

Running head: CROSS-CULTURAL COMPARISON OF MOBILE TELEPHONY

A CROSS-CULTURAL COMPARISON OF
PERCEPTIONS AND USES OF MOBILE TELEPHONY

By

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Abstract

Drawing from the theoretical orientation of Apparatchest (Katz and Aakhus, 2002), this study explored cultural similarities and differences in perceptions and uses of mobile telephony. A sample of college students from Japan, Sweden, Taiwan, Hawaii, and the U.S. Mainland were surveyed to assess (1) perceptions of the mobile phone as fashion, (2) attitudes about mobile phone use in public settings, (3) use of the mobile phone for safety/security, (4) use of the mobile phone for instrumental purposes, and (5) use of the mobile phone for expressive purposes. Results indicate some differences and several similarities among the cultural groupings and help lay the groundwork for future research and theory building.

The speed and magnitude of mobile phone adoption is a recent worldwide phenomenon akin to that of the television in the middle 20th century and the Internet in the late 20th century (Katz and Aakhus, 2002; Rice and Katz, 2003). Prior to 1990, the mobile phone was a rare and expensive technology with an adoption level too low for the charts to even register. During the 1990s mobile phone adoption exploded, and subscriptions reached a half billion around the globe (International Telecommunication Union, 2002). By the end of 2003 mobile phone subscriptions reached 1.3 billion worldwide. In fact, those who do not use a mobile phone are now in the minority in many countries (International Telecommunication Union, 2004). Although the explosive growth of this technology is remarkable and the social implications are myriad, the amount of social science research in this area is relatively small when compared to other pervasive communication technologies, such as the Internet (Rice and Katz, 2003).

The good news is that mobile communication research is on the rise, and researchers from all over the globe are making valuable contributions to our understanding of the social implications (see for example, Fortunati, Katz and Riccini, 2003; Katz, 2003; Katz and Aakhus, 2002; Ling, 2004). The global impact of its adoption and use and the international composition of researchers in this area have drawn attention to trends in the ways people think about and use mobile telephony in various cultures. For example, Katz and Aakhus identified similarities in communication habits associated with mobile phone use in Finland, Israel, Italy, Korea, the United States, France, the Netherlands, and Bulgaria. The authors explained, ‘despite the great variations in cultures – from teen dating to family arrangements and from economic based to social hierarchies – the use and folk understanding of the mobile phone seem to be pressing toward

conformity and uniformity' (2002: 313-14). While there are prominent similarities, the literature also reveals some interesting differences and distinctive cultural characteristics that influence the adoption and use of this growing technology.

The purpose of this article is to further explore cultural similarities and differences associated with mobile telephony by presenting findings from a cross-cultural comparison of perceptions and uses of the technology. A sample of college students from Japan, Sweden, Taiwan, Hawaii, and the U.S. Mainland were surveyed about their perceptions and uses of mobile telephony in order to assess similarities and differences among these members of the distinct cultural groupings. As Mante and Heres explained, 'attitudes to and positioning of technology is driven by social location ... of individuals and families' (2003: 129). This study aims to contribute to our understanding of the 'social location' of mobile telephony while adding to the budding body of literature in this area.

Theoretical Grounding

This study is rooted in the theoretical orientation of Apparatgeist (Katz and Aakhus, 2002). As noted above, Katz and Aakhus identified several cross-cultural trends in the adoption, use, and conceptualization of mobile telephony. These trends have emerged in many social contexts, including participation in social networks, changes in traditional communication habits to accommodate mobile communication, competent mobile communication, and unanticipated behaviors resulting from mobile communication. In an effort to explain these patterns and those associated with other personal communication technologies (PCTs), Katz and Aakhus advanced the concept of Apparatgeist, which refers to 'the spirit of the machine that influences both the designs of

the technology as well as the initial and subsequent significance accorded them by users, non-users and anti-users' (2002: 305).

Apparatgeist draws attention to both the meanings people construct for technologies and their social consequences. Katz and Aakhus advocated balanced consideration of the social and technological forces that shape perceptions and uses of PCTs by identifying a number of factors from each of these arenas. For example, values and norms are social factors that help guide the ways people use mobile phones. In addition, technological aspects such as handset size and design also factor into how people think about and use the technology (see Katz and Aakhus, 2002: 311 for an expanded list of social and technological considerations identified in their explication of Apparatgeist). Katz and Aakhus argued that these factors and others like them are important ingredients in the 'spirit' that results in consistent perceptions and uses of PCTs in disparate cultures. The notion that technology embodies a spirit may appear technologically deterministic on the surface. However, Katz and Aakhus recognized and avoided the pitfalls of determinism by likening the influence of media attributes to a cafeteria menu. They explained,

[Apparatgeist] is not a term that requires technological determinism. In fact, we argue that technology does not determine what an individual can do; rather, it serves as a constraint upon possibilities. Much as a cafeteria menu will not offer infinite meal choices, but rather presents a finite selection of meal choices, so too historically bound technology offers us a flexible menu of extensive, but not infinite, choices (2002: 307).

