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Reading About the Flu Online: How Health-Protective Behavioral Intentions Are Influenced by Media Multitasking, Polychronicity, and Strength of Health-Related Arguments

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ABSTRACT

As health organizations increasingly use the Internet to communicate medical information and advice (Shortliffe et al., 2000; World Health Organization, 2013), studying factors that affect health information processing and health-protective behaviors becomes extremely important. The present research applied the elaboration likelihood model of persuasion to explore the effects of media multitasking, polychronicity (preference for multitasking), and strength of health-related arguments on health-protective behavioral intentions. Participants read an online article about influenza that included strong and weak suggestions to engage in flu-preventive behaviors. In one condition, participants read the article and checked Facebook; in another condition, they were exposed only to the article. Participants expressed greater health-protective behavioral intentions in the media multitasking condition than in the control condition. Strong arguments were found to elicit more positive behavioral intentions than weak arguments. Moderate and high polychronics showed greater behavioral intentions than low polychronics when they read the article in the multitasking condition. The difference in intentions to follow strong and weak arguments decreased for moderate and high polychronics. The results of the present study suggest that health communication practitioners should account for not only media use situations in which individuals typically read about health online but also individual differences in information processing, which puts more emphasis on the strength of health-protective suggestions when targeting light multitaskers.

Introduction

The general purpose of the present study was to determine how message features (strong arguments) affect flu-protective behavioral intentions among college students with high and low preference for multitasking (polychronicity, Lindquist & Kaufman-Scarborough, 2007; Poposki, Oswald, & Brou, 2009) who read health messages about influenza at the presence of a media distraction. Our research builds on previous evidence suggesting that processing messages in media multitasking situations increases persuasion (Jeong & Hwang, 2012; Keating & Brock, 1974). This effect is explained by the elaboration likelihood model of persuasion (ELM), which posits that distraction contributes to peripheral-route processing at the cost of central-route processing (Petty & Cacioppo, 1986). We proposed that not only media multitasking situations but also individual differences in day-to-day multitasking affect persuasiveness of health messages, such that the distinction between strong and weak arguments will matter less to heavier multitaskers who often choose peripheral route of information processing than lighter multitaskers who tend to engage in central-route processing.

We explored the effects of media multitasking, argument strength, and polychronicity in the context of influenza prevention among college students. Although the flu has been

identified as one of the most common health problems in this population (Kingkade, Svokos, Klein, & Chan, 2014), students have low risk perceptions of the illness and low flu vaccination rates (Ramsey & Marczynski, 2011; Weinstein et al., 2007).

To develop effective health communication strategies to target college students, it is important to understand how they use the Internet. With the growth in the number of Internet users worldwide, health organizations have been increasingly using this medium to communicate with their audiences (Shortliffe et al., 2000; World Health Organization, 2013). Reading online has been a common way for young adults to receive health advice (Stellefson et al., 2011) as this medium provides confidential and convenient access to multiple resources (Escoffery, Miner, Adame, Butler, McCormick, & Mendell, 2005). Online information and suggestions about health significantly affect individuals' health decisions and improve self-health care (Fox & Duggan, 2013; Morahan-Martin, 2004). Despite the abundance of health content on the Internet, not all health-related suggestions are noticed, processed effectively, and lead to positive persuasive outcomes. It also has become difficult to process mediated contents due to constant distractions that new Information Communication Technologies (ICTs) create. Media multitasking, or using several media at the same time, is a widespread media use habit among students that can interfere with

health message processing. Multiple studies about persuasion and health have been conducted in a laboratory environment “clean” from the influences of surroundings (e.g., Handley & Runnion, 2011). The present study looked at health message processing in the presence of media distraction that reflected a more natural media use setting in which college students frequently process online health content.

Literature Review

The ELM and Media Multitasking

The ELM, a dual-processing model, posits that motivation, ability, and nature of message processing influence the likelihood of engaging in effortful thinking and changing attitudes and behaviors in accordance with persuader’s goals. Message receivers use central-route (systematic) and peripheral-route (heuristic) processing to evaluate information. During central-route processing, receivers scrutinize message arguments. If individuals are not motivated or do not have the ability to process information in an effortful way, they resort to peripheral-route processing by relying on heuristic cues to make judgments about information they are exposed to (Chaiken & Trope, 1999; Petty & Cacioppo, 1986). A number of factors interfere with effective information processing. Such factors reflect differences among individuals (e.g., mono- vs. polychronicity), message-specific features (e.g., argument quality), and situation context (e.g., media multitasking).

Media multitasking during work or studying is a common behavior among teenagers and college students (e.g., Foehr, 2006; Junco & Cotten, 2012; Kononova, Zazorina, Diveeva, Kokoeva, & Chelokyan, 2014; Levine, Waite, & Bowman, 2007). Media multitasking activities may involve different media (e.g., watching television and surfing the Internet), media and non-media tasks (e.g., texting while doing homework), and tasks “within” one medium (e.g., browsing a website and checking a social networking site (SNS); Foehr, 2006; Jeong & Fishbein, 2007; Pilotta & Schultz, 2005; Wallis, 2010; Yeykelis, Cummings, & Reeves, 2014). The present study focused on multitasking “within” one medium where a computer user switches between a website with health-related information and Facebook.

