

Dominic Madell & Steven Muncer

ARE INTERNET AND MOBILE PHONE COMMUNICATION COMPLEMENTARY ACTIVITIES AMONGST YOUNG PEOPLE?

A study from a 'rational actor'
perspective

Authors have noted that young people like to use the Internet and mobile phones for communication purposes. This paper reports results concerning use of the Internet and mobile phones for communication from a survey of 1340 English secondary schoolchildren conducted in 2002 and examines whether the use of either of these forms of communication technologies occurs at the expense of the other amongst this group. In agreement with background literature, it was found that communication via the Internet and mobile phones was popular amongst young people and small but significant positive correlations amongst the sample for measures of the use of the Internet and mobile phones for communication purposes were also discovered. This latter finding implies that these communication media are complementary rather than substitutable amongst young people. This article discusses a number of possible reasons for the popularity of the Internet and mobile phones for communication amongst young people and states that the positive correlations imply that children are 'rational actors' where communication via modern technology is concerned. That is, young people use the Internet and mobile phones strategically to meet different communication needs. It is concluded that as both of these forms of communication technology can be employed to achieve different purposes, the result is that neither negates the use of the other amongst this group.

Keywords chat room; children; communication; email; Internet; mobile phone

Introduction

The significance of communication over information provision as a purpose of the Internet has been recognized by a number of authors. For example, Odlyzko (2001, p. 1) stated that whilst industry leaders often tend to assume that 'Content is king' with regard to the Internet, it is actually connectivity that is more important for this technology since email is its most popular use. Likewise, Kraut (in press) (cited in Baym 2002) stated that email is the Internet's 'killer app' and also best predicts whether new users will stay online. Also, Smoreda & Thomas (2001) stated that Internet users' social networks are larger and more active than those of non-users, which implies that an important function of the Internet is communication. Biocca (2000, p. 26) also claimed that social aspects of the Internet are what draw people to it, stating that 'Internet services that allow like-minded people to gather and inter-connect are booming' and Joinson (2003, p. 188) described how some Internet search engines already focus more on social connectivity than content. He stated: 'Yahoo! now provides email, chat rooms, e-groups, instant messaging and personal spaces, with web directories and directed access to content seemingly relegated to a more minor role'. Joinson also opined that the Internet will be used more and more for social purposes as time goes on, as occurred historically with the telephone, citing Fischer (1992) who described how social uses of the telephone were initially discouraged by industry executives until the 1920s. (Before this time the telephone was viewed as a tool whose proper use was for business purposes.)

It has also been noted that young people in particular like to use the Internet for communication purposes. Pastore (2002) stated that according to AOL the Internet is the principal form of communication for teenagers, being more important to them than even the telephone. (Although it should be noted that Jordan (2001) stated that commercial data sometimes overestimate the importance of the Internet for its own purposes.)

However, there has been some concern in the past from researchers about the potential negative effects of the Internet on social well-being. For example, Kraut *et al.* (1998) and Nie & Erbring (2000) reported evidence which appears to indicate that those who use the Internet become socially withdrawn and experience negative psychological symptoms. However, these studies have been criticized: Rierdan (1999) attacked the study by Kraut *et al.* (1998) on methodological grounds and Baym (2002, p. 72) stated that Nie & Erbring's study, 'has been challenged for its leading questions, for offering no assessment of the magnitude of reported reductions in social contact, and for assuming all online activities are "non-social"'. Furthermore, Kraut *et al.* themselves stated that the findings of their 1998

study were not necessarily generalizable across different groups of people and over time (Kraut *et al.*, 2002) and, in a follow-up study of their 1998 respondents conducted three years later, Kraut *et al.* (2002) found that most of the negative effects of the Internet had disappeared.

Also, other studies have made positive findings with regard to Internet use and social well-being. Katz & Aspden (1997) did not find differences between Internet users and non-users in their sample for participation in religious, leisure and community organizations and also showed that in many cases use of the Internet augmented traditional social connectivity such as contacting family members. In addition, many of their sample developed friendships over the net and for the vast majority of users time spent with family and friends had not changed since they had started using the Internet. Kraut *et al.* (2002) also found positive effects of using the Internet on communication, social involvement and well-being in a longitudinal survey of 406 new computer and television users, and, in contrast with Kraut's (1998) finding, Franzen (2000) found that Internet use did not decrease respondents' network size or time spent with friends, and that email did not have negative effects on people's social networks. Finally, in a review of the Internet literature, Livingstone (2002, p. 13) indicated that communication via this medium is a healthy way for young people to socialize. She claimed that the literature shows that young people use online communication combined with offline forms in order to maintain usually local social networks and stated, 'for all but the already-isolated, the Internet supports rather than undermines existing social contacts'.