According to Katz and Aakhus, Apparageist is fueled by the socio-logic of ‘perpetual contact,’ which is rooted in an innate human desire for social connection, even to share one’s mind with another (Peters, 1999). The authors reasoned that mobile phones provide the means for perpetual contact, and therefore people tend to conceptualize the technology in coherent ways. They argued, ‘it seems that certain conceptual perspectives arise in people’s minds as a result of their interaction with technologies, and these are remarkably consistent across cultures. If this is indeed the case, future research should continue to detect this phenomenon’ (2002: 316-17). Drawing from this line of reasoning, the aim of the present study was to test whether select perceptions and uses of mobile phones are consistent among a sample of participants with very different cultural backgrounds.

Cultural Studies of Mobile Communication Practices

Cultural characteristics play an important role in how people make sense of their social reality (see for example, Hall, 1959; Geertz, 1983). Mobile telephony is no exception to this axiom. Although there are notable similarities in the dissemination and appropriation of the mobile phone in various countries, the ensuing literature demonstrates that distinctive cultural characteristics play into its rate of adoption and how people use the technology.

Finland is an appropriate starting point for this review of literature. Despite their reputation for silence, the Finns are renowned for embracing the mobile phone. In fact, at the turn of the millennium Finland had the highest per capita mobile phone adoption rate in the world (Puro, 2002). This high rate of penetration was influenced by the presence of Nokia, a leader in the telecommunications industry. Puro explained, ‘Every child in

Finland learns that there is one name, Nokia, that is somehow very special in Finnish life. It is something monumental and important and affects everyone in Finland' (2002: 28). The Finns even use the word 'nokialization' to describe this phenomenon.

Israel is also among the world's leaders for mobile phone use. Unlike the Finns, Israelis are known for their propensity for talk, and Schejter and Cohen (2002) attributed the unprecedented growth of mobile phone ownership in Israel to this distinctive characteristic of Israeli culture. Schejter and Cohen argued that mobile phones are particularly appealing to Israelis because of 'their need to be connected, their need to chatter and their basic audacious (*chutzpadic*) temperament' (2002: 38).

Like Nokia's presence in Finland and Israel's tradition for talk, cultural characteristics also help explain the rapid penetration of the mobile phone in South Korea (Kim, 2002). Mobile communication providers are among the top national advertisers in Korea, which allowed the mobile phone to be a familiar technology when it entered the Korean marketplace. Secondly, Korea suffers from a lack of telephone lines, and the mobile phone helps alleviate this problem. Thirdly, when it was introduced, the mobile phone made a positive social impression on Korean society. Early adopters tended to be wealthy business people, so the mobile phone was a symbol of success. Finally, the mobile phone suits the Korean custom of informal gatherings on very short notice (Kim, 2002).

The Netherlands is also a country with an exceptionally high diffusion rate for the mobile phone and other communication technologies (Mante and Heres, 2003). The Dutch have come to regard the mobile phone as a necessity. One explanation for this may be that Dutch citizens are progressively becoming 'technologically smart' (Beckers,

Mante and Schmidt, 2003). That is, Dutch citizens tend to have low levels of anxiety regarding the use of digital technology. This phenomenon may be due to the education system in the Netherlands, which is on the rise, as is the proliferation of technology in Dutch classrooms (Beckers et al., 2003).

Socio-economic and political forces also influence the adoption and use of mobile telephony. Vershinskaya (2003) discussed how profound social and economic changes in Russian society have resulted in an ICT revolution in the mid 1990s. From the 1960s to the 1980s Russia was perceived as lagging in the sphere of information technology. Gorbachev's restructuring, democratization, and openness in the late 1980s and early 1990s opened the door for dissemination of ICTs, such as the Internet and the mobile phone.

Not surprisingly, the collapse of the former Soviet Union has also affected the technological landscape of other nations. One of its former satellites, Bulgaria, has only a recent history of economic, cultural, and technological autonomy. At the beginning of the millennium, owning a mobile phone was not a priority for many Bulgarians who had more serious concerns and were struggling just to survive in the relatively poor country (Varbanov, 2002). However, mobile phone adoption has been growing and is expected to explode in the upcoming years. Varbanov (2002) explained that because of the cultural and economic landscape of Bulgaria, the mobile phone has become an important symbol of the future for this developing nation.

