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ATTITUDES TOWARD THE USE AND ROLE OF MOBILE TELEPHONY: A COMPARISON OF EAST AND WEST MALAYSIA

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This study examined lay beliefs and attitudes toward mobile telephony using the Mobile Phone Questionnaire. A total of 214 participants in West (Peninsular) Malaysia and 211 participants in East Malaysia responded to a series of statements relating to the use and role of mobile phones. Results suggested that mobile phone ownership and use in both samples was widespread. A factor analysis of 25 items on the Mobile Phone Questionnaire revealed three factors relating to (1) the social effects of mobile phones; (2) the life-changing effects of mobile phones, and; (3) the convenience and safety conferred by

mobile phones. There were cultural differences on Factors 1 and 2, with East Malaysians more strongly endorsing these factors. Explanations for these differences are discussed in conclusion.

Key words: Mobile telephony, social use, social role, Malaysia

1 Introduction

It is undeniable that mobile phones have radically altered the way interpersonal communication takes place [7, 11, 19-21, 28]. As of 2006, it was estimated that some 80% of the world's population had mobile phone coverage, with the figure likely to reach 90% by the year 2010 [12]. Indeed, global sales of mobile phones have now surpassed that of television sets for the first time [17].

Interestingly, this diffusion appears to have taken place independently of cultural habits and norms [1, 16, 26]. While mobile telephony penetration rates have been high in the Western hemisphere for some time, the largest growth rate of mobile telephony is currently occurring in African and Asian markets. Penetration rates in Hong Kong, for instance, topped 115% in 2004 [24], while purely on a numerical basis, India has become the biggest growth market for mobile phones globally [30].

A number of different factors have fuelled the growth of mobile telephony, including ease of use and affordability [17]. More recently, pay-as-you-go systems, where the subscriber is not committed to a long-term contract with mobile network operators, has augmented this growth. Furthermore, some research suggests that mobile phones may be used as a symbol of fashion or social status, thus enhancing its facilitatory role within peers groups [5]. Indeed, so ubiquitous is the dissemination of mobile telephony that it is often difficult to differentiate penetration rates by age, sex, education, or socioeconomic backgrounds [11, 20-21, 26].

Given these facts, it is surprising that relatively little research has examined attitudes toward the use and role of mobile telephony [27], particularly across cultures. This becomes all the more evident when public discourse and debate over controversial aspects of mobile telephony – such as the use of mobile phones while driving or the health effects of heavy mobile phone use – are taken into account. Rather, the available literature on mobile telephony has tended to focus on the adoption of mobile phones by different sectors of society (e.g., early users of technology versus 'technophobes') [27]. Other research has looked at the social role filled by mobile phones, particularly within peer groups [5, 9, 29].

In terms of explicit studies of attitudes toward mobile phones, the literature remains somewhat mute. A small number of studies have examined gender differences in such attitudes, generally reporting that, while women and men show similar levels of mobile phone use [8, 14, 19], the two genders may nevertheless use mobile phones differently or for different reasons. Specifically, men tend to stress instrumental phone uses (e.g., organising life, arranging meetings), whereas women tend to use mobile phones more as a medium for personal and emotional exchange [22-23].

More recently, Swami and Furnham [27] used a novel measure, the Mobile Phone Questionnaire (MPQ) to assess gender differences in attitudes and beliefs about mobile telephony. Their results indicated that there were both similarities and differences between genders. In terms of similarities, Swami and Furnham [27] reported that both men and women tended to view mobile phones as having life-changing effects, particularly in terms of its impact on business and private lives. On the other

hand, women were less likely than men to view mobile phone usage as transgressing social etiquettes or increasing social stress, and more likely to believe that mobile phones provided some benefit in terms of convenience and safety.

To date, however, the MPQ has not been used in a non-Western cultural setting, which the present study sought to rectify. This is important because, although rates of mobile phone penetration are uniformly high across the globe [14], there may nevertheless be cultural differences in attitudes towards mobile telephony that aid or hinder its use. Moreover, examination of attitudes toward mobile phones in non-Western settings is useful to counterbalance the dearth of research examining attitudes towards new technology in such settings. Insofar as mobile phones have reached a level of use that seems unrelated to a nation's wealth or relative standard of living, it becomes important to examine the impact of attitudes toward such technologies.

In the present study, therefore, we sought to examine attitudes toward mobile phones in two relatively distinct cultural settings, namely East and West (Peninsular) Malaysia. In general, the usage of mobile technologies in Malaysia is increasing, having grown from 9.7% coverage in 1995 to 55.9% in 2004 (see www.cmc.gov.my). More specifically, although the two sites share a number of similar cultural influences (e.g., recent historical trajectory and socio-political systems), it is possible to distinguish between sites for the purposes of empirical research. Specifically, the two samples can be differentiated in terms of socioeconomic development and ethnic composition.

