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Media use in long-distance friendships

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MEDIA USE IN LONG-DISTANCE FRIENDSHIPS

New media such as email and mobile phones have made it easier to maintain relationships over distances. The present paper examines which media people use to maintain long-distance friendships. The main focus lies on the comparison of email and phone. Media choice theories like media richness theory assume that media can be classified according to their richness, and that people choose the medium which fits best to the affordances of a specific task. The phone as richer medium should be preferred over email in the case of maintenance of long-distance friendships because it is easier to express emotions and to give immediate feedback via phone than via email. Email is an asynchronous medium and communication via email is therefore independent of space and time. Therefore, it can also be argued that email is preferred over the phone because it makes it easier to communicate across different work schedules or even time-zones. In two studies (Study 1 conducted in the Netherlands, Study 2 conducted in Germany) media use in long-distance friendships was measured. Across both studies, email was the most frequently used medium. In Study 1, an interesting asymmetric influence of closeness of the friendship emerged. The closer the friendship, the more emails were written in total, but the less the relative use of email. Instead, the percentage of phone calls increased. Study 2 aimed to replicate and explain this finding and assessed also the content of the phone call or emails. Whereas the intimateness of the emails did not change with increased closeness of the friendship, the intimateness of the phone calls increased with increasing closeness of the friendship. This result indicates that people use email primarily for staying in touch, whereas important personal matters are still discussed on the phone.

Modern (communication) technologies have changed people's interaction patterns. They have made it easier to maintain relationships over distances, and more and more social interactions are nowadays mediated by

communication media: 'The advent of modernity increasingly tears space away from place by fostering relations between 'absent' others, locationally distant from any given situation of face-to-face interaction' (Giddens 1990, p. 18). Relationships in modern societies are no longer confined to people living in the same village. Instead, the networks of people are dispersed and loosely knit, and many relationships are maintained with the help of trans-portation (cars, planes) and new communication technologies (Wellman & Gulia 1999). Even before the Internet, many relationships have been sustained by media – mainly letters and the phone. Letters and phone calls can easily bridge geographical boundaries, but asynchronous forms of computer-mediated communication (CMC) such as email constitute a fundamental improvement. They are distance-independent not only in use but also in cost; the messages are delivered rapidly, almost in real-time; and the com-munication is unobtrusive because of its asynchronous nature. Communi-cation partners do not have to coordinate their time schedules to be able to interact (Boase & Wellman 2005). Modern communication technologies have become so widespread that the boundaries between online and offline contacts have blurred. People communicate with most friends, family members and colleagues not exclusively face to face (FTF), but also via the phone, email or other media; likewise, contacts with friends made online often lead to FTF encounters (Parks & Roberts 1998; Wellman & Gulia 1999; Whitty & Gavin 2001).

In view of this development, the central question of this paper is not whether media can be used to maintain friendships, but which media people use to maintain friendships or, more specifically, which media people use to maintain *long-distance friendships*. Study 1 was exploratory and focused on email use among young Dutch adults, whereas Study 2 replicated and extended the findings of Study 1 in a more heterogeneous sample and focused more explicitly on the comparison between email and phone communication.

Long-distance friendships are a specific type of interpersonal relation-ships. They are less intimate than romantic relationships, and less task-oriented than work relationships. Many long-distance friendships have evolved from local friendships – they have turned into long-distance friend-ships when at least one of the friends has moved to another place for study, work or personal reasons. Thus, impression formation and relationship build-ing are not the central issues; the goal is mainly relationship maintenance.

Prior research has dealt with the question of whether it is possible to build up friendships via CMC at all and how friendships develop online (Walther 1992; Utz 2000; McKenna *et al.* 2002) and has compared the quality of online and offline friendships (Parks & Floyd 1996; Parks & Roberts 1998; Cummings *et al.* 2002). However, the question of whether it is possible to build and maintain 'real' friendships via email is not the same as the question as to which media people actually use in social

relationships. Studies on media use have mainly been conducted in an organizational context (Daft & Lengel 1986; Schmitz & Fulk 1991; Markus 1994; Fulk *et al.* 1995; Haythornthwaite & Wellman 1998). If they have focused on interpersonal relationships, they have often assessed media use across all types of relationships (e.g. family members, friends, acquaintances, colleagues; Cummings *et al.* 2002; Boase *et al.* 2006) or focused on one specific medium (e.g. Baym *et al.* 2004). This makes it difficult to relate media characteristics to the characteristics of a specific interpersonal relationship. Therefore, the present paper examines media use within one specific type of interpersonal relationships: long-distance friendships. The primary focus will be on the comparison of the two most frequently used media: email and phone (Baym *et al.* 2004; Boase *et al.* 2006).

