and purchase behaviors in e-commerce sites only because of data availability. However, viewers may search for brand or product information through other websites (e.g., Google) and make a purchase from e-commerce site apps. Finally, based on the results, we can ascertain who was more likely to search or purchase. However, we had little understanding of their psychological reasons.

Thus, future studies should include search and purchase behavior from other sites or applications as research objects. In addition to the advertising effect, we suggest that future studies investigate psychological reasons why viewers engage in searching and purchasing while watching television, for example, mood management. We invite future studies to uncover the reasons different from traditional e-commerce behavior to explain the store visits and purchase behaviors of media multitaskers.

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