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Email, Gender, and Personal Relationships

Bonka Boneva and Robert Kraut

Abstract

The current chapter uses both quantitative and qualitative data to examine how women and men use the Internet, and email in particular, to sustain their personal relationships. Socially constructed gender roles, we argue, influence, and in return are further enhanced, by the way the new technology is used for relationship maintenance. Women use email more than men in communicating with family and friends, and women use email more than men to revive family ties. Thus, our study suggests, women are using the new technology more than men in maintaining and even expanding their social networks. But men and women are using it similarly to keep up with their siblings, their parents, and they use email comparably when communicating most often with a friend. The new technology seems to encourage fathers to communicate more regularly with sons and daughters who live away from home and with whom they did not otherwise keep up with very much, while wives fulfill gender role obligations to keep up with the in-laws by using email to revive these relationships. Our study shows that email is having a generally beneficial effect on personal relationships, although more so for women than men.

Authors' note

The gender gap in the amount of Internet use has been narrowing, but gender differences in Internet use patterns and application preferences persist. Women, for example, are more likely to search the web for health information and educational purposes, while men are more likely to seek news and entertainment online (Pew Internet & American Life Project, 2000a; Weiser, 2000). The most profound gender difference in the use of the new technology, however, is electronic mail, with women, on average, using email more than men (Pew Internet & American Life Project, 2000a). Both women and men use email mostly to connect with others they already know, predominantly relatives and friends (Kraut, Mukhopadhyay, Szczypula, Kiesler, and Scherlis, 2000; Pew Internet & American Life Project, 2000a; Stafford, Kline, and Dimmick, 1999).

The current chapter examines how women and men use the Internet and email in particular to sustain their personal relationships. Socially constructed gender roles, we argue, influence and in return, are further enhanced by the way the new technology is used for relationship maintenance. Previous research suggests that women are more likely than men to define themselves through their social relations and to act as the communication hub between the household and kin and friends. Women, we argue, have now appropriated the Internet for these purposes. Further, we explore the specific ways in which the new communication technologies influence women's and men's social networks.

Between 1995 and 1998, there was an almost 50 percent growth in the use of email for personal relationships, whereas there was virtually no growth in the work-related use of email (Cummings and Kraut, 2002). However, very few studies have examined how already existing personal relationships are maintained online (Cummings, Butler, and Kraut, 2002; Pew Internet Report, 2000a; Stafford, Kline, and Dimmick, 1999), and even less is known about the impact of gender on relationship maintenance online (e.g., Boneva, Kraut, and Frohlich, 2001; Pew Internet & American Life Project, 2000a).

Gender differences in relating to others

Women and men tend to value relationships differently and to have different styles in sustaining them (e.g., Deaux and Major, 1987; Duck and Wright, 1993; Eagle and Steffen, 1984; Spence and Buckner, 1995). As a result, one would expect to see differences in the way men and women use the Internet for interpersonal communication. Some indications of such differences have started to appear in the research literature (e.g., Kraut, Patterson, Lundmark, Kiesler, Mukhopadhyay, and Scherlis, 1998; Pew Internet & American Life Project, 2000a), but their nature is still not well understood. Many authors have identified differences in the way men and women relate to others and manage their relationships, but these studies have focused on face-to-face communication.

In order to provide a context for examining gender-specific patterns of using the Internet to communicate with family and friends, we first review some of the gender differences in relating to others. Spence and Helmreich (1978) proposed the term *expressiveness* to indicate a set of attitudes and behaviors associated with emotional intimacy and sharing in personal relationships, and the term *instrumentality* to indicate a more "agentic" (interested in making things happen) style of relating to others, oriented around common activities. Even though women and men vary widely from one person to another on these styles, there is evidence that women are, on average, more relationally oriented, more expressive of their feelings and less "agentic" than men (e.g., Deaux and Major, 1987; Eagle and Steffen, 1984). Consequently, women have been found to be more expressive and men to be more instrumental in maintaining their relationships. Women tend to engage in intimate conversation with their good friends, whereas men tend to spend time in common activities with theirs (Caldwell and Peplau, 1982; Davidson and Duberman, 1982; Duck and Wright, 1993; Spence and Buckner, 1995; Twenge, 1997; Walker, 1994; Wright and Scanlon, 1991). It has also been suggested that women are more likely to communicate in order to avoid isolation and gain community, whereas men tend to communicate to gain and keep social position (e.g., Tannen, 1992).

Other authors have emphasized that men and women differ in their conversation styles. Hauser and colleagues (1987), for example, distinguish between a *facilitative* style of communication, when the parties seek continuous dialogue, which helps to 'ramp up' a conversation, and a *restricting* style, characterized by interrupting the

communication process at an early stage that tends to dampen the interaction. Women are socialized into using the facilitative style and men the restricting style (Maccoby, 1990).

Since women, on average, invest more in personal relationships, some studies have found that women have more extensive social networks (e.g., Moore, 1990; Walker, 1994; Wellman, 1992). Other studies, however, indicate that men report more same-sex friendships than women, although male friendships tend to be less intimate than female friendships (e.g., Claes, 1992). More specific gender role obligations are consistent with the general tendency of women to connect to others: women are expected to be the maintainers of family ties (Di Leonardo, 1987; Rosenthal, 1985) and of their family's connections to friends (Wellman, 1992).

These gender differences, while first reported in face-to-face behavior, have also been observed in the ways men and women use the telephone (Noble, 1987). Women, for example, are more frequent users of the telephone than men (e.g., Brandon, 1980; Lacohée and Anderson, 2001; Walker, 1994). Men use the phone more instrumentally than women do. Men are more likely than women to consider small talk and emotional sharing to be illegitimate motives to initiate phone contact, and they may not call if they do not have an instrumental reason to do so (Lacohée and Anderson, 2001; Walker, 1994). Because technology makes it easier to share thoughts and feelings at a distance than to engage in or organize common activities at a distance, women use the telephone more often than men to sustain a larger circle of distant friendships (Lacohée and Anderson, 2001; Walker, 1994).

Do these gender differences in communication and relationship styles hold for computer-mediated communication as well? Do women embrace computers more than men as a new means of connecting to others? If so, we may expect more use of the Internet for communication by women than men, and more expressive communication by women, and more instrumental communication by men. On the other hand, the technological features of email may somehow interfere with women's expressive communication style. Some studies indicate that the text-based communication format of email makes it less suitable for maintaining personal relationships than face-to-face communication or the phone (Cummings, Butler, and Kraut, 2002; Walther, 1996). Other studies suggest that email is especially suitable for management and coordination of activities, not for personal relationships (Sproull and Kiesler, 1986). That is, the text-based format of

email may facilitate an instrumental communication style more commonly associated with men.