Like Russia and Bulgaria, China has also undergone profound political and economic changes in the late 20th century that have fostered mobile phone adoption and use (Yu and Tng, 2003). Increased privatization of the marketplace has given rise to an

increase in personal space and personal choice. In addition, the Chinese have a tradition of developing *guanxiwang* or personal networks. In the past the Chinese have relied on these networks to secure goods and protection. In the new market economy, personal networks help the Chinese navigate social and economic changes. Fueled by privatization and the building of *guanxiwang*, 'The mobile phone as an artifact of daily living has taken on a set of connotations that are specific to the larger socioeconomic processes occurring in China' (Yu and Tng, 2003: 192).

The insights above illustrate the effects of social climate on mobile phone adoption through the eyes of researchers peering into particular cultures. There are also a number of studies comparing perceptions and uses of mobile phones cross-culturally. For example, Oksman and Rautiainen (2003) observed similarities in the ways teenagers in Finland and other Nordic countries use mobile phones to develop and maintain social networks, resulting in their own communications culture. Katz and Aakhus (2002) drew similar connections between the ways Finnish and Norwegian youth integrate the mobile phone into their daily lives.

In a comparison of a sample of Chinese and American mobile phone users, Caporael and Xie (2003) found that Chinese participants regarded mobile phone calls from employers as acceptable during non-work hours. In contrast, the Americans found work-related calls during these times to be largely unacceptable and tended to screen these calls. Additionally, the Chinese participants tended to turn their mobile phones off only during sleep, while the Americans turned theirs off at various times, such as while not calling out or while charging the batteries. Caporael and Xie (2003) also reported cultural similarities. Most notably, both the Chinese and the American participants

silenced their mobile phones in certain public settings, such as theaters, concert halls, churches, and some meetings.

In a comparison of Western European countries, Fortunati (2002) found significant differences in the degree to which the mobile phone was viewed as means for facilitating social relationships. Italians reported the highest scores for this attitude, followed by the French, the British, the Spanish, and the Germans respectively. Fortunati also reported that, compared to other Western European countries, Italians, along with the French, tended to adopt the mobile phone more for personal reasons rather than work-related reasons. In another study of the same countries, Hadden (1998) reported similarities in mobile phone use. In all of these Western European countries, mobile phone users were least likely to have their handsets on while attending a public event such as a show or a play and most likely to have them on while traveling in the car.

Mante (2002) found both similarities and differences in a comparison between the Netherlands and the United States. Participants from both countries were increasingly more mobile and relied on their communication devices to support this increased mobility. Another similarity is that both the Dutch and the American participants were sensitive to the intrusion of the mobile phone in public settings and wanted to talk on the mobile phone only during convenient times. However, the Americans reported a stronger sense of responsibility for being reachable to their colleagues and friends, while the Dutch reported a greater need for personal choice in the matter. Similarly, Dutch participants were less willing to let their work lives interfere with their personal lives. Mante (2002) concluded that although there were noticeable differences between the Dutch and the Americans, they were not as pronounced as expected.

In a cross-cultural comparison of perceptions of various portable technologies, Katz, Aakhus, Kim and Turner (2003) found that Koreans viewed the mobile phone as more expensive, more stylish, and more of a necessity than did participants from the United States. However, like Mante (2002), Katz et al. were more impressed by the similarities than differences in their comparison. Overall, attitudes toward mobile phone characteristics tended to cluster for participants from Korea, the United States, Namibia, and Norway. According to Katz et al. (2003), these findings may indicate an international mobile phone culture and/or universals or near-universals in the perceived role of communication in our lives.

The literature reveals some interesting similarities and differences in the adoption, use, and conceptualization of mobile phones in numerous countries. Various types of cultural characteristics are associated with the mobile communication practices in these countries, ranging from psychological/relational tendencies to socio-economic and political conditions. It is important to point out that the specific reasons (be they social-psychological or sociological in nature) for cultural similarities and differences are beyond the scope of this study, and that the aim here is restricted to providing a descriptive, exploratory, cross-cultural comparison of perceptions and uses of mobile telephony to help establish groundwork for future research and theory building. Accordingly, the following research question is advanced to guide this investigation:

RQ1: To what extent do perceptions and uses of the mobile phone differ among a sample of mobile phone users from Japan, Taiwan, Sweden, the U.S. Mainland, and Hawaii?

The perceptions and uses selected for examination in this study are rooted in the following themes from the literature on mobile telephony: (1) perceptions of the mobile phone as fashion, (2) attitudes about mobile phone use in public settings, (3) use of the mobile phone for safety/security, (4) use of the mobile phone for instrumental purposes, and (5) use of the mobile phone for expressive purposes.

