



Why do we multitask with media? Predictors of media multitasking among Internet users in the United States and Taiwan



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ABSTRACT

The study explored how media and audience factors, such as country of residence, media ownership, polychronicity, or the preference to do multiple things at the same time, predict media multitasking behaviors and if different motivations to multitask mediate the effects of these factors. The study is based on a cross-cultural survey ($N = 1972$) that included respondents from the United States and Taiwan. The findings indicated that media ownership, polychronicity, and four motivations (control, entertainment, connection, and addiction) positively predicted media multitasking behaviors. The four motivations were also found to mediate the effect of media ownership. American respondents were higher polychronics and heavier multitaskers than their Taiwanese counterparts. In the Taiwanese sample, polychronicity and motivations increased the effects of media ownership on media multitasking. In the American sample, polychronicity contributed little to the effect of media ownership, and the mediating role of motivations decreased with the increase in the level of polychronicity.

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1. Introduction

With the development of new technologies that offer consumers numerous ways to satisfy needs in information, communication, and entertainment, media multitasking has become an important object of exploration. While new, increasingly interactive electronic media provide individuals with terabytes of content, they also fight for people's time and attention. Although having unlimited media options, humans have limited time to process information they receive from multiple sources on a daily basis. Thus, they often multitask.

The habit of multitasking with media has increased significantly during 2000s with the growing uses of information and communication technologies (ICT; Roberts, Foehr, & Rideout, 2005). The growing body of literature on the topic focuses on three main areas: media multitasking patterns (Foehr, 2006; Rideout, Foehr, & Roberts, 2010), antecedents (Jeong & Fishbein, 2007; Wang & Tchernev, 2012), and effects (e.g., Wang et al., 2012; Zhang, Jeong, & Fishbein, 2010). Research about the patterns of media multitasking describes what media uses and other activities people tend to combine; and studies about antecedents and effects

explore media multitasking predictors and outcomes. The outcomes of multitasking with media have been examined in multiple studies (e.g., Armstrong & Chung, 2000; Bowman, Levine, Waite, & Gendron, 2010; Furnham & Bradley, 1997; Furnham, Gunter, & Peterson, 1994; Jeong, Hwang, & Fishbein, 2010; Junco & Cotten, 2011; Levine, Waite, & Bowman, 2007; Pool, Koolstra, & van der Voort, 2003; Salvucci & Macuga, 2002; Salvucci, Markley, Zuber, & Brumby, 2007; Zhang et al., 2010), while the literature about predictors of media multitasking calls for further development. The present research contributes to the existing body of knowledge about media multitasking antecedents by examining media and audience factors that predict the extent of media multitasking in different cultures. Determining and understanding the context in which media multitasking is facilitated leads to better explanation of its outcomes and informs strategies to deal with the consequences of this increasingly popular media use behavior.

The present research offers a cross-cultural investigation of media multitasking behaviors and its antecedents. The study was conducted in two countries: United States and Taiwan, which allowed to compare the results on a macro, market, level. Media- and audience-level predictors of media multitasking, such as media ownership and polychronicity, or the preference to perform multiple things in the same period of time, were examined and compared cross-culturally. The study also explored what motivates individuals in two different countries to use media concurrently

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and tested whether such motivations mediate the effects of individual-level predictors on media multitasking (Fig. 1).

2. Literature review

2.1. Media multitasking model

Media multitasking is defined as engagement in several concurrent activities at least one of which is related to media use (Foehr, 2006; Vega, 2009). It can occur between multiple devices (e.g., using the Internet on a computer and watching television) as well as within one device (e.g., multiple windows open on a computer screen; Wallis, 2010; Yeykelis, Cummings, & Reeves, 2014). The present study focused on the former media multitasking type, which refers to using multiple media/devices in the same period of time.

Jeong and Fishbein (2007) proposed a model, which outlined the main factors affecting media multitasking behaviors. Referring to Webster's et al.'s (2000) model of exposure to media, the researchers attempted to explain how media as well as audience factors affect multitasking behaviors. Media factors were defined as a combination of structural factors, such as the access to technology and mediated contents on a market, and individual factors, such as media ownership. Media ownership in this context refers to individuals having or being surrounded by media rather than the overall media market situation. Audience factors included personal, non-media characteristics such as socio-demographic (e.g., age, gender, socio-economic status) and psychological (e.g., sensation seeking) predictors.

Jeong and Fishbein's (2007) model was used as a starting point in the present study to examine media multitasking antecedents on both media and audience levels. First, collecting data in two countries (United States and Taiwan) made it possible to include a structural, market-level factor in the model and allowed cross-cultural, cross-market comparisons. Second, the measure of media ownership as an individual media factor was adjusted by accounting for new media devices, services, and options that diffused on mass markets over the past few years (e.g., social media, tablet computers, smartphones). In addition to media ownership, such psychological predictor of media multitasking as polychronicity, which has not been yet tested as part of the media multitasking model, was explored. Third, the model was modified by including additional psychological predictors – motivations that drive individuals to multitask with media. Not only it was tested whether motivations directly affect the extent of media multitasking but also it was examined if they mediate the effects of media ownership on this media use behavior. The following sections discuss media ownership and psychological predictors, such as polychronicity and motivations. Demographic predictors, gender and age, were included in the model as control variables (Fig. 1).

2.2. Media ownership

Media ownership in the context of the present study is treated as an individual rather than structural variable and conceptualized as the availability of various media options to an individual. In other words, media ownership represents what media technologies/devices an individual has and/or to what extent s/he is surrounded by media (Foehr, 2006; Jeong & Fishbein, 2007).

While previous studies of media multitasking accounted for major media and technologies (e.g., TV, computer) available in different places (e.g., bedroom), they did not tap on new fast-evolving media forms, such as online social networking (Wallis, 2010), and options (e.g., browsing Internet on a phone). In addition, Rideout et al. (2010) suggested to take into consideration a range of places

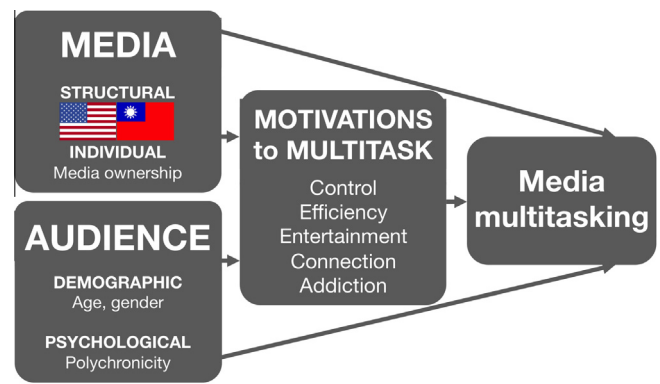


Fig. 1. Conceptual model of media multitasking.

where media are used: media used in homes (e.g., bedroom) and transit places (e.g., cars), as well as universally used mobile media (phones, laptops, tablets). Thus, the measure of media ownership was adjusted in the present study by including the diverse spectrum of media and technologies available to a modern consumer in different places. Participants answered questions about media present in individuals' homes, such as the number of TV sets, DVD player, CD player, desktop computer, Internet access in the house, and video game consoles. They were also asked about TV or DVD player installed in cars to account for media used in transit places. The list of mobile media possessions included laptop, tablet computers, mp3 player, and phone. Finally, respondents answered whether they could browse the Internet on their phones and reported how many social networking site accounts they had and actively used.

Greater availability of media devices to an individual on a daily basis increases engagement in media multitasking behaviors. 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 were found to facilitate media multitasking (Foehr, 2006; Jeong & Fishbein, 2007). It was hypothesized:

H1. Media ownership will positively predict the extent of media multitasking.

2.3. Taiwan vs. the United States: Cross-border comparison

One of the factors included in Jeong & Fishbein's (2007) model is national market, which is considered a macro, structural antecedent of media multitasking. It is proposed that the effects of individual-level predictors on media multitasking will differ by this macro-level factor. Cross-country research outlined three types of country characteristics that are important in the discussion of media multitasking: technological development, political freedoms that allow unrestricted circulation of information, and culture (Kononova, 2013; Kononova, Zazorina, Diveeva, Kokoeva, & Chelokyan, 2014). These characteristics are discussed further in relation to the case of the United States and Taiwan.