Email vs. phone

Media choice models assume that media can be characterized on the basis of more or less objective criteria and rank-ordered for example according to their social presence (Short *et al.* 1976), media richness (Daft & Lengel 1986), or subjective perceived richness (Schmitz & Fulk 1991). People are assumed to choose the medium that fits best with the affordances of the task or type of social interaction.

One important dimension to characterize media is synchronicity. Synchronous media are more close to FTF communication; they require both interaction partners to communicate at the same time. Examples are the phone or chats. A disadvantage of synchronous communication is that it requires coordination of schedules. However, synchronous communication allows the giving and receiving of immediate feedback – an advantage when it comes to the discussion of socio-emotional topics such as problems. Asynchronous communication is independent from space *and* time. Emails can be read immediately after they have been received, but also minutes, hours, days or even weeks later. Especially in long-distance relationships across time zones or between people with different time schedules this aspect might be important. Asynchronous media lack the possibility of giving immediate feedback, but they give people the opportunity to carefully compose their messages – an asset for in-depth discussions of problems. McKenna *et al.* (2002) found that those people who can better disclose their 'true' inner self via Internet make also more friends online; and Bargh *et al.* (2002) found that people actually could better disclose their 'true' inner self via Internet than via face-to-face communication. With regard to the aspect of synchronicity, email should be favored over the phone in long-distance relationships; especially if the distance is large and the time schedules of the interaction partners differ notably (Boase & Wellman 2006).

Media differ also on their recordability – i.e. the degree to which the interaction is *automatically* documented (Hancock *et al.* 2004). FTF communication and phone calls are usually not recorded although this is technologically possible. Letters and emails can be re-read, saved and archived easily. Especially in long-distance friendships with less frequent contacts, the recordability might be perceived as an advantage; consequently, email should be favored over the phone.

An often used dimension to characterize media is the number of channels – FTF communication is then perceived as the richest medium because it transmits information on all channels: audio, video, touch. In phone communication, touch and visual cues are filtered out, and CMC is reduced to verbal communication. The same rank order is proposed for social presence, that is the degree of salience of the presence of another person. With regard to friends who already know each other, cues regarding age, gender and appearance are not important. Gesticulation, mime and intonation, however, are helpful cues to judge the mood and emotions of the interaction partner and support so intimate communication. In line with this argumentation, Whitty & Gavin (2001) report that switching from online communication to phone calls is often perceived as a more intimate step in the development of the relationship. According to this logic, the phone should be more appropriate for intimate communication than email.

More important than these objective media characteristics is how people actually perceive media (Fulk *et al.* 1995; Schmitz & Fulk 1991). Several studies have dealt with this question. Dimmick *et al.* (2000) examined the gratification niches of email and phone. Forty-eight percent of their respondents indicated that they use the phone less since they adopted email, indicating that the two media compete. Email was found to be superior to the telephone for keeping in touch with people who lived far away and in different time zones. However, the phone had the broadest niche on the sociability dimension. The first finding refers to the advantages of asynchronicity, the second to the number of channels and therefore the degree of social presence/media richness.

Cummings *et al.* (2002) report the results of a survey of 979 employees of a national bank, and another one among 39 students – in both studies, email was judged as less useful for relationships than phone and FTF communication. The latter two were not significantly different from each other. In another study by Baym *et al.* (2004) the quality of FTF and phone communication was judged as higher than the quality of Internet communication. This difference was not very large, and Internet interactions were still perceived as high in quality. Nevertheless, CMC was judged primarily as 'particularly useful in maintaining long-distance relationships' (p. 314).

Even if people consider the phone as more suitable for maintaining relationships, this does not necessarily mean that they use it more often

than email. Media richness theory has proposed that people choose media according to their task-media fit (Daft & Lengel 1984, 1986), but empirical research has shown that people often do not act as rational actors (cf. Rice & Shook 1990). Several studies found that email predominates in long-distance relationships, especially in weak ties (Hampton & Wellman 2001; Quan-Haase et al. 2002; Boase & Wellman 2006). Based on these studies it can be expected that email is used more frequently than the phone in long-distance friendships.

