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Mobile Communication Networks in Japan and America

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Abstract: Scholars have argued that interpersonal networks are more dominated by kin and work ties in Japan than in America. This paper seeks to examine the extent to which these differences manifest in the voice calling patterns of smartphone users in these two countries. We draw on data collected from a smartphone application that we designed to anonymously collect mobile log and pop-up survey data. The application was used to collect data from 226 adults in living in Japan and 195 adults living in America. Using descriptive and multivariate statistics we compare the voice call interaction patterns of respondents in these two countries. We conclude by discussing the extent to which the concept of interpersonal collectivism can be applied to understand different patterns of mobile communication in Japan and America.

Keywords: Collectivism, mobile phones, national comparison, Japan, America

Japanese and American scholars have dedicated considerable effort to explaining and describing the interpersonal network differences that exist between their two countries. They have argued that interpersonal networks are more dominated by kin and work institutions in Japan than in America, and that this domination manifests itself through frequent contact with kin and work ties for the purposes of monitoring behavior. By contrast, it has been argued that Americans are less dependent on these institutions, and that they dedicate more time to interacting with other non-kin and non-work ties.

To what extent do these interpersonal network differences manifest themselves in the mobile phone usage patterns of individuals in Japan and America? In this paper we explore this issue using unique data collected from panel respondents located in Japan and America.

We begin our discussion by reviewing literature on interpersonal network differences in Japan and America. Next we draw on mobile communication literature to speculate about the possible role of mobile phones in the interpersonal networks of people living in Japan and America. With this literature in mind we state hypotheses that we then test using our two sets of panel data. We then discuss the broader implications of our findings and the limitations of this study.

Interpersonal Differences in Japan and America

Japanese scholars were among the first to argue Japanese interpersonal networks are more rooted in institutional practices than American interpersonal networks (Hata & Smith, 1983; Nakane, 1970). Later, Hofstede and colleagues helped to popularize the notion among Western scholars that people living in Eastern countries such as Japan inhabited significantly different social worlds than those living in Western countries such as America. Hofstede and colleagues (1983, 1984) argued that people living in collectivistic cultures tend to value group oriented social obligations over their own well-being and autonomy, while the opposite was true for those living in individualistic cultures. By 1994, Hofstede's collectivistic-individualistic concept was cited by

one-third of published studies focusing on cross-national differences (Hui & Yee, 1994). Although Hofstede's work helped to bring attention to the idea that there may be significant differences in the social lives of those living in Japan and America, his work has been highly criticized for not yielding consistent results over various studies (Earley & Gibson, 1998; Oyserman et al., 2002; Takano & Sogon, 2008), for lacking conceptual clarity (Bond, 2002; Earley & Gibson, 1998; Fiske, 2002; Oyserman, Coon, & Kemmelmeier, 2002; Triandis, 1994), and for oversimplifying the cognitive tendencies of individuals in different countries (Voronov & Singer, 2002).

Scholars have attempted to overcome the limitations of Hofstede's collectivist concept by drawing a distinction between categorical and interpersonal collectivism (Berwer & Gardner, 1996; Yuki 2003; Yuki, Maddux, Brewer, & Takemura, 2005). According to this line of reasoning, categorical collectivism occurs when individuals feel connected to others based on the sharing of categorical traits or group membership. For example, an individual might feel connected to others who are affiliated with their university or others with whome they perceive to be of the same ethnic group. By contrast, interpersonal collectivism occurs when individuals feel connected to others based on the sharing of interpersonal ties. For example, person A may feel connected or a sense of obligation to person B, if they both share a common tie to person C. These scholars have argued that drawing a distinction between categorical and interpersonal collectivism helps to resolve the inconsistent findings of studies using Hostede's collectivist concept by showing that Americans tend to be categorically collectivistic while Japanese people tend to be interpersonally collectivistic.