Studies have demonstrated the negative effects of media multitasking on memory, comprehension, students’ homework performance, grades, and time to complete homework (e.g., Armstrong & Chung, 2000; Bowman, Levine, Waite, & Gendron, 2010; Furnham & Bradley, 1997; Furnham, Gunter, & Peterson, 1994; Junco & Cotten, 2011; Levine et al., 2007; Wang & Tchernev, 2012). Students who spent more time using Facebook and other ICTs earned lower grades and showed worse exam performance than their counterparts who spent less time with Facebook and other new media

(Junco & Cotten, 2012; Rouis, Limayem, & Salehi-Sangari, 2011; Wood et al., 2012).

Paradoxically, media multitasking positively influences persuasive outcomes (Jeong & Hwang, 2012). Several studies applied the ELM to explain the rationale behind this effect. It has been found that media-related distractions, such as TV advertisements inserted in TV programs or various modalities of ads, such as sound, color, or design, can undermine high elaboration (central-route) processing and increase peripheral-route processing of persuasive messages (Anand & Strenthal, 1992). Jeong and Hwang (2012) proposed that media multitasking reduces comprehension and hinders the ability to generate counterarguments, which increases persuasion effects (Jeong & Hwang, 2012). Counterarguing requires more “counterdata” and “counterwarrant” and is more complex than comprehension and, thus, can be easily hindered by a distraction (Jeong & Hwang, 2012, p. 582). This finding is consistent with the evidence from an earlier study where participants who were exposed to light flashing while listening to persuasive messages showed lower ability to counterargue (Keating & Brock, 1974). We proposed the main effect of media multitasking on intentions to engage in flu-protective behaviors described in an online article.

H1: *Participants will indicate a greater intention to follow flu-protective suggestions described in an online article if they read it in a media multitasking condition (reading article and checking Facebook) compared with the control condition (reading article).*

Argument Strength

Health organizations and agencies, such as Centers for Disease Control and Prevention (CDC) or National Institutes of Health (NIH), and health media outlets such as WebMD provide online users with various types of information about illnesses, including the flu. Encyclopedia-like online articles often merge basic facts about a disease or disorder with ways to prevent and treat it (i.e., CDC, n.d.; NIH, n.d.; WebMD, n.d.). That is, arguments that advocate for health-protective behaviors are often included as part of health-related information. For example, CDC provides facts about flu vaccination while arguing that it is “the best way to reduce the chances that you will get seasonal flu and spread it to others” (CDC, n.d.).¹ The present study examined persuasive power of arguments incorporated in informative online articles about the flu. We studied whether strong and weak arguments would affect flu-protective behavioral intentions differently and whether these differences would vary by multitasking situation and habit.

¹Influenza is a serious disease that can lead to hospitalization and sometimes even death. Every flu season is different, and influenza infection can affect people differently. Even healthy people can get very sick from the flu and spread it to others. Over a period of 31 seasons between 1976 and 2007, estimates of flu-associated deaths in the United States range from a low of about 3,000 to a high of about 49,000 people. [...] An annual seasonal flu vaccine (either the flu shot or the nasal spray flu vaccine) is the best way to reduce the chances that you will get seasonal flu and spread it to others. When more people get vaccinated against the flu, less flu can spread through that community” (<http://www.cdc.gov/flu/protect/keyfacts.htm#vaccination-benefits>, CDC, n.d.).

Argument strength is often discussed as a dimension of a broader argument quality construct (e.g., Munch & Swasy, 1988; O’Keefe & Jackson, 1995). Argument quality is defined as the perception of a persuasive message as strong and cogent or weak and specious (Petty & Cacioppo, 1981). Petty and Cacioppo (1981) stated that argument strength is the basis to justify its quality where “the strong version of the message provided persuasive evidence (statistics, data, etc.)” to support a point of view and “the weak version of the message relied more on quotations, personal opinion and examples” (p. 850).

Judging argument quality is thought to be an outcome of central-route processing (Petty & Cacioppo, 1981). Studies have shown that strong arguments have a positive effect on persuasion (Jepson & Chaiken, 1990; O’Keefe & Jackson, 1995; Petty & Cacioppo, 1986). If an argument is strong, it will lead to generating more favorable or unfavorable thoughts about a phenomenon and fewer counterarguments. If the argument is weak, fewer thoughts will be generated, and the argument will be easy to counterargue (Chowdhury, Finn, & Olsen, 2007; Petty & Cacioppo, 1986).

O’Keefe and Jackson (1995) described several message features that have been used to manipulate argument strength. These features include specific argument elements, such as graphics or statistical data, correct or erroneous logic, and the level of ambiguity. The present study manipulated argument strength by adding statistical data and source identification to strong suggestions about health-protective behaviors while keeping weak arguments “vague” and having no statistical or source support (Petty & Cacioppo, 1981). We predicted a positive relationship between argument strength and persuasion (Petty & Cacioppo, 1986; Petty, Rucker, Bizer, & Cacioppo, 2004; Tormala, Brinol, & Petty, 2006).