The first theme refers to the extent to which one considers his/her mobile phone an article of personal display or fashion. Because it is worn on the body, many users regard the technology as an extension of their physical selves (Gant and Kiesler, 2001; Hulme and Peters, 2001) and characteristically fashionable (Katz et al., 2003). For this reason, the style of a mobile phone is a primary influencing factor in brand selection for some users of the technology (Lobet-Maris, 2003). Numerous studies show that adolescents are particularly conscious of handset styles and tend to view the mobile phone as a symbolic artifact of personal display (Alexander, 2000; Green, 2003; Ling, 2003; Ling, 2004; Lobet-Maris, 2003; Skog, 2002).

Another theme from the literature pertains to attitudes about mobile phone use in public settings. Users who speak on their mobile phones in public often do so at the expense of others around them. Bystanders are unwittingly cast into the role of spectator when mobile phone users talk too loudly while around others (Fortunati, 2003). Some are curious about what is being said (Paragas, 2003) and even treat it as a 'linguistic treasure hunt' (Fortunati, 2003: 11). However, others have voiced complaints about being forced into eavesdropping (Ling, 1996). This problem stems from the conflicting nature of private and public space, resulting in ambiguous norms for mobile phone use in public (Love and Kewely, 2003; Gant and Kiesler, 2001; Palen, Salzman and Youngs, 2001).

However, individuals are making efforts toward developing norms by explicitly discussing appropriate and inappropriate mobile phone use (Campbell and Russo, 2003; Ling, 2004; Ling and Yttri, 1999, 2002). In addition, there are some noticeable trends in where mobile phone users tend to silence their handsets or turn them off. Mobile phone users frequently leave their handsets off in certain public settings such as theaters, concert halls, churches, and some meetings (Caporeal and Xie, 2003; Haddon, 1998). Movie theaters and classrooms are perceived as particularly inappropriate locations for mobile phone use (Campbell and Russo, 2003; Campbell, 2004), while public sidewalks, grocery stores, and buses appear to be more suitable settings (Campbell, 2004). There is also evidence that certain behaviors during mobile phone use in public help mitigate the social intrusion, especially speaking quietly and keeping conversations brief (Campbell, 2004). The present study explores the extent to which one's cultural background plays a role in tolerance for mobile phone use in public settings.

The remaining variables examined in this study reflect primary uses of mobile telephony. Ling and Yttri (1999, 2002) identified three primary uses: safety/security, microcoordination, and hypercoordination. Safety/security refers to mobile phone use for emergencies and general security; microcoordination refers to mobile phone use for instrumental purposes; and hypercoordination refers to mobile phone use for these reasons as well as expressive purposes. Studies illustrate that mobile phone use for expressive purposes can demonstrate and reinforce social networks (see for example, Johnsen, 2003; Licoppe, 2003; Plant, 2001; Taylor and Harper, 2001), and the way one uses the mobile phone is at least partially influenced at the micro level through

interaction in personal communication networks (Campbell and Russo, 2003). This study explores whether mobile phone use is shaped at the larger cultural level as well.

Age, Gender, and Mobile Communication Practices

A number of studies indicate that certain trends in the adoption, perceptions, and uses of mobile communication technology are linked to age and gender. Adolescents tend to regard the technology as fashion (Alexander, 2000; Green, 2003; Ling, 2003; Ling, 2004; Lobet-Maris, 2003; Skog, 2002) and use the mobile phone for expressive purposes (Fortunati, 2002; Johnsen, 2003; Licoppe, 2003; Ling and Yttri, 1999, 2002; Taylor and Harper, 2001), while older adults have been found to emphasize mobile phone use for instrumental purposes and safety/security (Ling, 2004; Ling and Yttri, 1999, 2002). As for gender, there is some evidence that men have had more access to mobile phones than women in Norway (Hjorthol, 2000; Ling, 2000; Ling and Haddon, 2003), and other signs that males and females in that country have similarly high levels of ownership (Skog, 2002). Skog also found that males stressed the technical functions of mobile phones, while females valued social aspects, such as design, ring tone, and color. The following research question explores the effects of age and gender on perceptions and uses of mobile phones among the cross-cultural sample:

RQ2: To what extent do perceptions and uses of the mobile phone differ among age and gender groups in the sample?