Like the Internet, the mobile phone is also a modern technology the use of which has risen dramatically in the last decade or so, and, like the Internet, the mobile phone has been massively employed as a communication device. However, attempts to promote this device as an information-seeking tool have met with far less success than similar attempts with the Internet. Whilst authors have argued that the primary purpose of the Internet is for communication as described previously, few could claim that information-seeking is not also a significant function of this technology. However, this is not necessarily the case with mobile phones: one could contend that communication is really the sole significant function of the mobile phone for most people. In support of this point, Odlyzko (2001) notes the popularity of text messaging compared with the relative failure of WAP technology.

So, like the Internet, mobile phones are a technology used widely for communication purposes. Furthermore, like the Internet they are also especially popular amongst young people. Ling (2000) has stated that the mobile phone is important to teenagers for a number of reasons relating to availability, emancipation, security and micro-coordination and also describes how the mobile phone can be used as a crystallization symbol for adolescents, stating that even if they do not wish to own a mobile phone themselves, the existence of this technology within society allows them to define their

identity in terms of being against it. A study by Charlton *et al.* (2002) also highlighted the importance of mobile phones amongst groups of young people. This study discussed how in some cases they might be excluded from social groups because of lack of mobile phone ownership and also indicated that children who do not use mobile phones might be less likely to become adept at using other communication technologies.

Given that studies have indicated the importance of both Internet and mobile phone-based communication for young people, the question arises: does the use of one of these forms of technology for communication purposes negate the use of the other? For example, it might be the case that as mobile phones have now become popular some of the functions of the Internet have been replaced by this technology. One could certainly imagine, for example, the possibility that text messaging might have reduced the need for young people to send emails. If it were the case that mobile phones were fulfilling some of the functions of the Internet then one would expect to find negative correlations between measures of the use of these technologies.

However, one could equally conceive of a certain type of 'technologically competent' young person who would be likely to use both the Internet and mobile phones for different types of communication depending on the circumstances in which he/she wanted to communicate. There is evidence that people use different forms of communication technology for different purposes. For example, Smoreda & Thomas (2001) found that although the social networks people contacted using a mobile phone tended to be similar to those contacted on a landline, they were also smaller and more orientated towards friends than family. Further, they found text-message-based networks exaggerated this tendency still further and that email-based networks were the smallest and widest. Smoreda & Thomas (2001) also found that there was a tendency for people to use mobile phones, text messaging and email side by side and, notably, that those under the age of 25 years of age did this the most heavily. If the use of Internet technology for communication actually encourages the use of mobile phones (or vice versa), one would expect to find positive correlations between measures of use of these. The relationship between use of the Internet and mobile phones by young people for communication purposes is the subject of this paper.

Method

Design and measure

This paper focuses on the results of some of the questions asked in a survey of children's Internet and mobile phone use that was carried out between March and May 2002.

The questions examined in this paper all relate to communication via either the Internet or mobile phone and are as follows: 'Do you use the Internet for email?', 'Do you have a personal email address?', 'How often do you use the Internet for email?', 'Do you use chat rooms or sites?', 'Do you use your mobile phone for making calls?', 'Do you use your mobile phone for receiving calls?', 'Do you use your mobile phone for text-messaging?', 'How many phone calls do you make using your mobile phone?', and 'How many text messages do you send using your mobile phone?'. In addition, the answers to two other questions asked in the survey are described in this paper to indicate the popularity of Internet and mobile phone use. These are: 'Do you use the Internet?' and 'Do you have a mobile phone?'

Sample information

A total of 1340 students from secondary schools in Teesside, an area in the north-east of England, were surveyed. The students were from four secondary schools based in four different wards of Stockton-on-Tees, which is located in Teesside. (The term 'ward' describes the electoral divisions within the local authority). According to the National Statistics 'Neighbourhood Statistics' website, which quotes figures from the 'Department of Transport, Local Government and the Regions, Indices of Deprivation 2000', in the year 2000 Stockton-on-Tees was the 111th most deprived district in the UK out of 354 districts (where 1 was the most deprived and 354 the least). Table 1 gives information about the schools.