Despite ICT markets do not develop at the same pace in different countries (Norris, 2001), the United States and Taiwan share many similarities with regard to technology access. Over 99% of households in Taiwan and the United States own a TV set (Nielsen, 2013; R.O.C. Directorate-General of Budget Accounting and Statistics (DGBAS), 2014). Desktop computers and/or laptops can be found in four out of five American households; and 72.2% of Taiwanese have a PC (desktop computer) in their homes (DGBAS, 2014; Nielsen, 2013). Internet penetration – by individuals

using the Internet – reached 80% in Taiwan and 84.2% in the United States (International Telecommunication Union, 2014). Almost each American and each Taiwanese, on average, has at least one phone (96 phones per 100 American users and 128 phones per 100 Taiwanese users; International Telecommunication Union, 2014). As for smartphone use, two in three Americans (65%) and one in two Taiwanese (51%) have one (Nielsen, 2013; Want China Times, 2013). Social media penetration rates are high in both countries: there are 74% of social media users in the United States and 63% in Taiwan, with 51% of the American population and 57% of the Taiwanese population using Facebook (Internet World Stats, 2014; Pew Research Internet Project, 2014; Tableau, 2014). Although indicating high levels of ICT development, Taiwan and the United States show noticeable differences in game console ownership. Only 8.4% Taiwanese own one compared with 46% of Americans (DGBAS, 2014; Nielsen, 2013).

The two countries are similar not only in terms of highly developed media and ICT markets but also with regard to little political constraints related to information distribution. Taiwan and the United States score high on democratization (the U.S. ranks #19 and Taiwan ranks #35; The Economist Intelligence Unit, 2014) and press freedom (the U.S. is 32nd and Taiwan is 47th; Reporters Without Borders, 2013), which ensures high level of mediated content availability.

While the analysis of technological and political developments in the two countries reveals many similarities, the numbers from the United States indicate slightly higher levels of ICT and mediated content availability than the numbers from Taiwan. Thus, it was hypothesized:

H2. Country of respondents' residence will moderate the effects of media ownership on the extent of media multitasking.

Political and technological developments on national markets are not the only macro-level factors to be taken into consideration in cross-country research. The discussion of cultural differences becomes especially important when the states that are being compared do not show great discrepancy in major media and technology uses as well as political freedoms. The United States and Taiwan represent two cultures that may affect media use behaviors differently.

One of the most common distinctions in cross-cultural communication research is related to collectivist vs. individualist orientation (Hofstede, 1980). Many East Asian cultures, such as Taiwan, China, Hong Kong, Singapore, among others, are considered collectivist while many western countries, such as the United States, hold individualist values (Hofstede, 1984). Members of collectivist societies embrace the value of interdependence and importance of social relationships. In such societies, self is perceived as part of a whole (particularism). Each part of the whole is treated differently, depending on social status, context, and type of relationships with others. Communication in collectivist societies depends on context, nonverbal cues, and indirect messages the meaning of which is left to recipient for interpretation. Communication serves to maintain social relationship; thus, communication process is more important than the outcome. In addition, collectivist values are rooted in tradition, which leads to slower adoption of technologies. Those who grow up in individualist cultures value independence and perceive self as an autonomous unit (universalism). In such cultures, the same rules apply to each individual and communication situation. Individualist societies are often viewed as low context, which demands high level of message clarity and verbalization as well as increases the importance of information flow and accuracy. Outcome, i.e., effective transmission of messages, is perceived as the goal of communication and is more

important than communication process (Ferle, Edwards, & Lee, 2008; Gudykunst & Kim, 1992; Hofstede, 1980, 1984; Singelis & Brown, 1995; Yum, 1988).

The distinction between individualist and collectivist societies is related to cross-cultural differences in perceptions of time (Hall, 1959, 1976), which becomes vital in the discussion of media multitasking. Are collectivist cultures where people are used to doing multiple things at the same time more prone to embrace this growing media use behavior compared with individualist cultures where sequential order is important? This question leads to the discussion of polychronicity, the concept that is explicated in the following section.

2.4. Twofold concept of polychronicity

The concept of polychronicity, or the tendency to do multiple things at the same time, is twofold. First, polychronicity is considered a cultural phenomenon where multitasking is a shared behavior that characterizes a large group of people (Hall, 1959, 1976). Second, polychronicity can describe not only cultural but also individual differences where the level of multitasking habit varies from one person to another (Lindquist & Kaufman-Scarborough, 2007; Poposki, Oswald, & Brou, 2009).

The concept of polychronicity emerged as a cultural phenomenon popularized by famous anthropologist Edward Hall. Hall (1959, 1976) proposed the distinction between monochronic (M-time) and polychronic (P-time) cultures, which is rooted in perceptions of time that differ region by region. Schedule and punctuality are common for M-time cultures, while P-time cultures are characterized by “several things happening at once” and are guided by task completion process rather than an existing schedule (Hall, 1976, p. 17). Hall (1976) used metaphors such as road and ribbon to describe linear perceptions of time in monochronic regions, such as North Europe and North America. Major events in those regions are scheduled and expected to happen as scheduled, one at a time. In polychronic southern and eastern cultures (e.g., South America, Middle East), schedule is not as important as social interaction; thus, time is “sacrificed” for the sake of social relationship. In addition, Hall (1976) describes organizations in M-time cultures where subunits are often disconnected and individual tasks substitute the understanding of what the organization's overall goal is (universalism). In P-time cultures, one's work is perceived as part of the whole (particularism).

Polychronicity, also defined as preference for multitasking (Lindquist & Kaufman-Scarborough, 2007; Poposki et al., 2009; Slocumbe & Bluedorn, 1999), has been explored not only as a macro, culture-level phenomenon but also as an individual difference. Lindquist and Kaufman-Scarborough (2007) argued that people could behave in monochronic as well as polychronic ways within one culture, regardless of the cultural context. They developed a model of polychronic–monochronic tendency (PMTM) that accounted for the level of engagement in one vs. multiple activities, liking to engage in one vs. multiple activities, and feeling comfortable engaging in one vs. multiple activities at the same time. Lindquist and Kaufman-Scarborough's (2007) measure of polychronic–monochronic tendency developed on the basis of PMTM was used in the present study. The present study proposed that individuals who prefer to perform several tasks at the same time, i.e., score high on polychronicity, would combine media activities more frequently than those who like to do one thing at a time (monochronics). It was also asked if polychronicity would interfere with the effects of media ownership on media multitasking, such that high polychronics who own more media would be more likely to engage in media multitasking behaviors.

H3. Polychronicity will positively predict the extent of media multitasking.

RQ1. Will polychronicity moderate the effects of media ownership on the extent of media multitasking?

The cross-cultural nature of the sample for the present study allowed not only to test the effects of polychronicity on media multitasking but also determine if the country of respondents' residence would moderate these effects. Distinctions between process vs. outcome, social relationship vs. schedule and order, particularism vs. universalism in relation to P- and M-time cultures intersects with the dimension of collectivism/individualism, where collectivist societies can be viewed as polychronic and individualist societies can be considered M-time oriented. Taiwan in the present study is regarded a collectivist society and, thus, expected to be a polychronic culture while the United States, an individualist society, is viewed as a monochronic culture (Hofstede, 1984). It was predicted that cultural differences between Taiwan and the United States would be reflected in the effects of polychronicity on media multitasking.

H4. Country of respondents' residence will moderate the effects of polychronicity on the extent of media multitasking.

It was also asked if the country of residence would alter the interaction effect of media ownership and polychronicity on media multitasking.

RQ2. Will moderating effects of polychronicity on the relationship between media ownership and the extent of media multitasking differ by country?