A national survey of Internet use (Pew Internet & American Life Project, 2000a) showed that women use the Internet more for communication than do men. Of those who use email, women are more likely than men to use it to communicate with family and friends. Women, for example, were more likely than men to have sent email to their parents or grandparents and to have reached out electronically to their extended families of aunts, uncles or cousins. Women were more likely than men to use email to sustain distant friendships; 73 percent of women who use email said they had sent email to friends who lived far away, compared to 65 percent of men. More women than men emailers liked email, mostly because they find it more efficient than other forms of communication (Pew Internet & American Life Project, 2000a). Other studies have also suggested quantitative, and possibly qualitative, differences in how men and women use computers to communicate (e.g., Kraut, Patterson et al., 1998).

The current chapter examines in more detail how men and women use email to maintain their personal relationships. Guided by previous findings about gender differences in relational maintenance, we investigate how email use in maintaining certain types of relationships is influenced by gender. In particular, if women tend to be more relationally oriented than men, then it can be predicted that they will utilize email to maintain their larger personal networks more so than men. Gender role expectations of women to maintain relationships with family and relatives and, for married women to maintain relationships with family friends can be expected to result in women using email more often than men as an efficient way to fulfill these gender-role obligations.

In addition, because women tend to use an expressive relationship style – sharing thoughts and feelings – which is easier to accomplish at a distance, while men tend to use an instrumental relationship style – doing things together with others – which is more difficult to accomplish with those living far away, then it can be predicted that women will use email to maintain a larger distant social circle than men. Similarly, it can be expected that women, compared to men, spend longer time using email, since a facilitative communication style – characterized by encouraging dialogue and more typical of women, triggers more intensive email exchange locally as well as at a distance.

And lastly, if email is appropriated by women to maintain their relationships more so than by men, it can be expected that women's atti-

tudes toward email will be more positive than men's, and women will miss email more than men, because they benefit more than men from using email for personal relationships maintenance. We also explore what specific types of relationships are maintained by email most often, what types of dormant relationships are revived by email, and what types of messages are sent by email, and the impact gender may have.

We test our predictions analyzing three sets of data: Pew Internet & American Life Project March 2001 survey data, HomeNet Project 1998–9 survey data and HomeNet Project 1996–9 interview data. We first draw upon the two sets of survey data to set context, and then analyze the interview data in order to provide more detail to our understanding of how email is used by women and men to sustain active or revive dormant relationships.

Method

Quantitative data

The Pew Internet & American Life Project survey

SAMPLE
The Pew Internet & American Life Project 2001 survey (www.pewinternet.org) was a daily tracking survey on the use of the Internet in the United States, conducted in March 12–April 9, 2001. Results are based on data from telephone interviews of 2,135 respondents (48.2 percent men and 51.8 percent women). Because the HomeNet 1998–9 survey sample was predominantly Caucasian and the qualitative data analyses were based only on adults, we selected for Caucasian adults in the Pew Internet & American Life Project data analyses (N = 1,276). Of these, 11.6 percent had less than high school education, 34 percent were high school graduates, 28.4 percent had technical school or some college education, 16.1 percent were college graduates and 9.9 percent had some post-graduate education; 16.8 percent had household income of $30,000 or less, 28.9 percent over $30,000 but under $50,000, 34.5 percent over $50,000 but under $75,000 and 19.8 percent $75,000 or over.

MEASURES
In order to assess types of relationships sustained by email, we first analyzed the following two items: using email to communicate with

immediate and extended family ("Do you ever send email to any member of your immediate and extended family?"; measured on a dichotomous scale. The question was asked to only those who started to email family in the last year), and the family member/relative most often contacted by email ("Thinking about both immediate and extended family, which family member do you email *most often*?", with 8 categories: spouse, child, parent, sibling, aunt or uncle, cousin, niece or nephew, in-laws). In addition, using email ever to communicate with friends was assessed by one item ("Do you ever send email to any of your friends?"; measured on a dichotomous scale). Geographic location of a friend most often contacted by email was measured by the item "Which of your friends do you email most often – a friend who lives close by to you or a friend who lives far away?" (measured by a dichotomous scale, 1 = "a friend who lives close by"; 2 = "a friend who lives far away"). Two items were used to test for using email to expand communication with family and friends ("Since you started using email, have you started communicating with a family member that you did not keep up with very much before?" and "Have you used email or the Internet to look for or locate an old friend or family member you had lost touch with?"; both items were measured on a dichotomous scale). In addition, we analyzed three items measuring attitudes about email: "How useful to you is email for communicating with members of your family/with friends?" (both items were measured on a 4-point scale rating from 1 = "very useful" to 4 = "not at all useful") and "How much would you miss using email if you could no longer use it?" (measured on a 4-point scale, from 1 = "a lot" to 4 = "not at all"). For those who reported that they did start communicating with a family member regularly by email, they were also asked to point out which family member that was (using the same 8 categories above).

The HomeNet 1998–1999 survey

SAMPLE

We also draw upon cross-sectional quantitative data from the 1998–9 HomeNet survey (Kraut, Kiesler, Boneva, Cummings, Helgeson, and Crawford, 2002). The HomeNet project is a long-term investigation of how using the Internet at home is influencing the lives of Americans (for more details, see Kraut, Patterson, et al., 1998; Kraut et al., 2002). The 1998–9 HomeNet survey sample consisted of 446 individuals from 237 households in Pittsburgh, Pennsylvania, who had recently pur-

chased either a computer or a television during the spring of 1998. They were followed for one year. Respondents completed the survey questionnaire three times: in the spring of 1998, the fall of 1998, and the spring of 1999. Several measures of communication by email were consistently used in the three questionnaire surveys. Since the HomeNet interview sample that we analyzed included only Caucasian adults, for the purposes of the present report on the HomeNet survey data we selected on Caucasian adults with Internet access (N = 253). Because the first questionnaire was administered before many of the households had Internet access, the analyses here were done only on data from the second and third questionnaires, with scores averaged across the two surveys.

