

## **Multitasking Across Borders: A Cross-National Study of Media Multitasking Behaviors, Its Antecedents, and Outcomes**

ANASTASIA KONONOVA  
Michigan State University

The study explores media multitasking behaviors of young adults in the United States, Russia, and Kuwait ( $N = 532$ ). The results of multilevel modeling find that media factors such as structural, macro characteristics of media markets (e.g., technology distribution, the state of press freedom), individual media ownership, and audience demographic and psychological differences such as gender and sensation seeking predict media multitasking. In turn, media multitasking, along with structural characteristics of media markets, is found to predict perceived attention paid to primary media messages. The study offers cross-national evidence to support the existing developments in the area of media multitasking and suggests that individual- and market-level differences must be considered to explain media multitasking behaviors and perceived attention to mediated contents.

*Keywords: Media multitasking, perceived attention to primary media messages, digital divide, multilevel model analysis, cross-national comparison*

The rapid growth of new communication technologies over the past decade has drastically changed the media landscape and influenced media use behaviors (Roberts & Foehr, 2008). Media multitasking has been identified as one of these behaviors (Roberts & Foehr, 2008; Robert, Foehr, & Rideout, 2005) that has altered not only the way we operate media technologies but the way we perceive and process media content. Some models of media multitasking examine its predictors (Jeong & Fishbein, 2007), and some account for its possible effects (Bardhi, Rohm, & Sultan, 2010). The aim of this study is to test both predictors and outcomes of media multitasking cross-nationally.

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Anastasia Kononova: [kononovaa@gmail.com](mailto:kononovaa@gmail.com)

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The current study takes the theoretical perspective of the digital divide in its comparison of media multitasking models across three nations: Kuwait, Russia, and the United States. It is argued that some differences in media multitasking would be contingent on macro-level, structural characteristics of national markets—specifically, technology diffusion and socioeconomic and democratic developments (Norris, 2001). Such macro-level, structural factors were kept constant in previous research because media multitasking was examined within the U.S. media market (Jeong & Fishbein, 2007). This study offers a wider, cross-national perspective, which advances the existing theory.

Media multitasking research has predominantly focused on media behaviors of young Americans (e.g., children, teenagers, students). Evidence suggests that younger generations multitask often and more than older generations (Carrier, Cheever, Rosen, Benitez, & Chang, 2009; Rideout, Foehr, & Roberts, 2010; Roberts & Foehr, 2008). A study by Rideout et al. (2010) indicated that 7th- to 12th-graders multitask almost 30% of the time. Eighty percent of adolescents surveyed in 2003 and 2004 were involved in media multitasking (Foehr, 2006). To continue this line of scholarship, this study explores whether young people in other countries—Kuwait and Russia—multitask with media, what factors affect their multitasking behaviors, and what outcomes are associated with media multitasking.

### **Media Multitasking Model**

Media multitasking is a condition of being involved in more than one media-related activity at a time (Foehr, 2006; Vega, 2009; Wallis, 2010). People are engaged in media multitasking when they concurrently use different media (for example, reading news online and watching television simultaneously; Foehr, 2006; Roberts & Foehr, 2008), as well as when only one activity is media related (for example, exercising and watching TV simultaneously; Foehr, 2006; Jeong & Fishbein, 2007). This study focuses on behaviors associated with media pairing.

Jeong and Fishbein (2007) proposed a model that outlined the main predictors of media multitasking. Referring to Webster, Phalen, and Lichty's (2000) model of exposure to media, Jeong and Fishbein explained how media and audience factors predict multitasking behaviors. Media factors are understood as a combination of structural factors such as media market and access to technology and individual factors such as individual media ownership. Audience factors include demographic variables such as gender and socioeconomic status (SES) and psychological variables such as sensation seeking. This study tests the media multitasking predictors specified by Jeong and Fishbein. In addition, a possible outcome of media multitasking—perceived attention to primary media messages in multitasking situations—is proposed and tested.

Treating the country of residence (the United States, Russia, Kuwait) as a macro-level, structural factor allows mapping the differences among the three national samples with regard to media multitasking, its predictors (media ownership, SES, gender, and sensation seeking), and outcomes (perceived attention to primary media messages).

### **Nation-Level Factors Predicting Media Multitasking**

One of the major markers of the 21st century—the information age—is the diffusion of information and communication technologies (ICTs). Countries around the world have adopted new technologies to varying degrees, creating a “digital divide” (Norris, 2001, p. 3). Norris (2001) argues that, when analyzing cross-national differences in technology use, comparisons should go beyond technology distribution. The socioeconomic and democratic development of each country must be taken into account. Warschauer (2003) also moves beyond the focus on the traditional interpretation of access to technology, a divide between the haves and have-nots, suggesting that issues of conduits (e.g., whether a person has a working Internet connection) and literacy (e.g., whether a person knows how to use technology) as well as other physical, digital, human, and social factors should be included in the mix. Building on this argument, the present study describes three national media markets with regard to not only new technology diffusion and growth but each country’s socioeconomic and democratic developments.

#### ***Technology Diffusion and Growth***

The markets of traditional electronic media are saturated in all three countries. In Kuwait, Russia, and the United States, more than 95% of households have television, and many enjoy satellite TV and radio services (CIA Factbook, 2012a, 2012b, 2012c; NationMaster, 2012). The three national markets of cell phones are also highly developed; on average, each person possesses one mobile phone device (International Telecommunication Union, 2012).

Cross-national differences in information and communication technology distribution and growth predominantly occur in the newest media sector associated with computer ownership and Internet use. As shown in Table 1, the United States has the highest percentage of households with computers (75.5%), followed by Kuwait (69%) and Russia (55%) (International Telecommunication Union, 2012). Statistics on the Internet penetration, or the percentage of population using the Internet, are somewhat consistent with computer ownership data, such that 78% of the U.S. population uses the Internet, followed by Kuwait (74%) and Russia (48%) (Internet World Stats, 2012a, 2012b, 2012c). Internet growth rates are different. Although only half of the Russian population uses the Internet, Internet penetration increased 2000 to 2010 1,826% (Internet World Stats, 2011/2012b). Kuwait experienced an increase in Internet penetration of 633% over the same years (Internet World Stats, 2011/2012c). The rates for both countries indicate a need for development of Internet-based technologies. In the United States, Internet use grew only 175.3% from 2000 to 2010 (Internet World Stats, 2011/2012a). High Internet use and low Internet growth rates in the United States indicate that the U.S. market is approaching saturation, which is consistent with Norris’ (2001) digital-divide argument about U.S. leadership in the Internet market. The U.S. Internet market is atypical, Norris (2001) states, compared with other nations.

