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New Media Society 2008; 10; 547
DOI: 10.1177/1461444808091224

new media & society

Los Angeles, London, New Delhi and Singapore
Vol10(4): 547–564 [DOI: 10.1177/1461444808091224]

ARTICLE

Media use and relational closeness in long-term friendships: interpreting patterns of multimodality

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Abstract

Although most friendships use a variety of media to stay in touch, many studies have ignored the multimodality of social life. This study uses media niche theory to consider: changes in patterns of media use across time, which modalities tend to be used in association with other modalities; and the association between specific modalities and relational closeness. Data assessing modality usage and degree of friendship closeness were collected on best friendship pairs in 1987 and 2002. The results suggest that postal mail use has declined between 1987 and 2002, telephone contact has become a particularly potent predictor of relational closeness, and face-to-face contact is a less stable indicator of closeness. Intimacy and efficiency or convenience emerge as two potentially important constructs for understanding how modalities are used for maintaining relational closeness.

Key words

best friendship • email • face-to-face • media niche • longitudinal • postal mail • relational maintenance • telephone

During the final decades of the 20th century, as well as the first decade of the 21st century, many worldwide have adopted several new communication

media for relational use. Although humans have been transacting mediated communication for millennia (Scheele, 1970), computerized technology now enables more convenient contact across greater distances than any previous era. Email, once thought to be unwieldy for all but task-oriented functions (Sproull and Kiesler, 1986), is one such medium which has become commonly used for relational communication (Rainie and Horrigan, 2005).

The goal of this article is to consider how modality use may change over time in a friendship, what patterns of modality use exist in friendships, and the relationship between modality use and friendship closeness. Using media niche theory (Dimmick et al., 2000) as a theoretical basis, a longitudinal sample containing data on modality usage in 1987 and 2002 is analyzed to examine these research goals. A chief aim of this investigation is to move toward explaining not just the use of a medium in the moment, but rather how the use of various media might change as new media technologies are continuously developed and adopted.

LITERATURE REVIEW

In contrast to work which tends to treat online and offline social life as separate spheres (Beebe et al., 2004; Donchi and Moore, 2004; Kraut et al., 1998; Morahan-Martin and Schumacher, 2003; Nie and Hillygus, 2002; Nie et al., 2002; Robinson et al., 2002), this study ontologically assumes that social life is fundamentally multimodal: many – perhaps most – relationships in North-American culture are conducted not just across a single modality, but also using a combination of media (Baym et al., 2004). This was true in the past with media such as the telegraph (Standage, 1998), telephone (Fischer, 1992) and postal mail (Baron, 2000; Danet, 2001), and the multimodal nature of social life continues and complexifies further with the integration of computer-mediated technologies (Baym et al., 2004; Chen et al., 2002; Haythornthwaite, 2005; Quan-Haase et al., 2002; Wellman et al., 2003). Given that social relationships tend to be multimodal, it is important to understand the influence that the usage of each medium has on maintaining relational closeness and how the media used for relational maintenance change with the adoption of new communication media.

Dimmick et al.'s (2000) media niche theory is a useful sensitizing perspective for examining these questions. Media niche theory posits that each communication medium occupies a niche, or set of gratifications for which that medium is used. A niche may be broad (i.e. satisfying a wide array of gratifications) or shallow (i.e. satisfying only a limited range of gratifications), and the niche of one medium may compete against or complement the niche of another medium. For example, when using this

theory to compare use of the telephone and email, Dimmick et al. (2000) found that the gratifications of these two media overlap, and therefore compete, in their ability to transcend distance. However, the media differ and therefore complement each other in their capacities for intimacy and convenience, with the telephone providing a greater sense of intimacy while email's temporal flexibility (i.e. the ability to compose, send, receive and reply to messages asynchronously) provides increased convenience. Therefore, even although the gratifications of the telephone and email overlap, the introduction of email does not completely displace telephone usage.