Yamagishi and colleagues employ what they refer to as the 'institutional approach' to explain why Japanese people have stronger interpersonal collectivistic tendencies than their American counterparts. Contrary to theories which implicitly assume that culture simply sneaks into people's minds in the form of deeply rooted beliefs, Yamagishi and colleagues argue that institutions in Japan rely on mutual monitoring and relational dependency to ensure strong interpersonal relationships (Yamagishi, Cook, & Watabe, 1998; Yamagishi, Hashimoto, & Schug, 2008). To support their argument they conducted a number of experiments involving Japanese and American respondents to argue that mutual monitoring is responsible for stronger interpersonal relationships in Japan than in America (e.g. Cook et al. 2005; Kiyonari, Yamagishi, Cook, & Cheshire, 2006; Yamagishi et al., 1998; Yamagishi & Yamagishi, 1994). Using an experimental approach allows Yamagishi and colleagues to avoid focusing on specific examples of Japanese institutions. However, they refer to work by Kanazawa and colleagues which argues that kin, work, and school institutions are sources of strong mutual monitoring in Japan.

Hechter and Kanazawa (1993), and Miller and Kanazawa (2000), use empirical data from various sources to argue that Japanese kin, work, and school institutions involve more mutual monitoring than do American kin, work, and school institutions. In this literature review we will focus mostly on their arguments concerning kin and work institutions because these arguments are most relevant to our data that mainly includes adults who are no longer in school.

In regard to mutual monitoring in the workplace, Kanazawa and colleagues discuss several mechanisms through which Japanese workers experience more interaction than American workers. They argue that Japanese workers tend to work together in large open areas where they can monitor each other's behavior. Moreover, after work they often go out with colleagues to socialize, and partaking in these social events is typically expected. This constant monitoring that occurs during and after work hours further decreases opportunity to form relationships with non-work ties. By contrast, American workers are more likely to be separated by cubicles or offices, have more autonomy in determining their work schedules, and are generally not expected to socialize with

colleagues after work. This greater time and flexibility further allows them to build and maintain relationships outside of work.

Kanazawa and colleagues also discuss several mechanisms through which monitoring occurs in kin institutions in Japan. They argue that in comparison to American homes, Japanese homes have thinner walls, are smaller, and share more common area. This increases the potential for mutual monitoring while family members are at home. Moreover, aging parents often live at home, providing a constant source of monitoring for adult and young family members. Given that traditional gender divisions are more prevalent in Japan than America, women are more likely to stay at home and monitor children's behavior. This means that while children are at home they are likely to be under the watchful eye of their mother or grandparents, and while they are away at school or doing extracurricular activities mothers closely monitor their schedules. As with Japanese work institutions, the constant monitoring that occurs in Japanese kin institutions further decreases the opportunity that individuals have to form relationships outside of their families with non-kin ties.

To summarize, social scientists have dedicated substantial effort to explaining why people living in Japan are more interpersonally collectivistic than those living in America. The general individualism-collectivism dichotomy has been refined to focus on interpersonal collectivism as being one of the most salient ways in which Japanese people differ from their American counterparts. Yamagishi and colleagues have provided a theoretical explanation that draws attention to presence of monitoring within institutions, and empirical research of Kanazawa and colleagues has shown specifically how institutional monitoring differs in Japan and America. In the section that follows we will consider the extent to which such monitoring manifests in the mobile communication patterns of Japanese and American respondents.

Interpersonal Differences and Mobile Communication in Japan and America

To what extent do interpersonal network differences manifest themselves in the mobile phone usage patterns of individuals in Japan and America? On the one hand, mobile phones may be used to form and maintain relationships outside of kin and work institutions in Japan. If this is the case, we might find that mobile phones are used in similar ways in both Japan and America. On the other hand, it may be that mobile phones are used to increase monitoring that occurs with kin and work ties in Japan. If this is the case, we might find that mobile phone use is dominated by contact with kin and work ties in Japan more than America. In this section we will consider both of these arguments and conclude by developing hypotheses that will be tested in the analysis that follows.