In the first instance, the sample from Peninsular Malaysia was drawn from the Malaysian capital city, Kuala Lumpur, a modern metropolis that is the powerhouse of the Malaysian economy. In 2000, Kuala Lumpur had a gross domestic product (GDP) per capita of about US$8,000 and a low unemployment rate (2.6%) [10]. By contrast, our sample from East Malaysia was drawn from Kota Kinabalu, situated on the west coast of the state of Sabah, in Malaysian Borneo. Compared with Kuala Lumpur, Kota Kinabalu is much less developed socioeconomically, and Sabah remains one of Malaysia's least developed states (GDP per capita=US$2,400; unemployment rate=5.6%).

Secondly, compared with Kuala Lumpur, where there are large populations of Malays and Chinese, the population in Kota Kinabalu is also more ethnically diverse. To the extent that Kuala Lumpur is more affluent and less ethnically-diverse than Kota Kinabalu, this may have an effect of lay beliefs and perceptions about mobile telephony. Specifically, the former sample's greater affluence may have an influence on the affordability of mobile phones, which in turn affects mobile telephony's role in social aspects of everyday life. Nevertheless, given the evidence that mobile telephony penetration rates are widespread irrespective of socioeconomic development, we expected both samples to show similar rates of mobile telephony use.

2 Method

2.1 Participants

The first group of participants were 214 (110 women, 104 men) university undergraduates enrolled in various courses at two large, national universities in Kuala Lumpur. The mean age of participants in this group was 22.87 (*SD*=1.46), and all participants were of Malay (57.0%) or Chinese (43.0%) ethnicity. In terms of religion, the majority were Muslims (56.5%), with smaller groups of Buddhists

(27.6%), Christians (10.3%) and participants of other faiths (5.6%). Twenty-seven participants (12.6%) in this group were married, and the rest were single.

The East Malaysian group were 211 participants (131 women, 80 men) enrolled in various undergraduate life sciences courses at a university in Kota Kinabalu (age M=22.54, SD=2.11). The majority of participants in this group came from ethnic groups native to East Malaysia (55.9%), but there were also smaller groups of Malays (28.9%) and Chinese (15.2%). Most participants in this group were Muslims (53.6%; Christian=35.5%; Buddhists=10.9%). Finally, 89.6% of East Malaysian participants were single, and the rest were married.

2.2 Measures

All participants completed the Mobile Phone Questionnaire [6]. This is a 26-item scale containing items relating to the usage, ownership, and cultural status of mobile telephony (see Table 1). Item 11, which referred to the use of mobile phones on the London Underground, was revised to refer to subway trains (which exist in Kuala Lumpur but not Kota Kinabalu). For 25 items, participants indicated their agreement on an 8-point Likert scale (1=*Strongly agree*, 8=*Strongly disagree*). The final item asked participants to indicate their agreement on a binary scale (*Agree*/*Disagree*) as to whether 'mobile phone blockers, which disable mobile phones, should be fitted' in lecturer halls, galleries, concert venues, libraries, academic establishments, restaurants and trains.

Participants were also requested to provide their demographic details, including sex, age, ethnicity, religion, and marital status. Mobile phone ownership was measured on a binary scale (*Yes*/*No*). Respondents who answered *Yes* to the latter question were also asked to indicate how long they had owned their mobile phone, who pays or paid for the phone and call costs, the social use of the mobile phone, and how often they used their mobile phone (see Table 2).

2.3 Procedure

All participants were recruited opportunistically by the authors of this study and were not remunerated for their participation. All participants were tested in a large lecture theatre in the presence of examiners who ensured the questionnaire was appropriately completed. Participants were debriefed in a group discussion led by the experimenters following completion of the questionnaire.

3 Results

3.1 Between-group differences in demographics

A one-way analysis of variance (ANOVA) showed no significant between-group differences in participants' age, $F(1,424)=3.49$, $p>.05$. Mann Whitney U tests showed no significant differences in the distribution of participants' religion, $z=-1.79$, $p>.05$, or marital status, $z=-0.71$, $p>.05$. As expected, however, there was a significant difference in the distribution of ethnic groups, $z=-9.92$, $p<.001$.

3.2 Between-group differences in mobile phone ownership

Responses to the questionnaire items on mobile phone ownership are reported in Table 1. It is notable that all participants in both study sites reported owning a mobile phone. Mann Whitney U tests showed significant differences on length of ownership of a mobile phone, $z=-4.41$, $p<.001$, with Peninsular Malaysians more likely to have owned a phone for a longer period of time. There were also significant

differences in who had bought the phone for participants, z=-8.67, p<.001, with Peninsular Malaysians more likely to have bought the phone themselves. East Malaysians were more likely than Peninsular Malaysians to use their mobile phone for both social and business purposes, z=-8.74, p<.001. However, there were no significant differences in who paid for call costs, z=-0.92, p>.05, or frequency of mobile phone use, z=-1.01, p>.05.