H2: *Participants will indicate a greater likelihood of following flu-protective suggestions presented in the form of strong arguments than in the form of weak arguments in an online article about influenza.*

The ELM suggests that strong arguments generate greater persuasion effects than weak arguments when readers engage in central-route information processing (O’Keefe & Jackson, 1995; Petty & Cacioppo, 1986). As central-route processing increases and information recipients engage in scrutinizing a persuasive message, peripheral-route processing decreases. Thus the influence of strong arguments over weak arguments increases. In opposite situations, when individuals “take” the peripheral route to information processing, the difference between the two types of arguments decreases as individuals do not spend cognitive resources to attend to argument details (e.g., statistical data or detailed source description) and distinguish between arguments based on their quality. We hypothesized that when multitasking with media, individuals are less likely to process information through the central route (i.e., attend to argument details), which leads to a reduced difference between strong and weak arguments.

H3: *Participants will indicate a greater intention to follow flu-protective suggestions presented in the form of strong*

argument than in the form of weak arguments if they read an online article in control (non-multitasking) condition. In the media multitasking condition (reading article and checking Facebook), the difference between strong and weak arguments will become smaller.

Moderating Effects of Polychronicity

The effects of media multitasking on persuasion may vary by not only message features but also individual differences related to habitual performance of tasks at the same time, or polychronicity (Lindquist & Kaufman-Scarborough, 2007; Potoski et al., 2009). Polychronicity implies a belief that engaging in two or more activities at the same time is the best way to do things, a positive attitude toward engaging in two or more activities simultaneously, and multitasking behaviors (Bluedorn, Kaufman, & Lane, 1992).

Data related to polychronicity effects in multitasking situations are not consistent. Sanderson and colleagues (2013) indicated that individuals who are higher in polychronicity have a higher multitasking ability and overall work performance. Brasel and Gips (2011) did not find significant effects of polychronicity on the extent of media multitasking. Zhang, Goonetilleke, Plocher, and Liang (2005) demonstrated that polychronics were more prone to use simultaneous control of multiple tasks, while monochronics preferred to do it serially although no differences were found with regard to ratings of cognitive loads in multitasking situations.

The link between habitual media multitasking and performing multiple cognitive tasks at the same time has been established. Ophir and colleagues (2009) found that individuals who indicate heavy media multitasking habit perform worse on cognitive control exercises that demand filtering irrelevant information and task switching than do light multitaskers. While light multitaskers are stronger in the implementation of top-down attention control and ignoring irrelevant stimuli, heavy multitaskers sacrifice “performance on the primary task to let in other sources of information” (p. 15585). Ophir and colleagues (2009) suggest that heavy media multitaskers are “breadth biased” with regard to media consumption, as well as cognitive control tasks, and are oriented to exploratory, shallow information-processing style, while light media multitaskers succeed in focusing and being exploitative information processors.

Using Ophir, Nass, and Wagner’s (2009) logic, we argued that preference for multitasking would negatively predict the difference between strong and weak arguments due to “shallow” information-processing style that high polychronics may engage in. We expected high polychronics to engage in peripheral-route processing more than central-route processing and, as a result, attend to health-related suggestions in the online article without scrutiny that would impair the ability to distinguish between strong and weak arguments.

H4: *The difference between strong and weak arguments in their effects on flu-protective behavioral intentions will decrease with the increase in the level of polychronicity.*

We predicted that polychronicity would increase the effect of media multitasking on intentions to engage in health-protective behaviors.

H5: *In the media multitasking condition, high polychronics will indicate a greater intention to follow flu-protective suggestions than low polychronics. This difference will be smaller in the control condition.*

RQ1: *Will the intention to follow health-protective suggestions on the Internet differ as a function of three factors: argument quality, media multitasking, and polychronicity?*

Method

Design

The present study employed a 2 (media multitasking: multitasking vs. control) \times 2 (argument strength: strong vs. weak) mixed factorial experimental design. *Media multitasking* was a between-subjects factor with two levels. One group of participants read an online article about the flu on a health-related website and checked Facebook while reading (multitasking condition), and another group of participants read the same article without interruptions (control condition). Participants were randomly assigned to each multitasking condition. The article that each participant read included basic facts about the flu as well as flu-protective suggestions presented as strong and weak arguments. *Argument strength* was a within-subjects factor. Strong and weak arguments were included as part of the online article about the flu. We used argument strength as a within-subjects factor to reduce between-group error and make the experimental design ergonomic. *Polychronicity* was used in the study as a moderator.

Multitasking with Facebook

A pretest survey was conducted ($N = 388$) to ensure that college students use Facebook on a regular basis and multitask with it more often than with other popular media. The pretest results showed that 98% of respondents had a Facebook account, 74% checked it several times a day, and 88% did it at least once a day. About 84% of respondents indicated that they multitasked with Facebook, which was a more popular multitasking activity than texting/instant messaging (80%), using Twitter (62%), listening to music (61%), and watching YouTube videos (51%) combined with other tasks. Respondents reported that, on average, they switched to Facebook four times while doing a standard work- or study-related task. Based on these results, Facebook was selected for multitasking manipulation.