By gender, 50.5 per cent of the participants ($n = 677$) were male and 49.1 per cent ($n = 658$) were female (the remaining participants did not state their gender). Students were aged between 11 and 16 years old: the mean age of males was 13.2 years and the mean age of females was also 13.2 years. The participants from the schools used in the survey can be considered reasonably representative of the UK (if not necessarily English) secondary school students in many respects. For example, none of the schools was located in an area of extreme deprivation or extreme affluence and the mean GCSE point score for all the schools was quite close to the national average. Also, in terms of ethnicity the sample can be considered fairly representative of the rest of the UK, with the possible exception that people of Asian origin are under-represented. To illustrate, the Office for National Statistics (2002b) estimates that in April 2001, 92.1 per cent of the UK population could be described as 'White' compared with 91.6 per cent in this sample, 2.0 per cent could be described as 'Black Caribbean/Black African' or 'Black Other' compared with 1.0 per cent described as 'African/Afro-Caribbean' in this sample, 4.0 per cent could be described as 'Indian, Pakistani, Bangladeshi' or 'Other Asian' compared with 0.3 per cent described as 'Asian' in this sample, and 0.4 per cent were described as

TABLE 1 Information about schools used in survey

<i>school</i>	<i>name of ward in which school was located</i>	<i>type of school (age of pupils in years)</i>	<i>position of ward on Indices of Deprivation (2000)^a</i>	<i>mean GCSE point score for school in year 2000^b</i>	<i>percentage of sample which came from school (n)</i>
School A	Wolviston	Mixed comprehensive (11–16)	6723	40.5	64.1 (n = 859)
School B	Fairfield	Mixed comprehensive (11–16)	4403	40.2	28.8 (n = 386)
School C	Marsh House	Mixed comprehensive (11–16)	2965	35.2	3.7 (n = 49)
School D	Yarm	Mixed comprehensive (11–18)	6896	51.0	3.4 (n = 46)

^a This is from a total of 8414 English wards where 1 is the most deprived and 8414 is the least.

^b The points system is calculated by the following number of points being given for each grade received in a GCSE exam: A* = 8, A = 7, B = 6, C = 5, D = 4, E = 3, F = 2, G = 1. The national average GCSE point score for 15-year-old children in England in the year 2000 was 40.6 (Department for Education and Skills, 2000).

‘Chinese’ compared with 0.3 per cent described as ‘Oriental’ in this sample. Finally, 0.1 per cent of participants from this sample could be described as ‘Arabic’ but there is no comparative figure from the Office for National Statistics for this group. The remainder of the participants used in this survey (6.7 per cent) did not state their ethnic background.

Procedure

In two cases (Schools A and B), questionnaires were delivered to the school for teachers to administer and collect. In the other two cases (Schools C and D) one of the authors administered and collected the questionnaires. Participation in the survey was voluntary.

Results

Results concerning some of the questions asked of the participants are given in Tables 2–5.

TABLE 2 Percentage of children who considered themselves Internet users

<i>question</i>	<i>percentage of those who answered question (99.3 per cent of sample) who said 'yes'</i>
Do you use the Internet?	83.0

TABLE 3 Answers to questions concerning Internet communication

<i>question</i>	<i>percentage of Internet users who said 'yes'</i>
Do you use the Internet for email?	54.0
Do you have a personal email address?	73.9
Do you use chat rooms or sites?	20.4

TABLE 4 Percentage of children who said they had a mobile phone

<i>question</i>	<i>percentage of those who answered question (96.0 per cent of sample) who said 'yes'</i>
Do you have a mobile phone?	86.0

TABLE 5 Answers to questions concerning mobile-phone communication

<i>question</i>	<i>percentage of mobile phone users who said 'yes'</i>
Do you use your mobile phone for making calls?	91.9
Do you use your mobile phone for receiving calls?	80.0
Do you use your mobile phone for text-messaging?	89.4

In addition, answers to three other questions asked of participants: 'How often do you use the Internet for email?', 'How many phone calls do you make using your mobile phone?' and 'How many text messages do you send using your mobile phone?' are shown in Figures 1–3.

Table 2 indicates that around four-fifths of the young people surveyed used the Internet. Table 3 shows that over half of these used the Internet for email, although around three-quarters said they had an email address. Around a fifth of young Internet users said they used the Internet for chat rooms or sites. Table 4 indicates that the vast majority of young people had a mobile phone and Table 5 shows that most used them for making and receiving calls and text messaging.

