The Mobile-izing Japanese:
Connecting to the Internet by PC and Webphone in Yamanashi[1]

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The Internet, Media and Relationships
Japan as an Atypical and Typical Internet-Using Country

Engaging with Japanese Internet Use: Is Internet communication in Japan different than in America? Does the proliferation in Japan of mobile phones that can connect to the Internet (we call them "webphones") affect who talks with whom online? In this chapter, we compare the social relations in everyday life of Japanese users of mobile phones and PCs.

Our investigation into the unique character of Japanese Internet relationships departs from the scholarly norm. Most accounts of the Internet have been universalistic. They have suggested that the global evolution of the Internet's population and use is following the course of American forbearers, with early non-American users being predominantly young, well-educated men emailing with a wide range of strong and weak ties (Chen, Boase and Wellman, 2002). Such accounts have assumed that the users and uses of the Internet will eventually be the same around the world, and that current variations in Internet use exist only because other countries have not caught up to early-starting America or are too impoverished to do so.

Yet, societies often differ in their interpersonal relationships, socioeconomic systems, norms and values, and climate and geography. Not surprisingly, the users and the uses of the Internet often vary between societies (Miller & Slater, 2000; Chen & Wellman, 2004). The Internet is not a system floating ethereally above societies. It is embedded in the concrete realities of people, practices and power (Wellman and Haythornthwaite, 2002). For example, although a recent study of Catalonia described much less interpersonal email use than in America, it also showed substantial use of the web for dealing with institutions: obtaining information, booking theater tickets, finding plane schedules, and the like (Castells, et al., 2003). East Asian use of the Internet is also different. Heavily broadbanded Koreans are immersed in multiplayer online games (Tkach-Kawaski, 2003), while mobile Japanese (and Scandinavians) often use both webphones and PCs (Akiyoshi, 2004).

This chapter is the first published report of our study of the users and uses of the Internet in Japan. Survey data from 1320 adult respondents were collected in late 2002 in the somewhat rural prefecture of Yamanashi, more than 100 kilometers west of Tokyo. The respondents were asked about their use of both webphones and personal computers (PCs): how often they use them, what they use them for, and what sorts of relationships they have contacted. The chapter focuses on the social characteristics and the social relationships of the users of Internet-connected webphones and PCs. We:

- examine the Japanese context, so different from the canonical American context;
- compare the users of webphones and PCs;
- compare communication via mobile phones and PCs;
- analyze how webphones and PCs sustain strong and weak ties in social networks;
- analyze how webphones and PCs are related to the provision of social support.

Our work addresses the ongoing debate about the effects of Internet use on community and social support. We conclude by discussing the implications of webphone use for the "mobile-ized" nature of Japanese society. We believe that our results are informative about the nature of Japanese

communication and social networks, Japanese-American differences in Internet use, and the turn towards "networked individualism" that is happening in Japan as well as in North America (Meguro, 1992; Nozawa, 1996; Otani, 1999; Wellman, 2001, 2002).

The Shift from Solidary to Networked Communities: For over a century, the developed world has been experiencing a shift away from communities based on villages and neighborhoods and towards flexible partial communities based on networked households and individuals. A good deal of research is now showing that, rather than destroying community, the Internet adds on to existing relationships with community members: friends, acquaintances, relatives, and even neighbors (see the summary in Wellman & Haythornthwaite 2002). This is not a static phenomenon. Communication through the Internet appears to be facilitating the turn away from bounded, holistic communities of kin and neighbors and towards far-flung, multiple and partial communities.

Until now, thinking about the Internet has focused on its ability to communicate across continents at nearly the speed of light. At the same time, Internet users have been "glocalized" (Wellman 2003): bound to their desktops by the wires connecting to the Internet even as their interactions range widely in space. It is time to consider a new era: how the peripatetic mobile users of the Internet communicate with the members of their social networks and communities (also see Rheingold 2002).

The Japanese have been at the forefront of this new era. Already experienced and active users of *keitai* -- lightweight, feature-laden mobile phones – many Japanese are now using new models of mobile phones to communicate with social network members and to web surf for information. We wonder who is doing this and with what consequences for their social networks.

Mobile Japanese Internet Users
Mobile Culture in Japan and Around the World – An Emphasis on Youth

Accessing the Internet through the use of mobile phones has already become integrated into daily life for a significant proportion of the Japanese population (Barnes & Huff 2003). By the end of May 2001, more than 40 million Japanese were able to access the Internet through their mobile phones, with the number rising 55 percent to more than 62 million by the end of March 2003 (MPMHAPT 2003). By contrast, only 4 million North Americans could use mobile phones to access the Internet in August 2000 (Funk 2001).[2] In fact, mobile phones that can access the Internet have been so rare in the English-speaking world that we had to coin a new word, "webphone," to refer to them.

The four major Japanese webphone access providers are: NTT DoCoMo, KDDI, Vodafone, and Tsu-ka (in order of number of subscribers, January2004). Each uses a variety of Internet protocols: DoCoMo's I-mode is the most popular, followed by WAP (Wireless Application Protocol) and WAP2. Although WAP2 is the least popular, it is rapidly gaining a foothold in the market as it permits advanced "3G" (third generation) services that provide GPS (global positioning system), video clips, higher speed, and other advanced features (Kageyama, 2003).

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[2] We include SMS ("short message service", sometimes known as "texting") as well as regular email in our analyses. Accounts of webphone use in other East Asian societies include Yan (2003) for China and Chae & Kim (2003) for South Korea.

Japanese webphones have relatively large screens when compared to all but the most recent American mobile phones. Sending email through Japanese webphones is similar to sending email through PCs, although users have to cope with less user-friendly telephone keypads. Users enter the email address of the recipient, a subject line, and then the contents of their message. Moreover, webphones can send and receive email to and from PCs, as well as to other webphones.