**Table 1. Technology Distribution, Human Development, and Democratization in Kuwait, Russia, and the United States.**

	<b>Computer ownership</b>	<b>Internet penetration</b>	<b>Internet growth</b>	<b>Human Development Index</b>	<b>Gross national income per capita</b>	<b>Press Freedom Index</b>
	(percentage of households, 2010–2011)	(population percentage, 2011)	(percentage over 2000–2010)	(rank/value, 2011)	(in \$U.S., 2011)	(rank, 2011–2012)
<b>Kuwait</b>	69	74	633	63/0.760	47,926	78
<b>Russia</b>	55	48	1,826	66/0.755	14,561	142
<b>United States</b>	75.5	78	175	4/0.910	43,017	47

*Sources: For computer ownership, International Telecommunication Union (2012); for Internet penetration and Internet growth, Internet World Stats (2011/2012); for Human Development Index and general national income per capita, United Nations Development Programme (2011); for Press Freedom Index, Reporters Without Borders (2012).*

The use of the newest technology, such as computers and the Internet, has been hypothesized to predict media multitasking behaviors (Jeong & Fishbein, 2007). Computer ownership and Internet penetration were collapsed into one variable to represent the newest ICT distribution (nICT) on a media market.

- H1: Newest ICT distribution (nICT) in Kuwait, Russia, and the United States will positively predict media multitasking behaviors in these countries.

### **Socioeconomic Differences**

According to Norris (2001), not only technology diffusion but also socioeconomic and democratic developments must be considered in cross-national comparisons. Hargittai (1999) examines how human development can predict the diffusion of Internet in member countries of the Organisation for Economic Co-operation and Development and finds a strong correlation between a country's level of human development and Internet connectivity (Hargittai, 1998, 1999). The United Nations Development Programme (UNDP) has created a matrix of economic and social factors—such as income, health, and education—which are summed up in a country's Human Development Index (HDI; UNDP, 2011). According to the 2011 Human Development Report (UNDP, 2011), Kuwait, Russia, and the United States provide interesting cases in how they compare with regard to HDI. The United States ranks 4th, with a per

capita gross national income of \$43,017; Kuwait is ranked 63rd, with the highest gross national income per capita (\$47,926); and Russia is in the 66th position, with the lowest per capita gross national income (\$14,561; see Table 1). The current study explores whether media multitasking varies as a function of country's human development level.

H2: A higher HDI will be associated with greater media multitasking.

### **Press Freedom**

Democratic development is another macro-level factor that affects media—especially Internet—markets (Norris, 2001) because it is directly related to technology access and the availability of diverse media contents and forms. Press freedom is thought to be one of the most sensitive media indicators of democratization. The United States ranks 47th with regard to press freedom, while Kuwait ranks 78th and Russia 142nd (Reporters Without Borders, 2012; see Table 1). Thus, this study posits that greater press freedom, associated with greater availability of media options and channels on a national market, increases media multitasking.

H3: The state of press freedom in Kuwait, Russia, and the United States expressed by the Press Freedom Index will positively predict media multitasking behaviors in these countries.

In addition, the current study investigates which of the three macro-level factors best predict media multitasking.

*RQ1: Which of the three nation-level factors—nICT, HDI, and Press Freedom Index—best predicts media multitasking?*

### **Individual-Level Factors Predicting Media Multitasking**

The current study explores cross-country differences in the relationships between factors at the individual level (media ownership, socioeconomic status measured by household income and parental education, gender, and sensation seeking) and media multitasking. The relationship between multitasking and its psychological outcome (perceived attention to mediated messages) is explicated in the next section.

Jeong and Fishbein (2007) suggested that macro-level media factors—such as the structure of media markets that accounts for the availability of certain media technologies, “coverage and content options” (Jeong and Fishbein, 2007, p. 370)—may influence media ownership and the way people multitask with media. Media ownership is positively associated with media multitasking behaviors (Foehr, 2006; Jeong and Fishbein, 2007; Rideout et al., 2010). Media ownership in this context is treated as an

individual rather than structural variable and conceptualized as the availability of various media options to an individual. Media ownership is directly linked to the extent to which an individual is surrounded by media in everyday life and can easily access these media. For instance, a number of television sets in a household, the possession of a computer or laptop, and the availability of TV in one's bedroom facilitate media multitasking (Foehr, 2006; Jeong & Fishbein, 2007).

H4: Media ownership will be positively associated with media multitasking.

In addition to media factors such as media market and media ownership, this study examines audience demographic and psychological characteristics such as socioeconomic status, gender, and sensation seeking (Jeong & Fishbein, 2007). Foehr (2006) and Jeong and Fishbein (2007) found that media multitasking differs by gender and SES. In the current study, SES was measured by household income and parental education.<sup>1</sup>

H5: Men and women will report different levels of media multitasking.

H6: Respondents' household incomes will affect their media multitasking behaviors.

H7: The level of education among respondents' parents will affect media multitasking behaviors.

Finally, media multitasking has been considered as one of the ways to achieve sensation (Foehr, 2006; Jeong & Fishbein, 2007). Sensation seeking is an individual difference factor that reflects the needs to be adventurous and to seek complex, novel, thrilling experiences and risky situations. Heavy sensation seekers appear to be heavier media multitaskers than light sensation seekers (Foehr, 2006; Jeong & Fishbein, 2007).

H8: High sensation seekers will multitask with various media more than low sensation seekers.

The goal of the present study was to not only test relationships between each nation- and individual-level variable and media multitasking but explore multilevel models to estimate the overall effects of level-2 and level-1 predictors.

*RQ2: Will there be interaction effects of nation-level variables (nICT, HDI, and Press Freedom Index) and individual-level predictors (media ownership, sensation seeking, gender, household income, and parental education) on media multitasking?*

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<sup>1</sup> The demographic variables of respondents' age and education were not included in the proposed model because of the relative homogeneity of this study's cross-national student sample.