2.5. Motivations to multitask with media

While Jeong & Fishbein's (2007) model includes major types of media multitasking predictors, it does not account for psychological processes that occur prior to media multitasking but are not independent of it (i.e., these preceding processes are specific to media multitasking rather than market or individual). Such factors include motivations to multitask with media. With substantial research on media multitasking, not much available literature is devoted to the reasons why individuals combine media uses. Bardhi, Rohm, and Sultan (2010) found that young consumers are conscious about media multitasking gratifications and effects. These authors discovered that multitasking makes individuals feel more control over media uses, efficiency of work, enjoyment (engagement in Bardhi and colleagues' article, 2010), and connection to people (affiliation in Bardhi and colleagues' article, 2010). At the same time, Bardhi, Rohm, and Sultan's (2010) interviewees said that multitasking translated into the feelings of inefficiency, chaos, disengagement, and addiction (e.g., enslavement in Bardhi et al., 2010). Wang and Tchernev (2012) used dynamic panel analysis to investigate if media multitasking satisfies four basic media use needs: cognition, emotion (e.g., entertainment), socialization, and habit. The scholars found that individuals multitask with media because they want to gain information (cognition) and as a habit. At the same time, media multitasking was found to satisfy emotional (entertainment, relaxation) needs rather than cognitive needs that are usually being sought (Wang & Tchernev, 2012).

Based on the previous literature, five motivations to multitask with media were derived: control, efficiency, entertainment, connection, and addiction (Bardhi et al., 2010; Wang & Tchernev, 2012). Control refers to getting a handle on, being in charge of media use, having the power to decide which media and to what extent to use in a media multitasking situation. Efficiency is related

to cognitive gains such as effective information learning during media multitasking. Entertainment accounts for hedonic gratification, enjoyment with media multitasking. Connection refers to media multitasking driven by the need to keep in touch with other people. Addiction is related to habitual, routine media multitasking, which goes beyond user's control (Table 2). It was hypothesized that the proposed five motivations would positively predict media multitasking and asked which motivation would be the strongest in predicting this media use behavior.

H5. Control, efficiency, entertainment, connection, and addiction will positively predict the extent of media multitasking.

RQ3. Which media multitasking motivation will be the strongest in predicting the extent of media multitasking?

The present study also posited that the five motivations to multitask with media would mediate the effects of media ownership on media multitasking, such that the more media people own, i.e., the more they are surrounded by media, the more they would be motivated to use these media concurrently and, as a result, engage in media multitasking behaviors.

H6. Control, efficiency, entertainment, connection, and addiction will mediate the effects of media ownership on the extent of media multitasking.

Finally, it was asked if the effects of media ownership on media multitasking mediated by the five motivations would differ based on the levels of polychronicity and country of respondents' residence.

RQ4. How will mediating effects of control, efficiency, entertainment, connection, and addiction be different on different levels of polychronicity and country of residence?

To test hypotheses and answer research questions, a conditional effects model was run with media ownership as an independent variable, media multitasking index as a dependent variable, five motivations to multitask with media (control, efficiency, entertainment, connection, and addiction) as mediators, polychronicity and country of residence as moderators, and age and gender as control variables (please see conceptual model in Fig. 1 and statistical model in Fig. 2).

3. Method

3.1. Survey administration and sample

A cross sectional survey was administered in the United States ($N = 1040$) and Taiwan ($N = 932$). Two convenience samples were drawn from Internet users in both countries. In Taiwan, participants were recruited via Taiwan-based online panel database called CyberPanel, owned by InsightXplorer marketing research firm in Taipei. The survey was administered in Mandarin, the official language in Taiwan. Initially, the survey was designed in English and a research team member who is Taiwanese translated it to Mandarin. To validate the instrument in Mandarin language, a team of bilingual researchers from InsightXplorer who were familiar with the goal of the study and the target population was formed. Back translation was performed, and the translated document was compared with the original English version. Both the original and translated documents were evaluated several times to identify and eliminate possible problems. During the translation stage, the members of the research team from InsightXplorer interviewed several target participants to test the questionnaire. American participants were recruited via Amazon Mechanical Turk (MTurk), an Internet crowdsourcing platform. They read the

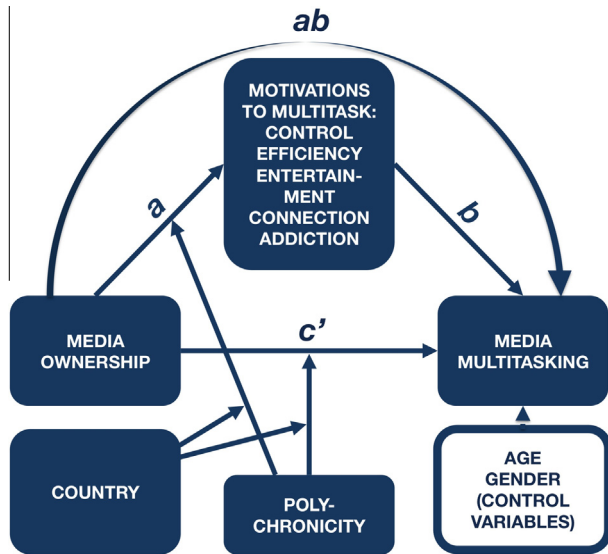


Fig. 2. Statistical model of media multitasking.

announcement about a media use study on MTurk and, if they decided to participate, clicked a link that directed them to the survey Web page on Qualtrics.

The sample's gender split was 47% of males to 44% of females (9% of respondents did not report gender or chose other options). Average age was 35 ($SD = 10.30$). About 43% of respondents had an associate degree; 22% held a bachelor's degree; and another quarter (20%) completed high school; 15% reported other levels of education or refused to answer. A third of respondents (33%) were single and another third were married (32%); 10% were dating with commitment; and the quarter chose other relationship options or refused to answer. All respondents in Taiwan were Taiwanese nationals and Asian. Two thirds of American respondents were White/Caucasian (67%); 6% were African American; 4% were Hispanic/Latino, and another 4% were Asian. About 15% of the American sample did not report race/ethnicity (please see Table 1 for age and gender information by country).

3.2. Measures

3.2.1. Media ownership

Media ownership index was computed with the use of 13 items. Participants were asked how many TV sets, desktop computers, and game consoles they had in their house. They also reported whether they had wireless Internet, CD and DVD players, a laptop, tablet computer, mp3 player, and phone. They were asked if they could access the Internet from the phone and how many active social networking sites accounts they had. Finally, respondents indicated if they had a TV/DVD in their car. The answers were summed into one media ownership index ($M = 12.51$; $SD = 3.02$).

3.2.2. Polychronicity

Polychronicity is the tendency to perform more than one task at a time, i.e., it is the preference for multitasking (Lindquist & Kaufman-Scarborough, 2007; Poposki et al., 2009; Slocumbe & Bluedorn, 1999). Polychronicity was measured with polychronicity–monochronicity tendency scale (PMTS, Lindquist & Kaufman-Scarborough, 2007), which included five 7-point items (e.g., “I prefer to do two or more activities at the same time.”). Cronbach's α (Cronbach, 1987) was .95 for both American and Taiwanese samples.

Table 1
Participants' age and gender by country.

	Taiwan ($N = 932$)	United States ($N = 1040$)
Gender		
Male	52%	42% ^a
Female	48%	42% ^a
Transgender		less than 1% ^a
Mean age	35 ($SD = 9.46$)	35 ($SD = 11.13$)

^a 15% of Americans participants did not report gender.

3.2.3. Country of residence

Participants were recruited in two countries: Taiwan and the United States.

3.2.4. Motivations to multitask with media

Eighteen statements were derived from previous literature (Bardhi et al., 2010) to measure five motivations: control, efficiency, entertainment, connection, and addiction. Each statement was rated on 7-point scales from 1 (“Strongly disagree”) to 7 (“Strongly agree”). (Factor loadings, descriptive statistics, and reliability are reported in Table 2).