Each participant in the multitasking condition was asked to check this SNS four times while reading an article about the flu. Materials were pretested with regard to speed of online reading to ensure that participants would have enough time to finish the article in both conditions. Participants in the control condition were given about 29 minutes to finish reading, and participants in the media multitasking condition were given about 33 minutes—29 minutes to read the article and 4 minutes to check Facebook four times (1 minute per check).

That is, participants in the multitasking condition checked Facebook four times in roughly half an hour.

Argument Strength

Participants read an online article about influenza. Ten strong and ten weak arguments about flu-protective behaviors were included in the article that also presented basic facts about the flu. Arguments were designed based on previous literature (Hunt, Smith, & Kernan, 1985; Jepson & Chaiken, 1990; O’Keefe & Jackson, 1995). Strong arguments represented suggestions to engage in flu-preventive behaviors supported with statistical information and attributed to a specific official source. Weak arguments represented suggestions that did not contain statistics and source attribution and, instead, were written in a vague way. The length of each argument was controlled for (40 words per argument on average). Arguments were pretested ($N = 38$) with regard to perceived persuasion strength. Each argument was rated on seven-point semantic differential scales as being “not persuasive/persuasive,” “of low/high quality,” and “weak/strong” (Cronbach’s alphas ranged from 0.86 to 0.96). A 2 (argument type) \times 10 (argument repetition) repeated-measures analysis of variance (ANOVA) showed a significant main effect of argument type: $F(1.37) = 16.55$, $p < 0.001$, $\eta^2 = 0.31$. Strong arguments were reported to be more persuasive ($M = 5.02$; $SD = 1.23$) than weak arguments ($M = 4.63$; $SD = 1.30$).

Polychronicity

Polychronicity was measured on seven-point scales using a previously validated 14-item index (Poposki et al., 2009; Cronbach’s alpha = 0.89) and entered in statistical analyses as an interval continuous variable.

Participants, Procedure, and Stimuli

A total of 121 students from a large Midwestern university in the United States participated in the experiment. The sample had a roughly equal gender split with 53% female participants. All participants reported English to be their native language. About 82% were Caucasian. The majority were seniors (43%) followed by juniors (35%). Five people reported having attention disorders that could affect their reading performance (e.g., ADHD and dyslexia). The responses of these participants were excluded from statistical analyses.

Before coming to the lab, participants filled out a three-minute online survey that measured their preference for multitasking (polychronicity) and two personality traits (extraversion and neuroticism) that are associated with multitasking (Lieberman & Rosenthal, 2001; Wang & Tchernev, 2012). Participants were allowed to take part in the lab experiment only after completing the survey.

Upon arrival to the lab and providing consent to participate in the study, subjects were instructed to read an online article about influenza on a laptop. To reduce familiarity with article content, we selected information that did not include obvious facts about the flu. For example, readers learned about two ways influenza virus could change: antigenic shift and drift, specific flu outbreaks in different countries, types of

influenza in humans and animals, and Guillain–Barré syndrome that may develop after having a flu.

In the control condition, participants read only the article. In the media multitasking condition, participants were asked to take four breaks to check Facebook when given the instructions to do so. Each Facebook break lasted for at least one minute. Before participants started reading the article, they opened the Facebook page in a different Web tab and logged into their Facebook accounts. Participants were instructed to turn off and put away their phones and to not check other websites during the procedure. When subjects finished the procedure, they took a five-minute break and continued with a survey measuring dependent, control, and demographic variables.

The article about influenza included five Web pages, each page being approximately 920–930 words in length. Information for the article was taken from the website of the CDC and modified for the purposes of the present study. Each article page included four paragraphs of text. Each paragraph presented facts about influenza and a suggestion to engage in flu-preventive behaviors. These suggestions were written as either strong or weak arguments. For example, the following was used as 1 of 10 strong arguments: “CDC statistics show that over the past 5 years, CDC flu telephone hotline helped 7,000 people to prevent the flu and 12,500 people to avoid flu-related complications. You should call CDC specialists for a free consultation.” The following was used as 1 of 10 weak arguments: “Public donations to virologic research organizations are highly encouraged for further development and manufacturing of cell-based flu vaccines. The contributions of people who care about health for everyone are highly appreciated by health scientists as well as practitioners.”

Dependent Measure

Participants rated the intentions to follow suggestions provided in the article that they had read on three seven-point semantic differential scales: unlikely/likely, not definitely/definitely, and improbably/probably. They rated 20 flu-protective behaviors that were advocated for in the article. Half of these behaviors were mentioned as strong arguments and another half as weak arguments. When participants read the article, the 20 flu-protective behaviors were incorporated as part of either strong or weak arguments. When participants rated each behavior as a dependent measure, the manipulation of strong and weak arguments was excluded from the questions. The items were used to compute two dependent variables: intentions to engage in flu-preventive behaviors incorporated in either strong arguments (Cronbach’s alpha = 0.90) or weak arguments (Cronbach’s alpha = 0.91).