MEASURES
Overall, email was assessed by two measures: an item asking about the time (in minutes) spent on sending email on the most recent weekday, and a four-item index of email use ("I use email frequently," measured on a 5-point scale; average time (in minutes) spent on a weekday using email; frequency of sending email messages from home, measured on a 7-point scale; "I hardly ever use email" reversed item, measured on a 5-point scale. Cronbach's alpha = 0.91; the scale was standardized and centered, with a mean of 0.) Because the distributions of the measures of email use were skewed, we took their log in the analyses that follow. When these measures had outliers, they were truncated. (For details on the measures used in the 1998–9 HomeNet Project survey, see Kraut et al., 2002). Using email to keep in touch with a friend or a relative who lives far away, and with people who live nearby was measured using two items ("In the past six months, how frequently have you used the Internet at home for keeping in touch with someone far away?" and "In the past six months, how frequently have you used the Internet at home for communicating with friends in the Pittsburgh area?"; measured on a 5-point scale, 1 = never; 5 = often).

Another set of questions asked about attitudes toward using computers to communicate with others. Respondents were asked to rate, first, how useful and second, how much fun computers were for a number of behaviors. For the purposes of this study, we analyzed items associated with using the Internet for communication: sending email, keeping up with family and friends, and finding new people to communicate with from all over the world. To put these findings in context, we also analyzed items associated with using the Internet for

entertainment: keeping up with music and entertainment, playing computer games and searching the worldwide web for hobby information. All items were measures on a 5-point scale, where one meant not at all useful (or fun) and five meant extremely useful (or fun).

Qualitative data

The present study is also based on analyses of interviews with adult women and men from 41 households in Pittsburgh, Pennsylvania. These interviews were conducted within the HomeNet Project between 1996 and 1999 in four sub-samples: 10 households in 1996, 14 in 1997, 5 in 1998, and 12 in 1999. We selected households where at least one member was in the top quartile (in the HomeNet survey sample as a whole) in time spent online.

All interviewees were Internet neophytes, and included 32 women (mean age 47) and 28 men (mean age 48.8). The sample comprised highly educated and high-income adults, with 77.5 percent having at least some college education and 35.2 percent a graduate degree; 73.1 percent had a household income of more than $35,000. Ninety-eight percent were Caucasian.

Interviews were semi-structured and lasted two to three hours. As a rule, all household members (including children) were interviewed, first as a group around the kitchen or dining room table and then individually in front of the family computer. All interviews were tape recorded and transcribed. The portion in front of the computer was videotaped as well. The analyses of the interviews followed standard guidelines for structured thematic analyses (see, for example, Silverman, 2000), using NUD*IST software (QSR, 1999). Coding was first done for three major types of relationships (relatives, friends, and acquaintances) and for three major Internet applications (email, chat rooms, and instant messaging) separately for the adult men and women in the four interview sub-samples. We analyzed the contents of 18 collections of excerpts from the interview transcripts, nine referring to women's and nine to men's electronic communication with relatives, with friends, and with acquaintances by email, or in chat rooms, or by instant messaging. However, we do not report our findings for each year separately, because, with very few exceptions, we did not identify changes over time in the way men and women were using the Internet to maintain personal relationships.

Does Email Perpetuate Gender Differences In Relational Maintenance?

Quantitative data results

2001 Pew Internet & American Life Project data results

First, logistic regression was conducted to test for gender differences in using email to communicate with immediate and extended family, and to communicate with friends, controlling for age, educational level, family income, and Internet use. Women more often than men reported having sent email to family ($\beta = 1.36$; $p = 0.002$): 78.7 percent of the women but only 68.2 percent of the men who use email had ever sent email to a family member. Similarly, women more often than men reported having sent email to friends ($\beta = 1.42$; $p < 0.001$): 83 percent of the women but only 76.3 percent of the men who use email had ever send email to a friend (see table 13.1).

Because our dependent variable was categorical (with more than two categories), multinominal logistic regression was conducted to test for gender differences in the family members they most often communicated with by email. We controlled for age, educational level, family income, and amount of Internet use. There was a significant gender effect ($\chi^2 = 41.45$; $df = 7$; $p < 0.001$). Women reported sending email most often to their sisters and brothers (34 percent), followed by their parents (18.8 percent), their in-laws (14.1 percent), and their daughters and sons (13.6 percent). Men who used email to communicate with family, sent email most often to their sisters and brothers (38 percent), followed by their parents (17.5 percent), their daughters and sons (12 percent) and their cousins (11.4 percent). Unsurprisingly, 14.1 percent of the women but only 3 percent of the men reported an in-law as someone they send email to most often, and 6.6 percent of the men but none of the women reported emailing their spouse (see table 13.1).

To test for gender difference on where a friend they email most often lives – nearby or far away, logistic regression was conducted, controlling for age, educational level, family income and Internet use. There was no significant gender effect on location of friends ($\beta = -0.24$; $p = 0.28$).

Logistic regression was conducted to test for gender differences in reviving family ties by email and using email to locate a friend or a family member, controlling for age, educational level, family income, and Internet use. There was a significant gender effect on reviving

Table 13.1 The effect of gender on email use for different types of relationships

Using email to	Women (%)	Men (%)	beta[a]	s.e.
Email immediate and extended family ever	78.7	68.2	1.36**	0.43
Email friends ever	83.0	76.3	1.42***	0.37
Send email most often to a nearby friend	43.3	45.8	−0.24	0.22
Send email most often to a far away friend	56.7	54.2	−0.24	0.22
Revive family ties	39.1	21.6	1.21***	0.23
Locate a family member or a friend	28.5	28.1	0.25	0.21

Choice of family member in email communication

	Email most often to[b]		Have revived family ties with[c]	
	Women (%)	Men (%)	Women (%)	Men (%)
Spouse	0	6.6	0.5	1.6
Child	13.6	12.0	1.9	8.1
Parent	18.8	17.5	5.7	4.0
Sibling	34.0	38.0	26.5	35.5
Aunt or uncle	5.8	7.8	10.9	7.3
Cousin	9.9	11.4	34.1	30.6
Niece or nephew	3.7	3.6	8.1	8.9
In-laws	14.1	3.0	12.3	4.0

Attitudes toward email[e]

	Women	Men	F[d]
Useful for family communication	1.69 (0.86)	2.06 (0.82)	17.18***
Useful for communication with friends	1.44 (0.63)	1.55 (0.71)	6.56**
Will miss email if no longer uses it	1.42 (0.79)	1.55 (0.96)	4.13*