3.2.5. Media multitasking

Ophir's et al. (2009) method in calculating media multitasking index was adopted in the present study. Ophir et al. (2009) calculated the proportion of time people multitask to the total number of hours they spent with media. The researchers focused on the following media types: television, music, nonmusic audio, video or computer games, telephone and mobile phone voice calls, IM and text messaging, email, Web surfing, computer-based video, offline computer-based applications, print media, and accounted for almost all situations in which individuals pair them. Media choices were adjusted due to the rapidly changing media landscape. Participants in the present study were asked to report a total number of hours per week they spend combining the following media uses: (1) television; (2) Internet accessed on a computer/laptop (SNS, online videos, other online content, searching, email, etc.); (3) computer/laptop used for offline purposes; (4) tablet computer; (5) talking on the phone; (6) texting and instant messaging; (7) Internet accessed on a phone (SNS, online videos, other online content, searching, email, etc.); (8) audio; (9) video/computer games; (10) print media. Also, participants had to report how often they used each medium simultaneously with other media. The responses were measured on the ordinal scale with four categories: “never,” “rarely,” “sometimes,” and “often.” Each ordinal category later received a numerical value: “often” = 1; “sometimes” = .67; “rarely” = .33; and “never” = 0. Then media multitasking index was calculated as a ratio of time spent multitasking with different media to the total time spent with all media (see Ophir et al., 2009, p. 15586 for details).

3.2.6. Demographic information

Participants reported basic demographic information. Age and gender were included in the model as control variables based on previous research that has shown that both demographic variables significantly predict media multitasking (Carrier, Cheever, Rosen, Benitez, & Chang, 2009; Foehr, 2006).

4. Results

4.1. Cross-sample differences

Before running the proposed model, cross-sample differences were examined. Eight t -tests were run with country as an independent variable and media multitasking, media ownership,

Table 2
Items, means, standard deviations, factor analysis and reliability results for media multitasking motivations.

Items	United States			Taiwan		
	Mean	SD	Factor loading	Mean	SD	Factor loading
<i>CONTROL</i>						
I multitask with media because I can control what information I consume	4.77	1.711	.879	4.27	1.343	.903
I multitask with media because it allows me to choose media content of my interest	4.91	1.686	.867	4.42	1.369	.886
I multitask with media because I can effectively filter media content	4.54	1.733	.849	4.04	1.344	.868
I multitask with media because I have all the information at my reach and disposal	5.13	1.673	.848	4.33	1.338	.890
I multitask with media because I feel like I have a handle on all of the different media types	4.55	1.760	.838	4.26	1.368	.904
Eigenvalue	3.67			3.97		
% of Variance Explained	73.33%			79.30%		
Cronbach's α	.91			.94		
<i>EFFICIENCY</i>						
I multitask with media because it allows me to carry out tasks more effectively	4.76	1.726	.906	4.25	1.386	.911
I multitask with media because it enables me to process media content faster	4.69	1.767	.881	4.25	1.354	.919
I multitask with media because it saves time	4.97	1.751	.885	4.52	1.363	.910
Eigenvalue	2.38			2.50		
% of Variance Explained	79.32%			83.45%		
Cronbach's α	.87			.90		
<i>ENTERTAINMENT</i>						
I multitask with media because I enjoy it	4.76	1.779	.901	4.14	1.434	.843
I multitask with media because it is entertaining	4.88	1.691	.872	4.19	1.355	.893
When I multitask with media, I feel happy	4.29	1.700	.884	4.11	1.316	.912
I multitask with media to relax	4.10	1.880	.817	4.00	1.377	.881
Eigenvalue	3.02			3.11		
% of Variance Explained	75.48%			77.85%		
Cronbach's α	.89			.91		
<i>CONNECTION</i>						
Media multitasking enables me to connect with friends and family	4.23	1.865	.854	4.00	1.394	.883
When I multitask with media, I feel closer to other people	3.31	1.789	.864	3.67	1.352	.909
Media multitasking enhances my social experiences.	3.83	1.880	.891	3.82	1.372	.915
Eigenvalue	2.27			2.44		
% of Variance explained	75.67%			81.37%		
Cronbach's α	.84			.89		
<i>ADDICTION</i>						
Multitasking with media is addictive	4.01	1.907	.780	4.08	1.515	.810
When I multitask with media, I feel like I have an attention deficit disorder (ADD)	3.06	2.001	.742	4.23	1.477	.603
I cannot stop multitasking with media even though I understand it can be harmful for my performance	2.94	1.792	.845	3.60	1.489	.837
Eigenvalue	1.87			1.72		
% of Variance explained	62.45%			57.34%		
Cronbach's α	.69			.62		

Table 3
Results of *t*-tests with country as an IV and media multitasking, media ownership, polychronicity, and five motivations to multitask with media as DVs.

	Country	N	Mean	Std. Deviation
MMI	United States	831	3.7028***	1.67154
	Taiwan	883	3.1269***	1.48590
MEDIA_OWNS	United States	869	13.2750***	3.71032
	Taiwan	923	11.7866***	1.90642
POLY	United States	892	4.7630***	1.70393
	Taiwan	932	3.8258***	1.38531
CONTROL	United States	876	4.7817***	1.46609
	Taiwan	932	4.2655***	1.20442
EFFICIENCY	United States	876	4.8063***	1.55669
	Taiwan	932	4.3394***	1.24916
ENTERTAINMENT	United States	876	4.5091***	1.52907
	Taiwan	932	4.1081***	1.20777
CONNECTION	United States	876	3.7888	1.60465
	Taiwan	932	3.8319	1.23805
ADDICTION	United States	876	3.3379***	1.49784
	Taiwan	932	3.9717***	1.12562

MMI = media multitasking; MEDIA_OWNS = media ownership; CONTROL, EFFICIENCY, ENTERTAINMENT, CONNECTION, ADDICTION = media multitasking motivations.
Group difference significance: **p* < .05; ***p* < .01; ****p* < .001.

polychronicity, and five motivations to multitask with media as dependent variables. All but one *t*-test identified significant differences (Table 3). American participants were found to own more media ($t(1712) = 7.55, p < .001$) and engage in multitasking more often ($t(1790) = 10.77, p < .001$) than their Taiwanese counterparts. Surprisingly, Americans, who represent an M-time western culture, were found to be more polychronic than Taiwanese, who represent an eastern culture ($t(1822) = 12.92, p < .001$). American participants also reported greater motivations to multitask with media for control ($t(1806) = 8.20, p < .001$), efficiency ($t(1806) = 7.05, p < .001$), and entertainment ($t(1806) = 6.21, p < .001$), while Taiwanese participants were more likely to multitask because of the addictive habit than Americans ($t(1806) = -10.21, p < .001$). No difference between the samples was found with regard to connection motivation ($t(1806) = -.641, p = .521$).

4.2. Media multitasking model

The proposed conditional effects model was tested with the use of PROCESS statistical software (Hayes, 2013). PROCESS allows to test for up to 76 simple and multiple mediation and moderation models as well as conditional effects models, which include both mediators and moderators. The model (model 12 in PROCESS, Hayes, 2013) is a conditional effects model where direct and indirect (mediated by motivations) effects of media ownership on

media multitasking are predicted to vary based on different values of moderator 1 (polychronicity), the effects of which, in turn, depend on the levels of moderator 2 (country of residence; Fig. 2).

Model 12 was run with the use of PROCESS statistical software with media ownership as an IV, media multitasking index as a DV, five motivations to multitask with media as mediators (the model allows the inclusion of up to 10 mediators), polychronicity as moderator 1, and country as moderator 2. The model tests for the main and interaction effects of media ownership, polychronicity, and country on mediating variables (motivations; a-path); main effects of motivations on media multitasking index (MMI; b-path); and main and interaction effects of media ownership, polychronicity, and country on MMI (c'-path). C'-path represents direct effects of independent and moderating variables on the dependent measure, and the product of *a* and *b* (*ab*) represents indirect (mediating) effects of motivations that are analyzed at different levels of moderators. Age and gender were included in the model as covariates (Fig. 2).

The model with media ownership, polychronicity, country, five motivations to multitask and interactions among these variables accounted for 35% of variance in media multitasking index (MMI) as an outcome variable ($R = .59$, $R^2 = .35$, $F(9,1661) = 99.91$, $p < .0001$).

H1 stated that media ownership would positively predict the extent of media multitasking. Media ownership was found to positively affect MMI ($B = .14$, $SE = .01$, $t = 9.85$, $p < .0001$, $CI_{LL-UL}^1 = .1118-.1674$). Those who owned more media tended to multitask with media more. H1 was supported.