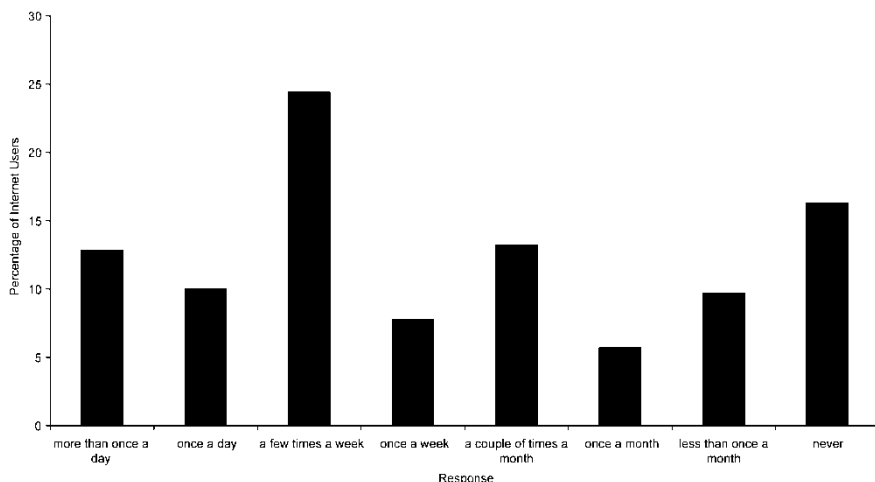


FIGURE 1 Frequency of use of the Internet for e-mail

Figure 1 shows that the modal category for participants’ use of the Internet for email was ‘a few times a week’, although a considerable proportion of respondents used the Internet more or less often for this purpose as well. Figure 2 shows that the modal category for number of phone calls made by mobile phone users was ‘a few a week but less than one a day’, although a considerable proportion of respondents also used their mobile phones more or less often for this purpose as well. Figure 3 shows that the modal category

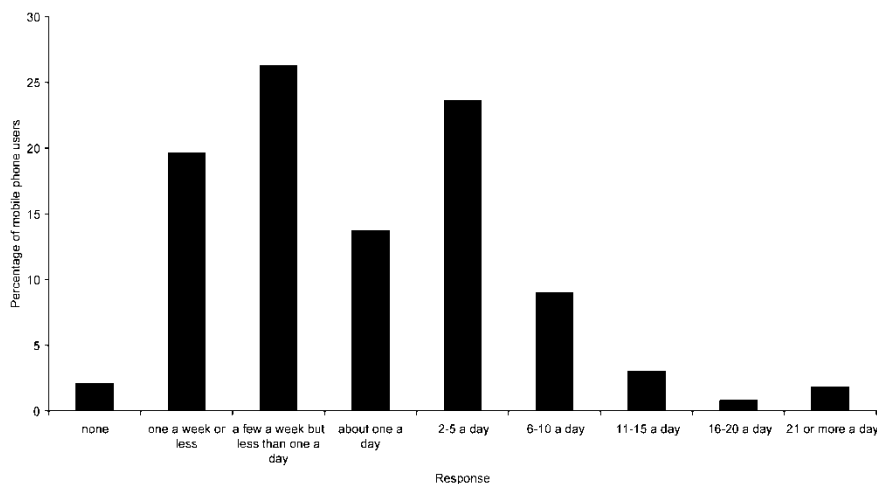


FIGURE 2 Number of calls made by mobile phone

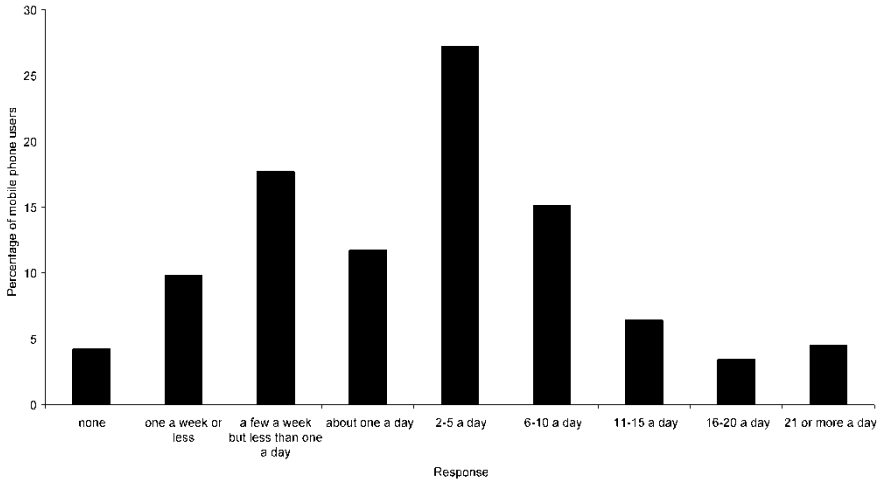


FIGURE 3 Number of text messages sent with mobile phone

for number of text messages sent using a mobile phone by participants was ‘2–5 a day’, although again a considerable proportion of respondents used their mobile phones more or less often for this purpose as well.