[a] Values are based on logistic regression described in the text.
[b] Multinominal logistic regression revealed significant gender effect ($\chi^2 = 41.45$; df = 7; $p < 0.001$).
[c] Multinominal logistic regression revealed significant gender effect ($\chi^2 = 17.36$; df = 7; $p < 0.05$).
[d] F-values are based on multivariate analysis of variance.
[e] 1 = very useful/a lot; 4 = not at all. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.
Source: Pew Internet and American Life Project, March 2001 survey data, http://www.pewinternet.org

family ties by email (β = 1.21; p < 0.001), with 39.1 percent of the women and 21.6 percent of the men reporting having started communicating regularly by email with a family member that they did not keep in touch with before. Multinominal logistic regression was conducted to test for which family member they revived communication with by email. Men and women had somewhat different preferences (χ^2 = 17.36; df = 7; p = 0.015). Men revived most often their communication with siblings (35.5 percent, compared to 26.5 percent for women), followed by cousins (30.6 percent) and nieces and nephews (8.9 percent, compared to 8.1 percent for women). Women revived most often their communication with their cousins (34.1 percent), followed by siblings (26.5 percent of the cases for women) and their in-laws (12.3 percent, compared to only 4 percent for men); 8.1 percent of the men but only 1.9 percent of the women reported starting regularly email communication with their sons or daughters with whom they had not kept in touch. However, logistic regression found no significant gender effect on using email to locate a friend or a family member (β = 0.25; p = 0.23).

Since three of the self-report measures of attitudes – usefulness of email for keeping in touch with family/relatives, with friends and importance of email – were theoretically and statistically related, a multivariate analysis of covariance was conducted to test for gender differences, controlling for age, education, household income, and Internet use. There was a significant multivariate (Hotelling's test) gender effect ($F(3,327)$ = 6.41; p < 0.001). The univariate tests showed significant gender effects on usefulness of email in communicating with family ($F(1,327)$ = 17.18; p < 0.001) and with friends ($F(1,327)$ = 6.56; p = 0.01), with women finding email more useful in communicating both with family and with friends than men. In addition, women indicated they would miss email more than men ($F(1,327)$ = 3.02; p = 0.04) (see table 13.1).

By and large, the Pew Internet & American Life Project data results support our predictions. Women use email more than men to communicate with family and with friends. However, women and men both email their immediate family most – siblings, parents, and children. However, men also communicate with their spouses by email, while women communicate with their in-laws. Men and women also differ in frequency of using email to revive family ties, and their patterns of family ties revived online are somewhat different. Women, for example, started communicating with their cousins most often and

only second with their parents; men, in contrast, started communicating most often with their parents and then, with their cousin. Interestingly, many more fathers (than mothers) started communicating with their daughters and sons, while, unsurprisingly, more women than men started communicating with their in-laws because of email. Men and women, however, seem equally interested in locating a family member or a friend online.

1998–1999 HomeNet survey data results

We used MANOVA to test for the effect of gender on frequency of email use and on time spent sending email, controlling for educational level, household income, and Internet use. (Since 98 percent of the HomeNet survey sample was Caucasian and we selected on adults, we did not control in these data analyses for race or age.) The overall effect of gender was not significant, although women were marginally more likely than men to report using email ($p = 0.11$).

Further, univariate analysis was conducted to test for gender effects on time spent on a weekday using email, controlling for education, household income and Internet use. There was a significant effect of gender ($F(1,217) = 4.23$; $p = 0.04$), with women spending more time ($M = 30.7$; $SD = 69.25$) than men ($M = 16.66$; $SD = 24.59$) per day sending email. There were no significant interactions, however, in the univariate analysis testing for overall email use (as measured by an index) men and women did not differ significantly ($F(1,218) = 0.77$; $p = 0.38$), although the difference was in the predicted direction (see table 13.2).

MANOVA was conducted to test for gender effects on frequency of email communication with friends in the local area and with people far away, controlling for education, household income and Internet use. The multivariate test was significant for gender ($F(2,239) = 3.31$; $p = 0.038$). There was no significant interaction of gender by geographic distance of the partner. Univariate tests showed no gender differences in frequency of people's use of email to communicate with local friends, but women were more likely than men to use email to keep up with people far away (see table 13.2).

Similarly, we used multivariate analyses to test for gender differences in attitudes about how useful and how much fun it is to use computers for five different activities, controlling for education, household income, and email usage. There was a significant gender effect on the dependent variables measuring how useful computers

Table 13.2 Means and standard deviations for women and men on measures of email use for personal relationships

Overall use of email	Women	Men	F^a
Using email (minutes)	30.70	16.66	4.23*
	(69.25)	(24.59)	
Frequency of using email	0.25	0.10	0.77^b
	(0.81)	(0.76)	

Frequency of using the Internet for different purposes[c]

	Women	Men	F
For communicating with friends in the Pittsburgh area	$2.48^†$	$2.36^†$	$2.76^†$
	(1.30)	(1.24)	
For keeping in touch with someone far away	2.98*	2.55*	6.62**
	(1.41)	(1.29)	

Attitudes toward Internet use for specific activities[d]

Software that allows you to . . .	How useful is . . .			How much fun is . . .		
	Women	Men	F	Women	Men	F
Send email	4.17	3.94	0.98	3.98**	3.48**	9.34**
	(1.12)	(1.11)		(1.15)	(1.08)	
Keep in touch with family and friends	4.09**	3.63**	8.95**	4.01**	3.56**	7.66**
	(1.02)	(1.10)		(1.07)	(1.09)	
Find new people to communicate with from all over the world	2.95*	2.53*	6.38**	3.18*	2.78*	4.91**
	(1.21)	(1.02)		(1.21)	(1.06)	
Keep up with music and entertainment	2.76	2.59	0.05	2.99	2.82	0.35
	(1.15)	(1.16)		(1.20)	(1.13)	
Play new computer games	2.59	2.52	0.55	3.07	3.05	0.07
	(1.20)	(1.06)		(1.34)	(1.18)	
Search the Internet or the worldwide web for hobby information	3.82	3.80	0.46	3.80	3.69	0.001
	(1.18)	(1.04)		(1.22)	(0.98)	

[a] F-values are based on the univariate analyses of covariance described in the text. Df for the numerator is 1 and df for the denominator varies between 217 and 240 for different dependent variables.

[b] This variable was centered with a mean of 0.