Control Variables

Extraversion and neuroticism were measured with the Big Five Trait Taxonomy instrument (John, Naumann, & Soto, 2008). Participants rated adjectives as representative of their personality (Cronbach’s $\alpha_{\text{extraversion}} = 0.88$, and Cronbach’s $\alpha_{\text{neuroticism}} = 0.85$). Another control variable included in the study was attitude toward flu vaccination. We measured it with four seven-point items from 1 “strongly disagree” to 7 “strongly agree”² (Cronbach’s alpha = 0.82).

Results

Bivariate correlation analysis indicated that neuroticism was negatively correlated with the strong-argument-dependent variable (Pearson correlation = -0.18 , $p = 0.023$), and attitude toward flu vaccination was positively correlated with both dependent measures (Pearson correlation_{strong} = 0.39, $p < 0.001$; Pearson correlation_{weak} = 0.27, $p < 0.001$). These variables were included in statistical analyses for control.

The result of testing Hypothesis 1 indicated a significant main effect of media multitasking: $F(1,105) = 7.20$, $p = 0.008$, $\eta^2 = 0.06$. Participants in the media multitasking condition ($M = 4.46$; $SD = 0.91$) were more likely to follow article suggestions than participants in the control condition ($M = 4.06$; $SD = 0.83$). Hypothesis 1 was supported.

To test Hypothesis 2, we ran a repeated-measures analysis of covariance (ANCOVA) with argument type as a within-subjects factor, media multitasking as a between-subjects factor, neuroticism and attitude toward flu vaccination as covariates, and intentions to engage in health-protective behaviors as a dependent measure. The main effect of argument type was significant: $F(1,105) = 12.92$, $p < 0.0001$, $\eta^2 = 0.11$. Participants were more likely to follow flu-preventive suggestions if they were presented in the form of strong arguments ($M = 5.03$; $SD = 0.69$) than in the form of weak arguments ($M = 3.51$; $SD = 1.06$). Hypothesis 2 was supported.

The result of testing Hypothesis 3 showed that no significant interaction effect of argument type and media multitasking on the dependent measure was found: $F(1,105) = 1.58$, $p = 0.211$. Hypothesis 3 was not supported.

To test hypotheses 4 and 5 with polychronicity as a continuous moderator, we used PROCESS statistical software (Hayes, 2013).³ To test Hypothesis 4, we calculated a new variable that represented the difference between the two dependent measures related to strong and weak arguments. This allowed us to test for interaction effect of argument type, which was a within-subjects factor, and polychronicity (Judd, Kenny, & McClelland, 2001). This new variable was regressed on polychronicity, and the relationship was found significant (unstandardized B coefficient = -0.18 , $SE = 0.09$,

²Examples of items to measure attitude toward flu vaccination: “Flu vaccination is a waste of time and money”; “Flu vaccination is important to remain in good health throughout the flu season.”

³PROCESS allows testing for up to 76 conditional effects and mediation models. The model that we tested in the present study (model 1 in PROCESS, Hayes, 2013) is a simple moderation model. One of the advantages for testing moderating effects in PROCESS over a standard SPSS ANOVA is that PROCESS allows including continuous moderators in the analysis. Instead of dichotomizing the moderator, we explored the effects of the manipulation at multiple levels of polychronicity, which provided a more nuanced picture of the results.

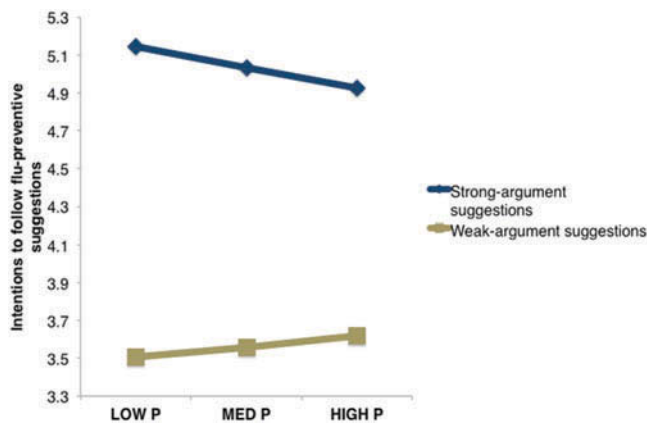


Figure 1. The difference in intentions to follow influenza-preventive suggestions presented as strong and weak arguments as a function of polychronicity. P = polychronics.

$t = -2.14$, $p = 0.035$, LLCI = -0.3517 , ULCI = -0.0130 ⁴). **Figure 1** demonstrates that the difference in following suggestions presented as strong and weak arguments decreased with the increase in the level of polychronicity, meaning that the more participants preferred to do multiple things at a time, the less likely argument strength was to influence their health-protective behavioral intentions. Hypothesis 4 was supported.