Table 6 shows gender differences in the percentage of participants who use both the Internet and mobile phones, just one of these technologies, or neither. The results indicate that just fewer than three-quarters of both males and females were users of both the Internet and mobile phones. A chi-squared test carried out on these data revealed that there was no association between gender and whether or not participants used both, one or neither of these technologies ($\chi^2 = 0.807, p > 0.05$).

Table 7 shows ethnic differences in the percentage of participants who used both the Internet and mobile phones, just one of these technologies, or neither. The results indicate that most members of most ethnic groups were users of both technologies (although it should be noted that numbers of all but those in the ‘White’ group were low). A chi-squared test carried

TABLE 6 Percentage of participants who use both the Internet and mobile phones, just one of these technologies, or neither by gender

gender	use of Internet and/or mobile phone (per cent)		
	neither	one of the two	both
Male	3.9	23.6	72.5
Female	3.0	24.1	72.9

TABLE 7 Percentage of participants who use both the Internet and mobile phones, just one of these technologies, or neither by ethnicity

<i>ethnic group</i>	<i>use of Internet and/or mobile phone (per cent)</i>		
	<i>neither</i>	<i>one of the two</i>	<i>both</i>
White	3.1	23.7	73.2
Asian	0	0	100
Arabic	0	0	100
Oriental	0	0	100
African/Afro-Caribbean	8.3	25.0	66.7

out on these data revealed that there was no association between ethnicity and aptness to use both, one or neither of these technologies ($\chi^2 = 0.807$, $p > 0.05$).

Table 8 shows correlations between questions asked in the survey concerning communication via the Internet and mobile phones. In general, the

TABLE 8 Correlations between Internet and mobile-phone communication

<i>question</i>	<i>do you use the Internet for email?</i>	<i>do you have a personal email address?</i>	<i>how often do you use the Internet for email?</i>	<i>do you use chat rooms or sites?</i>
Do you have a mobile phone?	$\Phi = .090$, $p < .005$	$\Phi = .056$, $p > .05$	$r_{pb} = .081$, $p < .01$	$\Phi = .078$, $p < .05$
Do you use your mobile phone for making calls?	$\Phi = .056$, $p > .05$	$\Phi = .071$, $p < .05$	$r_{pb} = .066$, $p < .05$	$\Phi = .029$, $p > .05$
Do you use your mobile phone for receiving calls?	$\Phi = .219$, $p < .0005$	$\Phi = .127$, $p < .0005$	$r_{pb} = .117$, $p < .0005$	$\Phi = .090$, $p < .01$
Do you use your mobile phone for text-messaging?	$\Phi = .231$, $p < .0005$	$\Phi = .166$, $p < .0005$	$r_{pb} = .160$, $p < .0005$	$\Phi = .101$, $p < .005$
How many phone calls do you make using your mobile phone?	$r_{pb} = -.023$, $p > .05$	$r_{pb} = -.061$, $p > .05$	$r_s = .090$, $p < .01$	$r_{pb} = .073$, $p < .05$
How many text messages do you send using your mobile phone?	$r_{pb} = .090$, $p < .01$	$r_{pb} = .052$, $p > .05$	$r_s = .196$, $p < .0005$	$r_{pb} = .125$, $p < .0005$

results show that there are many small, but significant positive correlations between questions relating to Internet and mobile phone communication. The significant correlations range from 0.066 to 0.196.

Conclusion

The results indicate that some, but by no means all, children use email (83.0 per cent of children classed themselves as Internet users and 54.8 per cent of these said that they used the Internet for email). However, nearly three-quarters of Internet users said they had a personal email address, which implies that some children have email addresses that they do not use. Internet users tended to use the Internet for email 'a few times a week'. A sizeable proportion of young Internet users frequented chat rooms or sites, but rather fewer than used email – only around a fifth of them said that they used the Internet for this purpose.

The survey also revealed that most children had a mobile phone (83.0 per cent). This figure for mobile phone ownership is rather higher than a similar one found in an NOP survey (2001) (http://www.nop.co.uk/news/news_survey_half_of_7-16s.shtml), which stated that only 48 per cent of 7- to 16-year-olds owned a mobile phone. This might be accounted for because much of the NOP sample was younger than that used in the present survey and also because the NOP survey was conducted over a year prior to the present one. However, the NOP survey also found that only 77 per cent of 14- to 16-year-olds owned a mobile phone, which suggests mobile phone ownership amongst young people has increased during the period between when that survey and this one were conducted.