[c] Measured on a 5-point scale (1 = never and 5 = often).

[d] Measured on a 5-point scale (1 = not at all useful (or fun) and 5 = useful (or fun).

† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: The HomeNet Project, 1998–9 survey data

were (F(6,233) = 4.12; p = 0.001). Univariate tests indicated that women more than men believed the Internet was useful for keeping up with family and friends, and scored higher than men on usefulness of computers in finding communication partners (see table 13.2). In contrast, there were no significant gender differences on non-social items, such as keeping up with music and entertainment, playing computer games, or searching the Internet for hobby information. However, although women scored higher than men on the usefulness of sending email, this difference was not statistically significant.

A comparable pattern was found for the effect of gender on the set of dependent variables measuring how much fun computers were for certain activities. Univariate tests showed that women more than men believed that computers were fun for sending email, for keeping up with family and friends, and for finding communication partners. In contrast, there was no significant effect of gender on the items that were not associated with personal relationships, namely, keeping up with music and entertainment, playing computer games, or searching the Internet for hobby information (see table 13.2).

The HomeNet survey data results support most of our prediction. Overall, women spent more time than men using email per day, although they did not use email more days per week. They used email more frequently than men to communicate with friends far away. Moreover, women more than men found email useful and fun.

By and large, the results of the two data sets analyses suggest a number of consistent patterns of using email to maintain personal relationships. Women, for example, are spending more time than men communicating with family and with friends by email, but both men and women send email most often to their siblings and parents. There are, however, mixed results on whether women and men are using email differently when communicating with people nearby and with people far away. On the other hand, data results show consistently that women think of electronic mail in more positive terms than men.

Qualitative data results

The survey data analyses reveal gender-related patterns of sustaining personal relationships using computers, but they provide no detail about differences in communication between friends and family. They

provide no information about the substance of the communication online. To explore these issues, we turn to the interview data.

All interviewees had Internet access, and at least one member in each household was in the top quartile (in the HomeNet survey sample as a whole) in time spent online. In the interviews, more women than men reported using email for personal relationships. Of the 32 women who were interviewed, 29 reported using email at home to communicate with others, whereas of the 28 interviewed men, only 14 used email. Of those who did not use email, all 3 women, but only 2 of the 14 men attributed it to lack of time and/or knowledge about how to use email or to having difficulty typing. None of the women and 5 men in the sample reported lack of interest in using email to communicate with others, illustrated in the following comments of 2 men who did not use email.

> JIM:[1]   I utilize the computer for entertainment and information. I don't email or any . . . I don't email at all.
> MARC: I don't email friends or relatives . . . I don't know why . . . I'm not one to communicate often with friends, you know, like, I communicate with them once a month and that's fine with me.

In the context of these findings – that 91 percent of the women and only half of the men in our sample use email to communicate with others – we further examine what specific relationships are sustained by this mode of communication.

Types of relationships sustained by email

Communication with family and kin

As in the Pew survey, interviewees conducted little communication within the household by email. Only two families reported using email among themselves. In one case, a family used email to communicate with each other in different parts of the house. In another case, a husband at work exchanged messages with his wife at home – on topics ranging from how their day was going to making shopping lists.

Communication by email with other family and more distant kin perpetuates the gender-role pattern described earlier. One of the female interviewees described explicitly such a gender-related pattern in her family.

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1   For considerations of confidentiality, we use pseudonyms throughout the text.

> BARBARA: In our family . . . I'm much more of the communicator and
> my husband is not. It's a typical, I guess, gender division, and it
> happens to be true in our case. I'm the one who, you know, talks on
> the phone to the other family members and makes social arrange-
> ments and all kinds of things like that, and when we got the email,
> that trend just stayed. I mean I am the one who emails our son, who's
> at college and I email other family members and my husband really
> has no interest in email. And he was never one who would talk on
> the phone, either. He occasionally has used it [the computer] to
> pursue a few of his, you know, hobby interests on the Internet, but
> other than that he doesn't use it. So, I don't know, it's not because he's
> shy, I just think people who aren't that interested in communicating
> they're not going to do it with email either.

The interview data suggest that women in the recent cohort were more
likely to use the Internet to communicate with family and kin than
those in the earlier sub-samples. Only 12 out of 20 women who used
email between 1996 and 1998 reported extensively using it to contact
their family and kin, while all nine women interviewed in 1999 did so.
We did not see similar cohort effects in men's email use.

   Women reported communicating by email most frequently with
their siblings and with their parents. Of the 29 women who used email,
10 corresponded with their siblings and 6 with their parents. Com-
munication with family was less common among the 14 men emailers
– only four reported staying in touch with siblings by email, and
none with parents. When women failed to use email with siblings or
parents, their most common explanation was that the relatives did not
have Internet access. Men were less likely to give this explanation.
These findings are consistent with the Pew Internet & American Life
Project data results for women, but not for men. However, the one time
that men reported they chit chat by email was when they emailed to
siblings. For example, in describing what sort of things he used to
write about in email with his brother, one male participant explained:

> JERRY: Um, reunion coming; what his life has been . . . You know, his
> circumstances, um, what my niece, his daughter is doing . . .

We also found weak evidence that email supplemented women's
telephone conversations with their parents, whereas it substituted
for telephone calls with their siblings. For example, some of the
women who communicated with both elderly parents and siblings

by email explained that they also called their parents as before, but called their brothers and/or sisters less often, since having the email connection.

Ten of the female interviewees (34.5 percent of the email users) and 3 of the male interviewees (21.4 percent) reported communicating by email with other kin – namely, cousins, aunts and uncles, a niece and a nephew, or, with their in-laws, findings very similar to the Pew Internet & American Life Project data results. One case is of particular interest because it presents a non-traditional way of meeting future in-laws. After their wedding date was announced, Jean started communicating with her future in-laws online before she even met them in person. For example, she developed a relationship with her sister-in-law online long before she met her in person on the wedding day.

The interviews do not contain adequate information on email communication between the parents and their children who do not live at home, because adults in the sample were young and the sample contained only four children (two daughters and two sons) away in college. Mothers reported staying in touch with all four by email, whereas only one father reported occasionally corresponding with his son. Three more women, who expected their daughters to be leaving for college soon, expressed enthusiasm about using email in the future to stay in touch with daughters in college. One family kept a common email account that they could use to keep in touch with their son in college, but only the mother regularly checked the account. With one exception (when a son regularly did not answer email), mothers found email connections with their children in college to be useful and satisfying.