While it is known that media niche theory can describe how various media are used, it is not clear how the niches of a medium may change over time. The course of college best friendships as they leave college and move through adulthood provides an ideal site for examining such potentially shifting patterns of multimodality. During early and middle adulthood, new occupational and family responsibilities often curtail the ability to invest time in maintaining friendships. Some formerly close friends become relationally distant, while others maintain a strong relational bond (Rawlins, 1992). Given the voluntary nature of friendship and the wide variety of media that are normative for maintaining friendships (see Baym et al., 2004; Chen et al., 2002), studying modality use in friendships may increase understanding of both patterns of multimodality in social life and the changing nature of this multimodality (i.e. how a medium's niche changes over time relative to other media). Using longitudinal data collected in 1987 and 2002 from dyads that were best friends in college in 1983, this research investigates the associations between the use of common interpersonal modalities and relational closeness.

This study chiefly addresses three issues regarding multimodality and relational closeness. First, it is concerned with changes in modality usage between the two phases (1987 and 2002) of the study. As email both competes with and complements other media, it is likely to alter the niches of these other interpersonal communication media; in particular, given the similarity of email to postal mail and its increased convenience, it seems likely that email would displace the relational maintenance function of postal mail. Declining usage of interpersonal postal mail within the USA (United States Postal Service, 2004) and globally (Universal Postal Union, 2004) suggests that this may be occurring. Therefore, it is hypothesized that:

> H1: Postal mail usage will have decreased significantly between the 1987 and 2002 phases of the study.

Second, this study is concerned with the patterns of modality usage that exist in friendships. In other words, the study seeks to discover which

modalities tend to be used in combination with other modalities. The extant literature does not provide grounds for a clear hypothesis, so a research question is advanced:

> RQ1: What patterns of modality usage exist between friendship dyads in 1987 and 2002?

Third, the study is concerned with the association between modality usage and relational closeness. From the perspective of media niche theory, this concern is tantamount to asking which media tend to be allocated to closer relationships. Dimmick et al. (2000) suggest that the telephone supersedes email in satisfying intimacy needs. Baym et al.'s (2004) results indicate that while email contact may signify that a certain level of closeness exists within a dyad, regular telephone contact may be reserved for closer relationships. Therefore, it is reasonable to assume that telephone usage accounts for variance in closeness beyond that predicted by email in 2002. Furthermore, if email has supplanted the interpersonal communication niche previously occupied by postal mail (Universal Postal Union, 2004), it could be assumed also that telephone usage accounts for variance in closeness beyond that predicted by postal mail in 1987 and that, relative to other media forms, postal mail usage will not be associated significantly with relational closeness:

> H2: In 1987, both telephone and postal mail usage will be positively associated with relational closeness, with telephone usage accounting for variance in closeness beyond that predicted by postal mail usage.
>
> H3: In 2002, both telephone and email usage will be positively associated with relational closeness, with telephone usage accounting for variance in closeness beyond that predicted by email usage.
>
> H4: In 2002, postal mail usage will not make a statistically significant unique contribution to variance in closeness.

It is not clear from previous research what niche face-to-face interaction occupies. While early theories of computer-mediated communication (CMC) held the supreme capability of face-to-face communication to transmit intimacy as a basic trait of the medium (Daft and Lengel, 1986; Sproull and Kiesler, 1986), other research suggests that face-to-face may not always transmit intimacy better than other media. In particular, face-to-face communication can be hindered by geographic distance (Baym et al., 2004; Chen et al., 2002), which is likely to be a limiting factor within the post-college friendships considered in this study. Because face-to-face communication requires both spatial and temporal coordination, it is often

the least convenient form of interaction, and therefore is not always a reliable indicator of relational closeness (Chen et al., 2002; cf. Haythornthwaite and Wellman, 1998). Given these conflicting predictions, a formal hypothesis about the role of face-to-face interaction is not advanced:

> RQ2: Does face-to-face contact explain variance in closeness beyond that predicted by other modalities?

Finding that face-to-face contact predicts additional variance in closeness beyond that explained by other media might serve as evidence in support of early CMC theories, such as media richness theory (Daft and Lengel, 1986); from a media niche perspective, this would suggest that face-to-face holds a unique niche as a communication medium used in particularly close relationships. A contrary finding would cast doubt on media richness theory (cf. El-Shinnawy and Markus, 1997), suggesting that other media can effectively supplant face-to-face's niche for maintaining relational closeness.

METHOD

The data analyzed for this study comes from a longitudinal investigation of college best friendships. Previous analysis of this data has revealed several predictors of relational closeness across the 19 years of the study (Griffin and Sparks, 1990; Ledbetter et al., 2004). The data is revisited here to probe the association between modality usage and relational closeness.