The vast majority of mobile-phone owning children used their phones for making and receiving calls and text messaging. Most mobile phone-owning participants used their phones to make a few phone calls a week (less than the two calls made a day that the NOP survey stated its participants made), and a few text messages a day (this figure does concur with the NOP figure, which states that young people tend to send two or three text messages daily). This latter finding reflects the current popularity of text messaging via mobile phone amongst young people.

There were no gender or ethnic differences revealed in the use of both the Internet and mobile phones, just one of these technologies, or neither. As there were large numbers of male ($n = 677$) and female ($n = 658$) school-children participating in this research, the finding concerning lack of a gender difference in use of these technologies can be considered fairly robust and indicative that both male and female young people are equally likely to be users of both the Internet and mobile phones. However, the fact that few participants from ethnic groups other than 'White' were

surveyed means that it is difficult to speculate about the uniformity of Internet and mobile phone usage between different ethnic groups.

The small but significant positive correlations between most of the questions relating to Internet and mobile phone use given in Table 6 imply that mobile phone and Internet communication are complementary activities amongst young people. The results indicate that if young people use the Internet to communicate then they are also (slightly) more likely to use a mobile phone, which supports findings by Smoreda & Thomas (2001) as discussed previously. Joinson (2003, p. 52) has discussed the 'rational actor approach' to the use of technology as described by Kling (1980) and Markus (1994) (cited in Joinson, 2003) and this may apply to young people. This theory maintains that people use the various features of different forms of communication technology strategically to meet their communication needs rather than technology itself determining people's behaviour. Therefore, in this case, young people are inclined to use the specific features of each type of technology to their best advantage. This could be a reason for the fact that there is a positive correlation between Internet and mobile phone communication: neither technology negates the necessity of use of the other amongst young people because they serve different purposes. Rather, an inclination towards technology amongst young people encourages most of them to use both the Internet and mobile phones for different types of communication.

Research provides some support for this conclusion. For example, this has indicated that computer-mediated communication (CMC) via the Internet has been used by young people to achieve a variety of different purposes. Livingstone & Bober (2003) illustrated this point with qualitative research findings concerning a number of forms of communication technology drawn from 14 focus groups with children. To take the example of email first, Livingstone & Bober's research found that young people described how they found email useful for a number of purposes, including: communicating cheaply with friends and relatives in other countries, sending longer messages, talking about personal issues, 'telling secrets', dealing with awkward situations such as ending relationships and even communicating with celebrities. It may also be the case that email (and, in fact, other forms of CMC) appeals to teenagers because it does not communicate power and prestige as it does not convey information about, for example, age, as other forms of communication such as voice phone calls might. Therefore, the young person's opinion may hold more weight than it would do via other forms of technology or with face-to-face communication. Tapscott (1998) argued that adults might take a well-reasoned argument more seriously online if the receiver of it was not aware, for example, that it came from a 14-year-old adolescent.

Livingstone & Bober (2003) also found that chat rooms were used by young people for certain other communication purposes (although, importantly, they also noted that, in many cases, 'Instant Messaging', which allows one to communicate online outside a public forum, was becoming more important to children than chat rooms). Chat rooms were used for 'messaging around', as a place for individuals' social networks to meet up and, interestingly, for seeking personal advice. One participant, Nina, described why chat rooms were useful for this final purpose by saying: 'If it was something you didn't want people to know about, then you'd probably say it in a chat room, because they don't know you, and you can just forget about it once it's gone' (Livingstone & Bober 2003, p. 19).

Baym (2002) also discussed how CMC provides reduced social cues affording the user a higher degree of privacy and a lower sense of social risk and accountability, which allows communicators to experiment with multiple identities. This may be another reason for the appeal of chat rooms to some young people. If Eriksson's theory of psychosocial stages is accepted (cited in, for example, Bee 1998), which asserts that adolescence is a time in which experimentation with identities is of paramount importance for teenagers to achieve a stable identity, then one can see how using chat rooms might allow young people to achieve this purpose. Orleans & Laney (2000, p. 65) also argued that, 'the opportunity to try on a variety of personas is one of the attractions and hallmarks of online activity. This can contribute to the development of social competency among adolescents' and Tapscott (1998), whilst agreeing that the Internet is a medium that allows adolescents to explore the self and establish an identity, even averred that cyber-dating might act as a prelude to real romantic relationships amongst some adolescents. Baym (2002, p. 71) also argued that friendships and social groups form online, the latter offering 'a sense of belonging, information, empathy and social status...'. Such relationships are likely to appeal to teenagers for whom social matters are often very important.