To test Hypothesis 5, we ran model 1 in PROCESS twice: first, with the dependent variable associated with strong arguments and, second, with the dependent variable related to weak arguments. Media multitasking was included in the analysis as an independent variable and polychronicity as a moderator. The effects of media multitasking on the intentions to follow suggestions presented in the form of strong arguments were found significant at values of the moderator from 3.19 to 5.25 as indicated by Johnson–Neyman regions of significance (**Table 1**). Moderate and higher polychronics expressed greater positive behavioral intentions in multitasking condition than in control condition than low polychronics (**Figure 2**). This difference becomes insignificant again at the highest values of polychronicity. Similar results were found for the intentions to follow suggestions presented in the form of weak arguments. The difference between control and multitasking conditions was significant at values of the moderator from 2.85 to 5.04 as indicated by Johnson–Neyman regions of significance (**Table 2**). Moderate and higher polychronics were more likely to intend to behave in accordance with weak-argument suggestions in multitasking condition than in control condition. This difference is smaller for low polychronics (**Figure 3**). Hypothesis 5 was supported at specific values of polychronicity (moderator).

The interaction effect of media multitasking and polychronicity on the difference between the dependent measures related to strong and weak arguments (research question 1) was not significant: unstandardized B coefficient = 0.03, $SE = 0.17$, $t = 0.18$, $p = 0.858$, LLCI = -0.3085 , ULCI = 0.3705.

Table 1. Conditional effect of media multitasking (independent variable) on health-protective behavioral intentions presented as strong arguments (dependent variable) at values of polychronicity (moderator)

Polychronicity value*	Effect	SE	t	p	LLCI	ULCI
-2.6886	0.0736	0.4004	0.1839	0.8545	-0.7210	0.8683
-2.4458	0.0976	0.3679	0.2653	0.7913	-0.6326	0.8278
-2.2029	0.1216	0.3358	0.3621	0.7181	-0.5449	0.7881
-1.9601	0.1456	0.3042	0.4785	0.6334	-0.4582	0.7493
-1.7172	0.1695	0.2732	0.6205	0.5364	-0.3727	0.7118
-1.4743	0.1935	0.2431	0.7960	0.4280	-0.2890	0.6761
-1.2315	0.2175	0.2143	1.0151	0.3126	-0.2078	0.6428
-1.4743	0.1935	0.2431	0.7960	0.4280	-0.2890	0.6761
-1.2315	0.2175	0.2143	1.0151	0.3126	-0.2078	0.6428
-0.9886	0.2415	0.1873	1.2895	0.2003	-0.1302	0.6132
-0.7458	0.2655	0.1630	1.6284	0.1067	-0.0581	0.5890
-0.5267	0.2871	0.1446	1.9847	0.0500	0.0000	0.5742
-0.5029	0.2894	0.1429	2.0252	0.0456	0.0058	0.5731
-0.2601	0.3134	0.1289	2.4306	0.0169	0.0575	0.5693
-0.0172	0.3374	0.1232	2.7388	0.0073	0.0929	0.5819
0.2257	0.3614	0.1268	2.8504	0.0053	0.1097	0.6130
0.4685	0.3853	0.1390	2.7724	0.0067	0.1095	0.6612
0.7114	0.4093	0.1578	2.5932	0.0110	0.0961	0.7226
0.9542	0.4333	0.1813	2.3904	0.0188	0.0735	0.7931
1.1971	0.4573	0.2077	2.2014	0.0301	0.0450	0.8696
1.4399	0.4813	0.2362	2.0375	0.0443	0.0125	0.9501
1.5277	0.4899	0.2468	1.9847	0.0500	0.0000	0.9798
1.6828	0.5052	0.2660	1.8991	0.0605	-0.0228	1.0333
1.9257	0.5292	0.2968	1.7828	0.0777	-0.0599	1.1184
2.1685	0.5532	0.3283	1.6849	0.0952	-0.0985	1.2048

* Polychronicity values are centered (uncentered $M = 3.72$, $SD = 0.90$)

** Regions of significance are highlighted in gray

Discussion

The findings of this study offered several contributions to research on the ELM and media multitasking. First, the results of the main experiment demonstrated that when multitasking with Facebook, individuals indicated greater intentions to follow influenza-preventive suggestions, which is consistent with the findings from previous research (Jeong & Hwang, 2012). The present study took the investigation of persuasive outcomes further by measuring behavioral intentions of participants. As behavioral intentions are considered to be a proximate predictor of behaviors (Ajzen, 1991), including

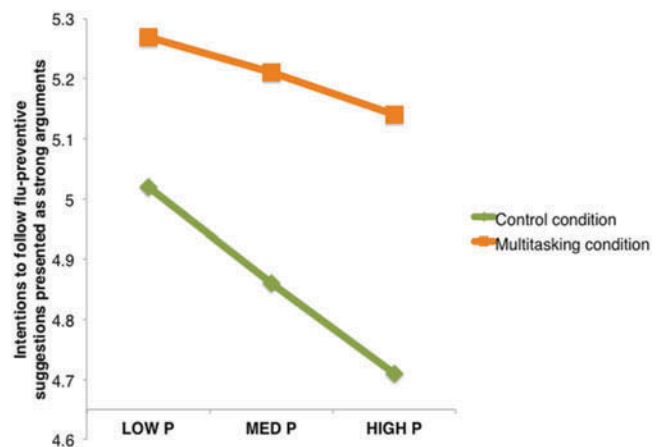


Figure 2. The effect of multitasking on influenza-preventive behavioral intentions at different levels of polychronicity (for suggestions presented in the form of STRONG arguments only). P = polychronics.