Participants

The participants were originally recruited in 1983 from undergraduate and graduate students at a small Christian liberal arts college. A variety of methods were used to find participants, including personal contacts and placing poster ads on campus. A dyad had to meet one rigorous criterion in order to be included in data analysis: each member of each dyad was asked, privately and individually, whether there was anyone on campus whom they considered to be a closer friend. If either member of the dyad identified even just one person with whom they were closer, the dyad completed the study measures but was discarded from data analysis. Additionally, cross-sex friends were asked privately and individually to report whether their relationship was romantic in any way; similarly, a dyad was discarded if either partner reported that a romantic element was present. After filtering dyads through these criteria, the initial sample was composed of three different types of friendships: male–male dyads ($N = 15$); female–female dyads ($N = 17$); and cross-sex, or male– female platonic dyads ($N = 13$). The measures that friends completed in 1983 are not germane to the current study and therefore will not be discussed further (see Griffin and Sparks, 1990).

The second phase of the study occurred in 1987, after all the participants had left campus. Questionnaires were distributed to participants through postal mail. The response rate was high: only six of the original 90 participants failed to return a survey, and at least one survey was received from at least one member of each dyad. One male–male dyad was discarded from the analysis due to the death of one of the friendship partners, yielding a 1987 sample of 44 friendship pairs. The third and final phase of the study, conducted in summer 2002, was methodologically similar to the 1987 phase. A survey was distributed to participants through postal mail. Again, the response rate was remarkably high: 58 participants (64%) participated in this phase, with at least one partner responding from 38 of the 44 dyads.

This final sample contained 11 male–male, 16 female–female, and 11 cross-sex friendships. However, a small number of these pairs reported no contacts in either the 1987 or 2002 phases of the study. Such cases seemed inappropriate to include in the dataset while searching for patterns of modality usage in relationships, and so were removed from the analysis. This further reduced the dataset to 39 dyads (13 male–male, 16 female–female, 10 cross-sex) in the 1987 sample and 33 dyads (10 male–male, 15 female–female, 8 cross-sex) in the 2002 sample.

Modality usage

During the second (1987) and third (2002) phases, participants were asked how frequently they communicated with the other member of the dyad through face-to-face, telephone and postal mail; in the third phase, participants again reported the amount of contact across each modality, this time also reporting frequency of email contact. For each modality, each participant could indicate the number of contacts per week, month or year. Responses were recomputed into scores that reflected the number of contacts per year (e.g. reporting one contact per month would be multiplied by 12 to yield a score of 12 contacts per year; 52 contacts per year, or one contact per week, was used as a ceiling value, indicating near-constant contact between the friends across that modality).

Friendship closeness

Participants completed Maxwell's (1985) Close Relationship Questionnaire (CRQ) in both phases. This questionnaire records reports of caring behavior across nine categories:

1 separation distress;
2 natural disclosure of intense feelings;
3 touching;
4 seeking to spend time;
5 imitation;

6 reciprocity of behavior;
7 help and gifts;
8 similarity in attitudes and values; and
9 disclosure of intimate details.

Unit of analysis

Throughout this study, dyads rather than individuals are the unit of analysis. Therefore, when possible, the responses of each member of the dyad were averaged to yield dyadic contact scores and closeness scores. Admittedly, it would be preferable to use more complex data analytic techniques, such as structural equation modeling, to analyze this dyadic data. However, such an approach was deemed inappropriate due to the small sample size of the data. However, it also seemed inappropriate to discard valuable data through either eliminating dyads in which only one friend returned data, or randomly removing one friend from pairs who both returned data and used only individual scores. The best compromise seemed to be to average dyadic scores when possible, and use individual scores as proxies for dyadic scores in pairs where only one friend returned data. Generally strong correlations between the contact and the closeness scores of members of dyads who both returned data suggest that this choice is acceptable.

Several other measures were collected during each phase of the study. For additional information about this study's methodology, see Griffin and Sparks (1990).