However, a recent study on media use of American teens revealed that the phone – the landline phone or the cellphone – is still the central medium of communication in daily life (Lenhart et al. 2005). Thus, prior research reveals somewhat mixed results with regard to the preference of media. One reason for these discrepancies might be the different samples – teens, students, or respondents selected by random digit dialing. Another reason for these discrepancies might be the focus on media use across different situations and different relationships (Dimmick et al. 2000; Cummings et al. 2002). This makes it difficult to draw inferences specifically about media use in long-distance friendships.

Two studies deal with similar questions to those in the current paper. Haythornthwaite (2000) examined what happens to relationships when FTF communication is unavailable or limited. However, this study looked at classmates in a distance-learning class, that is, a more task-oriented type of relationship. The theoretical background of the study was social network analysis; therefore, the comparison between weak and strong ties was central. Pairs of students with stronger ties used more media, and they used email more than the phone. However, in case of a task-orientated working relationship, email is also the medium that fits better with the affordances of the task. Documents can be attached, and agreements are documented and can easily be archived. Thus, there is no inherent conflict between convenience of the medium and task-medium fit; consequently, the preference for email is not really surprising. Baym et al. (2004) focused on interpersonal communication via Internet, the phone and FTF. In the first study reported in the paper, college students kept a diary about media use in their ongoing daily life. Most interactions were FTF, and there were slightly more phone calls (18.4 percent) than Internet interactions (16.1 percent). However, type of relationship has not been specified in this analysis. In the second study, the relative use of three media (FTF, phone, Internet) in four types of relationships (acquaintances, friends, family members, partners) was examined. However, the design was between-subjects. That is, there were 12 different versions of the questionnaire, and people evaluated only the last interaction via the respective medium. Unfortunately, there are no data available concerning the preference for email or the phone in this specific type of relationship. Instead, it was assessed which media participants used to communicate with

members of their local and distant (close) social circles. Internet was used more often in communication with members of distant circles than with members of local circles. More importantly, within distant social circles (close and less close ones), the phone was used somewhat, but not significantly, more than Internet communication. However, the circles averaged communication with relatives, friends and work colleagues, and the question was with what percentage of the respective circle they communicated at least sometimes via Internet, FTF, phone and mail. That is not the same as the question as to what percentage of their communication within a specific relationship was conducted via a specific medium. Thus, it is not possible to say which media people actually use to what extent in long-distance friendships. The main aim of Study 1 is to answer this question.

RQ1: Which media do people use to what extent in long-distance friendships?

An open research question is formulated because contrasting predictions can be derived. On the one hand it can be argued that most of the communication in a long-distance friendship will be conducted via email because email makes it easy to bridge large distances and even time zones. Even within the same time zone, email fits better in the time schedules of both communication partners. An email can be sent at any time, even late at night, when it might be impolite to call. Thus, if people choose media according to their convenience, a high proportion of communication in long-distance friendships should take place via email.

On the one hand it can be argued that most of the communication in a long-distance friendship will be conducted via phone because the phone is the richer medium more suited for intimate communication (Whitty & Gavin 2001). Thus, if people choose media according to their richness, a high proportion of communication in long-distance friendships should take place via the phone.

Additional factors, which might influence media choice, are taken into account as well. Studies on media choice have revealed that people are not rational actors that choose media according to their appropriateness in a different situation (Rice & Shook 1990; Markus 1994). Fulk and colleagues (1995; Schmitz & Fulk 1991) suggested that perceived media richness is a better predictor of actual media use than objective media richness. They examined email use in organizations and found that email use is predicted by email skills and perceived email richness. The same should hold true for media choice in interpersonal settings, leading to the following hypotheses:

H1: The higher the email skills, the more the email use.
H2: The higher the perceived email richness, the more the email use.

Perceived email richness refers to the usefulness of email to express socio-emotional contents. According to the social information processing perspective (Walther 1992), it is possible to verbalize socio-emotional contents and compensate for the lack of nonverbal cues (Utz 2000). However, another factor that might be important for the maintenance of interpersonal relationships is immediacy of feedback. Therefore, it was also assessed how important immediate feedback was for participants. It was expected that people who do not attach much importance to immediate feedback show a stronger preference for email communication.

H3: The lower the importance of immediate feedback, the more the email use.