The percentage of young adults in Japan who use webphones to email is much higher than in America and many parts of Europe where webphone email has failed to attract a majority of people from any age group. This difference is partly due to marketing strategies taken by Japanese mobile phone providers that catered to the desires of youth and young adults. Japanese providers initially sold webphones as entertainment devices for the younger generation, rather than trying to sell them as practical tools for older business people. By gearing webphones to the younger generation as something fun and relatively inexpensive, they were able to capture this group who were already the largest consumers of mobile phones. As Japanese youth were the first adopters of webphones, it makes sense that webphone use has diffused so quickly and become so ubiquitous among them. After gaining a foothold in the youth market, webphone providers beefed up bandwidth and web interfaces, making their services more attractive to a wider audience.

Cultural differences and marketing tactics may have driven the quick and ubiquitous adoption of this new technology by younger Japanese. They were probably predisposed to send email through webphones by their extensive use of pagers in 1990s to contact friends and organize social activities. (Parents who wanted to keep tabs on their children's activities also spurred the use of pagers.) This incorporation of pagers into everyday routines set the stage for the adoption of webphones with their advantage of smoothly integrating voice and message contact.

Only a few ethnographic studies have investigated younger Japanese use of pagers and mobile phones. One study reports that mobile phones afford Tokyo youth important advantages (Ito, 2001). The ability to send short messages at any time allows users to keep in frequent contact with friends, strengthening their social networks and providing a feeling of "ultraconnectedness". This sort of communication typically occurs frequently but with only a small number of friends (between 2 and 5). At the same time, typing quick messages gives a new kind of freedom, for it often can be done somewhat covertly without alerting parents. Contacting friends can occur late at night while parents are sleeping, something not easily done through wired landline phones that rarely reside in Japanese children's bedrooms. Complementing this is a Japanese concern since the 1960s to develop more communication between spouses and between parents and children (Matsuda 2004). The result is a concentrated, active use of mobile phones use to expand and enhance contact with close friends and immediate family.

The advantages that webphones offer Japanese youth are probably similar to the advantages that ordinary mobile phones (those that cannot be used to access the Internet) offer young people in other countries. Youth adopt mobile phones, worldwide, to increase their autonomy and the quality of their ties with friends. For example, European youth are more likely than their parents to use mobile phones to build their social networks and to tell parents their whereabouts (Ling 2001, 2004). Furthermore, mobile phones have become incorporated into youth culture to such an extent that exchanges of text messages, airtime, and even mobile phones themselves have become heavily reciprocated, binding youth closely together. Text message exchanges are often incorporated into face-to-face contact with peers

during "hang-out time". When messages and phones are shared among the group, they add to the interaction of the entire group rather than only of their owners (Weilenmann & Larsson, 2001; Taylor & Harper 2003).

Will young users continue to rely on webphones as they grow older? On the one hand, the desire to be in constant contact with friends may dissipate as young adults enter more instrumental relationships at the workplace and save their recreational time for contact with spouses and family at home. On the other hand, heavy habitual use of this technology between friends and family may continue as people age and continue to integrate webphones into their work and domestic relationships.

By contrast to young adults and youth, older adults first encountered the Internet by using personal computers (PCs) to email and use the web (Miyata 2002). The mobile phones they first used were not able to access the Internet. Hence, it is possible that older adults have not developed the habit of using mobile phones to access the Internet even when their new webphones have this capability.

The Internet Users of Yamanashi

Our study of Internet users is based on our random sample survey of 1,320 adults in Yamanashi prefecture, Japan. Yamanashi is a mixed rural and urban area, located in the center of Japan. It is typical of Japan (outside of the Tokyo and Osaka urban agglomerations) in the characteristics of its population and its Internet users.

[Table 1 about here]

Within the Yamanashi prefecture, 40 neighborhoods were randomly selected by postal code, with a random selection of 33 individuals within each of those neighborhoods. Potential respondents were chosen from a voters list of people aged to 20-65 years old. Surveys were in paper form, delivered in-person, and collected in-person three weeks later. Three-quarters (76 percent) of the selected individuals completed the survey, providing a total sample size of 1,002 respondents. Surveying took place between November 15 and December 5, 2002.

For our analysis, we have divided respondents into three types: those who use both webphones and PCs, those who use only webphones and those who use only PCs. Our rationale is that those using only webphones or PCs may have different characteristics and patterns of use than those who use both media.

Age, Gender and Mobile/PC Use

Age: Age marks the largest difference in use of email by mobile phone and PC. The percentage of people using both webphones and PCs declines dramatically with age. A large majority of young adults in their 20s access email through the use of webphones (Figure 1). About half (46 percent) of the respondents in their 20's use both the webphone and PC, while 46 percent only use webphones. In sum, 92 percent of all respondents in their 20s use webphones for email.[3] The use of webphones by those in their 20's is so marked that they comprise 39 percent of all webphone users even though they are only 21 percent of the sample. They are 1.9 times as likely to be webphone users than the average

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[3] The World Internet Project Japan (2001) found a similar rate of 91% among those in their 20s.

respondents. Somewhat older adults in their 30s also are disproportionately high webphone users, comprising 29 percent of all webphone users even though they are only 20 percent of the sample. They are 1.4 times as likely to be webphone users than the average respondents. The disproportionate use of webphones by younger adults is so great that adults aged 20-39 own two-thirds (68 percent) of all webphones even though they comprise only two-fifths (41 percent) of the sample.

[Figure 1 about here.]

By contrast to low webphone email use by adults over aged 40+, the percentage of respondents using only PCs to exchange emails increases until the age of 60. Moreover, older adults are more apt to use only PCs for email, while younger adults are more apt to use both webphones and PCs. Not only do the ways of accessing the Internet vary by age, so does the frequency of sending email. Older Japanese, aged 50+, are much less likely to exchange email (or use the Internet) at all, by contrast to North America where those aged 50+ frequently exchange emails and use the Internet (UCLA, 2003).