Method

Participants

Three hundred eighteen students taking courses at a private university in Hawaii volunteered for this study. This university was well suited for a cross-cultural comparison

because of its exceptionally diverse student body. This diversity can be attributed to the university's geographic location and its mission to promote global citizenship by bringing students from around the globe together in scholarship. The 318 volunteers were citizens of 30 countries from all over the world. In order for each group to be large enough to find significant differences, only the cultural groupings with 25 or more participants were included in this study. In addition, only mobile phone users were included in the analysis. The subsequent sample consisted of 231 participants (65% female, 35% male). Eighty-nine participants were from the U.S. Mainland, 53 from Hawaii, 34 from Taiwan, 29 from Sweden, and 26 were from Japan. For the purposes of this study, participants from the U.S. island-state of Hawaii were treated as belonging to a separate cultural category than individuals from the U.S. Mainland because of their distinct heritage, social and physical environment, dialect, and geographical location. On average, the students from Sweden, Taiwan, and Japan had been living in Hawaii for slightly under two years, and participants from the U.S. Mainland had been in Hawaii for a little over three years. The mean age of participants was 25. Fifty percent of the participants were seeking an undergraduate degree, 42% were seeking a graduate degree, and the remainder (8%) was taking courses, but not seeking a degree. Participants reported an average of 750 minutes per month for mobile phone calls and all other services, sent an average of 10 text messages per week, received an average of 11 text messages per week, and had an average of four years of experience using a mobile phone.

Instrumentation

A self-report survey was used to assess perceptions and uses of mobile telephony, demographics, and frequency of mobile phone use. Participants completed an instrument

with 61 items. Thirty-two items pertained to this study, and the rest were used for another investigation. The factors assessed in this study (i.e., fashion, public use, safety/security, instrumental use, and expressive use) and the survey items that comprise them were derived from an instrument developed and used by Campbell and Russo (2003). The instrument used by Campbell and Russo also assessed attitudes about mobile phone use while driving and comfort with mobile communication technology. These two factors were left out of the present study because they are not as salient in the mobile communication literature and the author wanted to prevent response fatigue.

For items assessing perceptions and uses of mobile telephony, participants were asked to respond using a 5-point Likert-type scale, with response options ranging from 'Strongly disagree' to 'Strongly agree.' For items assessing culture, experience with mobile telephony, degree of use, and age, participants were asked to provide written responses. Participants were asked to circle the correct response option provided for sex and level of education. After data collection, a principal components factor analysis was conducted with a varimax rotation for the 24 items assessing perceptions and uses of mobile telephony. The criteria for loading on a factor were (1) a factor loading of at least .52, (2) maximum loading on a secondary factor no more than .36, and (3) an eigenvalue greater than 1.00. Four items were removed from the analysis for not meeting these criteria. The 20 remaining items yielded five interpretable factors for perceptions and uses of mobile telephony. Table 1 shows eigenvalues, Cronbach's alpha, and descriptive statistics for each factor. Descriptive statistics (range, mean, and standard deviation) for factors with multiple items are reported at the composite level (i.e., on a scale of 1-5), rather than the aggregate level (e.g., 5-25).

Three items loaded above .72 on the first factor. These items were labeled 'expressive use' because they reflect mobile phone use as a form of self-expression and maintaining social relations. The expressive use factor was assessed using items such as the following: 'I use my mobile phone to "catch up" with friends or relatives,' 'I use my mobile phone for personal reasons, like chatting with friends, catching up on gossip, or telling a joke.'

Four items loaded highly on Factor 2, with one item loading .59 and the others above .71 on the factor. These items reflect the degree to which one regards the mobile phone as an artifact of personal display or fashion; therefore, the factor was labeled 'fashion.' The following survey items illustrate the fashion factor: 'The way a mobile phone looks would be an important consideration to me if I were to purchase a new one,' 'I would like to be able to personalize the way my phone looks.'

Four items loaded above .55 on the third factor. The items for this factor were labeled 'safety/security' because they collectively reflect mobile phone use for this purpose. The following survey items represent the safety/security factor: 'I carry my mobile phone around at night because it makes me feel safer,' 'I don't think of my mobile phone as a security device.'

Five items loaded above .54 on Factor 4. These items, labeled 'public use,' assess generalized attitudes about mobile phone use in public, as well the acceptability of use in particular public settings, including grocery stores, restaurants, and buses. The following survey items illustrate the public use factor: 'There is nothing wrong with taking a call on a mobile phone while in a public setting,' 'I find it irritating to hear someone talking on a mobile phone while in a restaurant.'

Four items loaded higher than .52 on Factor 5. These items were designated ‘instrumental use’ because they assess mobile phone use for logistical coordination. The following survey items demonstrate the factor of instrumental use: ‘If I am running late to meet people, I often call them on my mobile to let them know,’ ‘I frequently use my mobile phone to schedule appointments.’

Table 1

Factor Eigenvalues, Scale Reliabilities, and Summary Statistics

Factor	Eigenvalue	Alpha	<i>M</i>	<i>SD</i>	Range
Expressive use	5.04	.79	3.79	.93	1.00-5.00
Fashion	2.57	.71	3.26	.77	1.00-5.00
Safety/security	2.38	.68	3.70	.72	2.00-5.00
Public use	1.97	.75	3.24	.73	1.00-4.80
Instrumental use	1.24	.64	4.08	.58	2.25-5.00

Procedure

With permission from the university’s institutional review board, surveys were administered in the classrooms of undergraduate and graduate level courses in a variety of subjects. Only mobile phone users completed the instrument used for this analysis; non-mobile phone users in the classrooms were asked to complete another instrument that is beyond the scope of this study. Surveys took about 10-15 minutes to complete on average. All participants received an informed consent form notifying them that participation was voluntary and confidential.