Finally, chat rooms also appeal to adolescents because of their often light-hearted nature. Baym (2002) cited Danet *et al.* (1997, p. 66) who stated that computer communication is inherently playful because of its 'ephemerality, speed, interactivity, and freedom from the tyranny of materials'.

Livingstone & Bober (2003) also discussed why young people like to use mobile phones for some, often different, communication purposes. For example, they described how one participant in their research stated that voice calls or text messaging were useful because they could be made from any location. However, text was often preferred to voice calls for financial reasons, which might be one of the reasons why more text messages were sent than voice-calls made amongst young people involved with this research.

Grinter & Eldridge (2001) also conducted some interviews with children regarding their use of mobile phones (principally for text-messaging).

From these, they drew conclusions as to some of the reasons why young people may prefer to use mobile phones instead of other communication devices in various situations. They described how children stated that they may text-message or even make voice-calls to their friends' mobiles in order to arrange landline phone calls as this allowed them to avoid talking to their friends' parents, whilst at the same time taking advantage of the lower cost of landline phone calls. They also discussed how young people used their mobile phones for 'hypercoordination' (defined as 'the practice of frequently revisiting and revising arrangements with others using a mobile' (Grinter & Eldridge 2001, p. 227)). For example, if someone was late for a trip to the cinema, others in a group could be easily informed. Grinter & Eldridge (2001) also indicated how young people used one of the supposed shortcomings of text-message communication, namely a small character limit, to their advantage. Interviewees described how this feature allowed them to forego conversational etiquette and get directly to the point of a conversation, thus saving them time and money. Furthermore, the use of text-messaging also prevented those contacted from wandering 'off-topic' in the case of people who talked too much, and reduced sensations of awkwardness in the case of conversations with those who were difficult to talk to. This research also indicated that teenagers used text-messaging to control their mobile phone expenditure, as text messages are charged at a fixed rate, compared with phone calls which vary in cost with duration and distance. Finally, the discreetness of text-messaging meant that it could be used when other forms of communication were inappropriate or impossible, for example when the person being contacted was in a public situation.

The practice of text messaging has also been discussed by Kasesniemi & Rautiainen (2002, p. 182), specifically amongst Finnish teenagers. They stated that 'message collecting, circulating chain messages and collective reading and composing, are means by which teens enact their own message culture'. Kasesniemi & Rautiainen also discussed how adolescents may often appear to have two personalities: a 'brave' one when they converse via text-message and a more reserved one during face-to-face communication. Thus, as with CMC, text-messaging may be popular amongst adolescents because it mediates communication, reducing social risk. Furthermore, like CMC, text-messaging may be popular amongst the young because of its inherently playful nature. Danet's (1997) (cited in Baym 2002, p. 66) description of CMC's 'ephemerality, speed, interactivity, and freedom from the tyranny of materials' could equally be applied to text-messaging as to CMC. Furthermore, as has been stated, adolescence is traditionally a time in which socializing becomes important, especially with the opposite sex, so communication via text-message for social purposes may be easier for young people who are developing social skills or who are shy. It may

also give adolescents time to think about how best to phrase messages that communicate delicate subjects and, finally, it may also be the case that text-messaging is popular amongst adolescents because it allows them to practise surreptitious communication or transfer light-hearted messages that are not necessarily worth a phone call.

To conclude, the positive correlations between measures of communication by Internet and mobile phone found in this study indicate that young people use different forms of communication technology for different purposes depending, for example, on the social, practical and financial circumstances of the situation. This supports the 'Rational Actor' approach to the use of technology as described by Joinson (2003). As both Internet and mobile phone communication can be employed to achieve different purposes, as described, the result is that these technologies complement rather than substitute for each other amongst young people.

Acknowledgements

This study was funded by the University of Durham.