### **Psychological Outcomes of Media Multitasking**

Media multitasking should be considered in scholarly work as a product of media and audience factors and as a powerful factor itself. Cognitive effects of media multitasking have drawn the attention of researchers, especially those who explore the learning patterns and cognitive development of children and adolescents (Vega, 2009; Wallis, 2010). The information-processing approach (Basil, 1994; Lang, 2000, 2006) has been widely used to explain media multitasking effects. According to the information-processing theories, mental resources that help people attend to and memorize information are limited (Basil, 1994; Eysenck, 1984; Lang, 2006, 2000; Wickens, 1984). Spending more resources on one task can damage the performance on another. Eysenck (1984) suggested that when simultaneous tasks are simple, a person can succeed in working on both. Combining tasks, at least one of which is well practiced or automatic, allows multitasking as well. For example, walking might not disrupt a person from listening to music because walking is a well-practiced activity. However, cognitive loads increase with the difficulty of tasks, which leads to a failure in performing at least one of them (Eysenck, 1984). Since the processing of media messages often deals with information intake—that is, it requires cognitive resources to attend to, encode, and store information—it is likely that media use activities are resource demanding.

Some experimental studies have found that combining several activities, including media use activities, leads to cognitive losses associated with at least one task (Armstrong, Boriarsky, & Mares, 1991; Armstrong & Chung, 2000; Armstrong & Sopory, 1997; Furnham & Bradley, 1997; Furnham, Gunter, & Peterson, 1994; Ophir, Nass, & Wagner, 2009; Pool, Koolstra, & van der Voort, 2003; Stangor and Duan, 1991; Vega, McCracken, Nass, & Labs, 2008; Zhang, Jeong, & Fishbein, 2010). In addition to real cognitive costs, such as the failure to attend to and recall information, media multitasking is associated with perceived cognitive losses. Multitasking with instant messaging is associated with perceived distractibility and inability to complete homework (Junco & Cotton, 2011; Levine, Waite, & Bowman, 2007). Bardhi et al. (2010) noted that young consumers are conscious about negative effects of media multitasking, such as inefficiency, chaos, disengagement, and enslavement (addiction to media). Young consumers associate this media behavior with distraction, procrastination, and failure to learn.

To explore the perceived costs of media multitasking, this study focuses on perceived attention to messages that are conveyed by primary media in multitasking situations. It is argued that the more individuals multitask with different media, the more they perceive primary media messages as cognitively demanding (i.e., requiring more attention, concentration, thought, etc.). For example, if an individual regularly multitasks with other media while primarily using the Internet, perceived attention to Internet messages will increase, because secondary media often add to the cognitive load. Hence, multitasking with a certain primary medium increases perceived attention paid to the messages of this medium. The present study posits:

- H9: More media multitasking will lead to more perceived attention paid to the contents of primary media messages.

The study also asks whether nation-level variables affect perceived attention to primary media messages and interact with media multitasking, treated as an individual-level factor, in predicting the dependent measure.

*RQ3: Will there be main effects of nation-level variables (nICT, HDI, and Press Freedom Index) on perceived attention to mediated messages?*

*RQ4: Will there be interaction effects of nation-level variables and media multitasking on perceived attention to mediated messages?*

### **Method**

#### **Sample**

Three cross-sectional surveys with convenience samples ( $N = 532$ ) were conducted at three universities: in the United States ( $n = 201$ ), in Kuwait ( $n = 179$ ), and in Russia ( $n = 152$ ). About 29% of participants were Kuwaiti citizens; 28% reported they were U.S. citizens; and 29% were citizens of Russia (2% checked "Other," and 12% did not report their nationality). Most respondents were men (54%), with a mean age of 20 years ( $M = 19.91$ ;  $SD = 1.96$ ), and nearly a third of respondents reported being college freshmen (see Table 2).

#### **Procedure**

U.S. students recruited from a large Midwestern university were asked to respond to an online survey (SurveyGizmo.com). Paper-and-pencil surveys were administered at universities in Kuwait and Russia. The surveys in the United States and Kuwait were conducted in English.<sup>2</sup>

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<sup>2</sup> Although Arabic is the official language in Kuwait, "English is widely spoken" (CIA World Factbook, 2012a). Respondents in Kuwait were recruited from a Western-style school, where English is the only instruction language. Many schools in Kuwait are based on U.S., British, and Canadian models of education. Before entering a college or a university, a high school student in Kuwait who attends a U.S., Australian, British, Canadian, or bilingual school is encouraged to speak, write, and read English. Fluency in English is an admission requirement, and English is an instruction medium language in many colleges and universities in Kuwait. These universities require students to submit English language proficiency test scores (IELTS, TOEFL) with other admissions documents. Students must speak in English during classes and often do so while socializing around campus. The issue of bilingualism is not limited to Western-style universities. According to the CIA World Factbook (2012a), Kuwait maintains a multicultural character among its population, and more than half of the population are immigrants from other countries. In addition, the Gulf region, including Kuwait, has capitalized on the importance of openness and global competitiveness, which has brought the wide adoption of the English language (Wheeler, 2000).



**Table 2. Participant Demographics by Country.**

	<b>Kuwait</b> ( <i>n</i> = 179)	<b>Russia</b> ( <i>n</i> = 152)	<b>United States</b> ( <i>n</i> = 201)
Gender			
Male	46%	47%	65.5%
Female	54%	53%	34.5%
Mean age	21 ( <i>SD</i> = 2.25)	19 ( <i>SD</i> = 1.55)	20 ( <i>SD</i> = 1.00)
Education			
Freshman	10%	68%	20%
Sophomore	26%	0%	51%
Junior	24%	2%	27%
Senior	39%	30%	2.5%

### Measures

**Country.** Country of residence (United States, Kuwait, and Russia) was included in the study as a structural, macro-level factor. Indices of computer ownership and Internet penetration, HDI, and press freedom (see Table 1) were assigned to each country. The indices of computer ownership and Internet penetration (%) were collapsed into one index of newest information and communication technology distribution (nICT; Cronbach's  $\alpha$  = .94). Three macro-level variables—nICT, HDI, and Press Freedom Index—were included in additional analyses.