We first consider the argument that mobile phones are tools of liberation, and as such enable the formation of non-kin and non-work ties in Japan. There are two possible reasons that mobile phones may be used in this way. First, it may be that kin and work relationships in Japan have changed significantly since the data used by Kanazawa and colleagues was collected in the 1980s and 1990s. A recent study by Boase and Ikeda (2012) using nationally representative survey data shows only minor support for the assumption that Japanese core networks are dominated more by institutional ties than American core networks. This finding might be due in part to large economic and demographic changes that have occurred in Japan during the past two decades. Since the recession occurring in the 1990s Japanese companies have downsized and the promise of long-term employment has been broken (Ministry of Health, Labour and Welfare, 2007). This may have decreased dependency on Japanese work institutions, which may have resulted in decreased interaction and monitoring in the workplace. Moreover, an increased divorce rate and an older age at time of marriage in Japan (Cabinet Office Director-General for Policies on Cohesive Society,

2004; Ministry of Health Labour and Welfare, 2008a; Ministry of Health Labour and Welfare, 2008b) may have resulted in decreased monitoring among kin. If it is true that there is now less monitoring in work and kin institutions, it is possible that mobile phones are also not used to monitor kin and work ties more in Japan than America. Moreover, less monitoring with these types of ties would imply that individuals have greater opportunity to form relationships outside of kin and work institutions. If this were the case, mobile phones may be useful tools for forming these types more voluntary non-kin and non-work ties.

Second, evidence shows that young people in Japan often use their mobile phones to form new relationships (Boase & Kobayashi 1998; Boase & Akiyoshi, 2010). This is likely because mobile phones provide the flexibility to coordinate future interaction with newly met individuals, and their one-to-one interface means that communication is private and directed to specific individuals who may not be present in workplaces or shared homes (Rainie & Wellman, 2012). Although this research has only been conducted on young people living in Japan, it is possible that adults also use mobile phones in similar ways. Given that Japanese adolescence were among the first groups to heavily adopt mobile phones in the 1990s, this generation of early adopters are already adults and may continue to use their mobile phones to form relationships outside of kin and work institutions.

Although it may be possible that mobile phones are used to build and maintain contact with non-kin and non-work ties in Japan, there is also good reason to believe that people living in Japan still use mobile phones to maintain greater contact with kin and work ties than those living in America. Although it possible that changes to kin and work institutions over the past two decades have decreased monitoring with kin and work ties in Japan, it seems unlikely that such a large-scale social change could occur so as to make the communication practices of people in Japan identical with those of Americans. It is quite possible that even though practices may have changed somewhat, there is still more monitoring among kin and work ties in Japan than in America. If this is the case, mobile phones may be used as a tool to extend and intensify monitoring between kin and work ties in Japan. Moreover, this would also imply that people living in Japan would have less time to maintain relationships with non-kin and non-work ties than those living in America, and this would be reflected in their mobile phone use.

Moreover, mobile phone studies conducted around the world have generally shown that mobile phones are used to bond intensely with small groups of friends and family (e.g. Campbell & Kwak 2012; Ling 2008). Similar findings have been shown through studies conducted in Japan, although the focus has been on Japanese youth (Ito & Okabe, 2005; Ito, 2005). Research drawing on adult respondents in Japan has shown that mobile phones are used to connect with small numbers of individuals (Miyata, Boase, Wellman, & Ikea, 2005). Overall, mobile phone research suggests the Japanese adults will use mobile phones to maintain contact and monitor the same people that they see in their daily lives. If it is true that monitoring occurs more in Japanese kin and work institutions than in American kin and work institutions, we expect that communication with kin and work ties will dominate mobile phone usage in Japan more than in America.

If Japanese kin and work ties rely on mutual monitoring more than American kin and work ties do, it is also likely that people in Japan do not enjoy socializing with their kin and work ties as much as people in America. In other words, it may be the Americans have stronger kin and work ties than their Japanese counterparts, insofar as tie strength is indicated by emotional connection rather than social obligation. In this case we would expect differences in mobile phone usage in Japan and America to vary by tie strength. Not only would people in Japan have greater contact with kin and work ties than people living in America, but this contact would be with weaker kin and work ties.

Given this argument we pose the following four hypotheses.

H1: Kin and work ties dominate mobile voice calling more in Japan than in America.

H2: Other non-kin and non-work ties dominate mobile voice calling more in American than in Japan.

H3: H1 and H2 will be more strongly supported for weak ties than for strong ties.

H4: Support for H1 thru H3 will remain when controlling for demographic differences between the Japanese and American respondents.