⁴CI = confidence interval; LL = lower level; UL = upper level

Table 2. Conditional effect of media multitasking (independent variable) on health-protective behavioral intentions presented as weak arguments (dependent variable) at values of polychronicity (moderator)

Polychronicity value*	Effect	SE	t	p	LLCI	ULCI
-2.6886	0.4214	0.6214	0.6782	0.4993	-0.8119	1.6547
-2.4458	0.4373	0.571	0.7658	0.4457	-0.6961	1.5706
-2.2029	0.4532	0.5212	0.8694	0.3868	-0.5813	1.4876
-1.9601	0.4690	0.4721	0.9934	0.3230	-0.4680	1.4061
-1.7172	0.4849	0.4241	1.1435	0.2556	-0.3567	1.3265
-1.4743	0.5008	0.3773	1.3272	0.1876	-0.2481	1.2497
-1.2315	0.5167	0.3326	1.5536	0.1235	-0.1434	1.1767
-0.9886	0.5325	0.2906	1.8322	0.070	-0.0443	1.1094
-0.8732	0.5401	0.2721	1.9847	0.050	0.0000	1.0802
-0.7458	0.5484	0.253	2.1676	0.0326	0.0463	1.0506
-0.5029	0.5643	0.2218	2.5439	0.0125	0.1240	1.0045
-0.2601	0.5802	0.2001	2.899	0.0046	0.1830	0.9774
-0.0172	0.5960	0.1912	3.1174	0.0024	0.2166	0.9755
0.2257	0.6119	0.1968	3.1098	0.0025	0.2214	1.0024
0.4685	0.6278	0.2157	2.9101	0.0045	0.1996	1.0559
0.7114	0.6437	0.245	2.6274	0.0100	0.1574	1.1299
0.9542	0.6595	0.2813	2.3443	0.0211	0.1012	1.2179
1.1971	0.6754	0.3224	2.0949	0.0388	0.0355	1.3153
1.3193	0.6834	0.3443	1.9847	0.0500	0.0000	1.3668
1.4399	0.6913	0.3666	1.8857	0.0623	-0.0363	1.4189
1.6828	0.7071	0.4129	1.7126	0.0900	-0.1124	1.5267
1.9257	0.723	0.4607	1.5693	0.1198	-0.1914	1.6374
2.1685	0.7389	0.5096	1.4500	0.1503	-0.2725	1.7503

* Polychronicity values are centered (uncentered $M = 3.72$, $SD = 0.90$)

** Regions of significance are highlighted in gray

health communication context (e.g., Sheeran, 2002; Sheppard, Hartwick, & Warshaw, 1988), we argue that the results of the present study will be useful for health communication scholars and practitioners who plan to explore health-protective behaviors. We also suggest that future studies focus on actual health-protective behaviors of young adults that may change as a function of media multitasking.

Second, the present study found that the effect of argument strength varied as a function of polychronicity. The results suggest that situational media multitasking may be a less powerful factor in predicting health persuasion outcomes than individual differences in the habit of doing multiple things at the same time. We found that the difference between intentions to follow suggestions based on strong versus weak arguments became smaller with the increase in the level of

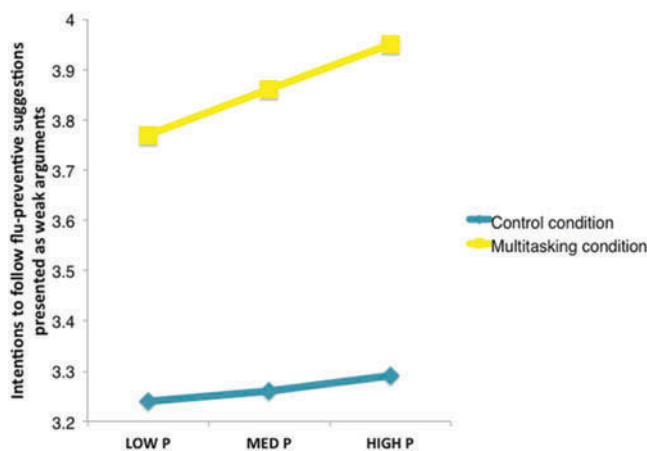


Figure 3. The effect of multitasking on influenza-preventive behavioral intentions at different levels of polychronicity (for suggestions presented in the form of WEAK arguments only). P = polychronics.