**Media ownership.** A media ownership index was computed with four items. Participants were asked if they had a television set in their bedroom, a computer with Internet access in their bedroom, a laptop, and wireless Internet in their house. The responses were dummy-coded (yes = 1; no = 0) and summed into a 5-point continuous media ownership variable, where 0 was the lowest media ownership and 4 meant the highest media ownership within the sample (Jeong & Fishbein, 2007).

**Sensation seeking.** Sensation seeking was measured with seven items (Cronbach's  $\alpha$  = .75; Arnett, 1994; Jeong & Fishbein, 2007) rated on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*). Cronbach's  $\alpha$  for the United States was .79, Russia = .75, and Kuwait = .71.

**Gender, household income, and parental education.** Each participant reported his or her gender, monthly income per household, parental education, and other demographic information. *Gender* was centered, where 0 meant male and 1 meant female. *Income per household*, measured with seven nominal categories, was transformed into a binary variable and centered. Almost half of all participants (49%) who reported income were in category 0, meaning that their monthly household income was \$1,500 or less for the U.S. sample; 45,000 Russian rubles or less for the Russian sample; and 500 Kuwaiti dinars or less for the Kuwaiti sample. Another half of respondents (51%) who reported monthly income

said it was higher than \$1,500 for the U.S. sample, higher than 45,000 Russian rubles for the Russian sample, and higher than 500 Kuwaiti dinars for the Kuwaiti sample. *Parental education*, measured with two questions about mother's and father's education, which included seven choices each, was collapsed into one variable. Two variables were transformed into dummy variables, where 0 meant no completed college education and 1 meant completed college education (bachelor's level and higher). Then, the scores were summed into one variable, such that 0 meant that both parents did not complete college, 1 meant that at least one parent had earned a college degree, and 2 meant that both parents had college degrees.

**Media multitasking.** Participants were asked to report a total number of hours per week they spend using eight different media: (1) television; (2) music; (3) nonmusic audio; (4) video or computer games; (5) telephone, mobile phone, voice calls, and SMS; (6) Internet; (7) Internet-based communication tools (i.e., e-mail); and (8) print media. Also, participants had to report how often they used each medium (identified as primary) simultaneously with other media. The responses were measured on an ordinal scale with four categories: never, rarely, sometimes, and often. Each ordinal category received a numerical value: often = 1; sometimes = 0.67; rarely = 0.33; and never = 0. Then, a media multitasking index was calculated (see Ophir et al., 2009, p. 1586 for details).

**Perceived attention.** This variable was measured with four items (Cronbach's  $\alpha = .84$ ; Potter & Choi, 2006). Respondents rated on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*) how much attention they paid to messages conveyed by each of the eight media. For each of the eight media (identified as primary), respondents rated four statements: "I pay a lot of attention to the content of [primary medium]," "I don't find the content of [primary medium] interesting," "I put a lot of thought into the content of [primary medium]," and "I never concentrate on the content of [primary medium]" (Potter & Choi, 2006). The scales loaded well in each national sample—Cronbach's  $\alpha$  for the United States was .85, Russia = .81, and Kuwait = .84—and for each medium—television (Cronbach's  $\alpha = .63$ ), music (Cronbach's  $\alpha = .73$ ), nonmusic audio (Cronbach's  $\alpha = .75$ ), video or computer games (Cronbach's  $\alpha = .81$ ), telephone (Cronbach's  $\alpha = .73$ ), Internet (Cronbach's  $\alpha = .71$ ), Internet-based communication tools (Cronbach's  $\alpha = .74$ ), and print media (Cronbach's  $\alpha = .74$ ).

## Results

### *Examining Cross-Country Differences*

Multilevel model analysis was performed with the use of HLM7 software to test the hypotheses and answer the research questions. Before running multilevel statistical tests, cross-country differences for each individual-level variable were examined with the use of univariate analyses of variance (ANOVA) and a chi-square test. Country was included in each test as an independent variable with three levels: Kuwait, Russia, and the United States.

**Media ownership.** The results of a univariate ANOVA with media ownership as a dependent variable showed significant differences in media ownership by country:  $F(2,526) = 77.85, p < .001, \eta^2 = .23$ . U.S. participants ( $M = 3.54, SD = 0.60$ ) reported owning more media than Kuwaiti participants ( $M = 3.32, SD = 0.70$ ) and Russian participants ( $M = 2.56, SD = 0.96$ ). Pairwise comparisons (Bonferroni

correction) showed a significant difference between the U.S. and Kuwaiti samples ( $p < .05$ ) as well as differences between the U.S. and Russian samples ( $p < .001$ ) and between the Kuwaiti and Russian samples ( $p < .001$ ).

**Sensation seeking.** The results of a univariate ANOVA with sensation seeking as a dependent variable indicated a significant cross-country difference with regard to sensation seeking:  $F(2,523) = 4.59$ ,  $p < .05$ ,  $\eta^2 = .02$ . The Kuwaiti sample reported the highest sensation seeking scores ( $M = 4.23$ ,  $SD = 1.10$ ), followed by Russia ( $M = 4.17$ ,  $SD = 1.23$ ) and the United States ( $M = 3.90$ ,  $SD = 1.11$ ). Only the difference between Kuwait and the United States was statistically significant (Bonferroni correction:  $p < .05$ ).

**Household income.** Cross-country household income differences were significant in a nonparametric chi-square test:  $\chi^2(2) = 73.35$ ,  $p < .001$ . About three-quarters of Kuwaiti respondents reported they were from households with a higher income (74%), and three-quarters of Russian respondents reported they were from households with a lower income (74%). The household income split was somewhat equal for U.S. respondents, with 51% of them being from households with a higher income.

**Parental education.** There was no significant difference in parental education across the three samples:  $F(2,495) = 2.04$ , n.s. About two-thirds (63%) of the entire sample reported that both parents had completed college; 24% had one parent with a college degree; and 13% reported that neither parent had completed college.