Method

The data for this study was collected using the Communication Explorer smartphone application that was developed by the authors to anonymize and collect voice, text, and email log data and to complement this data with on-screen survey questionnaires.

Two sets of respondents located in Japan and America were selected for this study using existing representative panels of individuals maintained by a research company. Respondents were initially recruited to these panels using a combination of face-to-face and telephone solicitation, and information regarding their demographics and use of technology was recorded by the company. Using these representative panels, the company was able to identify potential respondents who owned Android smartphones and request that they participate in our study.

During the winter and spring of 2011, panel participants who were Android users in both countries were asked to complete a screening survey that included information on their mobile phone use. Those who were considered to be regular Android users and who had valid Gmail addresses were then offered a small sum of money to install a copy of the Communication Explorer application on their Android phones and respond to a daily pop-up questionnaire at least 30 times over the course of approximately two months.

For the American sample, approximately 49 percent of the 400 panel participants who completed the screening survey were considered suitable candidates, agreed to participate, and completed all 30 daily pop-up surveys, giving us a total sample of 195 American respondents. For the Japanese sample, approximately 22 percent of the 1,006 respondents who completed the screening survey were considered suitable candidates, agreed to participate, and completed all 30 daily pop-up surveys, giving us a total sample of 226 Japanese respondents.

Respondents in the American sample were a mean of 35 years old, 61 percent were female, 67 percent were college educated, 56 percent were married, and 60 percent worked full-time. Respondents in the Japanese sample were a mean of 35 years old, 19 percent were female, 58 percent were college educated, 65 percent were married, and 76 percent were working full-time.

Although the research company that collected the data had access to the identity of the individuals who participated in the study, this information was not forwarded to the authors and every effort was made to maintain the anonymity of the respondents. To ensure that respondents could not be identified based on their Android log data the application assigned anonymous numeric codes to all voice call events (voice calls made and received), text message events (text messages sent and received), and Gmail events (messages sent and received). The application then assigned numeric codes to all contacts in the respondent's Android contact book. It further assigned another set of anonymous numeric codes to the above events indicating if the same individual was contacted through multiple media. For example, if a respondent voice called "J. Smith" and sent "J. Smith" a text message, the voice call event would receive a numeric identification code of "0102" and the text message event would receive a numeric identification code of "5992". Moreover, both the voice call and the text message would receive another

identification code of "0993" to indicate that it was the same individual ("J. Smith") who was both called and texted. The name "J .Smith" was not recorded to maintain anonymity, nor were any telephone numbers or text message content recorded.

After numeric codes were assigned to all events and address book contacts, the application recorded the time, date and duration of phone calls, as well as the date and time of text and email messages. In total, the application collected information on 711,745 voice, text, and email log events from the American respondents and 409,093 voice, text, and email log events from the Japanese respondents. No content of voice, text or email messages was recorded by this application. After this process occurred the respondents were asked several questions and they selected a time of day when they would prefer to do to the onscreen pop-up survey question. The onscreen pop-up survey then occurred once a day and respondents needed to complete at least 30 pop-up surveys to be included in the study. The pop-up survey asked a short series of questions about a randomly selected individual with whom the respondent had communicated in the previous 24 hours. The first time that a pop-up survey occurred regarding a specific individual it would ask respondents to indicate the individual's social role. Using simple "Yes" radio buttons, respondents could indicate if the individual was a family member, someone known from work, or someone that they enjoyed socializing with, by simply tapping on the buttons where appropriate. Respondents were able to select the "Yes" button for more than one social role category. If that same individual tie with whom the respondent already answered pop-up survey questions was again the most commonly contacted individual for another 24 hour period, a different pop-up survey question would appear that did not contain social role questions. This is because it is unlikely that social roles would change during the data collection period so there was no need to ask these questions more than once.

Through the use of these first pop-up survey questions, social role information was gathered from a total of 1,593 social ties of the American respondents and 1,450 ties of the Japanese respondents. American respondents had an average of 8 social ties for whome they completed the first pop-up survey, and Japanese respondents had an average of 6.4 social ties for whome they completed this first pop-survey. Many of the surveys that the respondents completed were concerning social ties with whom they had already completed a first pop-up survey.