Additionally, it was expected that the availability of Internet access influences email use.

H4: The higher the availability of Internet access, the more the email use.

These hypotheses were tested in a survey among young Dutch adolescents (aged 20–35). In this phase of life, many people move to another town because they go to university or start their first job. Additionally, this age group is familiar with new communication media.

Study 1: Method

Procedure

A questionnaire was sent via email to young Dutch adults. The respondents were asked to think of a friend who lives in another place and to answer the subsequent questions with regard to communication with this specific person.

Measures

Media use. People were presented with a list of seven communication modes (FTF, phone, email, SMS, chat/IM, letters, other) and asked to indicate what percentage of their communication with their friend was covered by the seven categories. Additionally, the absolute number of emails exchanged with the friend per month was assessed. The content of their emails was to be judged on a five-point scale ranging from 'very superficial' to 'very intimate'.

Characteristics of the friendship. Distance, duration of the friendships, and closeness of the friendship (five-point-scale) were measured.

Accessibility/costs of email. Participants were asked about the type of Internet connection (modem, broadband, etc.; at home, at work, etc.) and whether they had to pay for their Internet connection themselves.

Email skills. Email skills were assessed by two items, typing skills and specific email skills ($\alpha = 0.73$). Answers were given on a five-point-scale ranging from 1 = very bad to 5 = very good. *Perceived email richness* and *importance of immediate feedback* were measured on five-point-scales (1 = totally disagree, 5 = totally agree). Perceived email richness was assessed by four items (e.g. 'I can express my personal feelings well in email'; $\alpha = 0.70$). The scale importance of immediate feedback had four items (e.g. 'I think it is a disadvantage that I do not receive an immediate answer from my friend'; $\alpha = 0.70$).

Demographic characteristics. Participants were asked to indicate their age, gender, and education level.

Participants

Eighty-three young adults participated in the survey. Two-thirds of the sample were female, the average age was 24 years (range 20−35). Most of the friends (56 percent) were separated by more than 50 kilometers, and 43 percent of the friendships had lasted longer than five years. The mean friendship intensity was relatively high, $M = 4.03$ (SD = 0.67) on a five-point scale.

Results

Media use

Email turned out to be the preferred medium in long-distance friendships: 31 percent of the communication was done via email, followed by FTF (27 percent), phone (22 percent) and chat/IM (11 percent). SMS, letters and other communication media were used barely. Email use was not significantly higher than FTF communication, $t(83) < 1$, n.s., but email use was significantly higher than phone use, $t(83) = 2.31$, $p < 0.05$. The mean number of emails was $M = 6.77$ (SD = 6.82), and the content of the emails was judged as neither superficial nor very intimate, $M = 3.28$ (SD = 0.83).

Influence factors

Forty-three percent of the participants reported that they and their friend had email access at home and at work/university, and only 7 percent reported that one of them had only restricted Internet access. Participants estimated their

email skills as high, $M = 4.17$ (SD $= 0.57$. Perceived email richness was regarded as moderate, $M = 3.45$ (SD $= 0.52$), and the importance of immediate feedback was relatively neutral, $M = 3.12$ (SD $= 0.66$). Email skills correlated with perceived email richness, $r(83) = 0.41$, $p < 0.01$.

Separate regression analyses with percentage of email communication and absolute number of emails written per month as criterion variable and accessibility, costs, perceived email richness and importance of immediate feedback as predictors revealed no significant results, both Fs $(5,72) < 1$. Hypotheses $1-4$ were therefore rejected.

Additional findings

Exploratory data analysis revealed that the absolute and relative number of emails were independent of each other, $r(80) = -0.08$, n.s. To further explore this initially unexpected finding, the influence of friendship closeness on email use was examined. There was a positive correlation between closeness and absolute number of emails exchanged per month, $r(77) = 0.24$, $p < 0.05$, but a negative correlation between friendship closeness and relative number of emails per month, $r(77) = -0.22$, $p < 0.05$.

Discussion

Email is indeed the most frequently used medium in long-distance friendships – at least among young Dutch adults. Despite the phone's ability to transmit nonverbal socio-emotional cues such as intonation and to provide immediate feedback, email is chosen over the phone. Instant messenger, which is very popular with American teens (Lenhart *et al.* 2005), has not reached this level of popularity in the Netherlands.