RESULTS

H1: modality use between 1987 and 2002

The first central concern of this study is how modality usage changed between 1987 and 2002, hypothesizing that postal mail usage decreased between these two times (H1). Descriptive statistics were computed on the seven raw contact frequency variables:

1 face-to-face contact in 1987;
2 telephone contact in 1987;
3 postal mail contact in 1987;
4 face-to-face contact in 2002;
5 telephone contact in 2002;
6 postal mail contact in 2002; and
7 email contact in 2002 (see Table 1).

These descriptive statistics alone reveal changes in media use between the two phases of the study: While the average amount of contact across face-to-face and telephone decreased, postal mail usage decreased most dramatically between 1987 ($M = 8.53$, $SD = 12.29$) and 2002 ($M = 1.35$, $SD = 2.25$).

While 10 dyads reported 10 or more postal mail contacts per year in 1987, no dyad reported more than nine postal mail contacts per year in 2002, with most dyads reporting postal mail contact scores that were much lower. The mean amount of email contact in 2002 ($M = 6.15$, $SD = 11.81$) is quite high in comparison, surpassing the mean amount of contact face-to-face ($M = 3.14$, $SD = 10.15$) or through the telephone ($M = 4.79$, $SD = 11.33$).

The descriptive analysis of the raw contact variables revealed large levels of skewness and kurtosis among all of the contact variables (see Table 1). In preparation for ANOVA and regression analysis, all contact variables were subjected to a log-10 transformation. This transformation was successful in reducing skewness and kurtosis for these variables, and these transformed variables are used in the analyses described below.

• Table 1 Descriptive statistics for raw contact scores by modality

MODALITY	1987 SAMPLE	2002 SAMPLE
Face-to-face		
Median	2.5	0.0
Mean	9.65	3.14
SD	16.92	10.15
Skewness	1.87	5.14
Kurtosis	2.04	27.76
N	39	33
Telephone		
Median	5.0	0.0
Mean	10.22	4.79
SD	14.63	11.33
Skewness	2.11	4.59
Kurtosis	3.56	22.84
N	39	33
Postal mail		
Median	4.0	0.5
Mean	8.53	1.35
Std. Dev.	12.29	2.25
Skewness	2.34	2.29
Kurtosis	5.46	5.09
N	39	33
Email		
Median	——	0.0
Mean	——	6.15
SD	——	11.81
Skewness	——	4.22
Kurtosis	——	20.45
N	——	33

Three repeated measures ANOVAs were used to compare the change in face-to-face, telephone and postal mail contact between 1987 and 2002. The results indicated statistically significant differences between the time periods for face-to-face ($F(1, 32) = 11.78$, $p < .01$, partial $?^2 = .27$), telephone ($F(1, 32) = 21.90$, $p < .01$, partial $?^2 = .41$) and postal mail contact ($F(1, 32) = 55.60$, $p < .01$, partial $?^2 = .64$). Descriptive statistics indicate that this difference is in the direction of decreased usage for all of the contact variables (see Table 1); such decrease in contact is not abnormal in the natural course of college best friendships (Rawlins, 1992). However, the magnitude of the difference is clearly larger for postal mail than it is for either face-to-face or the telephone. These results are consistent with H1: among these friends, postal mail usage decreased significantly between 1987 and 2002.

RQ1: patterns of modality use

RQ1 asks about the patterns of modality usage in the sample. To investigate this focus of the study, Pearson correlations were computed between the seven transformed contact variables (see Table 2). First, the pattern of multimodality found in this analysis is a link between face-to-face and telephone contact. The use of these two modalities was positively associated in 1987 ($r = .57$, $p < .01$) and even more strongly in 2002 ($r = .82$, $p < .01$). Second, longitudinal links emerged between telephone contact in 1987 and 2002 ($r = .34$, $p = .05$) and postal mail contact in 1987 and 2002 ($r = .46$, $p = .01$). Interestingly, such a longitudinal association did not occur for face-to-face contact during the two phases of the study ($r = .15$, $p = .42$). Third, in 2002 one medium was strongly associated with all other 2002 modality measures: the telephone. Phone contact was significantly correlated with contact across all other 2002 media (face-to-face: $r = .82$, $p < .01$; email: $r = .65$, $p < .01$; postal mail: $r = .44$, $p = .01$). In sum, while several associations between the usage of the modalities were found, three clear findings seem to emerge:

- a link between telephone and face-to-face contact in both phases;
- a longitudinal link between postal mail contact and telephone contact during the two phases, but not face-to-face contact; and
- a strong link between 2002 telephone contact and the other 2002 modality usage measures.