Using the social role information gathered from the first pop-up survey we coded ties into the following 3 categories: kin, work, and other. To operationalize tie strength we further coded each of these 3 categories into strong and weak ties. Strong ties are those ties with whom respondents reported that they enjoy socializing, and weak ties are those with whom they do not report that they enjoy socializing. The enjoyment of socializing is a particularly salient trait of tie strength in this study because it is likely that communication which is carried out for the sole purpose of mutual monitoring is not an activity that is intrinsically enjoyable to those involved. Moreover, emotional closeness has been considered an important dimension of tie strength (Marsden, 1984) and enjoyment of socialization is likely a proxy of emotional closeness.

To compare mobile phone activity in Japan and America, we limit our analysis to voice calls. This is because Japanese mobile phones carriers do not use the same SMS (short message system) network system as American mobile phone carriers. Instead, many Japanese mobile phone carriers send text messages as e-mail, and bypass the standard SMS infrastructure entirely. The implication is that our application was unable to retrieve representative SMS data for Japanese respondents. We further do not include email data because we are unable to know if email was sent and received by mobile phones or through the personal computer browser-based Gmail interface. Because our literature is focused on mobile phone use we felt it prudent to focus only on mobile

phone voice communication as this allows for a fair and logical comparison between our two data sets.

Analysis and Results

The first hypothesis posits that kin and work ties dominate mobile voice calling more in Japan than in America. We test this hypothesis in two ways: by examining the extent to which the percentage of unique ties contacted are kin and work ties, and by examining the total number of voice calls made with kin and work ties.

The results presented in Table 1 show the percentage of unique ties in each social role contacted through mobile voice calls. They show that American respondents contact a higher percentage of kin ties than Japanese respondents (35 versus 27 percent, respectively). This result is contrary to the first hypothesis that leads us to expect that Japanese respondents will contact a higher percentage of kin ties than American respondents. However, these results also show that Japanese respondents contact a higher percentage of work ties than American respondents (41 versus 23 percent, respectively). This result supports the first hypothesis with regards to work ties.

Table 1. Percentage of ties with whom voice calls occur by social role

	All Ties		Strong Ties		Weak Ties	
	Japan	US	Japan	US	Japan	US
Kin	27	37	39	40	14	19
Work	41	23	24	21	58	36
Other	32	40	37	39	27	46

The results presented in Table 2 show the median number of voice calls for each social role among Japanese and American respondents. The mean values were not presented because these are highly skewed distributions to which a small number of respondents have extremely high numbers of voice calls. Contrary to the first hypothesis, the results show that medium number of voice calls with kin among the American respondents is more than twice that of the Japanese respondents (20 versus 9 calls, respectively). Contrary to the first hypothesis, American respondents have nearly twice the median number of voice calls with work ties than Japanese respondents (4 versus 7 calls, respectively).

In sum, descriptive statistics show mixed support for the first hypothesis that states that both kin and work ties dominate voice calling more in Japan than America. Although we find some support for this hypothesis concerning work ties, we find evidence to the contrary concerning kin ties.

Table 2. Median number of voice calls by social role

	All Ties		Strong Ties		Weak Ties	
	Japan	US	Japan	US	Japan	US
Kin	9	20	12	22	5	8
Work	4	7	5	6	4	8
Other	3	5	3	5	2	5

The second hypothesis posits that other (non-kin and non-work) ties dominate mobile voice calling more in American than in Japan. The results presented in Table 1 show some support for this hypothesis. A greater percentage of other ties are contacted by American respondents than by Japanese respondents (40 versus 32 percent, respectively). The results presented in Table 2 also show some support for this hypothesis. American respondent show a higher median number of voice calls with other ties to Japanese respondents (5 versus 3 voice calls, respectively). Overall, we find support for the second hypothesis using descriptive statistics.

The third hypothesis posits that H1 and H2 will be more strongly supported for weak ties than for strong ties. To examine this hypothesis we start by examining differences in strong and weak ties concerning H1, which focuses on kin and work ties. The results presented in Table 1 do not support this hypothesis concerning weak versus strong kin ties. American respondents have a greater percentage of weak ties that are kin than Japanese respondents (19 versus 14 percent, respectively) while both American and Japanese respondents have similar numbers of strong ties that are kin (40 versus 39 percent, respectively).