Interestingly, neither objective (accessibility of an Internet connection, costs) nor subjective (perceived email richness, importance of immediate feedback) factors predicted email use. These results might partly be due to ceiling effects – most people had a broadband Internet connection at home and at university/work, and email skills were estimated as high. It remains surprising that importance of immediate feedback and email richness did not influence actual email usage. Obviously, people choose email more for convenience reasons – email is available and does not interrupt the friend's time schedule.

There was an unpredicted finding – absolute and relative number of emails were independent of each other. Closeness of friendship turned out to be a moderating factor. The positive correlation between friendship closeness and absolute number of emails exchanged might be explained by the fact that in close friendships more communication takes place (Boase *et al.* 2006; Haythornthwaite 2000; Haythornthwaite & Wellman 1998). The negative

correlation between closeness and percentage of email communication would then indicate that − even if the overall amount of communication is higher in close friendships − email is less preferred in close friendships. Thus, despite the fact that email is used most frequently in long-distance friendships, it might be regarded as less suitable for the maintenance of close friendships. Consequently, it should be used especially among acquaintances, but less so among best friends. There was a positive correlation between closeness and percentage of phone communication, $r(77) = 0.25$, $p < 0.05$, which would support the post-hoc explanation that richer media are preferred in closer friendships.

Another indicator that email might be a convenient, but not the most suitable communication medium for the maintenance of friendships, is that the content of the emails was not judged as intimate. This fact is puzzling because emotional intimacy usually characterizes close friendships. Obviously, intimate conversations take place via other media. Unfortunately, the intimateness of the phone calls was not measured in Study 1. Study 2 was designed to compare email and phone communication and to explicitly test these post-hoc explanations.

Study 2

Study 2 aimed to replicate the basic findings of Study 1 in a more heterogeneous sample, thereby examining the generalizability of the results. Moreover, it focused on the comparison of email and phone communication and tested the moderating role of closeness of the friendship. Based on the post-hoc explanations of the results of Study 1, the following hypotheses were derived:

H1: Overall, email is preferred over the phone in long-distance friendships.
H2: The closer the friendship, the more communication overall (in total, but also separately for email and phone).
H3: The closer the friendship, the higher the percentage of phone communication.
H4: The closer the friendship, the lower the percentage of email communication.

If the phone is preferred over email in very close friendships because it is better suited for the discussion of personal and intimate topics, closeness of friendship should be related mainly to intimateness of the phone conversations, but less so to intimateness of the email conversations.

H5: The closer the friendship, the more intimate the content of the communication.

H6: The effect predicted in H5 should be more pronounced in phone communication.

These hypotheses were tested in an online study among German Internet users. A broader and more heterogeneous sample was used to examine the generalizability of the results of Study 1.

Method

Procedure

An online survey was conducted among German Internet users. The study was announced in several newsgroups and mailing lists. Participants were instructed to think of the last person living in a different place to whom they had written a private email, and answer all subsequent questions with regard to this person.

Participants

One hundred and fifty-three individuals assessed the first page of the online questionnaire, and 120 completed (almost all) questions. Similar dropout rates are reported for other Internet studies (cf. Musch & Reips 2000). The n.s. in the analyses vary accordingly. Participants' mean age was 31, ranging from 17 to 59. Men were slightly overrepresented (55 percent vs. 45 percent women).

Measures

Media use. Again, participants were asked to indicate what percentage of their communication was conducted via FTF, phone, email, SMS, chat/IM, mail, or other communication media (relative media use). Absolute media use was assessed for emails and phone calls. Participants were asked how many emails they wrote to the other person each month and whether the content was superficial or intimate (1 = very superficial, 5 = very intimate). The same questions were asked for the emails written by the other person. Frequency and content of phone calls were assessed similarly. Frequency of contact was assessed as a general measure of communication intensity. Participants were asked to indicate on an ordinal scale (once a year − several times a day) how often they communicated with this person.

Importance of immediate feedback and perceived email richness. Importance of immediate feedback and perceived email richness were assessed with four versus three items respectively (αs = 0.70 and 0.83).

Friendship characteristics. Participants indicated whether the other person was male or female, how long they had known each other, and how long they had already lived in different places. Closeness of the friendships was measured by two items ($\alpha = 0.81$), which were answered on a seven-point Likert-scale: 'How would you characterize your relationship to this person?'(1 = shallow acquaintance, 7 = close friendship) and 'How important is this person to you?'(1 = not at all, 7 = very).