polychronicity. That is, medium and higher polychronics were less likely to distinguish between strong and weak arguments in evaluating their health-protective behavioral intentions. This finding is consistent with our predictions that higher polychronics prefer exploratory, “shallow” strategies to in-depth information processing. They do not engage in central-route processing to the same degree as low polychronics do and are less likely to distinguish between strong and weak arguments. There are at least two implications of this finding: one for the theory and another for the industry of health communication. First, it adds another dimension to the concept of distraction discussed in the context of the ELM. Our study showed that distraction as an attribute of a situation does not interfere with the effects of strong and weak arguments. However, people’s preference to do multiple things at the same time does. Distraction affects differences in message feature processing to the degree we choose it to affect us on a daily basis by engaging in habitual multitasking behaviors. This leads to a managerial implication: health communication practitioners are suggested to target heavy and light multitaskers differently regardless of the situation in which they read online articles about health. While heavy multitaskers might not be “picky” about health-related arguments, targeting light multitaskers will require more emphasis on the strength of health-protective suggestions that include statistical data, source identification, and other quality features.

As predicted, media multitasking positively affected behavioral intentions. Practitioners in the fields of health and communication should treat this finding with caution. On the one hand, media multitasking, a widespread habit of young adults, affects health persuasion in a positive way. On the other hand, such effect might occur at the cost of cognition and in-depth central-route processing. It is a question for future research how stable such effects are and whether peripheral-route processing leads to real attitudinal and behavioral changes with regard to health-protective behaviors. Longitudinal studies need to be done in the future to test whether persuasive effects of media multitasking that are associated with increased peripheral-route processing and reduced counterarguing (Jeong & Hwang, 2012) persist over time and whether they are comparable with the effects mediated by central-route processing. Two specific suggestions for the future studies arise. First, it is important to measure processes, such as argument comprehension, agreement, and counterarguing, that are predicted to mediate the effects of media multitasking on persuasion. One of the shortcomings of the present study is that argument agreement and counterarguing were not measured. We relied on previous evidence to hypothesize that media multitasking reduces counterarguing and, as a result, increases persuasion. Future studies should test more complex mediation models. Second, the ELM posits that central- and peripheral-route processing work in the “zero-sum game” manner. When one increases, another one decreases. It should be noted that other dual-processing models, such as heuristic-systematic model (Chaiken & Trope, 1999), offer criticism of such mutual exclusiveness. Future research should focus on how both information-processing routes function in media multitasking situations.

While media multitasking may seem to be an appealing media use habit, health communication practitioners are suggested to look for ways to persuade without hindering information receivers' memory, comprehension, and analytical processing. In this regard, the finding that higher polychronics are less likely to distinguish between strong and weak arguments is concerning and calls for improved education in the field of health communication. Considering that the Internet offers not only health information but also health misinformation, it is important to design interventions for heavier multitaskers within young populations like college students to teach them how to read health-related messages attentively and critically.

The results of the present study did not show a significant interaction effect of argument type and media multitasking, meaning that the difference in participants' intentions to follow health-protective suggestions presented as strong and weak arguments did not decrease from control to media multitasking condition. This may indicate that multitasking with Facebook has become such a routine media use habit of college students that it does not significantly affect the processing of argument strength. This also suggests that other features of argument strength should be explored in the future to test their "susceptibility" to distraction created by media. Although providing a good review of argument strength operationalization ("quality" in O'Keefe & Jackson, 1995) with the use of specific features, such as statistical data, O'Keefe and Jackson (1995) pointed out that such feature manipulations had been unsystematic. Future investigations will need to address this problem.

The current study has some limitations. First, participants in the media multitasking condition were instructed to check Facebook four times at specific times during the procedure. This could interfere with the study's ecological validity as college students in real life check social media more and less frequently and do it spontaneously rather than based on the lab instructions. Although we strived to create a more natural media use environment for student participants by asking them to multitask with Facebook, we used the method of experiment, which implies control over the effects of undesirable factors. Second, the present study focused on only one specific message feature, argument strength, and one individual difference, polychronicity. Future research should explore other message elements (e.g., persuasive appeal) and individual differences (e.g., issue knowledge) outlined in the ELM in relation to performance in media multitasking situations. Third, the online article, although being written on a health topic relevant to college students, included factual encyclopedia-like information that the Internet users usually do not seek when they search for medical guidelines and advice. Health issue relevance and involvement in relation to the manipulated online content should be studied in the future. Finally, the effects of media multitasking, argument strength, and polychronicity have to be tested in other health contexts, expanding the implications beyond the issue of influenza.

Despite the limitations, the present study illuminated findings that are important on theoretical and practical levels. It tested the effects of media multitasking on health-protective behavioral

intentions, which extended the existing knowledge on multitasking, persuasion, and health information processing. It contributed to a better understanding of relationships between media multitasking and health persuasion by exploring the moderating effects of polychronicity. It revealed important findings with regard to the links between polychronicity and argument strength. The study offered several managerial implications that deal with designing strong persuasive arguments and messages in the area of health communication and accounting for situational and individual difference factors in communicating them to target audiences.

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