Gender: Gender is also related to the mode of accessing the Internet. For each age group, different percentages of women and men use webphones, PCs, or both (Table 2). For example, more women (47 percent) than men (45 percent) in their 20s use only webphones. Gender differences change for older age groups. In general, men in the older age groups are somewhat more likely to use a combination of webphones and PCs: 38 percent of men in their 30s use both webphones and PCs to email, as compared to 33 percent of women in their 30s. While 35 percent of men in their 40s use both media, only 21 percent of women in their 40s use both. Many middle-aged men make heavy use of their PCs at work and have less need for webphones. Moreover, Japanese women have historically used PCs less than men (Ono & Zavodny, 2004).

[Table 2 about here.]

Webphone Specialists and Email Use

As we have seen, many younger adults use both webphones and PCs to access the Internet. In addition, younger adults are more likely to use only webphones to access the Internet. However, age is not the sole predictor. Yamanashi respondents with lower levels of technological skill are more likely to use only webphones to access the Internet (Table 3). The lower the respondents rated their ability to use various kinds of technology, the more they tend to only use webphones.[4] By contrast, those using PCs (either alone or in combination with webphones) report themselves to be more skilled when using technology. This accords with a nationwide Japanese survey that found that people using both webphones and PCs had relatively higher levels of perceived skill using keyboards (Ikeda 2002).

[Table 3 about here]

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[4] Self-perceived technical confidence was measured by a scale ranging from 7 to 21. The scale was compiled from seven questions that asked respondents to rate their ability to do certain technical tasks: sending a fax, recording television programs using a VCR, sending emails by computer or webphone, typing with a keyboard, using a search engine from a computer or webphone, downloading a file from a computer or webphone, and installing a computer program.

Webphone and PC Contact with Social Networks

Do people maintain different kinds of networks when they use webphones, PCs, or both to email? The differences could be because of the kinds of people using these different media or because of the nature of the media used. For example, Japanese businessmen are reluctant to use the more intimate, less formal webphones to send business-related email.[5] To address this question, we examine how much email is exchanged, and the extent to which email is exchanged with local or distant ties, and with strong and weak ties.

Frequency of Email Contact

Slightly more emails are sent by webphones than by PCs. Those who only use webphones send an average of about 6 emails per day, while those who only use PCs send two-thirds fewer, an average of about 2 emails per day. The greatest number of emails are sent by those using both webphones and PCs, about 6 emails per day through their webphone, plus about 2 emails per day through their PC, for a total of 8 emails per day.

Those who only use webphones and those who use both webphones and PCs send, on average, the same number of *webphone* emails per day: about 6. Those who only use PCs and those who use both PCs and webphones also send, on average, the same number of *PC* emails per day: about 2.[6] In short, using both media, webphones and PCs, adds to the number of emails sent: one medium does not replace the other. This finding, that using both a PC and a webphone is associated with more frequent email use, is congruent with other studies' findings that the more media that are used, the greater the overall amount of communication (Haythornthwaite & Wellman 1998; Quan-Haase, et al. 2002; Hogan, 2003). It further suggests that different sorts of email are being sent by webphones and PCs.

Local and Long-Distance Contact

Emails exchanged by webphones tend to be more local than emails exchanged by PCs. People who only use webphones are especially likely to use their webphones to send email to people who live nearby (Table 4). People who use both PCs and webphones are more likely to use webphones to send messages to others who live nearby (within one hour's travel by car) and to use PCs to send messages to those who live further away. People who only use PCs are the most likely to communicate with others who live further away.

[Table 4]

These findings are consistent with the ethnographic research discussed above showing that young Japanese use webphones to send quick emails to nearby friends. Their exchanges may simply be about trivial matters, used to maintain a feeling of connectedness, or to arrange things such as asking a spouse to pick up food on the way home from work. The mobile nature of webphones makes them perfect for arranging meetings or changing plans at the last second (Ling & Yttri 2002; Smith 2000). As

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[5] Mizuko Ito, personal communication, November 5, 2003.
[6] The per day estimates of frequencies of contact were translated from respondent-reported frequency codes. The original values were: 0 = no email sent in general or no email sent or received yesterday; 1 = 1 to 5 emails yesterday; 2 = 6 to 10 emails yesterday; 3 = 11 to 25 emails yesterday; 5 = 26 to 50 emails yesterday; 6 = more than 51 emails yesterday.

typing messages is more difficult through a webphone than a PC, we believe that respondents reserve PC email for richer, in-depth contact.

Contact with Weak and Strong Ties

Does the Internet help maintain social networks? To address this question, we examine three properties of social networks: the number of supportive ties, network diversity, and network size.

Supportive Ties: Does the immediacy of portable webphones or the range of PCs facilitate the availability of social support? To measure the number of supportive ties, respondents were asked to report the number of network members that would give them words of encouragement (emotional support), provide them with a small amount of money (financial support), or aid them in tasks such as moving house, or providing others goods and services (instrumental support). The number of network members in all three categories was summed and divided by three.

The data show that users of both modes of Internet access --- webphones and PCs -- have the highest number of supportive ties (2.53), followed closely by users of PCs only (2.49), users of webphones only (2.49) and non-users of either PCs or webphones (2.38; see Table 5). Are these small differences in the supportiveness of networks due to the mode of communication used – webphone or PC – or to some other factors? We used regression analysis to take into account intercorrelations among key variables. For example, respondents who use only PCs tend to be older than those who use webphones (alone, or with PCs). Social networks grow in size with age, greater time in the work force, and experience.