Demographics. Age, gender, occupation and education were assessed.

Results

Descriptive

The mean distance was 964 km (SD = 2710), and in 80 percent of the cases the mean distance was 100 km or more. Sixty-nine percent of the friendships had already lasted longer than five years, and the mean closeness of friendship was $M = 5.57$ (SD = 1.18), indicating that a broader range of social relationships was covered in this study. Seventy percent of the participants lived in the same place as the interaction partner at the beginning of the relationship. Participants wrote each other on average $M = 11.2$ emails per month (SD = 14.7). The mean number of phone calls was $M = 4.4$ (SD = 7.5).

Media use. Regarding the relative use of media, the following pattern emerged: email was the most heavily used communication medium (43 percent), followed by the phone (22 percent) and FTF (21 percent). Six percent of the communication was done via SMS, 3 percent each via post and chat. Thus, consistent with H1, email was by far the preferred medium to maintain long-distance relationships. Again, absolute number of emails and percentage of email use were independent of each other (see Table 1). Relative and absolute use of phone calls, however, was slightly positively related.

TABLE 1   Correlations between the measures of email and phone use (Study 2).

	1	2	3	4	5	6
1. email relative (%)	–	−0.54**	0.06	−0.37**	0.23*	−0.19*
2. phone relative (%)		–	−0.05	0.27**	−0.11	0.45**
3. email absolute (per month)			–	0.31**	−0.02	−0.04
4. phone absolute (per month)				–	−0.14	0.05
5. intimateness emails					–	0.27*
6. intimateness phone calls						–

Again, perceived email richness and importance of immediate feedback did not predict percentage of email communication, $F < 1$. The regression analysis with absolute number of emails exchanged as dependent variables also failed to reach significance, $F(2,119) = 2.14$, $p = 0.12$, although the Beta for perceived email richness was significant, $\beta = 0.18$, $t(119) = 2.02$, $p < 0.05$.

Moderating role of friendship intensity

First of all, the closer the friendship, the more frequent the communication overall, $r(133) = 0.37$, $p < 0.001$, Spearman's rho. More specifically, closeness of friendship correlated with absolute number of emails, $r(129) = 0.21$, $p < 0.05$, and number of phone calls, $r(126) = 0.35$, $p < 0.01$ (see Table 1). H2 is therefore confirmed. Closeness of friendship correlated negative with *relative* use of email (percentage), $r(132) = -0.43$, $p < 0.01$, but positive with *relative* use of the phone (percentage), $r(114) = 0.41$, $p < 0.01$, thereby confirming H3 and H4.

To better illustrate these findings, the sample was divided into four groups via a quartile split on closeness ($Ms = 3.78$, 5.20, 6.18 and 7.00, accordingly). A 4 (closeness)×2 (medium: email vs. phone calls) analysis of variance with repeated measurement on the last factor and *absolute* number of emails versus phone calls respectively per month as dependent variable revealed a main effect of closeness, $F(3,121) = 5.11$, $p < 0.01$. As already shown in the correlational analyses, the closer the friendship, the more communication took place (see Table 2, first two rows). There was also a main effect of medium, $F(1,121) = 26.95$, $p < 0.001$, indicating that people communicated much more via email ($M = 11.14$) than via phone ($M = 4.36$).

Relative use of email and phone was also analyzed by a 4 (closeness)×2 (medium: email vs. phone calls) analysis of variance with repeated

TABLE 2 Absolute and relative use of email and phone and intimateness of communication as a function of closeness of the friendship (Study 2).

	closeness of friendship			
	1 (low)	2	3	4 (high)
emails per month	7.81	7.93	12.88	15.93
phone calls per month	1.12	2.50	4.56	9.25
relative email use	64%	48%	38%	37%
relative phone use	11%	19%	26%	29%
intimateness emails	2.70	3.12	3.24	3.04
intimateness phone calls	2.84	3.11	3.66	3.89

measurement on the last factor. The main effect of medium was again significant, $F(1,110) = 52.02$, $p < 0.001$. Much more communication was done via email ($M = 47$ percent) than via phone ($M = 21$ percent). More interesting, this effect was qualified by the interaction between closeness and medium, $F(3,110) = 7.42$, $p < 0.001$. As can be seen in Table 2, the proportion of email dropped from 64 percent to 27 percent with increasing intensity of friendship. In contrast, the proportion of phone calls increased only slightly from 11 percent to 29 percent. Simple comparisons showed that group 1 and 2 communicated significantly more via email than via phone, whereas this difference was only marginally significant in group 3 and not significant in group 4.