H2 proposed that the country of respondents' residence would moderate the effects of media ownership on the extent of media multitasking such that positive relationship between media ownership and media multitasking will be stronger in the American sample compared with the Taiwanese sample. The media ownership \times country interaction effect was significant ($B = .05$, $SE = .01$, $t = 3.78$, $p < .001$, $CI_{LL-UL} = .0249-.0788$), however, not in the direction predicted. Plotting the interaction effect showed that Taiwanese who own fewer media engaged in media multitasking to a lesser degree than Americans on the same level of media ownership. The cross-country difference decreased with the increase in media ownership (Fig. 3). Thus, the effect of media ownership on media multitasking was stronger for Taiwan than for the United States.

H3 stated that polychronicity would positively predict the extent of media multitasking. As predicted, polychronicity positively affected MMI ($B = .20$, $SE = .03$, $t = 7.26$, $p < .0001$, $CI_{LL-UL} = .1450-.2523$). Higher polychronics were more likely to multitask with media than monochronics. H3 was supported.

RQ1 asked if polychronicity would moderate the effects of media ownership on the extent of media multitasking. Polychronicity \times media ownership interaction effect on MMI was significant ($B = .02$, $SE = .01$, $t = 2.17$, $p < .001$, $CI_{LL-UL} = .0019-.0374$). Plotting the interaction effect indicated that the effect of media ownership on the extent of multitasking increased with the increase in the level of polychronicity (Fig. 4). Polychronicity affected MMI to somewhat the same degree on different levels of media ownership.

H4 predicted that the country of respondents' residence would moderate the effects of polychronicity on the extent of media multitasking. Polychronicity \times country effect was not significant ($B = .01$, $SE = .02$, $t = .60$, $p = .549$, $CI_{LL-UL} = -.0298-.0562$). H4 was not supported.

RQ2 asked if moderating effects of polychronicity on the relationship between media ownership and the extent of media

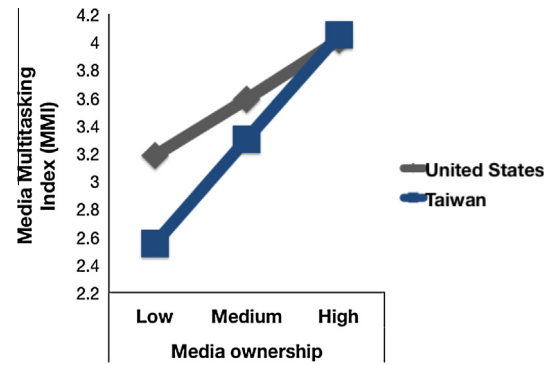


Fig. 3. Media ownership \times country interaction effect on the extent of media multitasking.

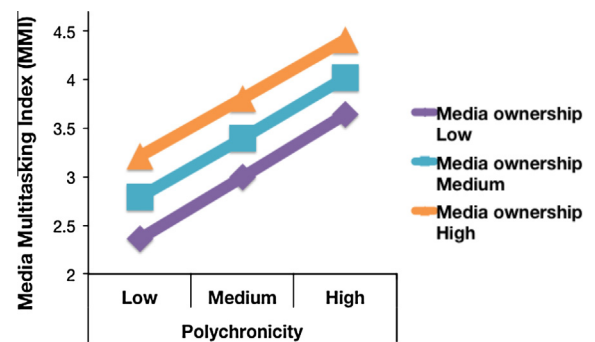


Fig. 4. Media ownership \times polychronicity interaction effect on the extent of media multitasking.

multitasking would differ by country. Country \times polychronicity \times media ownership interaction effect on MMI was significant ($B = .02$, $SE = .01$, $t = 2.57$, $p = .01$, $CI_{LL-UL} = .0053-.0396$). The effects of media ownership were significant at all levels of both moderators (Table 4). As illustrated in Fig. 5, the scope of the effects of media ownership on MMI was somewhat the same across different levels of polychronicity among the U.S. respondents. As for the Taiwanese sample, the scope of the effects of media ownership on MMI steadily increased with the increase in the level of polychronicity. Thus, media ownership affected the extent of media multitasking similarly among low, medium, and high polychronics in the U.S., while the effects of this independent variable on the dependent measure increased along with the increase in polychronicity.

H5 posited that control, efficiency, entertainment, connection, and addiction would positively predict the extent of media multitasking. RQ3 asked which motivation would be the strongest in predicting the extent of media multitasking. Four out of five motivations to multitask with media positively affected MMI: control ($B = .11$, $SE = .05$, $t = 2.16$, $p = .031$, $CI_{LL-UL} = .0102-.2091$), entertainment ($B = .09$, $SE = .04$, $t = 2.16$, $p = .031$, $CI_{LL-UL} = .0084-.1742$), connection ($B = .20$, $SE = .03$, $t = 6.15$, $p < .0001$, $CI_{LL-UL} = .1353-.2619$), and addiction ($B = .08$, $SE = .03$, $t = 2.66$, $p = .008$, $CI_{LL-UL} = .0197-.1305$). H5 was mostly supported. The more individuals were motivated to multitask with media for media use control, pleasure, connection with other people, and because of addiction, the more they multitasked with these media. As seen from B coefficients reported above, connection was the strongest motivation to predict multitasking with media, followed by control, addiction, and entertainment. Efficiency did not significantly predict MMI ($B = -.01$, $SE = .04$, $t = -.16$, $p = .870$, $CI_{LL-UL} = -.0914-.0773$).

¹ CI = confidence interval; LL = lower level; UL = upper level.

Table 4
Conditional direct effects of media ownership on media multitasking index (MMI) at different values of polychronicity and country of residence (Fig. 5).

Country	Polychronicity	Effect	SE	t	p	LLCI	HLCI
United States	Low	.0915	.02	4.81	<.0001	.0542	.1288
Taiwan	Medium	.1231	.03	4.04	=.0001	.0632	.1829
United States	High	.0852	.01	6.61	<.0001	.0600	.1105
Taiwan	Low	.1889	.02	7.77	<.0001	.1412	.2366
United States	Medium	.0790	.02	5.17	<.0001	.0490	.1090
Taiwan	High	.2548	.04	6.43	<.0001	.1771	.3326

H6 stated that control, efficiency, entertainment, connection, and addiction would mediate the effects of media ownership on the extent of media multitasking. A simple mediation model (model 4 in PROCESS) with five motivations as mediators, media ownership as independent variable, and MMI as a dependent variable was run to test the hypothesis (model 12 only tests for conditional mediating effects). Overall, the model explained 4% of variance in MMI ($R = .20$, $R^2 = .04$, $F(1,1673) = 67.13$, $p < .0001$). The total, c ($B = .17$, $SE = .01$, $t = 14.13$, $p < .0001$, $CI_{LL-UL} = .1501-.1985$), and direct, c' ($B = .12$, $SE = .01$, $t = 11.01$, $p < .0001$, $CI_{LL-UL} = .1004-.1440$), effects of independent on dependent measure were significant. As for indirect (mediating) effects (ab), four out of five motivations mediated the relationship between media ownership and media multitasking. The more users in Taiwan and United States were motivated to multitask with media for control ($B = .01$, $SE = .01$, $CI_{LL-UL} = .0053-.0242$), entertainment ($B = .02$, $SE = .004$, $CI_{LL-UL} = .0087-.0265$), connection ($B = .02$, $SE = .004$, $CI_{LL-UL} = .0083-.0226$), and addiction ($B = .002$, $SE = .001$, $CI_{LL-UL} = .0004-.0056$), the more they engaged in this media use behavior. H6 was mostly supported. Efficiency did not mediate the effects of media ownership on MMI ($B = .005$, $SE = .004$, $CI_{LL-UL} = -.0028-.0130$).

RQ4 asked how mediating effects of the motivations would differ on different levels of polychronicity and country of residence. Conditional indirect (mediating) effects were examined for each of the four significant mediators (control, entertainment, connection, and addiction; please see Fig. 6). As shown in the figure, in Taiwan, mediating effects of control, connection, and addiction steadily increase with the increase in polychronicity. This means that Taiwanese respondents who own more media and score higher on polychronicity scale are more prone to engage in multitasking with media through control, connection, and addiction. As for the mediating effect of entertainment in Taiwan sample, it did not change much at different polychronicity levels. The analysis of indirect effects in the American sample showed a different pattern. While the effect of media ownership on MMI mediated

by motivation to connect did not change at different levels of polychronicity, mediating effects of control, entertainment, and addiction steadily decreased with the increase in polychronicity. This means that motivations to control, enjoy, and maintain addictive media multitasking habit became less important to those Americans who owned more media and were higher polychronics.