3.3 Descriptive statistics: Questionnaire analysis

The mean scores of the first 25 questionnaire items are given in Table 2. Item 26 asked participants to indicate their agreement whether mobile phone blockers should be fitted in various locations. Responses to this item are presented in Table 3. Mann Whitney *U* tests showed no significant group differences on responses to the following items: lecture halls, z=-0.94, p>.05, galleries, z=-1.83, p>.05, libraries, z=-0.16, p>.05, and academic establishments, z=-1.43, p>.05. There were, however, significant differences for concert venues, z=-2.86, p<.05, restaurants, z=-5.96, p<.001, and train carriages, z=-4.59, p<.05. These items were not analysed further.

3.4 Factor analysis

To examine the factor structure of the MPQ, we conducted an exploratory factor analysis using Varimax (orthogonal) rotation. We initially included participants from both study sites in the analysis to ensure a stable factor structure, although we also conducted separate analyses within groups (see below). Subsequent analyses were also conducted with direct Oblimin (oblique) rotation, and yielded similar results. Here, we report the results of the Varimax rotation to highlight the independent nature of the factors. The number of factors extracted was determined by examination of the scree plot test [3]. Scale items were grouped by factor of the highest loading, and each factor was given a label based on the content of the items loading upon and based on the labels used by Swami and Furnham [27] (see Table 4).

Factor 1 contained items referring to the 'social effects' of mobile telephony (e.g., increasing stress), and items loading onto this factor were scored differentially (eigenvalue=2.16, 8.64% of variance accounted for). Factor 2 referred to the 'life-changing effects' of mobile telephony (e.g., effect on private lives). Items loading on this factor were generally low-scoring, suggesting agreement with these items (eigenvalue=2.13, 8.53% of variance accounted for). Finally, Factor 3 contained items referring to the 'convenience and safety' of mobile telephony, and participants generally agreed strongly with these items (eigenvalue=2.13, 8.52% of variance accounted for). It is notable that Factors 1 and 2 were also uncovered in the factor analysis conducted by Swami and Furnham [27] with British participants.

We also ran separate factor analyses for East and Peninsular Malaysian participants separately. There were a number of discrepancies between the factor structures for the individual groups and the overall model, which may have been due to the relatively small within-group sample sizes. For the Peninsular Malaysian group, Item 22 loaded onto Factor 1 rather than Factor 2, and additional items loaded onto Factor 1 (Items 4 and 5). For the East Malaysian group, the factor referring to life changing effects emerged as the primary factor, followed by the factor referring to 'social effects' and 'convenience and safety,' respectively. There were a number of additional items loading onto each of these factors that did not load onto the overall model.

3.5 Group and sex comparisons on factor scores

For both groups, it was still possible to discern a similar factor structure to the overall model. We, therefore, computed three factor scores for each participant by taking the average of responses to scale items associated with each factor, based on the overall factor structure. Responses for Item 21 were reverse-coded prior to this analysis. The mean scores and reliabilities for each factor were: Factor 1 (Peninsular Malaysia: M=4.45, SD=1.18, α=.63; East Malaysia: M=4.09, SD=1.23, α=.59), Factor 2 (Peninsular Malaysia: M=3.38, SD=1.34, α=.70; East Malaysia: M=3.57, SD=1.37, α=.63), Factor 3 (Peninsular Malaysia: M=2.68, SD=1.14, α=.56; men M=3.02, SD=1.27, α=.55). Cronbach's α coefficients for each factor subscales showed middling reliability [18].

To test for sex and group differences on these factor scores, we computed a multivariate analysis of variance (MANOVA). The results showed an overall significant effect of group, $F(3,418)=6.71$, $p<.001$; $\eta_p^2=.05$, but not of sex, $F(3,418)=1.20$, $p>.05$. The interaction between sex and group was significant, $F(3,418)=2.92$, $p<.05$; $\eta_p^2=.02$. An examination of the ANOVA results for group effects showed that Peninsular Malaysian participants gave higher ratings (stronger disagreement) to items on Factor 1, $F(1,423)=8.27$, $p<.05$; $\eta_p^2=.02$, while East Malaysians gave higher ratings to items on Factor 3, $F(1,423)=9.19$, $p<.05$; $\eta_p^2=.02$. The only significant ANOVA result for the sex by group interaction was for Factor 2, $F(1,191)=4.96$, $p<.05$; $\eta_p^2=.01$. Overall, Peninsular Malaysian men gave higher scores (strong disagreement) on this factor than did East Malaysian men, while Peninsular Malaysian women gave higher scores than their East Malaysian counterparts.