Results

A factorial multivariate analysis of variance (MANOVA) was conducted to determine the effects of three independent variables (culture, age, and gender) on the following five dependent variables: (1) perceptions of the mobile phone as fashion, (2) attitudes about mobile phone use in public settings, (3) use of the mobile phone for safety/security, (4) use of the mobile phone for instrumental purposes, and (5) use of the mobile phone for expressive purposes. The independent variable of culture contained five levels: Japan ($n = 26$), Sweden ($n = 29$), Taiwan ($n = 34$), Hawaii ($n = 53$), and U.S. Mainland ($n = 89$). The variable of age was divided into three groupings: 18-22 ($n = 109$), 23-29 ($n = 82$), and 30+ ($n = 38$). Two participants did not report their age. Gender had two levels, male ($n = 79$) and female ($n = 150$). Two participants did not report their gender.

Before analyzing the results of the factorial MANOVA, Box's Test for homogeneity of dispersion matrices was evaluated in order to determine whether the variances and covariances among the dependent variables were the same for all levels of the factors – an assumption for the MANOVA test. Results showed that Box's Test was significant, $F(240, 7,493) = 1.22, p < .01$, indicating there were differences in the matrices and that the assumption of homogeneity of variance was violated for at least one of the independent variables in the study. Additional tests for homogeneity of variance revealed that this assumption was met only when both age and gender were removed from the analysis. Box's Test was not significant when culture was used as the sole independent variable, $F(60, 40,488) = 1.02, p < .42$. Therefore, RQ2 was removed from the analysis, and culture served as the sole independent variable (RQ1).

A one-way MANOVA was conducted to determine the effects of culture (Japan, Sweden, Taiwan, Hawaii, and U.S. Mainland) on the five dependent variables (attitudes about mobile phone use in public, perceptions of the mobile phone as fashion, use for safety/security, instrumental use, and expressive use). Significant differences were found among the cultural groupings on the dependent measures, Wilks' $\Lambda = .73$, $F(20, 734) = 3.61$, $p < .001$, multivariate partial $\eta^2 = .08$. Table 2 reports the means and the standard deviations of the dependent variables for the five cultural groups.

Table 2

Means and Standard Deviations on the Dependent Variables for the Five Groups

Culture	Fashion		Public Use		Safety		Instrumental		Expressive	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Sweden	3.23	.77	3.40	.56	3.14	.57	4.29	.42	3.93	.71
Taiwan	3.50	.68	3.28	.64	3.61	.66	3.83	.54	3.43	.90
Japan	3.22	.65	2.71	.70	3.62	.69	3.99	.69	3.55	.71
Hawaii	3.24	.77	3.44	.73	3.91	.77	4.11	.55	3.85	.91
U.S. Mainland	3.21	.84	3.22	.76	3.83	.67	4.12	.62	3.92	1.04

Analysis of variance (ANOVA) was conducted for each dependent variable as follow-up tests to the significant MANOVA. A Bonferroni procedure was used to protect against Type 1 error, so each ANOVA was tested at the .05 divided by 5 or .01 level. The ANOVA on the safety/security scores was significant, $F(4, 225) = 7.22$, $p < .001$, partial $\eta^2 = .11$, as was the ANOVA on the public use scores, $F(4, 225) = 5.20$, $p < .001$, partial $\eta^2 = .09$. Although the ANOVA for instrumental use was not significant, it approached

significance, $F(4, 225) = 2.87, p < .02$, as did the test for expressive use, $F(4, 225) = 2.36, p < .05$. The ANOVA for fashion, $F(4, 225) = .93, p < .45$, was not significant.

Post hoc analyses to the univariate ANOVAs for the safety/security and public use scores consisted of pairwise comparisons, using Tukey's HSD, to determine which cultures differed significantly for each of these dependent variables. Post hoc tests for the safety/security scores revealed significant differences between the Swedish ($M = 3.14, SD = .57$) and U.S. Mainland participants ($M = 3.83, SD = .67$), $p < .001$. Significant differences for the safety/security scores were also found between the Swedish participants and those from Hawaii ($M = 3.91, SD = .77$), $p < .001$. These findings show that participants from the U.S. Mainland and Hawaii regarded and used their mobile phones significantly more for safety/security than did those from Sweden.