5. Discussion

The present study explored how media ownership and psychological factors predict media multitasking behaviors. The study was based on a cross-country survey that included respondents from two states: United States and Taiwan.

Media ownership significantly predicted media multitasking behaviors in both samples. The more media devices participants possessed, the more places these devices were available at (e.g., home, car), and the greater access to the Internet and social networking sites participants had, the more they were engaged in media multitasking behaviors. American respondents reported to have more media than their Taiwanese counterparts. The fewer media Taiwanese respondents had, the less likely they were to engage in media multitasking, compared to American participants. These cross-country differences became insignificant with the increase in media ownership in both samples. This finding suggests that technology adoption may be a powerful factor in reducing cross-cultural differences in media use behaviors.

As predicted, polychronicity significantly affected media multitasking. Those individuals who had a tendency to do several things at a time were more prone to pair media. Interestingly and opposite to expectations, Americans were found to be higher polychronics than Taiwanese respondents. In addition, they also reported a greater degree of media multitasking than their Taiwanese counterparts. This finding supports the evidence from previous studies that shows that people in the United States multitask with media more than people in other countries (Kononova, 2013; Kononova et al., 2014; Voorveld, Segijn, Ketelaar, & Smit, 2014). On the one hand, it may suggest that media technology, indeed, has the power to change culture, in particular, perception of time, where engagement with multiple electronic media alters the ways people organize and act according to their schedules. Alternatively, and paradoxically, this finding may also suggest that media multitasking is a logically growing phenomenon in monochronic cultures. The increasing uses of electronic media may allow people in such cultures to deal with schedules and meet deadlines faster. Moving from one activity to another in a timely manner may create the illusion of multitasking with things happening one after another but so proximate in time that they seem to happen simultaneously. Future research should focus on specific features of monochronic and polychronic cultures (e.g., the importance of schedule) and test for associations with multitasking behaviors. In addition, there should be a clear distinction among different media multitasking situations (e.g., work vs. leisure) to understand the contexts in which simultaneity occurs. On the other hand, the fact that Americans report to be more polychronic and engage in media multitasking more than their Taiwanese counterparts may suggests a limitation for previous scholarship that did not systematically measure cultural mono- and polychronic differences. The distinction between M-time and P-time emerged on the basis of observations (Hall, 1959, 1976) but little is known about how different cultures quantitatively measure on mono- and polychronicity scales.

As predicted, media ownership and polychronicity positively contributed to reported media multitasking behaviors, where high polychronics with high media ownership were more likely to multitask with media. The effect of media ownership moderated by

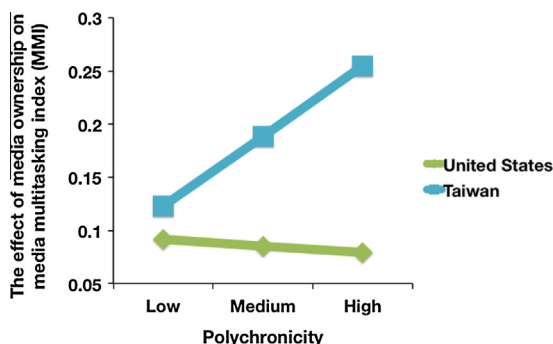
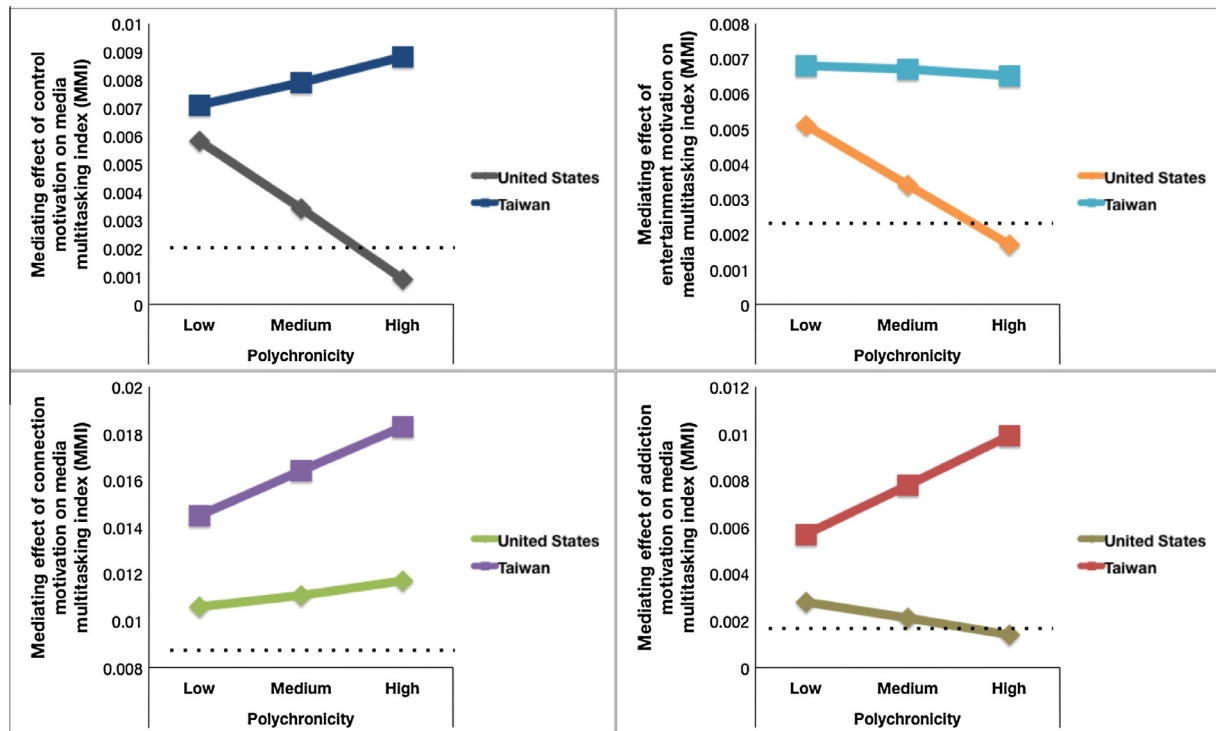


Fig. 5. Media ownership × polychronicity × country interaction effect on the extent of media multitasking.



..... The line indicates regions of statistical significance. Data points plotted above the line indicate significant effects, while data points plotted below the line show that effects are not significant.

Fig. 6. The effects of media ownership on the extent of media multitasking mediated by control, entertainment, connection, and addiction motivations at different levels of polychronicity and country.

polychronicity differed by country. Media ownership effect on media multitasking increased with the increase in the level of polychronicity in the Taiwanese sample, meaning that the more media Taiwanese owned and the higher they scored on monochronicity–polychronicity scale, the more they multitasked with media. At the same time, media ownership affected American respondents' media multitasking behaviors to the same degree, regardless of the level of polychronicity, suggesting that this psychological factor was less important in increasing the effects of media ownership on MMI within the American sample than with Taiwanese respondents. Since American ICT market is slightly more saturated than Taiwanese market and Americans are found to own more media than Taiwanese respondents, it could be that greater availability and ownership of media for Americans makes individual differences in mono-polychronicity less significant, where monochronics engage in media multitasking behaviors to the same degree as polychronics.

Cross-sample comparisons of motivations to multitask with media revealed that Americans had greater motivations to pair media for cognitive reasons (control and efficiency) – which is consistent with the characteristic of individualist culture oriented to outcome – and entertainment while Taiwanese respondents reported higher addiction to media multitasking. American participants were motivated to multitask with media because of “constructive” reasons, while their Taiwanese counterparts were driven by “destructive” motives. Control, connection, entertainment, and addiction positively predicted media multitasking while efficiency was not a significant factor. Connection was the strongest media multitasking predictor, with respondents reporting greater media multitasking when motivated to stay connected with other people. The four motivations were also found to mediate the effect of media ownership on the extent of media multitasking. Overall, the more media respondents had, the more

they multitasked with them through being motivated to control media use situation, connect with other people, enjoy media use, and maintain addictive media use habit.