**Media multitasking.** The results of a univariate ANOVA with media multitasking as a dependent variable showed significant differences in media multitasking by country:  $F(2,499) = 27.20$ ,  $p < .001$ ,  $\eta^2 = .10$ . U.S. ( $M = 3.88$ ,  $SD = 1.15$ ) and Kuwaiti ( $M = 3.94$ ,  $SD = 1.18$ ) participants reported similar media multitasking scores that were higher than the scores reported by Russian participants ( $M = 3.00$ ,  $SD = 1.35$ ). The differences between the Russian sample and the U.S. and Kuwaiti samples were significant (Bonferroni corrections:  $p < .001$  for both), while the difference between the U.S. and Kuwaiti samples was not significant. Media multitasking scores were also examined by each medium and gender. Means and standard deviations are reported in Table 3.

**Perceived attention.** The results of a univariate ANOVA with perceived attention to primary media messages as a dependent variable indicated a significant cross-country difference in perceived attention paid to media messages:  $F(2,487) = 15.37$ ,  $p < .001$ ,  $\eta^2 = .06$ . U.S. ( $M = 5.09$ ,  $SD = 0.68$ ) and Kuwaiti ( $M = 5.02$ ,  $SD = 0.76$ ) participants reported they paid more attention to primary media messages than Russian participants ( $M = 4.66$ ,  $SD = 0.69$ ). The differences between the Russian sample and the U.S. and Kuwaiti samples were significant (Bonferroni corrections:  $p < .001$  for both). The difference between the U.S. and Kuwaiti samples was not significant.

**Table 3. Media Multitasking by Country, Gender, and Medium.**

Country	TV		MUZ		AUD		GAM		PHO		WEB		EMA		PRI	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
<b>Kuwait</b>																
Male	4.00	1.44	3.74*	1.29	2.51*	1.84	2.52	1.68	4.05*	1.61	3.94	1.36	4.13	1.45	2.67*	1.68
Female	3.95	1.13	4.13*	1.20	3.16*	1.65	2.29	1.90	4.60*	1.75	4.16	1.31	4.36	1.47	3.21*	1.76
Total	3.98	1.28	3.96	1.26	2.89	1.77	2.40	1.81	4.33	1.73	4.04	1.36	4.24	1.48	2.96	1.75
<b>Russia</b>																
Male	2.33	1.84	2.90*	1.62	1.04**	1.61	2.31	1.82	3.19*	1.95	2.75**	1.50	2.60*	1.79	1.59*	1.79
Female	2.71	1.63	3.46*	1.22	1.99**	1.86	1.74	1.88	3.89*	1.76	3.59**	1.60	3.31*	1.82	2.27*	1.51
Total	2.54	1.73	3.20	1.44	1.52	1.80	1.99	1.87	3.57	1.88	3.20	1.60	2.97	1.83	1.95	1.67
<b>United States</b>																
Male	3.79	1.22	3.79	1.14	2.19	1.89	1.78	2.16	4.13	1.53	4.24	1.18	4.08	1.34	2.93	1.66
Female	3.70	1.38	3.81	1.33	2.01	1.96	2.21	1.51	3.68	1.71	4.03	1.30	3.85	1.68	2.63	1.95
Total	3.76	1.27	3.79	1.20	2.12	1.91	1.92	1.97	3.96	1.61	4.16	1.23	4.00	1.47	2.81	1.77
TOTAL	3.49	1.54	3.68	1.33	2.21	1.91	2.10	1.90	3.98	1.75	3.84	1.44	3.78	1.66	2.62	1.79

Note. Higher values indicate a greater extent of media multitasking. TV = television; MUZ = music; AUD = nonmusic audio; GAM = computer and video games; PHO = phone (landline and cellular); WEB = Internet; EMA = e-mail; PRI = print media.

\* T test showed a significant mean difference between men and women at the level of  $p < .05$ .

\*\* T test showed a significant mean difference between men and women at the level of  $p < .01$ .

### Preparing Data for Multilevel Modeling

Standard multiple regressions were performed with the entire sample as well as with each country-specific sample to select significant individual-level predictors of media multitasking and perceived attention to be included in multilevel models.

Media ownership, sensation seeking, gender, household income, and parental education were entered in a standard regression model with media multitasking as a dependent variable. The model was significant— $F(5,452) = 6.46, p < .001, R^2 = .07$ —indicating media ownership ( $\beta = .23, t = 4.91, p < .001$ ) and sensation seeking ( $\beta = .09, t = 1.98, p < .05$ ) as significant media multitasking predictors. The examination of country-specific samples showed that gender also predicted media multitasking (Kuwait:  $\beta = .21, t = 2.56, p < .05$ ; Russia:  $\beta = .17, t = 1.83, p = .07$ ; the United States:  $\beta = -.17, t = -2.18, p < .05$ ). Women in Kuwait and Russia multitasked more than men, and U.S. men multitasked more than U.S. women. Based on these results, media ownership, sensation seeking, and gender were included in multilevel analyses as level-1 variables. Household income and parental education were not included in further analyses because they did not significantly predict media multitasking.

Perceived attention was regressed on the media multitasking variable in a simple linear regression test. The model was found significant— $F(1,462) = 21.11, p < .001, R^2 = .04$ —showing that

media multitasking positively predicted perceived attention to mediated messages ( $\beta = .21, t = 4.59, p < .001$ ). Thus, media multitasking was included in further analyses as a predictor of perceived attention to primary media messages.

Hierarchical linear modeling (HLM) was selected as a statistical technique to test the effects of individual-level and macro-level structural factors on dependent measures. The analyses were run with the use of HLM7 software. Media ownership, sensation seeking, and gender were included in the analyses as individual-level factors predicting media multitasking. Furthermore, media multitasking was treated as an individual-level predictor of perceived attention to primary media messages. Newest ICT distribution (nICT), HDI, and Press Freedom Index were used as nation-level predictors of media multitasking and perceived attention. The data were examined for and met the assumptions of normality and linearity. The assumption of homogeneity of variance was tested in each HLM, indicating no significant differences in residual level-1 variances across countries. This test indicated that there was no heteroscedasticity problem in data distribution.