Content of communication. A 4 (closeness) × 2 (medium: email vs. phone calls) analysis of variance with repeated measurement on the last factor and content of the communication as dependent variable revealed three significant effects. The main effect of medium indicated that the content of phone communications was judged as more intimate ($M = 3.37$) than the content of the emails ($M = 3.09$), $F(1,110) = 4.11$, $p < 0.01$. The main effect of closeness revealed that the content of communication became more intimate when the friendships were closer ($Ms = 2.91$, 3.11, 3.45 and 3.46, respectively), $F(1,110) = 3.24$, $p < 0.05$. H5 is therefore supported. However, only the difference between the two groups with close and very close friendships and the group with the superficial friendships was marginally significant. Again and in line with H6, these main effects were qualified by an interaction, $F(3,110) = 4.21$, $p < 0.01$. As can be seen in Table 2, only the content of phone calls became deeper and more intimate with increasing closeness. Group 3 and 4 discussed significantly more intimate content in their phone calls than groups 1 and 2 did. The content of emails did not differ between the four groups – communication via email always tended to be neither superficial nor intimate. When the differences within the groups are the focus of analyses, it turns out that phone conversations were not always more intimate than email exchanges. This was only the case in (very) close friendships (group 3 and 4). That is, people with less close friendships communicate relatively superficially via both media. People with close friendships use email for the more superficial conversations, but they discuss really intimate things via phone.

Discussion

Study 2 replicated the basic finding of Study 1 in a different sample: email is the most widely used medium in long-distance friendships – at least in Western Europe. Thus, even in a more heterogeneous sample, email

turned out to be preferred over the phone. Again, attitude towards asynchronous media and perceived email richness did not significantly predict email use, indicating that task-medium fit does not determine media choice. Email is probably chosen for convenience reasons – email as an unobtrusive communication medium that does not disturb the interaction partner. Communication in emails was found to be neither really intimate nor entirely superficial. Phone calls, on the other hand, were used for really intimate conversations – but only among (very) close friends; in less close friendships the content of phone calls did not differ significantly from the content of emails.

General discussion

Two studies showed that email is the most popular medium for the maintenance of long-distance friendships. The first study focused relatively narrowly on close long-distance friendships of young Dutch adults. The second study examined close and less close long-distance friendships of German online users – the second sample was therefore more heterogeneous with regard to the sample (age, education), the closeness of friendships, and the distances covered by the long-distance friendships.

Email is preferred over the phone, despite the fact that the phone is the richer medium. Prior studies on media richness theory have shown that people often do not choose the medium that fits best the affordances of the task (e.g. Markus 1994). In line with these findings, attitude towards asynchronous media or perceived email richness did also not predict email use in the current research. Study 1 showed that the preference for email is also not predicted by accessibility of email or email skills. However, accessibility and email skills were high. Thus, the results mainly demonstrate that email has become a part of everyday life communication.

The popularity of email might primarily be due to its convenience as an asynchronous medium. Phone calls require that both communication partners have time, and scheduling of phone appointments is especially difficult if friends live in different time zones. An email can always be sent, it does not intrude on the communication partner and he or she can answer whenever it is convenient. Other studies have already shown that email is suited for keeping in touch despite different work schedules and time zones (Dimmick et al. 2000; Baym et al. 2004; Boase & Wellman 2004).

An interesting finding of the present study with important methodological implications is the zero correlation between absolute and relative email use. Focusing on absolute email use leads to the opposite conclusions of those focusing on relative email use – thus, to fully capture the phenomenon, both measures are needed and possible moderator variables have to be taken into account.

The initially surprising zero correlation can be explained if closeness of friendship is included as a moderator variable. The closer the friendship, the more communication in total − across all media. That is, closer friends write each other more emails per month than less close friends do; and they also phone each other more often than less close friends do. However, the closer the friendship, the larger the preference for richer media. That is, the relative preference of email over the phone becomes smaller and even not significant with increasing closeness.