As a whole, our qualitative data findings do not indicate that email usage introduced any dramatic changes in the gender-specific pattern of communication with family and kin. There was, however, one case when using email resulted in redefining a traditional communication pattern. One participant, Barbara, took advantage of email to change dramatically her relationships with both her father and her son. From the beginning of her marriage, she had long, weekly phone conversations with her mother; her father would get on the line only briefly to say "hi." She had hardly ever exchanged personal thoughts and emotions with him before he started using email. With email, they started a regular correspondence and her father shared his feelings, thoughts and personal history with her. Still, when Barbara would call home, it

would be only her mother, but not her father, who would talk to her. "If it were not for the email, I wouldn't have talked to my father . . ." Barbara also found email communication with her son in college more gratifying than phone communication with him.

> Barbara: I email him [my son] a lot. And I enjoy that and I feel that we have a much better communication on email than we would on the phone. And if we didn't have email I wonder what our communication would be, because somehow when I call, it's like, you know, he's busy, or he's tired, or he's studying, or whatever.

Such cases suggesting that email is radically changing relationships with friends and kin, however, were exceptions in our data. Despite this, we believe it is important to investigate in depth such cases in the future in order to better understand why this is happening and how gender and other social and personal factors influence this process.

Communication with friends

In our interview sample, women and men differed in the size of the circle of friends they sustained by email. Twenty-three women, or 72 percent of the women interviewed (79 percent of the email users) and 9 men, or 32 percent of the men interviewed (64 percent of the email users) reported staying in touch with friends using email. These findings, again, are comparable to the Pew Internet & American Life Project data results. In addition, the interviews suggest that, like communication with family and kin, women have the responsibility for sustaining relationships with common family friends by email. Irene and Tom, a husband and wife whom we interviewed, described this pattern in their family. It seemed natural to them that Irene was the one who communicated directly with family and common friends by email, thus leaving Tom feeling that he did not need to duplicate the activity.

> Irene: [talking about relatives and friends] . . . people email me stuff and I'll send it to him [her husband].
> Tom: . . . rather than both sending [email] . . . I mean, she talks [by email] to them and then she emails me anything I need to know, so I don't really communicate directly with them, but indirectly, through her routing me the emails.

Communication with local friends

Women and men did not seem to differ much in their use of email to communicate with geographically local friends. Seven men (25 percent of those interviewed and half of the male emailers) and 10 women (31 percent of those interviewed and 34 percent of the female emailers) reported using email to communicate locally with friends. These findings are consistent with the survey results, and support our prediction about local personal email exchange. In the interviews, both men and women emphasized the convenience of email for organizing activities and arranging events with friends and acquaintances in the area. However, the uncertainty of whether the message would be accessed on time was a major reason for not using email even more often for local personal communication.

Neither women nor men seemed to use email just to chat with local friends. There was only one exception – a woman who reported preferring email over phone to "chat" with her closest friend locally.

> JANE: I have a friend that lives 10 minutes away and we email back and forth [just to chat] . . . I could pick up the phone and talk, but we don't.

Jane explained that they email instead of talking by phone, because "it is painless," "[i]t's like sending notes in class" – she could do it at the spur of the moment.

Communication with geographically distant friends

In contrast to its restricted use for local relationships, the interviews showed email as more central to distant relationships – be it with friends or with relatives, with women using it more extensively for this purpose than men. The interviews showed that email made it easier for both men and women to sustain personal friendships with people far away in at least three different ways. First, email helped people to retain relationships despite geographic mobility. Several interviewees reported that after moving to a new location or a job, email kept them in touch with people from the old location – former colleagues, friends from college, or neighbors. Hampton and Wellman (2001) report similar findings. While geographic relocation frequently interrupted regular contacts with extended family and non-intimate friends, email countered this disruption with low-cost communication.

> SUSAN: [W]e use email to keep in touch with people who live in places where we've lived at various points and you know, who we haven't seen in a long time and who would otherwise be tricky to keep in touch with. So, we email, certainly not on a daily or even . . . well, depending . . . at least weekly or monthly . . . way back and forth.

Second, email provided a low-cost means of reinvigorating previously dormant relationships. The Pew survey data results, for example, showed that about 28 percent of those who use email have tried to locate a family member or a friend online. Similarly, some of the interviewees reported that a combination of email and the worldwide web allowed them to actively search for friends they had lost contact with and to re-initiate contact with them. Thus, through email people intensified their communication with dormant friends and acquaintances. Jill, for example, explained how she was able to keep in touch with some friends, with whom in the past she had only exchanged Christmas cards.

> JILL: On Christmas cards I sent out the email address and I did discover I had some surprising contacts . . . I did find again some long lost friends.

Finally, and more rarely, email allowed people to develop relationships with others far away that they would not have maintained otherwise. Irene, for example, described being able to build strong relationships communicating frequently by email.

> IRENE: [T]here are people I never talk to, like my friend in Alaska, I never talk to him on the phone, we just email each other. Also, my friend in Ireland, we never talk, we just email, so, that's really nice because . . . My friend in Alaska I've only seen him three times ever and we . . . basically our whole relationship for the three or four years has been over the Internet and emailing, so, that's kind of interesting.

The interviews suggest that email expands the circle of geographically distant friends more for women than for men. Eleven women (38 percent of emailers and 34 percent of all women with Internet access) and 4 men (29 percent of emailers and 14 percent of all men with Internet access) reported keeping in touch with more geographically distant friends because of email. The HomeNet Project survey data also showed that women use email more often to keep in touch with someone far away. However, when it concerns one far away friend to

whom they email *most often*, the Pew Internet & American Life Project data results did not show a significant gender difference.

Message types and patterns of message traffic

To better understand how email builds and sustains relationships, we analyzed interviewees' descriptions of their email content and a limited sample of email messages that they made available to us. These data suggest that there are at least three types of email messages: boilerplate messages, messages for coordination, and messages for personal sharing. Each of them plays a different role in developing and sustaining relationships. Because of the small sample of messages, we do not even speculate here on possible gender differences.

Message types

BOILERPLATE MESSAGES

Boilerplate messages include jokes, stories, sayings, greeting cards, pointers to music sites, and other pre-fabricated messages copied by the sender from one source and then forwarded, often to more than one recipient. For example, one of the women in the sample received the following note addressed to her and nine other recipients, most of whom she did not know:

> *Feminist saying*, ca. *1968–72*: "The hand that rocks the cradle can also cradle a rock."