#### ***HLM With Media Multitasking as a DV***

**Null model.** Before individual- and nation-level variables were entered into the models with media multitasking as a dependent variable, an unconstrained (null) model without any predictors was run. The results indicated significant cross-country variability in media multitasking,  $\chi^2(2) = 43.84, p < .001$  with the individual-level variance term ( $\sigma^2$ ) = 1.38 and the nation-level variance term ( $\tau_{00}$ ) = .24. The intraclass correlation coefficient ( $ICC = \tau_{00}/(\sigma^2 + \tau_{00})$ ) indicated that about 15% of the variance in media multitasking is at the nation level ( $ICC = .24/(1.38 + .24)$ ) and 85% is at the individual level.

**Nation-level models.** Since the first set of hypotheses (H1 to H3) dealt with the nation-level predictors (nICT, HDI, and Press Freedom Index), each of these macro variables was entered in the model as a grand-centered level-2 variable. The variables were not analyzed together because of the multicollinearity problem. Although being qualitatively different, the three macro variables were highly correlated (Pearson's correlation coefficient for nICT and Press Freedom = .1; for HDI and Press Freedom = .8; for nICT and HDI = .7). The variable nICT is expressed in percentages, where higher percentage means greater nICT distribution. HDI and Press Freedom Index are indices where lower numbers refer to better conditions (e.g., ranking 1 is better than ranking 122). Thus, positive regression coefficients for models with nICT and negative regression coefficients for models with HDI and Press Freedom Index were interpreted in a similar manner.

The model with nICT as a level-2 variable indicated that nICT predicted media multitasking ( $b = .04, SE = 0.007, t(426) = 6.13, p < .001$ ) such that an increase in nICT was associated with an increase in mean media multitasking. Newest ICT distribution explained 88% of nation-level variance ( $\tau_{null} = .24; \tau_{mean} = .03; r^2 = (\tau_{null} - \tau_{mean})/\tau_{null} = (.24 - .03)/.24$ ), Intercept1,  $u_0$  statistic:  $\chi^2(1) = 4.12, p < .05$ . Hypothesis 1 was supported.

The model with HDI as a level-2 variable showed that HDI was not a significant predictor of media multitasking ( $b = -.005$ , n.s.), Intercept1,  $u_0$  statistic:  $\chi^2(1) = 34.67$ ,  $p < .001$ . Hypothesis 2 was not supported.

The model with Press Freedom Index as a level-2 variable demonstrated that the index predicted media multitasking ( $b = -.009$ ,  $SE = 0.002$ ,  $t(426) = -5.76$ ,  $p < .001$ ), meaning that the improvement of press freedom was associated with an increase in mean media multitasking. This level-2 predictor explained 71% of nation-level variance ( $\tau_{\text{null}} = .24$ ;  $\tau_{\text{mean}} = .07$ ;  $R^2 = (\tau_{\text{null}} - \tau_{\text{mean}})/\tau_{\text{null}} = (.24 - .07)/.24$ ), Intercept1,  $u_0$  statistic:  $\chi^2(1) = 8.37$ ,  $p < .01$ . Hypothesis 3 was supported.

RQ1 asked which level-2 variable would best predict media multitasking. According to the statistical evidence, nICT explained the most between-group variance in media multitasking (88% of nation-level variance) followed by Press Freedom Index (71% of between-group, nation-level variance). HDI did not predict media multitasking.

**Individual-level model.** Media ownership, sensation seeking, and gender were included in HLM analysis as group-centered level-1 variables that were hypothesized to predict media multitasking (H4, H5, H8). Outputs for fixed effects showed that media ownership ( $b = .17$ ,  $SE = 0.08$ ,  $t(424) = 2.06$ ,  $p < .05$ ) and sensation seeking ( $b = .11$ ,  $SE = 0.05$ ,  $t(424) = 2.12$ ,  $p < .05$ ) positively predicted media multitasking. Individuals with greater availability of media and those who scored higher on sensation seeking tended to multitask with media more. Hypotheses 4 and 8 were supported. Random effects of media ownership and sensation seeking, however, did not explain variance in media multitasking (media ownership slope,  $u_1$ :  $\chi^2(2) = .67$ , n.s.; sensation seeking slope,  $u_2$ :  $\chi^2(2) = 4.38$ ,  $p = .11$ ).

Gender was not a significant predictor of media multitasking (fixed effect of gender:  $b = .12$ , n.s.). Hypothesis 5 was not supported.

As per the results of standard multiple regressions used to select level-1 predictors for HLM, household income and parental education (H6 and H7) were excluded from the analysis since they did not significantly affect the DV in the entire sample as well as country-specific samples. Hypotheses 6 and 7 were not supported.

**Mixed models.** To answer RQ2, which asked about interaction effects of level-1 and level-2 predictors on media multitasking, group-centered level-1 variables (media ownership, sensation seeking, and gender) were included in three mixed models with each level-2 variable (nICT, HDI, and Press Freedom Index). A mixed model with nICT as a level-2 variable showed that an increase in a country's nICT was associated with a weaker relationship between sensation seeking and media multitasking (nICT for sensation seeking slope:  $b = -.01$ ,  $SE = 0.005$ ,  $t(420) = -2.03$ ,  $p < .05$ ). Better rankings on HDI and Press Freedom Index in two mixed models with HDI and Press Freedom Index as level-2 variables were also associated with a weaker relationship between sensation seeking and media multitasking (HDI for sensation seeking slope:  $b = .004$ ,  $SE = 0.002$ ,  $t(420) = 1.95$ ,  $p = .05$ ; Press Freedom Index for sensation seeking slope:  $b = .003$ ,  $SE = 0.001$ ,  $t(420) = 2.07$ ,  $p < .05$ ). Similarly, a higher percentage of nICT as well as better rankings on HDI and Press Freedom Index were associated with a lower likelihood

of gender predicting media multitasking (nICT for gender slope:  $b = -.03$ ,  $SE = .01$ ,  $t(420) = -2.62$ ,  $p < .01$ ; HDI for gender slope:  $b = .01$ ,  $SE = 0.004$ ,  $t(420) = 3.31$ ,  $p = .001$ ; Press Freedom Index for gender slope:  $b = .009$ ,  $SE = .003$ ,  $t(420) = 2.87$ ,  $p < .01$ ). Overall, the results indicated that the better the country's scores are on the newest ICT distribution, human development, and press freedom, the weaker sensation seeking and gender as individual-level predictors of media multitasking become.