The results presented in Table 1, however, do support the third hypothesis concerning work ties. A higher percentage of weak ties are work ties for Japanese respondents as compared to American respondents (58 versus 36 percent, respectively), while a similar percentage of strong ties are work ties for both Japanese and American respondents (24 versus 21 percent, respectively).

Contrary to the results presented in Table 1, the results shown Table 2 do not support the third hypothesis as it pertains to kin and work ties. These results show higher contact with weak kin and work ties among American respondents than Japanese respondents (i.e., a median number of 8 calls with American kin ties versus 5 calls with Japanese kin ties, and 8 calls with American kin ties versus 4 calls with American kin ties), as well as higher contact with strong kin and work ties among American respondents than Japanese respondents (i.e., a median number of 22 calls with American kin ties versus 12 calls with Japanese kin ties, and 6 calls with American kin ties versus 5 calls with Japanese kin ties).

Next, we examined the third hypothesis as it pertains to H2, which focuses on other (non-kin and non-work) ties. The results presented in Table 1 clearly support this hypothesis concerning strong versus weak other ties: a greater percentage of weak ties are other ties among American respondents than among Japanese respondents (46 versus 27 percent, respectively), while a similar percentage of strong ties are other ties among Japanese and American respondents (37 versus 39 percent, respectively).

Overall, descriptive statistics show mixed support for a third hypothesis insofar as it is supported in regards to work and other ties, but not in regards to kin ties.

The fourth hypothesis posits that support for H1 thru H3 will remain when controlling for demographic differences between the Japanese and American respondents. To test this hypothesis we created negative binomial count models predicting the number of voice calls found in respondent logs. These multivariate models allowed us to control for demographic factors while using social roles as independent variables. Negative binomial count analysis was used over regular regression because voice calls are positively and highly skewed distributions with only positive values. We note that we also attempted to use zero inflated negative binomial count analyses because the distributions of the dependent variables contain high numbers of zero values. However, for all models Vuong tests showed no value in using the zero inflated models over the standard negative binomial models. We used the “cluster” option available in STATA to account for the nested nature of this data and did not use nested multivariate analysis because there were not enough ties per respondent to fit the specifications of this type of model. The results of this multivariate analysis are presented in Table 3.

In regards to H1 and H2, Models 1 and 2 show that when controlling for demographic factors both Japanese and American respondents have more voice calls with kin ties than with work and other ties (p. < .001 and p. < .001 for both "Kin Ties" coefficients in Models 1 and 2). In other words, when controlling for demographic factors it is not the case that kin and work ties dominate mobile voice calling more in Japan than America, it is also not the case that other ties dominate mobile voice calling more in America than Japan. The results presented in Table 3, Models 3 thru 6 show mixed support in regards to H3 when controlling for demographic factors. Among weak ties, as predicted the results show that weak kin and work ties are contacted more among Japanese respondents (p. <.001, Model 6) than American respondents (p not significant at the 0.05, Model 5), however, only strong kin ties are contacted more than other ties among both Japanese and American respondents (p. < .001 and p. < .001 for both "Kin Ties" coefficients in Models 3 and 4). In sum, in regards to our fourth hypothesis, we show no support for H1 and H2 when controlling for demographic factors, and mixed support for H3 when controlling for demographic factors.

Table 3. Negative binomial count model predicting to number of voice calls

	All Ties		Strong Ties		Weak Ties	
	Japan	US	Japan	US	Japan	US
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Social Role (ref = Other Ties)						
Kin Ties	9.06 ***	5.99 ***	6.96 ***	5.52 ***	4.35 ***	1.13
Work Ties	0.22	0.18	0.17	0.18	3.32 ***	0.80
Demographics						
Age	-3.52 ***	-0.65	-3.63 ***	-0.40	-0.27	-2.3 *
Female	0.53	-0.70	-0.06	-0.75	0.34	0.92
College Degree	-0.30	-0.66	0.04	-0.56	-0.75	-0.16
Married	0.19	-2.05 *	0.21	-1.89	0.06	-1.34
Working Full-Time	0.81	-0.13	0.07	-0.04	3.67 ***	0.08
Constant	8.42 ***	12.42 ***	8.89 ***	11.55 ***	3.66 ***	6.9 ***
Wald Chi Square	155	58	103	48	40	14
N	1,420	1,565	712	1,354	708	211

* = p < 0.05, ** = p < 0.01,
*** = p < 0.001
All coefficients are Z values.