Like conventional greeting cards, these boilerplate messages serve to remind partners of each others' existence and, as such, preserve a relationship as a potential resource for companionship, advice, or social support at some later time. It is also important to emphasize that these are messages often addressed to a group of receivers – the circle of sender's friends and/or relatives. Whether and how this could affect the density of one's social network needs to be studied further.

COORDINATION MESSAGES

A second type is a coordination message. It is used to set up a joint activity or other occasion where the participants share companionship and other social resources. This excerpt from a message of one woman to another illustrates this second type:

> JULIE: I don't know how your plans are working out for tomorrow
> night, but it's no problem with me if we have to reschedule it for next
> week or whenever. I will be out of the house most of tomorrow, so
> you probably won't be able to get me on the phone then anyway.

Other examples of messages for coordination included organizing a
group of friends to play golf over the weekend, arranging monthly
board-game nights with 20 other family friends, and managing activi-
ties of a local community committee on families and education.

MESSAGES FOR PERSONAL SHARING

The third type of messages have personal content that directly sup-
ports the relationship. Such messages have an expressive nature, and
in themselves provide companionship and social support by allowing
communicators to share thoughts and feelings with one another. Con-
trast, for example, the coordination email from Julie above with the
following message Alice sent. Alice's message has substantive content,
which enacts the relationship.

> Long time no hear from! How are you? I'm getting by. I'm still working
> at the law firm as a receptionist but I am bored!!! And I was turned down
> for two jobs this week. I had second interviews for both. I thought at
> least one would be good! I really feel like I suck!!! Anyway, I came across
> your address and thought I'd write you. Hope all is better for you. I'm
> glad spring is coming!!

Dorothy, a creative writer, exchanges emails with her artist mother,
along with regular phone calls and occasional visits. They talk about
family gossip and the events of the day, and in particular, what her
mother has been working on that day. These messages also serve to
enact the relationship, by themselves providing companionship and
social support.

> DOROTHY: For her [my mother], talking about work in progress is very
> interesting to her and can get her going. So, she'll be telling me she's
> working on something and ask for my ideas on it and I'll send ideas
> back and so, back and forth, that kind of thing, and then family gossip
> . . . you know, this sister is coming to dinner, or you know, this
> nephew said this funny thing. There's a certain amount of family chit
> chat in there, too.

We have some preliminary evidence that women may not consider
email very suitable for sharing of emotions and personal thoughts. Six

women reported that they restricted their email contacts to light conversation, reserving deep conversations involving social support for more interactive media – the phone or, in more recent times, instant messaging. Kathleen described media choice when communicating with her daughter this way:

> KATHLEEN: [W]hen times were stressful, she [my daughter] would call up . . . you know, that upset does not necessarily come through on an email. And so, I was there for emotional support . . . So, a lot of it was not conversational . . . While, just here [in her email messages] is some information . . . what are you doing, Mom, and I would write back and you know, those kind of things . . . it's likely to be much longer and in depth if we're on the phone.

However, at least two women judged email more appropriate than the phone for deep, emotionally laden topics with someone far away. In one case, a female family friend was terminally ill and her husband used email to keep friends informed about her physical and emotional state. In another case, email communication supplied indispensable emotional support for two sisters after their mother died.

> CYNTHIA: My Mom had died a while ago and . . . we were talking about that through email and you know, she [my sister] said stuff about my Mom and everything, and . . . the way we were talking, I'm thinking, I probably never would have said that to her.

Although these examples may only be exceptions, they suggest some of the conditions under which email may be preferred over the telephone for sharing deep emotions. Email is more efficient than interactive media for broadcasting messages to a group of recipients. In addition, email is a more reflective medium than the phone or instant messaging, and allows the writer to more carefully choose and review message content before sending it.

Patterns of message traffic

The interviews data suggest two differing styles of email use for maintaining personal relationships: *facilitating dialogue* (enacting the relationship in intense bursts of email communication) and *restricting dialogue* (interrupting the communication at an early stage). Several women emphasized that they emailed others "in spurts," activating a

dormant relationship through an intensive communication exchange for a few days, then allowing it to die back. The following excerpt is an example of how initiating communication with another stimulates further communication for women.

> JILL: For a short spurt I'll email her back and we'll email for a couple of days and then we sort of fade out for awhile until the next spurt . . . [Once we get in touch,] I usually get excited about emailing the person, it just makes me want to talk to them more.

In contrast, some of the male interviewees seemed more apt to accept substantial delay between messages. One of the interviewees, Jim described this pattern in some detail. When he would get an email message from a friend, he would almost never respond to it right away. He may or may not get back to him in some future communication session.

> JIM: I don't see much use [in email] unless it's something important. If it's something [important], I'd like to get to it later, like, I won't answer right then. Like, say, if I'm just checking email, but if I really want to write [back] something, I'll leave it [the message] there, so the next time I can come back and write whatever it is.

Another interviewee, Harry emphasized that intensive email message exchange with another person was not something "men do."

> HARRY: For me, it [email] usually has a point of giving him [his friend] information, asking him questions: are you available for that . . . Not back and forth simultaneously in chains. Not for me; maybe for Elizabeth [his daughter].

A wife commenting on her husband's use of email revealed a similar *restricting* email communication style.

> MARY: People generally send him a letter and then a couple of weeks later he sends them three lines. And that's about it . . . You know, he'll have lots of things to say every so often, but then months will go by and he won't be very interested in it.

Our interview data findings also suggest that instant messaging, by facilitating dialogue, may be more appealing to women than to men. Melanie, interviewed in 1999, preferred instant messaging to email for reasons described below.

> MELANIE: Well, first of all, an email message . . . it's a one-sided con-
> versation, you have to get a response before you can type anymore,
> but on instant chat we use a split screen all the time, so you can chat
> constantly. It's just like talking on the telephone except that you're
> using a printed word instead, [which is] much better.

However, because instant messaging did not exist when we started to
collect interview data, its use is under-represented in our sample.

Both email and instant messaging are text-based communication
modalities. Some previous studies have suggested that women
express themselves better in words than men, and men tend to be more
reluctant to communicate using written text (Maccoby and Jacklin,
1974). In our interviews, four of the women emphasized that they
enjoy using email because it is a text-based communication medium,
as illustrated below.