Taking into account the content of the communication shed further light on this asymmetry. Prior research has shown that it is possible to build up friendships or to convey socio-emotional contents via CMC (Walther 1992; Parks & Floyd 1996; Parks & Roberts 1998; Utz 2000; Whitty & Gavin 2001). However, it turned out that people did not use emails for real intimate conversations. Instead, they preferred the phone as a richer medium when it comes to the discussion of really personal matters. This finding could also explain why participants in Baym *et al.*'s (2004) study judged the quality of phone conversations to be higher than the quality of Internet interactions − people simply described different types of interactions. In Study 2, even very close friends used email for communication that was neither superficial nor intimate. Whereas the simple comparison of the content of emails and phone calls led to the conclusion that phone calls were always more intimate than emails, the closer analysis with closeness as moderator variable showed that even phone calls were not necessarily used for intimate and deep communication either. Phone calls with acquaintances were rather superficial as well; the intimateness of their content did not differ significantly from emails. Thus, people might discuss intimate topics via the phone, but they do so only with close friends. It is also interesting that the intimateness of emails was not influenced by closeness. That is, even close friends did not discuss intimate and personal topics via email. They might use email to keep in touch, to schedule the time for the next phone call or FTF meetings, to send each other pictures or jokes. The present study did not examine why people favor the phone for more intimate conversations. The phone could be favored because of its higher media richness and social presence − fewer socio-emotional cues get lost. But the phone could also be favored because it is a synchronous medium and allows people to receive immediate feedback, advise or offer consolation. Future research is needed to explore this issue further.

Strengths and limitations

Although the main findings of Study 1 were replicated in Study 2, there are also several limitations. First and foremost, one should be cautious in generalizing the results. The samples were not representative of Dutch as opposed to German Internet users. In the first study, students were

overrepresented. In the second, participants were recruited via mailing lists and newsgroups – thus, experienced and heavy Internet users are probably overrepresented. However, at least within this sample, the percentage of email was not correlated to duration of Internet use, $r(121) = -0.04$, n.s. The exact percentages to which the different media were used in communication with long-distance friends should therefore not be generalized to other populations. However, the basic finding that email is the preferred medium should also hold for other samples, at least in Western Europe. Online surveys are less controlled settings than laboratory studies, but research has shown that Internet studies are reliable and valid research methods (e.g. Gosling *et al.* 2004).

Another limitation is the interpretation of the percentage ratings. Do they relate only to quantity (number of phone calls, emails, SMS, visits, . . .), is quantity somewhat weighted by the length of the email or the phone call, and how can length of an email be compared with the length of a phone call? Time is not a good indicator because it takes longer to type than to talk. Number of words would be a better indicator, but people are probably not good at estimating the number of words written in an email or spoken during a phone call. Do people also include quality (superficial vs. intimate) of the communication when making percentage judgments? Interpretation was left up to the participants and participants might differ in how they interpreted it. However, this measure was chosen because it assesses people's actual perception of their friendship as rather email-supported or phone-supported – the variable of interest in the present research. However, to get a more objective picture of the two media central to this research, email and phone, number of emails/calls and content of the emails/calls were assessed additionally.

A strength of the current research is that it measured email and phone use in absolute and in relative terms, as well as the intimateness of the emails and phone calls. Prior studies have often focused only on one of these measures (Haythornthwaite 2000; Baym *et al.* 2004). If only relative or only absolute use of emails were assessed, the present study would have come to different conclusions. Thus, one of the main implications of the paper is a methodological one: It is necessary to measure quantity of communication in absolute and relative terms; otherwise, contradictory findings might emerge.

Another strength is that the paper focused on a very specific type of relationship. Long-distance friendships are social relationships, but less intimate than romantic relationships. They are also less task-oriented than relationships between classmates or work colleagues. The geographical separation makes it necessary to use media for at least parts of the communication. Other studies (e.g. Baym *et al.* 2004; Boase *et al.* 2006) have often assessed media use over several strong or weak ties, thereby mixing up communication with different partners (family members, partners, friends, colleagues . . .)

and different purposes (social, task-oriented), which made the results more difficult to interpret. The present paper focused on one type of relationship but replicated the main findings of Study 1 in a more heterogeneous sample, stressing the validity of the analysis.

To summarize, email is the medium used most frequently in maintaining long-distance friendships. However, for really intimate conversations – which occur only among close friends – the phone is preferred. Absolute number of emails sent was not related to percentage of email communication; and concentration of only one measure would have led to different conclusions. An important piece of methodological advice for future studies is therefore to use several measures of media use and to take into account possible moderators such as closeness of friendship.

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