[Table 5]

Having more supportive ties is associated with older age, being a member of an organization, and sending greater amounts of email by webphones (Table 6).[7] Hence, the differing number of supportive ties for users of webphones and PCs reflects disparities in the age of users of each mode rather than the mode itself. People tend to add to their supportive ties as they grow older they. People who are members of organizations tend to gather more supportive ties, especially when they are active members.[8] Frequent communication also matters: Those who send more than 6 emails by webphone have significantly larger supportive networks than those who did not send any emails by webphone. It may be that communication leads to more support; and it may be that those who need more support are in more communication (for similar pre-Internet Canadian data, see Wellman, 1979; Wellman & Wortley, 1990).

[Table 6]

Network Diversity: Diverse networks provide access to new sources of information and resources: The more different types of people you know, the more social milieus you are likely to be connected

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[7] The rather low explained variance (R^2) is common in Japanese surveys as many respondents do not want to divulge their personal income, and wealthier individuals tend to have more supportive ties.

[8] Organizational involvement was measured with a three-point scale (non-member, member, active member) for each of ten formal organizations, such as labor unions or charitable organizations, and three informal groups. Scores were summed to indicate a measure of group association.

with (Feld, 1982). Network diversity has many different facets, such as occupational diversity, gender diversity, ethnic diversity, etc. We focus on occupational diversity because people who work in different occupations often come from different social backgrounds (Lin, 2001). Respondents were asked to indicate if they have any relatives, friends, or acquaintances in any of 15 categories of diverse occupations. A count of the number of different occupation categories was made for each respondent, yielding a score from 0 to 15, with a higher score indicating greater diversity of contact.

Those who use only PCs for email score markedly higher on network diversity (mean score = 4.5) than the other categories: users of both webphones and PCs (4.1), non-users (3.6), and webphone-only users (3.6; Table 5). Similar to our analysis of supportive ties, we used regression analysis to see if this difference is actually linked to the mode of communication used. The data show that as is the situation for supportive ties, organizational involvement and frequent communication are positively associated with network diversity. In fact, involvements with formal and informal associations are the two strongest predictors to having occupationally diverse networks (Table 6). Not surprisingly, the more groups joined and actively involved with, the more varied are the occupations encountered. The data show that PC-based email facilitates political participation, while webphone-based email does not (for more details, see Ikeda, Kobayashi & Miyata, 2003).

Weak Ties: As we have hypothesized that webphones (like other cellphones) are especially important for maintaining strong ties (close friends and family) and PCs maintain weak as well as strong ties, we have tried to discern the size of weak tie networks. Yet, this is hard to do in a short, closed-ended survey. To estimate the size of weak tie networks, we asked respondents about how many New Year's greeting cards they had sent in the past year.[9] As the great majority of ties in a network are relatively weak (Bernard, et al., 1990; Watts, 2002), this is a crude estimate of the number of weak ties respondents have.

By contrast to our hypothesis, those who send emails only by PC sent a significantly larger number of greeting cards in the past year, a mean of 91 (Table 5). Users of both webphone and PC trail substantially, sending a mean of 61 cards. However, they send somewhat more than non-users (47) and webphone-only users (40).

Regression analysis shows that older age is positively associated with sending New Year's cards, as is organizational involvement, being married, and having at least a university education (Table 6). All of the variables provide contexts for meeting other people. Sending PC-based email is also positively associated, supporting our hypothesis that sending more PC-based email is associated with having larger networks and a larger number of weak ties.

As these associations between variables are similar to those found for the number of supportive ties and for the diversity of networks, it is not surprising that all three network variables are related: Larger numbers of weak ties are associated with more network support and more diverse networks. In general, those who use only PCs and those who use both PCs and webphones have more diverse networks and larger numbers of weak and strong ties than those who use only webphones and those who do not use either media. Their social networks lack richness in comparison to those who use PCs, whether in combination with webphones or not.

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[9] Sending New Year's cards in Japan is analogous to sending Christmas cards in North America.

The Networks of Dual Webphone and PC Email Users

The results above suggest that the natures of webphone and PC email are different: It is not that the media are fully substitutable, with the handiest one being used. For example, as PC email is entered by keyboard and is read on bigger screens, it should contain longer messages than webphones that use cumbersome thumbpads to write messages and small screens to read them. As weak ties are usually contacted less frequently, they may be likely contacted with longer, PC-based emails that explain their purpose in more detail than the common webphone messages: "I love you," "Meet me in 10 minutes" and "Please bring home a bottle of beer". In this way, the medium affects not only the message, but also the kind of person to whom the message is intended.

Network Characteristics and Modes of Communication: To investigate the relationship between network characteristics and modes of communication, we focused on those respondents who use both webphones and PCs to send emails. We have already seen that such dual users have more strong ties and more weak ties. Regression analysis also shows that for dual users, the frequency of sending PC-email is more strongly associated being in diverse social networks than is the frequency of sending webphone-email (Table 7). The more emails sent, the greater the statistical association, with the strongest association being among people who sent PC email at least 6 times yesterday. Moreover, moderate PC-email users (those who sent 1-5 messages yesterday) sent more New Year's cards, indicating having a larger number of weak ties in their networks. There is no association between sending webphone email and sending New Year's cards. Indeed, although it is not statistically significant, the data show that the more webphone messages sent, the smaller the greeting card network (Table 7).

[Table 7 about here]

As another indicator of the size of networks, respondents were asked to report the number of email addresses kept in their webphones or PCs. Those using both webphones and PCs keep an average of 36 addresses in their webphones and 23 in their PCs. Even if the addresses they kept in both devices overlap completely, we know there are still at least an average of 36 people with whom they have sent or received email. This number is much higher than the 26 addresses of those who only use a webphone and the 17 addresses of those who only use a PC.

Most of the ties in PC address books are weaker ties of acquaintanceship rather than stronger ties with close friends and family. This is because respondents report that they only exchange supportive email between 1 and 3 network members, presumably those with whom they have strong ties. This may be a low estimate, as both earlier Japanese (Otani 1999) and Canadian data (Wellman 1979; Wellman & Wortley 1999) shows a mean of 5 strong ties.[10] The inference is clear: only a few of the names in the PC and webphone address books are strong, supportive ties. Most are weaker, but still significant enough to be entered into address books. Moreover, many weak ties are not in these address books. They are answered when they contact the respondents, or their infrequently used addresses are found in other ways.