Mediating effects differed by the levels of polychronicity and country of residence. In the Taiwanese sample, mediating effects of control, connection, and addiction increased and the mediating effect of entertainment stayed somewhat the same with the increase in polychronicity. Thus, as predicted, media ownership, polychronicity, and several motivations positively contributed to the increase in media multitasking behaviors. At the same time, the mediating effects of control, entertainment, and addiction decreased and the effect of connection only slightly increased on different levels of polychronicity in the American sample. The findings with the sample of Taiwanese respondents suggest somewhat linear relationships between media ownership, polychronicity, and motivations, on the one hand, and MMI, on the other, where the proposed factors positively contributed to MMI. The findings with the American sample show that when the levels of polychronicity increase, the role of motivations in mediating the effect of media ownership decreases and, at some point, becomes insignificant. This means that motivations to multitask with media become somewhat less important to American media multitaskers when the level of polychronicity, or preference for multitasking, goes up. No qualitative differences in moderated mediated effects were indicated across the four motivations.

The present study has a number of theoretical and methodological implications. It offers an adjusted measure of media ownership and media multitasking to reflect the newest available media forms, options, and places to use media. In addition, the model of media multitasking proposed in the present study included new antecedents, such as polychronicity, which was measured as an individual difference factor and compared across the two cultures, and motivations to multitask with media. Including

motivations to the model added a new theoretical level to studying predictors of MMI that involve not only media and audience factors independent of media multitasking behaviors but also “intermediary” variables that can be influenced by the antecedents listed above and are directly related to media multitasking. Working with data from two countries allowed to test the model cross-nationally, taking into consideration macro-level factors, such as ICT market and cultural context.

The study has a number of practical implications. Media multitasking has been widely studied with regard to its effects on human cognition and behavior. Empirical evidence suggests that most of the outcomes of this behavior are negative such that media multitasking decreases memory, comprehension, counterarguing, and performance on everyday tasks (e.g., homework; Armstrong & Chung, 2000; Bowman et al., 2010; Furnham & Bradley, 1997; Furnham et al., 1994; Jeong et al., 2010; Junco & Cotten, 2011; Levine et al., 2007; Pool et al., 2003; Zhang et al., 2010). Moreover, multitasking with technology can be life threatening, for example, when drivers use mobile phones for voice calling and texting while operating a vehicle (Salvucci & Macuga, 2002; Salvucci et al., 2007). The outcomes of this media use habit cannot be fully understood without proper analysis of its antecedents. Knowing what can lead to media multitasking and who multitasks with media will inform the strategies in how to deal with the consequences of this growing trend. To investigate it further, researchers, communication professionals, and policymakers should understand what shapes media multitasking behaviors: media factors that depend on technology acquisition and may require external control over media and technology use or psychological predictors that may require more insights into human mind. As the present study indicates, differences in media ownership and polychronicity translate into differences in media multitasking behaviors and, thus, require different approaches with regard to the outcomes that may be negative for some and non-existent or positive for others.

The knowledge of individual differences that predict multitasking with media will benefit communication and information technology practitioners as it allows to understand customers and audiences better, develop more sophisticated products, and communicate messages more efficiently. System designers might alter their products based on the level of media ownership among their customers as those with the high level of device ownership use information and communication technologies differently from those who own few. Advertisers and journalists should consider audience demographic and psychographic characteristics not only to tailor message contents but also to select the right channels for message communication. Individuals with higher socio-economic status who own more ICTs and those who tend to do several things at once might engage in media multitasking and be less attentive to mediated messages compared with those who own fewer media and/or like to do activities in sequential order. Understanding the motives of media multitasking will also help professionals tailor their products and messages to media use situations to maximize effectiveness in work and communication as well as pleasant experiences for users and minimize distraction and inefficiency.

The present study offers suggestions to international organization workers and business owners. As the results indicate, the effects of media ownership, polychronicity, and motivations to multitask vary by national markets different in ICT development and cultural characteristics. Despite the proposition that the United States is a monochronic culture, the results of the present study show that American users are more prone to polychronicity and multitasking with media than Taiwanese users. This means that media strategies used on the American market may not be easily adopted in foreign countries, such as Taiwan, and should be localized. In particular, international workers who use

cross-platforms to promote their businesses and organizations in the United States might consider using fewer channels of communication in Taiwan. International practitioners should also take into account cross-cultural differences in motivations to use multiple media at once that, on a bigger scale, can reflect overall attitudes of users toward multitasking. It was found that not only Taiwanese respondents engaged less in media multitasking but also they multitasked with media because of addiction more than their American counterparts. Such negative, “destructive” perception of media multitasking should not be left unnoticed. It could be the case that in Taiwan, people hold more negative attitudes toward this media use behavior that is associated with distraction and inability to focus. On the contrary, American respondents reported multitasking for more “constructive” reasons such as control, efficiency, and entertainment. Thus, introducing new ICTs in Taiwanese market, international entrepreneurs should analyze how much it will interfere with the use of other media and whether such interference will be perceived negatively by users. Finally, the present study found that individual differences in polychronicity had a stronger moderating effect in the Taiwanese sample than in the American sample. It means that communication professionals working on the Taiwanese market should approach low and high polychronics differently, for example by using single-channel communication among low polychronics and disseminating messages across several platforms among high polychronics.

Future research on media multitasking should focus on the following areas. It is suggested to re-evaluate and expand conceptual network with regard to the attitudes toward media multitasking behaviors in different countries. It is also proposed that media multitasking should be studied in relation to the context in which it occurs, for example, work vs. leisure. Media multitasking should also be explored on different levels: private, social, and organizational. The context in which media multitasking happens may be predicted by different antecedents. Finally, family-related cross-cultural differences should be taken into account when studying media use as parental influences may affect attitudes toward media multitasking and, as a result, lead to differences in media use behaviors and attitudes toward them.

6. Conclusion

Multitasking with media has become an international trend (Kononova, 2013; Kononova et al., 2014; Voorveld et al., 2014). Multiple studies suggest that using media while doing something else can negatively affect cognition and behaviors (e.g., Armstrong & Chung, 2000; Bowman et al., 2010; Furnham & Bradley, 1997; Furnham et al., 1994; Jeong et al., 2010; Junco & Cotten, 2011; Levine et al., 2007; Pool et al., 2003; Salvucci & Macuga, 2002; Salvucci et al., 2007; Zhang et al., 2010). In order to develop strategies to deal with the consequences of this spreading media use behavior, it is important to explore its antecedents. Individual-level predictors that refer to media ownership and use as well as demographic and psychological characteristics of audience, such as age, gender, sensation seeking, and polychronicity, vary based on the broader context related to national markets (Jeong & Fishbein, 2007; Kononova, 2013). Since national markets are different based on technology adaption, political developments, and culture, it is argued that individual-level predictors will affect the extent and direction of media multitasking behaviors differently. In summary, the present study (a) adjusted the model of media multitasking (Jeong & Fishbein, 2007) by proposing new psychological components (polychronicity, motivations); (b) adjusted the measure of media ownership; (c) enhanced media multitasking index measure; and (d) compared the effects of

individual-level predictors in the United States and Taiwan. Although previous literature characterizes North American societies as individualist and monochronic (Hall, 1959, 1976; Hofstede, 1984), the results of the present study showed that Americans reported higher levels of polychronicity and multitasking, compared with Taiwanese media users. This and other findings of the study suggest that the effects of technology adoption on cultural values have to be further explored and methodologies to examine cultural characteristics and media uses across nations have to be further refined.