Overall, the descriptive analysis shows mixed support for our first two hypotheses insofar as they are at least somewhat supported in regards to work and other ties, but not in regards to kin ties. Contrary to our expectations, kin ties dominate voice calling more in America than Japan. The descriptive analysis shows somewhat mixed results in regards to strong and weak tie differences in Japan and America, insofar as it is supported in regards to work and other ties, but not in regards to kin ties.

The multivariate analysis does not support the first hypothesis that kin and work ties dominate voice calling in Japan more than America. The multivariate analysis also does not support the second hypothesis that other ties dominate voice calling in America more than Japan. To the contrary, the analysis shows that when controlling for demographic differences between these two samples, kin ties dominate voice calling in both in the Japanese and American samples. The multivariate analysis shows mixed support for the third hypothesis. It shows that when

controlling for demographic differences between samples, strong kin ties dominate voice calling in both the Japanese and American samples. However, when controlling for demographic factors we do find support for the hypothesis that weak kin and work ties dominate voice calling more in the Japanese sample than in the American sample. It is important to note, however, that this particular result may be due in part to the fact that the N value for the weak tie American respondent model is much lower than the N value for the weak tie Japanese respondent model (N = 211 and 708, respectively).

Discussion and Conclusion

Both the descriptive and multivariate analyses indicate that kin ties dominate voice calling in both America and Japan. This finding is contrary to the large amount of scholarship on interpersonal collectivism in Japan that lead us to expect that people living in Japan would have greater contact with kin ties than people living in American. However, it is consistent with the mobile communication literature that shows mobile phones are used to bond heavily with kin ties in America and in other countries. This finding suggests that there may be a uniform tendency among people in a variety of nations and cultures to use mobile phones as a means of maintaining heavy contact with kin ties.

Although scholarship on interpersonal collectivism suggests that Japan is more collectivistic than America in regards to monitoring that occurs with work ties, our results show only mixed support for this tendency as it applies to mobile phone use. Although we find clear support for this tendency when looking at the descriptive statistics, we find little support when considering multivariate statistics that control for demographic differences between the Japanese and American samples. The contrary findings in the descriptive versus multivariate analyses are likely due to the influence of gender -- the Japanese sample was dominated by male respondents who may have higher work obligations than female respondents. This result does not necessarily contradict the argument that Japanese work institutions employ mutual monitoring more than American work institutions, insofar as these work institutions may be most influential for Japanese males who are more often promised long-term employment than their female counterparts. Further research is needed to understand the extent to which gendered divisions in the workplace result in different mobile phone usage in Japan and America with regards to contact with work ties.

Although this study is an important first step in understanding national differences in mobile phone use in Japan and America, it is not without its limitations. First, this study has focused only on voice calling, and it is possible that different communication patterns would be found when comparing text message usage in Japan and America. Future studies that develop smartphone data collection applications to allow for the collection of text message logs on Japanese phones will enable researchers to make such comparisons. Second, although our smartphone log data is highly accurate, smartphone users do not currently represent larger populations. This is particularly true of the Japanese sample that we use in this study, which is dominated by male respondents. As smartphones diffuse more widely there will be greater opportunity to use smartphone applications to collect both accurate and representative data.

To conclude, theories of interpersonal collectivism explain different mobile usage patterns in Japan and America to some extent. However, our results suggest that national differences in mobile phone usage cannot simply be explained through reference to interpersonal collectivistic tendencies in Japan. Rather, it appears that mobile technology has been particularly useful among adults as a means of maintaining contact with kin ties, and that this tendency exists in the very different national cultures of Japan and America. Although it would be inappropriate to conclude,

based on this study alone, that the mobile nature of these devices makes them particularly useful in maintaining contact with kin ties under a variety of social conditions, future research comparing mobile usage in a variety of countries may help us to understand the extent to which this is the case.

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