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[10] The greater Japanese reticence in disclosing personal information suggests that the number of Japanese relationships cannot be easily compared with the number of North American relationships.

The number of strong ties maintained through the use of email is greatest for those using both a webphone and a PC. Those using both a webphone and PC reported an average of 2.8 supportive people in their social networks, those using only a webphone reported 2.6, but those using only a PC reported a much lower total of 1.1 supportive people (F=11.33, p<.01). Thus, not only do people who use both webphones and PCs have larger networks and more contact with network members, they also have a larger number of supportive ties in their networks. Here too, using multiple media to communicate with network members is associated with being in larger, more communicative, and more supportive social networks.

Discussion

Summary

The use of webphones and PCs varies by age and gender. Those who only use webphones tend to be in their 20s and 30s, and rate themselves low in their ability to use technology. In addition to their heavy use of webphones, people in their 20s and 30s are also heavy users of PCs, with many being dual users of both webphones and PCs. Between the ages of 30 and 59 there is an increase in the proportion of respondents who exchange email through the use of PC only.

Although gender differences are not so great among those in their 20s, they become more pronounced among older respondents in their 30s and 40s. In these latter age groups, a greater percentage of men combine media, possibly because they are more likely to use PCs at work.

There is significant variation in the amount and kinds of contact with social networks by media. People use webphones more than PCs to send emails, even when they have both webphones and PCs available. Yet webphone email tends to be with people who are nearby, while PC email tends to be with people who are further away as well as nearby. Webphones are most often used to send short quick messages with close friends and family, allowing them to keep emotionally connected and organize meetings, or with those who are nearby, facilitating arrangement of everyday activities. Those who send many webphone emails have more supportive ties. By contrast, PC-based email messages are apt to be to weak as well as strong ties, and are not as likely to be linked to imminent physical get-togethers. Those who send many emails have larger and more diverse networks.

Using two modes of communication supports larger social networks. To a certain extent, the two modes are complementary, with webphone mail used differently than PC mail for maintaining ties. Webphone email is more closely associated with strong, supportive ties. PC email is used to contact weak as well as strong ties. Webphones support intensive relationships with loved ones and other strong ties. They are interfaces for intimate contact, and enable intimates to be accessible anywhere and anytime. By contrast, PCs support more extensive networks. They are interfaces with the rest of the world – as well as with intimates – and allow users to be selective in whom they are in contact with and when this contact takes place.

It is probable that within a short time, the great majority of Yamanashi residents will use both webphones and PCs to send messages. Hence, those respondents who mix media by using both webphones and PCs are a harbinger of this future. Not only do such dual-mode users have more strong and weak ties with whom they can exchange email, they are in more frequent contact with them. Moreover, those who exchange higher numbers of emails tend to have a greater number of strong ties.

Japan: A Mobile-ized Society

A Mobile-ized Society: The proliferation of the Internet is facilitating social changes that have been developing for decades in the ways that people contact, interact, and obtain resources with each other. Now the emphasis of connectivity in the developed world appears to be moving from transportation to communication: from airport terminals and road networks to computer terminals and networks. In this technologically changing world, the Yamanashi study indicates the interplay between communication modes and social networks in a society that is increasingly emphasizing computer-mediated communication. The study also shows that the North American Internet experience is not necessarily the norm for other developed societies.

There are important similarities, too. The Yamanashi evidence, taken together with research done in North America and Europe, shows that the Internet is not a self-contained transcendental world but is immanent in everyday life (Wellman & Hogan, 2004). Thus, these Japanese data are consistent with North American data that shows that people who use multiple media tend to have stronger and more frequently contacted ties (Wellman 1988, 1992; Haythornthwaite & Wellman, 1988; Wellman, Boase & Chen, 2002; Quan-Haase, et al., 2002; Castells, et al. 2003). Rather than operating at the expense of the "real" face-to-face world, the Internet is an extension, with people using all means of communication to connect with friends and relatives. The Internet is another means of communication that is being integrated into the regular patterns of social life. Other research by our NetLab suggests that this integration of online and offline life is also true for communities of practice at work (Haythornthwaite & Wellman 1998; Koku, Nazer & Wellman 2001; Koku & Wellman 2004).

The Yamanashi study highlights how different forms of computer-mediated communication are used for different purposes. Webphones are most often used to send short, quick messages with those who are physically near-by. They are less often used to access the Internet, and they are rarely used to gather information about social issues or to participate in online communities. It appears that webphones are useful to maintain strong ties with people who are socially or physically close (see also Rivière & Licoppe's French data, 2003). However, webphones are not used much to contact weaker ties or to develop more diverse networks. This may be because webphones are not well suited to afford connections to sites where weak tie relationships may be formed, such as chat rooms and issue-oriented sites. Then again, there may be a population cohort effect because webphone-only users are younger adults who may not be as interested in discussing issues as are middle-aged and older Japanese adults.

Our results call into question the traditional stereotype of Japan as a closed, bounded society (see also Meguro 1992; Nozawa 1996; Otani 1999, White 2002). People are on the move, getting information, making arrangements, and contacting friends and relatives through wireless webphones and wired PCs. Young adults in their twenties are especially heavy users of webphones. Yet, the fact that those in their thirties also use webphones heavily suggest that this is not a twenty-something phase. Rather, it is a trend towards mobile connectivity – which we call mobile-ization – that is becoming increasingly prevalent throughout Japanese society. As those in their twenties and thirties grow into middle-age, we expect their mobile communication to continue, although tempered by a heavier reliance on faster and more informative big-screen PCs at work and at home.