References

- Baym, N. K. (2002) 'Interpersonal life online', in *The Handbook of New Media*, ed. L. A. Lievrouw & S. Livingstone, Sage Publications, London, pp. 67–76.
- Bee, H. (1998) *Lifespan Development*, 2nd edn, Longman, Harlow.
- Biocca, F. (2000) 'New media technology and youth, trends in the evolution of new media', *Journal of Adolescent Health*, vol. 27S, pp. 22–29.
- Charlton, T., Panting, C. & Hannan, A. (2002) 'Mobile telephone ownership and usage among 10- and 11-year-olds: participation and exclusion', *Emotional and Behavioural Difficulties*, vol. 7, no. 3, pp. 152–163.
- Franzen, A. (2000) Does the Internet make us lonely?, *European Sociological Review*, vol. 16, no. 4, pp. 427–438.
- Grinter, R. E. & Eldridge, M. (2001) 'Y do tngrs luv 2 txt msg?', [Online] Available at: <http://www2.parc.com/csl/members/grinter/ecsw.pdf> (January 2004).
- Joinson, A. N. (2003) *Understanding the Psychology of Internet Behaviour: Virtual Worlds, Real Lives*, Palgrave Macmillan, Basingstoke.
- Jordan, T. (2001) 'Measuring the Internet: host counts versus business plans', *Information, Communication and Society*, vol. 4, no. 1, pp. 34–53.
- Kasesniemi, E. & Rautiainen, D. (2001) 'Mobile culture of children and teenagers in Finland', in *Perpetual Contact: Mobile Communication, Private Talk and Public Performance*, eds J. E. Katz & M. A. Aakhus, Cambridge University Press, Cambridge, pp. 170–192.

- Katz, J. E. & Aspden, P. (1997) 'A nation of strangers?', *Communications of the ACM*, vol. 40, no. 12, pp. 81–86.
- Kraut, R., Lundmark, V., Patterson, M., Kiesler, S., Mukopadhyay, T. & Scherlis, W. (1998) 'Internet paradox, a social technology that reduces social involvement and psychological well-being?', *American Psychologist*, vol. 53, no. 9, pp. 1017–1031.
- Kraut, R., Kiesler, S., Boneva, B., Cummings, J., Hegelson, V. & Crawford, A. (2002) 'Internet paradox revisited', *Journal of Social Issues*, vol. 58, no. 1, pp. 49–74.
- Ling, R. (2000) "We will be reached", the use of mobile telephony among Norwegian youth', *Information Technology and People*, vol. 13, no. 2, pp. 102–120.
- Livingstone, S. (2002) 'Children's use of the Internet: a review of the research literature', [Online] Available at: http://www.ncb.org.uk/resources/lit_review.pdf (January 2004).
- Livingstone, S. & Bober, M. (2003) 'UK children go online, listening to young people's experiences', [Online] Available at: <http://personal.lse.ac.uk/bober/UKChildrenGoOnlineReport1.pdf> (January 2004).
- Nie, N. H. & Erbring, L. (2000) 'Internet and society, a preliminary report', [Online], Available at: <http://www.stanford.edu/group/siqss/> (January 2004).
- NOP World Survey (2001) 'Half of 7–16s now have a mobile phone', [Online] Available at: http://www.nop.co.uk/news/news_survey_half_of_7-16s.shtml (January 2004).
- Odlyzko, A. (2001) 'Content is not king', [Online] Available at: http://firstmonday.org/issues/issue6_2/odlyzko/index.html (January 2004).
- Office for National Statistics (2002a) 'Neighbourhood statistics', [Online] Available at: <http://www.neighbourhood.statistics.gov.uk/home.asp> (January 2004).
- Office for National Statistics (2002b) 'Population size, 7.9 per cent from a minority ethnic group', [Online] Available at: <http://www.statistics.gov.uk/cci/nugget.asp?id=273> (January 2004).
- Orleans, M. & Laney, M.C. (2000) 'Children's computer use in the home: isolation or sociation?', *Social Science Computer Review* vol. 18, no. 1, pp. 56–72.
- Pastore, M. (2002) 'Internet key to communication among youth', [Online] Available at: http://cyberatlas.Internet.com/big_picture/demographics/article/0,,5901_961881,00.html (January 2004).
- Rierdan, J. (1999) 'Internet-depression link?', *American Psychologist*, vol. 54, no. 9, pp. 781–782.
- Smoreda, Z. & Thomas, F. (2001) 'Social networks and residential ICT adoption and use', Eurescom Summit 2001 <<3G Technologies & Applications>> Heidelberg 12–15 Nov. 2001.

Tapscott, D. (1998) *Growing up Digital: The Rise of the Net Generation*, McGraw-Hill, New York.

Dominic Madell is a PhD student in the Applied Psychology section of the University of Durham Psychology Department. His research focuses on the use of the Internet by young people in the UK. *Address:* Department of Applied Psychology, University of Durham, Stockton Campus, University Boulevard, Thornaby, Stockton on Tees, UK. [email: d.e.madell@durham.ac.uk]

Steven Muncer is a Senior Lecturer in the Applied Psychology section of the University of Durham Psychology Department. His recent research has been concerned with the impact of the Internet on laypeople and lay understanding of everyday phenomena. Previously he has published widely in the area of gender differences in aggression. [email: s.j.muncer@durham.ac.uk]