### ***HLM With Perceived Attention as a DV***

**Null model.** An unconstrained (null) model was run with perceived attention to primary media messages as a dependent variable. The results showed significant cross-country variability in perceived attention:  $\chi^2(2) = 35.05$ ,  $p < .001$  with individual-level variance term ( $\sigma^2$ ) = .48 and nation-level variance term ( $\tau_{00}$ ) = .06. The intraclass correlation coefficient ( $ICC = \tau_{00}/(\sigma^2 + \tau_{00})$ ) indicated that about 11% of variance in media multitasking is at the nation level ( $ICC = .06/ (.48 + .06)$ ) and 89% is at the individual level.

**Individual-level model.** Media multitasking was entered in a hierarchical linear model as a group-centered level-1 variable (H9). Fixed effects output indicated that multitasking positively predicted perceived attention paid to primary media messages ( $b = .08$ ,  $SE = 0.03$ ,  $t(426) = 2.69$ ,  $p < .01$ ). The random effect of media multitasking did not explain variance in perceived attention,  $\chi^2(2) = .45$ , n.s.

**Nation-level models.** To answer RQ3, which asked about the main effects of level-2 variables on perceived attention, each of the three grand-centered variables (nICT, HDI, and Press Freedom Index) was entered in the model with perceived attention as a dependent variable.

Newest ICT predicted perceived attention ( $b = .02$ ,  $SE = 0.003$ ,  $t(426) = 5.76$ ,  $p < .001$ ). The increase in a country's nICT was associated with an increase in mean perceived attention to primary media messages. ICT distribution explained 99.97% of nation-level variance ( $\tau_{null} = .06252$ ;  $\tau_{mean} = .00002$ ;  $r^2 = (\tau_{null} - \tau_{mean})/\tau_{null} = (.06252 - .00002)/.06252$ ), Intercept1,  $u_0$  statistic:  $\chi^2(1) = .07$ , n.s.

HDI was not a significant predictor of perceived attention ( $b = -.004$ , n.s.), Intercept1,  $u_0$  statistic:  $\chi^2(1) = 18.12$ ,  $p < .001$ .

The Press Freedom Index predicted perceived attention ( $b = -.005$ ,  $SE = 0.001$ ,  $t(426) = -5.66$ ,  $p < .001$ ), meaning that improvement in press freedom was associated with the increase in mean perceived attention. This level-2 predictor explained 99.63% of nation-level variance ( $\tau_{null} = .06252$ ;  $\tau_{mean} = .00023$ ;  $r^2 = (\tau_{null} - \tau_{mean})/\tau_{null} = (.06252 - .00023)/.06252$ ), Intercept1,  $u_0$  statistic:  $\chi^2(1) = 1.14$ , n.s.

**Mixed models.** RQ4 asked about interaction effects of level-1 and level-2 predictors on perceived attention. Examining outputs for fixed effects showed no significant interactions between the level-1 variable (media multitasking) and level-2 predictors (nICT, HDI, and Press Freedom Index) on perceived attention (nICT for media multitasking slope:  $b = -.002$ , n.s.; HDI for media multitasking slope:  $b = .0004$ , n.s.; Press Freedom media multitasking slope:  $b = .0005$ , n.s.).

### Discussion

A cross-national survey was conducted to explore media multitasking behaviors among U.S., Kuwaiti, and Russian students, macro- and individual-level factors that predict these behaviors, and psychological effects of media multitasking, such as perceived attention to primary media messages. The theoretical framework of the digital divide was applied to explain cross-country differences.

The study found significant differences by country in media ownership, sensation seeking, media multitasking behaviors, and perceived attention to primary media messages. U.S. and Kuwaiti respondents were heavier media multitaskers than Russian respondents. This pattern was observed when examining the overall media multitasking index as well as multitasking scores for each medium (see Table 3). In addition, electronic media such as television, music, phone, Internet, and e-mail were more likely to be paired with other media. Cross-country comparisons of perceived attention mirrored the results, such that U.S. and Kuwaiti participants reported they paid more attention to primary media messages than their Russian counterparts. Significant differences in individual media ownership could partially explain cross-country discrepancies in media multitasking and perceived attention as media ownership was greater in U.S. and Kuwaiti samples compared with the Russian sample. Interestingly, the sensation-seeking analysis revealed that Americans, while being the heaviest media multitaskers, paying the most attention to mediated messages, and owning the most media, scored the lowest on sensation seeking, whereas Kuwaitis scored the highest. While suggesting that cross-cultural differences in sensation seeking should be further investigated on their own, the present study offers evidence and explains how this psychological variable, among others, affects media multitasking and whether the relationship differs by country.

The study took the perspective of the digital divide to explain how macro-level differences in technology distribution as well as socioeconomic and democratic developments affected media multitasking behaviors. Two indices that reflect distribution of the newest ICT and press freedom development in each country were significant predictors of between-nation variance in media multitasking. The findings supported the digital divide hypothesis in two ways. First, residents of countries with higher rates of computer ownership and Internet penetration (e.g., United States) were more likely to use media simultaneously compared with residents in countries with lower levels of newest ICT distribution (e.g., Russia). Second, respondents from countries with a better ranking on press freedom (e.g., United States) multitask with media more than their counterparts from countries with lower rankings of press freedom (e.g., Kuwait and Russia). Such effects persisted when perceived attention to primary media messages was entered in the analysis as a dependent measure. Thus, residents of countries with higher nICT and a better ranking of press freedom reported they paid more attention to primary media messages. Perhaps nICT and press freedom predicted differences in media multitasking and perceived attention across countries because these factors are direct indicators of the situation in a media market. Newest ICT distribution reflects access to digital media technologies, and press freedom accounts for the availability of various media contents, forms, and channels. The more media options are offered to a customer, the more likely he or she will engage in media multitasking and pay attention to media messages.



The digital divide hypothesis did not find statistical support when the Human Development Index was entered in the model as a nation-level predictor. The lack of support for this hypothesis could be explained by the fact that HDI components used to calculate the index (e.g., life expectancy, gross national income, years in school; UNDP, 2011) go beyond reflecting the conditions of a media market, which could weaken the role of human development in explaining respondents' media uses and attention to media.