4 Discussion

This is the first study to have used the MPQ to examine attitudes toward mobile telephony in a non-Western sample. The results of this study showed that, first, penetration rates of mobile telephony in the two present samples appear to be very high, insofar as all participants reported ownership of a mobile phone. The present results also showed that participants believed mobile phones had an impact on social life, brought life-changing effects, and had benefits in terms of convenience and safety. However, our results also showed than, in comparison with Peninsular Malaysians, East Malaysians were less likely to believe that mobile phones had a strong social effect and were more likely to believe that it conferred some benefit in terms of convenience and safety. These results are discussed in turn.

First, the present results suggest that ownership of mobile phones is ubiquitous in both the study samples. All participants reported owning a mobile phone, which certainly accords with the extant literature on penetration rates of mobile telephony [14]. In addition, most participants reported using their mobile phones regularly (e.g., across sample, 46.8% of participants reported using their mobile phones more than 10 times a day). It would seem, therefore, irrespective of Malaysia's state of socio-economic development, mobile telephony penetration is extremely high and mirrors penetration rates in other Asian countries. More than this, mobile telephony diffusion in Malaysia appears to be comparable to rates in the West, although we caution that our sample should not be considered representative of Malaysians in general.

However, the present results also indicated that Peninsular Malaysians were more likely than East Malaysians to have owned a mobile phone for a longer period of time. This probably reflects rates of technological diffusion in Malaysia, beginning in more developed localities such as the capital city

before spreading to other, less developed areas such as Kota Kinabalu. Peninsular Malaysians were also more likely than their East Malaysian counterparts to have bought their phones themselves, which may reflect the greater affluence of the former sample. Although we did not measure participants' socio-economic status in the present study, the available evidence suggests that, in general, individuals in Peninsular Malaysia enjoy a more affluent lifestyle than their East Malaysian counterparts, and this may have an effect on the affordability of mobile phones. We suggest, therefore, that although it is difficult to differentiate mobile telephony penetrations rates by socioeconomic background in Malaysia, regional wealth and development may nevertheless affect the rate of technological diffusion (e.g., the latest technological advancements may only be available in the more developed Peninsular Malaysia) as well affordability.

A factor analysis of 25 items on the MPQ revealed three factors that accounted for about a quarter of the variance in the data. Two of these factors were similar to factors extracted by Swami and Furnham [27] with data from a British undergraduate sample, namely the social and life-changing effects of mobile telephony. This suggests that participants across different cultural and study sites identify these as important aspects of the use of mobile phones. It may be suggested, therefore, that irrespective of cultural or national backgrounds, participants appear to have a similarly positive view of the effects of mobile phones on the social aspects of life. In sum, these studies also corroborate previous work that has examined the social role played by mobile phones, especially among younger age groups [9, 29].

Analysis of the Malaysian data, however, also identified a third factor not extracted by Swami and Furnham [27] with British undergraduates, referring to the convenience and safety of mobile phones. It would appear, therefore, that convenience and safety are important issues in relation to mobile telephony for Malaysian participants. Possible reason for this include the suggestion that the importance of safety and convenience issues increases with decreasing socioeconomic status, or that such issues become more salient when other forms of telecommunication (e.g., the Internet) are not widely available. Indeed, it is worth highlighting the rates of Internet penetration are lower in Malaysia (44.0%) compared with Britain (66.4%) [15], and this may fuel a greater reliance on mobile telephony for communication needs. Of course, these suggestions remain speculative in the present instance, and future work would do well do examine these issues in greater detail.

The present study also showed that there were a number of differences between Peninsular and East Malaysians in these attitudes. First, East Malaysians appeared more likely to endorse the view that mobile phones had a strong social effect on everyday life. Secondly, East Malaysians were also more likely to endorse the view that mobile phones provided benefits in terms of safety and convenience [2, 25]. One possible explanation for these finding is that, in the less socioeconomically-developed setting of East Malaysia, the effects of any technological improvement will have been felt more strongly. By opening up new channels of communication where previous avenues were either non-existent or circumscribed, mobile phones may have had a more prominent effect on changing social relations in East Malaysia.

While we have interpreted the data as demonstrating meaningful differences between study sites, it should also be noted that the partial eta squared values of these differences were relatively small. In line with this, Cronbach's alpha coefficients for the extracted factor scores showed on middling

reliability. We would, therefore, strongly urge follow-up studies that examine these issues in greater detail among the Malaysian public. In this regard, it would also be useful to future work to examine the attitudes of non-student samples toward mobile telephony, as this would enhance the generalisability of findings.

To conclude, the present study extends the use of the MPQ to two non-Western samples, and shows that there are both similarities and differences in attitudes toward mobile phones between East and Peninsular Malaysians. Overall, our data support the conclusion that mobile telephony has a ubiquitous presence across cultures, and that it has had a strong impact on the everyday social life. These results may be useful for interpreting the manner in which different cultures assimilate and relate to new technological advancements.

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