Follow-up comparisons for the public use scores revealed significant differences between participants from Japan ($M = 2.71, SD = .70$) and Hawaii ($M = 3.44, SD = .73$), $p < .001$. In addition, significant differences were found between the Japanese and Swedish participants ($M = 3.40, SD = .56$), $p < .003$. These results show that participants from Hawaii and Sweden were significantly more tolerant of mobile phone use in public than were those from Japan.

Discussion

Summary of the Study

Participants from Japan, Sweden, Taiwan, Hawaii, and the U.S. Mainland were surveyed to assess differences and similarities in their (1) perceptions of the mobile phone as fashion, (2) attitudes about mobile phone use in public settings, (3) use of the mobile phone for safety/security, (4) use of the mobile phone for instrumental purposes,

and (5) use of the mobile phone for expressive purposes. Examination of differences and similarities among age and gender groups was included in the original design of the study (RQ2), but these independent variables were removed from the analysis because of a lack of homogeneity of variance across the levels of the age and gender groupings.

Homogeneity of variance was observed across the five levels for culture, so the primary research question (RQ1) exploring cultural differences/similarities in perceptions and uses of mobile telephony was analyzed using a one-way MANOVA and follow-up post hoc procedures.

Results of RQ1 revealed some significant differences as well as several similarities in how members of the cultural groupings perceived and used mobile telephony. Most notably, participants from the U.S. Mainland and Hawaii used their mobile phones significantly more for safety/security than did those from Sweden. In addition, participants from Hawaii and Sweden were significantly more tolerant of mobile phone use in public than were participants from Japan. The other comparisons did not yield statistically significant differences among the cultural groupings, although the tests for instrumental and expressive uses approached statistical significance.

Interpretation of the Findings

It is plausible that participants from Japan reported significantly lower tolerance for mobile phone use in public than those from Hawaii and Sweden because of the relatively high population density in Japan. Data from the previous decade show that Japan was three times more densely populated than Europe and twelve times more densely populated than the United States during this time (United States Library of Congress, 2003). It may be that the high population density in Japan causes mobile phone

use in public to be more of a social intrusion than it is in less densely populated areas.

Ling (1996) found that individuals took offense to being forced into eavesdropping when they could hear others speaking on mobile phones around them in public settings.

Although this supposition is speculative, it is reasonable to conclude that in more densely populated areas it is more difficult to avoid eavesdropping on mobile conversations in public settings.

The finding that Swedish participants used the mobile phone significantly less for safety/security than did participants from the U.S. Mainland and Hawaii is more difficult to explain. The obvious explanation for this finding would be a lower crime rate in Sweden, resulting in a heightened sense of security and less of a need to use the mobile phone for this purpose. However, studies indicate that the crime rate in Sweden is fairly comparable to that in the United States. For example, in 1994 there were 713 cases of violent crime (murder, assault, rape, and robbery) per 100,000 citizens in the United States compared to 705 per 100,000 in Sweden (Lee, 1997). Another study comparing the prevalence of crime (both violent and nonviolent) from 1989-2000 in numerous industrialized countries showed that citizens in Sweden actually had a higher rate of overall reported victimization than citizens of the United States during this time (Van Kesteren, Mayhew, and Nieuwbeerta, 2000). Additional research should be conducted to verify and explain the finding that Swedish mobile phone users regard and use the technology significantly less for safety/security than mobile phone users in the U.S. Mainland and Hawaii.

While the cultural differences uncovered in this study are interesting, the number of non-significant differences is also a noteworthy finding. Cross-comparison of the five

dependent variables among the five levels of the independent variable could have potentially resulted in 50 cases of statistically significant differences between cultural groupings, yet statistically significant differences were found in only four cases. On the surface, these results appear to suggest that the real story of this study lies in the cultural similarities rather than in the differences that were found. However, before arriving at this conclusion, closer scrutiny of the results is warranted. Although the follow-up ANOVA tests for instrumental and expressive use were not statistically significant at $p < .02$ and $p < .05$ respectively, these tests approached statistical significance, and would have been statistically significant had a Bonferroni procedure not been used. Given the limitations of this study (discussed in the ensuing section), it is important to acknowledge the exploratory nature of this research, which may have influenced the tests for differences. With a larger, more representative sample, it is quite possible that the nearly-significant tests in this study would have resulted in more definitive differences among the cultural groupings. Therefore, the results of this study are interpreted as indicative of both similarities and differences in perceptions and uses of mobile telephony in the cultures examined.