References

- Armstrong, G. B., & Chung, L. (2000). Background television and reading memory in context: Assessing TV interference and facilitative context effects on encoding versus retrieval processes. *Communication Research*, 27, 327–352.
- Bardhi, F., Rohm, A. J., & Sultan, F. (2010). Tuning in and tuning out: Media multitasking among young consumers. *Journal of Consumer Behavior*, 9, 316–332.
- Bowman, L. L., Levine, L. E., Waite, B. M., & Gendron, M. (2010). Can students really multitask? An experimental study of instant messaging while reading. *Computers & Education*, 54, 927–931.
- Carrier, L. M., Cheever, N. A., Rosen, L. D., Benitez, S., & Chang, J. (2009). Multitasking across generations: Multitasking choices and difficulty ratings in three generations of Americans. *Computer in Human Behavior*, 25, 483–489.
- Cronbach, L. J. (1987). Statistical tests for moderator variables: flaws in analysis recently proposed. *Psychological Bulletin*, 102(3), 414–417.
- Ferle, C. L., Edwards, S. M., & Lee, W. N. (2008). Culture, attitudes, and media patterns in China, Taiwan, and the US: Balancing standardization and localization decisions. *Journal of Global Marketing*, 21(3), 191–205.
- Foehr, U. G. (2006). Media multitasking among American youth: Prevalence, predictors and pairings. *Kaiser family foundation report*. Menlo Park, CA: Kaiser Family Foundation.
- Furnham, A., & Bradley, A. (1997). Music while you work: The differential distraction of background music on the cognitive test performance of introverts and extroverts. *Applied Cognitive Psychology*, 11, 445–455.
- Furnham, A., Gunter, B., & Peterson, E. (1994). Television distraction and the performance of introverts and extroverts. *Applied Cognitive Psychology*, 8, 705–711.
- Gudykunst, W. B., & Kim, Y. Y. (1992). *Communicating with strangers: An approach to intercultural communication*. New York: McGraw-Hill.
- Hall, E. T. (1959). *The Silent Language*. Garden City, NY: Doubleday.
- Hall, E. T. (1976). *Beyond culture*. New York.
- Hayes, A. F. (2013). PROCESS statistical software. <<http://www.afhayes.com>>.
- Hofstede, G. (1980). *Culture's consequences*. Beverly Hills.
- Hofstede, G. (1984). Cultural dimensions in management and planning. *Asia Pacific Journal of Management*, 1(2), 81–99.
- International Telecommunication Union (2014). *Statistics*. <<http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>>.
- Jeong, S. J., & Fishbein, M. (2007). Predictors of multitasking with media: Media factors and audience factors. *Media Psychology*, 10, 364–384.
- Jeong, S. H., Hwang, Y., & Fishbein, M. (2010). Effects of exposure to sexual content in the media on adolescent sexual behaviors: The moderating role of multitasking with media. *Media Psychology*, 13(3), 222–242.
- Junco, R., & Cotten, S. R. (2011). Perceived academic effects of instant message use. *Computers & Education*, 56, 370–378.
- Kononova, A. (2013). Multitasking Across Borders: A Cross-National Study of Media Multitasking Behaviors, Its Antecedents, and Outcomes. *International Journal of Communication*, 7(23), 1688–1710.
- Kononova, A., Zashorina, T., Diveeva, N., Kokoeva, A., & Chelokyan, A. (2014). Multitasking goes global: Multitasking with traditional and new electronic media and attention to media messages among college students in Kuwait, Russia, and the USA. *International Communication Gazette*, 76(8), 617–640.
- Levine, L. E., Waite, B. M., & Bowman, L. L. (2007). Electronic media use, reading, and academic distractibility in college youth. *CyberPsychology & Behavior*, 10(4), 560–566.
- Lindquist, J. D., & Kaufman-Scarborough, C. (2007). The polychronic–monochronic tendency model PMTS scale development and validation. *Time & Society*, 16(2–3), 253–285.
- Nielsen (2013). Consumer electronics ownership blasts off in 2013. <<http://www.nielsen.com/us/en/insights/news/2013/consumer-electronics-ownership-blasts-off-in-2013.html>>.
- Norris, P. (2001). *Digital divide: Civic engagement, information poverty, and the Internet worldwide*. Cambridge University Press.
- Ophir, E., Nass, C., & Wagner, A. D. (2009). Cognitive control in media multitaskers. *PNAS*, 106(37), 15583–15587.
- Pew Research Internet Project (2014). Social networking fact sheet. <<http://www.pewinternet.org/fact-sheets/social-networking-fact-sheet/>>.
- Pool, M. M., Koolstra, C. M., & van der Voort, T. H. A. (2003). Background media and homework performance. *Journal of Communication*, 53, 74–87.
- Poposki, E. M., Oswald, F. L., & Brou, R. J. (2009). *Development of a new measure of polychronicity*. MICHIGAN STATE UNIV EAST LANSING.
- R.O.C. Directorate-General of Budget Accounting and Statistics (2014). The Survey of Family Income and Expenditure in Taiwan Area, 2013. <<http://win.dgbas.gov.tw/files/doc/result/102.pdf>>.
- Rideout, V. J., Foehr, U. G., & Roberts, D. F. (2010). Generation M2: Media in the lives of 8- to 18-year-olds. *Kaiser family foundation report*. Menlo Park, CA: Kaiser Family Foundation.
- Roberts, D. F., Foehr, U. G., & Rideout, V. (2005). *Generation M: Media in the lives of 8-18 year-olds*. Menlo Park, CA: Author.
- Salvucci, D. D., Markley, D., Zuber, M., & Brumby, D. P. (2007). iPod distraction: Effects of portable music-player use on driver performance. Retrieved from <<http://www.citeseer.ist.psu.edu>>.
- Salvucci, D. D., & Macuga, K. L. (2002). Predicting the effects of cellular-phone dialing on driver performance. *Cognitive Systems Research*, 3, 95–102.
- Singelis, T. M., & Brown, W. J. (1995). Culture, self, and collectivist communication linking culture to individual behavior. *Human Communication Research*, 21(3), 354–389.
- Slocumbe, T. E., & Bluedorn, A. C. (1999). Organizational behavior implications of the congruence between preferred polychronicity and experienced work-unit polychronicity. *Journal of Organizational Behavior*, 20(1), 75–99.
- Tableau (2014). Taiwan Institute for Information Industry Studies Social Media Trends with Tableau. <<http://www.tableausoftware.com/learn/stories/taiwan-institute-information-industry-studies-social-media-trends-tableau>>.
- Vega, V. (2009). Media-multitasking: Implications for learning and cognitive development in youth. *Background paper presented at seminar on the impacts of media multitasking on children's learning & development*, Stanford University, July 15th.
- Voorveld, H. A., Segijn, C. M., Ketelaar, P. E., & Smit, E. G. (2014). Investigating the prevalence and predictors of media multitasking across countries. *International Journal of Communication*, 8, 23.
- Wallis, C. (2010). *The impact of media multitasking on children's learning & development: Report from a research seminar*. New York, NY: The Joan Ganz Cooney Center at Sesame Workshop.
- Wang, Z., David, P., Srivastava, J., Powers, S., Brady, C., D'Angelo, J., et al. (2012). Behavioral performance and visual attention in communication multitasking: A comparison between instant messaging and online voice chat. *Computers in Human Behavior*, 28(3), 968–975.
- Wang, Z., & Tchernev, J. M. (2012). The "myth" of media multitasking: Reciprocal dynamics of media multitasking, personal needs, and gratifications. *Journal of Communication*, 62(3), 493–513.
- Want China Times (2013). Taiwan no. 1 smartphone dependency in Asia-Pacific: Poll. <<http://www.wantchinatimes.com/news-subclass-cnt.aspx?id=20130814000067&cid=1103>>.
- Webster, J., Phalen, P., & Lichty, L. (2000). *Ratings analysis* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.
- Yeykelis, L., Cummings, J. J., & Reeves, B. (2014). Multitasking on a single device: Arousal and the frequency, anticipation, and prediction of switching between media content on a computer. *Journal of Communication*, 64(1), 167–192.
- Yum, J. O. (1988). The impact of confucianism on interpersonal relationships and communication patterns in East Asia. *Communications Monographs*, 55(4), 374–388.
- Zhang, W., Jeong, S. H., & Fishbein, M. (2010). Situational factors competing for attention: The interaction effect of multitasking and sexually explicit content on TV recognition. *Journal of Media Psychology*, 22(1), 2–13.