Towards Networked Individualism: The Yamanshi results support our NetLab's working assumption that developed societies, worldwide, are becoming less bound up in neighborhood and kinship solidarities and more constituted as networked individualism. The traditional criterion of "community" is of a neighborhood or village in which many of the residents know each other (Wellman & Leighton 1979). Yet, communities have become far-flung and privatized, shifting from groups interacting face-to-face in visible public spaces to individuals communicating privately over much larger distances. Communities and societies have been shifting towards networked societies where boundaries are more permeable, interactions are with diverse others, and linkages switch between multiple networks, (Wellman, 1997, 1999, 2001; Castells, 2000). Hence, many people communicate with others in ways that spread out across group boundaries. Rather than relating to one group, they cycle through interactions with a variety of others, at work or in the community. Their work and community networks are diffused, sparsely knit, with vague, overlapping, social and spatial boundaries.

Changes in the nature of computer-mediated communication both reflect and foster the development of networked individualism in networked societies. Internet and mobile phone connectivity is to persons and not, by contrast, to wired telephones that ring in a fixed place for anyone in the room or house to answer. The developing personalization, wireless portability, and ubiquitous connectivity of the Internet all facilitate networked individualism as the basis of community. The person has become the primary unit of connectivity, rather than the household, work unit, voluntary organization, or social group. Because connections are to people and not to places, the technology affords shifting of work and community ties from linking people-in-places to linking people anywhere. It is I-alone who is reachable wherever I am: at home, office, highway, shopping center, hotel, or airport. Computer-supported communication is every*where* but is situated no*where*. The person has become the portal.

This shift facilitates personal communities that supply the essentials of community separately to each individual: support, sociability, information, social identities, and a sense of belonging. The person, rather than the household or group, is the primary unit of connectivity. Just as 24/7/365 Internet computing means the high availability of people sitting in place at their desktop PCs, the proliferation of webphones and wireless computing is bringing an even higher availability of people without regard to place. Supportive convoys travel ethereally with each person (Ling & Ytrri, 2002; Katz, 2002). Webphones allow instant access to intimates and imminent gatherings. PCs allow more leisurely messages to intimates as well as more formed messages to a much larger of set of ties. By contrast to the one-to-one nature of webphones, PCs are more easily portals to chats and message-exchanges with large sets of people.

The technological development of computer networks and the societal flourishing of social networks are affording the rise of networked individualism in a positive feedback loop. Just as the flexibility of less-bounded, spatially dispersed, social networks creates demand for collaborative communication and information sharing, the rapid development of computer-communications networks nourishes societal transitions from group-based societies to network-based societies (Castells, 1996, 2000; Wellman, 2002). Moreover, networked societies are themselves changing in character. Until quite recently, transportation and communication have fostered place-to-place community, with expressways and airplanes speeding people from one location to another (without much regard to what is in between). Telephone and postal communication have been delivered to specific, fixed locations. At present, communication is taking over many of the functions of transportation for the exchange of messages.

Communication itself is becoming more mobile, with mobile phones and wireless computers proliferating.

In networked societies, each person is a switchboard, between ties and networks. People remain connected, but as individuals, rather than being rooted in the home bases of work unit and household. Each person operates a separate personal community network and switches rapidly among multiple sub-networks. The inherently personal and individualistic webphone makes this even more convenient. In effect, the Internet and other new communication technology are helping individuals to personalize their own communities. This is neither a *prima facie* loss nor gain in community, but rather a complex, fundamental transformation in the nature of community. For as Ito and Okabe point out (2004), even as the boundaries of physical co-presence weaken, new boundaries of online availability and shared attitudes may develop.

Not only has the volume of communication increased, we believe that the velocity of communication has also increased in Japan and elsewhere in the Internet-using world. Although email is asynchronous and does not necessitate instantaneous response, in practice many people respond quickly. Moreover, distant network members who did not have much contact when limited to face-to-face, telephone, or postal communication are now in frequent Internet contact. Telephone costs are plummeting and mobile phones mean availability is increasing even when people are away from home or workplace. Internet communication essentially ignores distance and minimizes per message costs. The further the distance between network members, the more important is the Internet in maintaining ties (Quan-Haase et al. 2002; Chen, Boase & Wellman 2002).

Thus, the impact of computer-mediated communication will be that people have larger-scale social networks: more people, more communication, and more rapid communication. Witness how those Yamanshi residents who use both webphones and PCs to communicate have larger social networks and more frequent communication with these networks. Large social networks with high frequencies and velocities of communication allow information – and perhaps knowledge – to diffuse more rapidly.

It is not clear if the high use of computer-mediated communication will foster more densely knit communities – good for conserving resources -- or more sparsely knit communities – good for obtaining new information and other resources. On the one hand, some characteristics of the Internet foster denser networks: the ability of Internet users to communicate simultaneously with multiple others, and the ease of copying and forward messages to others. In such cases, it is more likely for the friend of my friend to become my friend. On the other hand, as social networks become larger it is often more difficult for them to maintain their density. As the size of the network increases arithmetically, the number of ties must increase geometrically to maintain the same level of density.

The Yamanashi results suggest that webphone use may foster a complex digital divide. Social scientists have been discussing the digital divide at least for a decade: the gap between users and non-users of the Internet. More recently, they have highlighted the gap between those who merely have marginal access to the Internet and those who are active, informed users: what Manuel Castells (1996) calls "the interactors" and "the interacted" (see also Chen and Wellman 2004). Yamanashi shows us that even the "interactors" may themselves have limited use of the power of the Internet when they only use webphones. Limited screen size and access speed restrict the use of websites, keyboard limitations constrain the length and complexity of messages, and in Yamanashi at least, a more limited range of

people are contacted. Moreover, webphone messages are overwhelmingly segregated exchanges between two persons, while PC-based email involves bringing multiple others into conversations (Geser 2003). The result is a mixture of segregated, bilateral web conversations integrated with group-based chats with physically present friends (Ito & Okabe 2004).