An individual-level model with media multitasking as a dependent measure indicated that media ownership and sensation seeking predicted this media use behavior, which offers new, cross-national evidence to support the existing theoretical developments (Foehr, 2006; Jeong & Fishbein, 2007).

Gender predicted media multitasking in each national sample but did not do so when the samples were combined. The explanation of these results might be rooted in the nature of the relationship between gender and media multitasking in each nation. Kuwaiti and Russian women reported they multitasked more than their male counterparts, a pattern consistent with the existing literature (Foehr, 2006). The opposite was found in the U.S. sample, where men, in general, multitasked more than women. Furthermore, the relationship between gender and media multitasking differed by a country's macro, structural features. In the United States—the country with higher ICT distribution, HDI, and press freedom ranking—gender was less likely to predict media multitasking. Although media multitasking is gender specific in all three countries, this distinction fades in markets that are higher in newest technology saturation and have more media options.

A closer look at gender-specific multitasking activities within each national sample might shed some light on the intriguing results. As shown in Table 3, there were no differences in multitasking with each medium between U.S. men and women. Kuwaiti and Russian women reported they multitasked more with music and nonmusic audio, phone, Internet and e-mail, and print media compared with their male counterparts. Roberts and Foehr (2008) have noted that research has not yet addressed gender differences in media multitasking, while some evidence has confirmed the stereotype of women being heavier multitaskers ("juggling several household tasks while caring for children"; Roberts & Foehr, 2008, p. 29). The present cross-cultural study showed that the stereotype has shifted from West to East. It could be that women in societies with clearer divisions of gender roles tend to multitask more. Furthermore, the explanation could be related to the motivations that drive individuals to multitask with media. Empirical evidence suggests that men and women use new media (Internet and social networking sites) for different purposes: women are more likely to use media for social interaction and men for information and entertainment (Barker, 2009; Jackson, Ervin, Gardner, & Schmitt, 2001; Jackson, Zhao, Kolenic, Fitzgerald, Harold, & von Eye, 2008; Weiser, 2000). This study found that women in Kuwait and Russia multitasked more than men with such communication tools as phone, Internet, and e-mail. The need for social connectivity may have contributed to the increase in using these media concurrently with other media activities. Future research should continue the investigation of gender and cultural differences in media multitasking motives and habits.

An interaction effect was found with regard to the relationship between sensation seeking and media multitasking. This relationship was weaker in countries with higher nICT distribution, HDI, and

press freedom ranking (the United States). The findings could be explained by cross-national differences in habituation of media multitasking, especially among high sensation seekers. As discussed, the U.S. ICT market is more saturated than the Kuwaiti and Russian markets, which are growing rapidly. Media multitasking for U.S. sensation seekers, compared to their Kuwaiti and Russian counterparts, has perhaps become ritualized and habitual and thus no longer satisfies the need for novel, thrilling experiences.

Media multitasking was thought of as not only a dependent measure but a powerful predictor. The study found a strong positive relationship between this media use habit and perceived attention paid to primary media messages. Heavier media multitaskers in the three samples reported they paid greater attention to media contents than light media multitaskers. As predicted, media multitasking increases perceived cognitive demands of the primary media message processing. This finding suggests that habitual use of more than one medium at a time leads to the perception of media messages as demanding more attention, thought, and concentration, and can possibly result in feeling overwhelmed and constantly distracted.

### ***Limitations***

Despite its important findings, this study was limited by a few factors. The study used convenience samples of U.S., Kuwaiti, and Russian college students. This not only limits the study's ability to generalize to a larger population but might explain the lack of support for some hypotheses. For example, the three samples were quite homogeneous, which may have limited the variability in predictors, such as the level of household income and parental education, which, in turn, explains the weak relationships these factors had with media multitasking. Future research should use more representative and diverse samples.

The use of the convenience samples also might partially explain why the fixed effects of some level-1 predictors were found significant while their random effects were not. Undoubtedly, the present study offers valuable insights into cross-national discrepancies with regard to media multitasking, its predictors, and outcomes as well as relationships among them. Yet more representative samples could ease the task of building a full random coefficients model of media multitasking. The lack of significant random effects also might be due to the small sample of countries included as level-2 data. Another statistical limitation was related to the problem of multicollinearity among the nation-level variables. Being qualitatively different, they showed high indices of correlation and were not included together in statistical analyses. This limited the understanding of unique and shared variance that these predictors could explain in dependent measures. Future international studies of media multitasking should include more nations to improve the model fit and reach greater variability for macro-level predictors.

Future research on media multitasking should consider the dynamic changes in the media environment when attempting to quantify media use. The current study used Ophir and colleagues' (2009) measure of media multitasking, which disregards new forms of media use (e.g., social network websites). Finally, the current study is limited by its reliance on self-reported measures of media use, multitasking, and perceived attention. For example, perceived attention does not always reflect the amount of cognitive resources that are required for and allocated to message processing. It is also problematic to measure

cognitive outcomes of media multitasking in nonexperimental research. Although it was possible to measure how respondents felt about messages of a certain medium, it was difficult to measure real costs of message processing. Thus, while primary media messages might be perceived as demanding more attention by those who multitask regularly (due to increased cognitive loads), it does not necessarily translate into allocation of more resources for message processing and increase or decrease the effectiveness of such processing. Future studies should refine self-report measures. More importantly, future researchers should explore the current theoretical model by virtue of observation rather than self-report.

### **Conclusion**

This study has a high exploratory value because it examines the trend of media multitasking internationally. It advances the understanding of the digital divide and explains how discrepancies in access and use of technology, a nation's human development, and level of press freedom influence patterns of media multitasking. Media multitasking is a phenomenon growing in significance and importance not only in the field of media and mass communication research but in the fields of cognitive psychology, public health, risk communication, and education. The study finds that the three countries differ in social and economic aspects, and these differences transcend to the way individuals multitask with media.

Overall, the results supported the study's predictions about media multitasking behaviors, their antecedents, and outcomes as well as cross-cultural differences in these variables and the relationships among them. Media structural and individual factors, as well as audience demographic and psychological characteristics, contribute to the explanation of media multitasking behaviors among young people and affect perceived cognitive demands required to process media contents.

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