> JILL: [W]hen you're typing, at least in my own self, I can talk better
> when I'm typing and I'll type my thoughts better than if I'm saying
> them on the phone, you know.
> IRENE: I say it in email, you know, I write it, 'cause I'm more careful
> when I write than when I talk. So, if I do not want to give, say, some
> information that they're not gonna be happy to hear, I will do it very
> diplomatically [by email].

It is not clear, though, if text per se or the possibility of having more
control over the communication process is what may make email or
instant messaging more attractive to some people than non-text-based
communication modalities.

Discussion and Conclusions

Our study suggests that women use email more often than men to
sustain or invigorate their personal relationships. Similar to previous
findings (for example, The Pew Internet & American Life Project,
2000a), our analyses of all three datasets show that overall, women use
email more than men in communicating with family and friends, and
women use email more than men to start communicating regularly with
a family member that they did not keep up with very much before. The
different role obligations men and women have in personal relationship
maintenance and the different value they place on personal relation-
ships may account for these differences in email use.

Thus, our study suggests, women are using the new technology more than men in maintaining and even expanding their social networks. But both men and women are using it intensively to keep up with their siblings and their parents. The new technology seems to encourage men to communicate more regularly with their sons and daughters, while wives are taking advantage of less costly (both in time and money) email to fulfill gender role obligations to communicate with the in-laws. Email is having a generally beneficial effect on personal relationships, although, it seems, more so for women than for men.

Our findings, of course, are conditional on the limitations of our survey and interview samples. Our survey and interview samples are not directly comparable. For example, HomeNet survey data were collected from a relatively small sample only in the city of Pittsburgh. The Pew Internet Project data are more diverse, but still is not representative of the population as a whole. The face-to-face interviews were accumulated gradually between 1995 and 1999, while the survey data reported here were collected in 1999 and 2001 using different methods (mail surveys and phone interviews). While the HomeNet Project data reflects mostly email usage at home, most of the Pew Internet Project data include both home and work email usage. The participants in our samples were predominantly middle aged, middle class, married, white Americans. Men and women who are not middle class and white may have different gender ideologies and different patterns of personal relationship maintenance and styles of relating to others. For example, at least one study (Argyle and Henderson, 1985) found that the number of friends and choice of communication modality vary across social groups. People from higher socioeconomic groups tend to have more friends compared to lower socioeconomic groups, and working-class women tend to communicate more face-to-face than higher socioeconomic group women. Married people, on average, have fewer friends compared to non-married people (Hause, 1995).

Only one author coded the interviews, and our conclusions about message content are based on the text of a small sample of messages as well as on interviewees' comments about their messages. Also, we do not compare email to other modes of communication, nor do we consider the gender of the corresponding partner. Previous studies, for example, show differences in communication patterns between same-gender and different-gender friends (e.g., Parker and de Vries, 1993). We do not control for availability of email for interviewees' relatives and friends.

Despite these limitations, our study shows some patterns across samples. It appears that some pre-existing differences between men and women in their beliefs and behaviors in maintaining personal relationships are being perpetuated in email communication. For example, women in the United States have been traditionally responsible for maintaining relationships among family and friends, and we find that they have appropriated email as a new tool for this traditional role obligation. Women also reported more often than men sending email to extended family, especially cousins and in-laws. These findings of gender differences using email replicate gender differences using the phone, or sending greeting cards, and letters. In all these modes of communication, women do most of the "work of kin" (cf., Di Leonardo, 1987). However, for both women and men, the new technology seems to have stimulated communication with adult siblings and cousins, and between fathers and their children more so than between mothers and their children. Relationships with siblings – for both women and men – outnumbers any other type of relationship maintained by email. Our findings show that, in fact, women and men have quite similar patterns of types of family/kin relationships that they maintain regularly by email, but they differ in frequency of communication with family and kin.

We have mixed results on the role of proximity in email use and how it is influenced by gender. Our study shows that men and women do not differ in using email locally for personal relationship maintenance. Email is useful for setting up joint activities, and both men and women use it for coordinating social activities with local partners. These findings are consistent with recent reports on a tendency for women to become more instrumental in their relationships (Duck and Wright, 1993; Spence and Buckner, 2000; Twenge, 1997; Wright and Scanlon, 1991). In addition, women seem to use email to keep in touch with relatives and friends far more often than men. But women and men do not differ when using email to contact one friend they communicate with most often by email – whether nearby or far away. It could be that women use email more than men to maintain a larger social network at a distance, while email is similarly used when emailing frequently to one friend of choice, independent of where this friend lives – nearby or far away.

Both HomeNet and Pew Internet & American Life survey data show that women have more positive attitudes toward using email as a tool to connect to others. They find sending email to family and friends more useful and more enjoyable than men do. Other studies

have come to a similar conclusion – email is more psychologically gratifying to women than to men (see, for example, Pew Internet & American Life Project, 2000a; Stafford, Kline, and Dimmick, 1999). One reason could be that women tend to express themselves better in words than men do (Maccoby and Jacklin, 1974). Also, since using text in an asynchronous mode provides the individual with more control over the conversation (e.g., McKenna and Bargh, 2000), email could be psychologically more advantageous to women than to men. Research findings show that women tend to worry more about their relationships and the impression they make on others in communicating, while men tend to be more relaxed about the state of their personal relationships (Michelson, 1988). Using communication modalities that allow for more control over what they say and when they say it may be more gratifying to women than to men.

We have only weak evidence that gender differences in communication styles show in email communication too. Women, who are more likely to use a facilitative communication style (seeking dialogue), seem to communicate by email "in spurts," enacting their relationships in intense bursts of communication. In contrast men, being more prone to a restricting style of communication, seem to tolerate considerable delays between communication sessions. These findings suggest that instant messaging may differentially appeal to women than men, because it better supports highly interactive communication sessions.

While our study shows that email is appropriated by both men and women to enact already existing patterns of relationship maintenance, we also found some indications that certain types of personal relationships may be changing as a consequence of computer-mediated communication. For example, email seems to intensify communication with siblings, and of fathers with their daughters and sons. Also, our interview data suggest that women are using email to supplement telephone conversations with their parents, whereas they are substituting it for telephone calls with their siblings. Is computer-mediated communication slowly changing relationship dynamics, or is it just shifting communication modalities?

While our study focuses on email, Internet services for real-time communication have been spreading rapidly, especially among the younger population. Future research on the issues of how a variety of new technologies are used to sustain or change personal relationships should include all these modalities, and more diverse demographic groups.

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