The turn towards networked individualism before and during the age of the Internet suggests more people maneuvering through multiple communities of choice (where kinship and neighboring contacts become more of a choice than a requirement Wellman, 1999; Greer, 1962). This phenomenon started in Japan before the advent of the Internet (Nozawa, 1996, Otani, 1999), but webphones and PCs are probably accelerating it. Webphone users have the possibility of contacting whom they want, whenever they want, and wherever they are located. This suggests a fragmentation of community, with people increasingly operating in a number of specialized communities that rarely grab their entire, impassioned or sustained attention. The multiplicity of communities should reduce informal social control and increase autonomy. It is easier for people to leave unpleasantly controlling communities and increase their involvement in other, more accepting ones.

Networked individualism should have profound effects on social cohesion. Rather than people being a part of a hierarchy of encompassing polities like nesting Russian dolls, they belong to multiple, partial communities and polities. Some communities may be widely dispersed, such as those found in electronic diasporas linking far-flung members of emigrant ethnic groups (Mitra, 2003). Some may be traditional, local groups of neighbors with connectivity enhanced by listservs and other forms of computer mediated communication (Hampton, 2001). In a "glocalized" world, local involvements fit together with far-flung communities (Wellman, 2003), because the McLuhanesque "global village" (1962) complements traditional communities rather than replaces them. This is especially true today when almost all computers are physically wired into the Internet, rooting people into their desk chairs. Even as the world goes wireless, the persistence of tangible interests, such as neighborly get-togethers or local intruders, keep the local important (Hampton & Wellman, 2003). Local and long-distance – webphone and PC – it is all one fluid and complex social network.

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Table 1: Internet Activities in Yamanashi Prefecture

	Population (February 2003)	Internet Users*	Activities on Internet (percent of users)*			
			Exchange Information	Send Information	Gather Information	Others
Japan	127,450,000	46.4	39.5	5.6	32.4	14.0
Yamanashi	888,210	44.5	37.8	5.7	30.4	13.4

*Based on Survey of Time Use and Leisure Activities in 2001

Table 2: Percentage of Email Users by Gender and Age

Age	Men				Women			
	Both by Webphone and PC	By Webphone	By PC	Non-user	Both by Webphone and PC	By Webphone	By PC	Non-user
20-29	44.7	44.7	1.9	8.7	48.1	47.2	3.8	0.9
30-39	38.1	32.0	11.3	18.6	33.3	41.2	8.8	16.7
40-49	35.2	17.2	20.5	27.0	21.2	22.2	12.1	44.4
50-59	6.5	11.3	23.4	58.9	7.3	12.2	11.4	69.1
60-65	3.6	5.4	8.9	82.1	0.0	1.5	0.0	98.5

Table 3: Demographic Variables & Perceived Ability to Use Email Technology (Multiple regression)

	By Both Webphone and PC			By Webphone Only			By PC Only			Non Users		
	B	S.E.	Exp(B)	B	S.E.	Exp(B)	B	S.E.	Exp(B)	B	S.E.	Exp(B)
Gender												
(0=female,1=male)	−0.495 *	0.228	0.609	−0.120	0.201	0.887	−0.053	0.315	0.949	0.692 *	0.270	1.997
Age (reference=20-29)												
30-39	−0.714 **	0.272	0.490	−0.296	0.245	0.744	1.267 *	0.514	3.550	1.637 **	0.479	5.141
40-49	−0.870 **	0.299	0.419	−1.289 **	0.277	0.275	2.087 **	0.517	8.062	2.390 **	0.471	10.916
50-59	−2.098 **	0.374	0.123	−2.042 **	0.324	0.130	3.252 **	0.541	25.843	2.882 **	0.479	17.858
Over 60	−2.259 **	0.798	0.104	−3.340 **	0.586	0.035	2.399 **	0.780	11.014	3.738 **	0.592	41.996
Education (reference=middle school)												
High school	0.344	0.608	1.411	0.694	0.362	2.001	−0.081	0.676	0.922	−0.325	0.397	0.723
Some college	0.157	0.620	1.170	0.266	0.392	1.305	0.762	0.707	2.142	−0.242	0.448	0.785
Undergraduate degree or more	0.468	0.625	1.597	−0.623	0.431	0.536	1.363 *	0.692	3.908	−0.713	0.480	0.490
Employment Status (reference= full-time)												
Working Part-time	−0.231	0.327	0.793	0.046	0.270	1.047	−0.097	0.522	0.908	0.270	0.347	1.311
Self-employment	0.273	0.411	1.313	−1.075 *	0.503	0.341	0.443	0.438	1.558	0.260	0.417	1.297
Student	1.180 *	0.598	3.254	−0.615	0.569	0.541	−18.122	8611.048	0.000	0.554	1.279	1.741
Home Maker	−0.537	0.377	0.585	−0.380	0.315	0.684	0.615	0.471	1.850	0.703	0.369	2.019
Other type	−0.857 *	0.424	0.424	−0.009	0.303	0.991	0.952 *	0.423	2.592	−0.230	0.370	0.794
Unemployed	0.118	0.548	1.126	−0.630	0.480	0.532	0.303	0.841	1.353	0.648	0.635	1.912
Partner(0=no, 1=partner)	0.432	0.345	1.541	−0.564	0.305	0.569	0.082	0.429	1.086	0.425	0.387	1.529
Kids who living together(0=no, 1=yes)	0.414	0.294	1.513	0.081	0.269	1.085	0.095	0.315	1.100	−0.494	0.277	0.610
Perceived Ability to Use Technology	0.323 **	0.032	1.381	−0.051 *	0.023	0.950	0.297 **	0.040	1.346	−0.386 **	0.030	0.680
Constant	−6.081	0.793	0.002	0.824	0.519	2.279	−9.808	1.039	0.000	2.474	0.646	11.865
Cox & Snell R Square	0.311			0.174			0.178			0.504		

N=969

* = Significant at 0.05.   ** = Significant at 0.01.