The findings of the present study may be further interpreted using theoretical frameworks from research on communication technologies. The cultural similarities indicated in this study may be viewed through the lens of Apparageist (Katz and Aakhus, 2002). According to Apparageist, there is an underlying spirit that guides the adoption and use of personal communication technologies, and this spirit is wrought with both social and technological 'reasonings' that tend to be consistent across different cultures. Social considerations include roles, norms, network externalities, reference groups, folk

theories, and other visages of social context and social applications. Although social context can vary widely in disparate cultures, Katz and Aakhus argued that people have a universal drive for perpetual contact, a socio-logic that ‘underwrites how we judge, invent and use communication technology’ (Katz and Aakhus, 2002: 307). Technological factors such as size, ease of use, and media exposure also contribute to patterns of communication technology use. The theoretical orientation of Apparatchgeist helps bring into focus the interplay between social and technological characteristics that plays a role in coherent patterns of mobile phone use and conceptualization in dissimilar cultures.

This study revealed some interesting cultural differences that also merit theoretical analysis. The present study was essentially a follow-up to one conducted by Campbell and Russo (2003), which used the same instrument to reveal statistical consistencies for the perception and use factors within personal communication networks. That is, Campbell and Russo (2003) found evidence that these perceptions and uses are socially influenced through interaction within micro-level social networks. The findings in Campbell and Russo’s study support the Social Influence Model of technology use, which suggests that media perceptions are, at least partially, socially constructed in tight-knit social networks (Fulk, 1993; Fulk, Schmitz and Ryu, 1995; Fulk, Schmitz and Steinfield, 1990; Schmitz and Fulk, 1991). The present study was conducted to explore the extent to which the perceptions and uses examined by Campbell and Russo (2003) are also shaped in larger cultural networks. Using the Social Influence Model as theoretical framing allows one to view the cultural differences in the present study as indicative of the social construction of meaning that takes place at the macro level as well as the micro level.

Limitations of the Study

While this study offers valuable insights into perceptions and uses of mobile telephony among members of disparate cultural groups, some important limitations should be acknowledged that hinder generalizability of the findings. As noted, participants in the study comprised a convenience sample of university students. Due to a lack of resources, the author was not able to utilize randomized sampling techniques. Being of similar age and education level, participants in the study were too demographically homogenous to truly represent their respective cultures. Examination of the effects of age was also hindered by the nature of this sample. Age has played a prominent role in previous mobile communication research, and future studies of this nature should strive for a wider range of age groups to better examine how this variable is associated with perceptions and uses of the technology. Representativeness is also limited by the relatively small number of participants in each group and the fact that, although the participants were members of disparate cultures, there were (temporarily) living in the same geographic region at the time the surveys were administered. It is possible that these distinctive characteristics of the sample caused the responses to be different from a random sample from the same population strata. Therefore, this study should be regarded as exploratory in nature. In addition, the number of cultural groups included in the study is also a limitation. Additional cultural groupings would have shed light on more differences and similarities in how mobile communication technology is perceived and used around the globe. It would be especially interesting to include participants from less industrialized countries. Due to these limitations in scope and methods, this investigation should be regarded as a preliminary study that offers one glimpse into how people from

distinct cultures think about and use mobile phones, and additional research is needed to further explore these matters.

Directions for Future Research

First, follow-up research should be conducted to better understand the differences that were found in this study. Additional research will help verify the findings and illuminate why individuals from the U.S. Mainland and Hawaii apparently regard and use the mobile phone more for safety/security than Swedes do. Additional research should also be conducted to better understand why Japanese participants reported being less tolerant of mobile phone use in public than did participants from Sweden and Hawaii. The near-significant differences in instrumental and expressive uses of mobile telephony should also be examined in future studies. As noted, the sampling limitations may have hindered the ability to yield statistical significance, and therefore additional research is needed to investigate the extent to which members of disparate cultures use the mobile phone in these ways.

In addition to cultural differences, future research should further explore similarities in how people think about and use mobile telephony. Many of the results of this study are consistent with those of other studies highlighting cross-cultural similarities in perceptions and uses of mobile phones and other communication technologies (see for example, Katz et. al, 2003; Mante, 2002). Future research should be conducted to help explain these similarities. Katz et. al offer the three possible explanations for cross-cultural similarities found among young people:

- There is an international culture of the mobile phone that spans continents.
- There is an international teen culture in which the mobile phone plays a role.

- There are universals or near-universals in the way people perceive the role of communication in their lives (2003: 85).

In addition to these possibilities, the theory of Apparatgeist suggests that a host of interlacing social and technological factors give life to an underlying ‘spirit of the machine’ that encourages similarities in the adoption and use of PCTs around the globe. Several of the findings of this study help support the perspective of Apparatgeist. However, this is a young theoretical orientation that warrants further development. Future research and theory building of cross-cultural perceptions and uses of communication technologies are needed to better understand whether and why ‘the tendency is for people to operate by identifiable, consistent and generalized patterns, and to rely on a common set of strategies or principles of reasoning despite individual creativity and worldwide cultural diversity’ (Katz and Aakhus, 2002: 310).

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