Table 4: Distance (Percentage)

	By Both Webphone and PC		BY Webphone Only	By PC Only
Emails by Webphone	Emails by Webphone	Emails by PC	Emails by Webphone	Emails by PC
Living together	19.1	11.5	18.1	0.0
less than10 minutes away by car	12.7	4.9	13.5	3.8
less than 1 hour away by car	42.7	39.3	46.8	34.6
less than 5 hours away by car	19.7	34.4	18.1	38.5
more than 5 hours away by car	5.1	4.9	2.9	15.4
Living abroad	0.6	4.9	0.6	7.7

Table 5: Number and Diversity of Network

	By Both Webpohone and PC	BY Webphone Only	By PC Only	Non-users	F	
N	251	244	111	378		
Number of Supportive Ties*	2.53	2.49	2.49	2.38	2.67	*
Diversity of contancts	4.09 ab	3.60 b	4.48 a	3.63 b	3.48	*
Number of new year's cards sent	60.70 b	39.55 c	90.77 a	47.21 bc	19.87	**

* = Significant at 0.05.   ** = Significant at 0.01.

Means that share the same letter do not indicate a significant difference by Scheffe test.

Only those means with different letter pairs are significant (ie. a and b or b and c).

* The mean of sum up 3 items, informational, emotional and financial support.

Table 6: Regression Analysis: All Respondents

Predictors	Supportive Networks		Diversity of Contacts		# New Year's Cards Sent	
Gender (0=female,1=male)	0.046		0.320		11.512	*
Age (reference=20-29)						
30-39	-0.232	**	0.438		18.942	**
40-49	-0.279	**	0.307		14.804	*
50-59	-0.182		1.045	*	21.349	**
60-65	-0.104		0.424		25.338	**
Education (reference=middle school)						
High School	0.113		-0.377		9.116	
Some college	0.061		0.008		13.511	
Undergraduate degree or more	0.021		0.894		27.848	**
Employment Status (reference=full time worker)						
Part- time worker	0.042		0.049		-6.639	
Self-employment	-0.071		1.055	*	5.538	
Student	0.115		-2.593	**	-7.932	
Home Maker	0.062		0.255		-15.172	*
Other type	0.180	*	-0.446		-6.001	
Unemployed	-0.054		-0.838		-0.090	
Partner (0=no, 1=partner)	-0.070		-0.032		27.944	**
Kids who living together (0=no, 1=yes)	0.044		-0.369		-0.814	
Associations	0.473	**	3.618	**	25.189	**
Number of email sent by webphone yesterday (reference=nonusers)						
1 ~ 5	0.065		0.374		3.694	
6 ~ 10	0.255	*	1.473	**	-1.530	
More than 11	0.293	*	1.153		-1.332	
Number of email sent by PC yesterday (reference=nonusers)						
1 ~ 5	-0.010		-0.383		14.954	*
6 ~ 10	-0.210		0.799		-12.636	
Supportive networks			0.843	**	8.613	**
Diversity of Contacts	0.036	**			3.205	**
Number of Greeting Cards	0.001	**	0.011	**		
Constant	1.628		-3.542		-68.098	
Adjusted R²	0.126		0.237		0.233	
N	817		817		817	

* = Significant at 0.05.   ** = Significant at 0.01.

Table 7: Regression Analysis for Users of Both PCs and Webphones

Predictors	Supportive networks		Diversity of contacts with anyone		Number of new year's cards sent	
Gender (0=female,1=male)	0.058		0.379		11.734	
Age (reference=20-29)						
30-39	-0.260	*	-0.237		19.720	*
40-49	-0.479	**	-0.043		21.863	*
50-59	-0.133		-0.302		21.192	
60-65	-1.908	**	-0.255		113.682	*
Education (reference=middle school)						
High School	-0.193		-3.507	*	12.985	
Some college	-0.180		-3.619	*	19.293	
Undergraduate degree or more	-0.157		-2.877		23.376	
Employment Status (reference=Full time						
Part-time worker	0.153		-0.447		-3.649	
Self-employment	0.214		-0.253		-12.802	
Student	-0.123		-1.843	*	-13.582	
Home Maker	0.263		-0.240		-10.120	
Other type	0.540	*	-0.310		-16.096	
Unemployed	0.083		-0.321		1.447	
Partner(0=no, 1=partner)	-0.037		0.706		24.654	*
Kids who living together(0=no, 1=yes)	-0.049		-0.608		6.399	
Associations	0.305		2.710	**	21.726	
Number of email sent by webphone yesterday (reference=nonusers)						
1~5	0.020		0.780		-4.141	
6~10	0.174		0.900		3.319	
More than 11	0.292		0.497		-7.952	
Number of email sent by PC yesterday (reference=nonusers)						
1~5	-0.120		-0.367		21.631	**
6~10	-0.420		3.727	**	-13.229	
Supportive networks			0.836	**	17.040	**
Diversity of Contacts	0.045	**			1.915	
Number of Greeting Cards	0.003	**	0.006	**		
Constant	2.061		0.738		-77.142	
Adjusted R^2	0.177		0.228		0.303	
N	219		219		219	

* = Significant at 0.05.   ** = Significant at 0.01.

Figure 1: Email Users by Age

Percentage of email users

	20-29	30-39	40-49	50-59	60-65
Both by Webphone and PC	45.9%	35.7%	29.0%	6.9%	1.7%
By Webphone	46.4%	36.7%	19.5%	11.7%	3.3%
By PC	2.9%	10.0%	16.7%	17.4%	4.1%
Non-user	4.8%	17.6%	34.8%	64.0%	90.9%

age

Legend: Both by Webphone and PC — By Webphone — By PC — Non-user