H2, H3, H4, and RQ2: modality use and relational closeness

The next focus of this study was on the association between modality usage and relational closeness. Two hierarchical multiple regression analyses were used to investigate this focus. The first regression investigated the association between modality usage in 1987 and 1987 closeness scores (i.e. 1987 closeness score served as the dependent variable). Postal mail was entered in the first

• Table 2 Correlation matrix of 1987 transformed contact measures, 2002 transformed contact measures and CRQ scores

	1987 FtF	1987 Phone	1987 Postal	2002 FtF	2002 Phone	2002 Postal	2002 Email	1987 CRQ	2002 CRQ
1987 FtF	——	.57**	.01	.15	.10	−.13	.22	.39*	.10
1987 Phone		——	.23	.23	.34*	.15	.33	.52*	.39*
1987 Postal			——	.06	.30	.46**	.31	.46**	.37*
2002 FtF				——	.82**	.12	.49**	.11	.58**
2002 Phone					——	.44*	.65**	.38*	.83**
2002 Postal						——	.30	.44**	.54**
2002 Email							——	.25	.72**
1987 CRQ								——	.40*

*$p < .05$, **$p < .01$, FtF = face-to-face

For correlations between two 1987 variables, $N = 39$; for correlations involving at least one 2002 variable, $N = 33$.

• Table 3 Hierarchical regression equation predicting relational closeness, 1987

Step	Variables entered	Std β	t	R^2 change	F Change (df)	Total R^2	F Total (df)
1	Postal mail	.46	3.15**	.21	9.92 (1,37)**	.21	9.92 (1,37)**
2	Postal mail	.36	2.69*	.18	10.39 (1,36)**	.39	11.42 (2,36)**
	Telephone	.43	3.22**				
3	Postal mail	.39	2.89**	.03	1.72 (1,35)	.42	8.33 (3,35)**
	Telephone	.31	1.89†				
	Face-to-face	.21	1.31				

† $p < .10$, *$p < .05$,; **$p < .01$.

step of the regression, telephone in the second step and face-to-face in the third step. This order flows from Dimmick et al.'s (2000) previous findings about which media tend to be used for social intimacy: postal mail is less likely to be used to convey intimacy and therefore is entered first; telephone usage is entered second because it occupies a broader and deeper niche for conveying relational intimacy, and therefore should account for variance beyond that accounted for by postal mail; and given the prediction of early CMC theories that face-to-face contact occupies a special niche for maintaining relational closeness (Daft and Lengel, 1986; Short et al., 1976; Sproull and Kiesler, 1986), face-to-face usage is entered last to examine whether it accounts for any variance beyond that predicted by telephone and postal mail. It should be noted also that these media are entered in order of decreased efficiency: postal mail does not require temporal or spatial coordination of participants; the telephone requires temporal but not spatial coordination; while face-to-face communication requires both temporal and spatial coordination.

The regression analysis (see Table 3) revealed a significant change in variance in the first step ($R^2 = .21$, adjusted $R^2 = .19$, R^2 change $= .21$, $F[1, 37]$ change $= 9.91$, $p < .01$) and the second step ($R^2 = .39$, adjusted $R^2 = .35$, R^2 change $= .17$, $F[1, 36]$ change $= 10.39$, $p < .01$), but not the third step ($R^2 = .42$, adjusted $R^2 = .37$, R^2 change $= .03$, $F[1, 35]$ change $= 1.72$, $p = .20$). In the first step, mail usage was a statistically significant predictor of relational closeness ($\beta = .46$, $t = 3.15$, $p < .01$). In the second step, telephone usage emerged as a significant predictor ($\beta = .43$, $t = 3.22$, $p < .01$) along with mail usage ($\beta = .36$, $t = 2.69$, $p = .01$). In the third step, postal mail usage remained a statistically significant predictor of closeness ($\beta = .39$, $t = 2.89$, $p < .01$), while face-to-face contact did not emerge as a significant predictor ($\beta = .21$, $t = 1.31$, $p = .20$). Telephone usage approached but did not achieve statistical significance in this final step of the regression ($\beta = .31$, $t = 1.89$, $p = .07$). These results provide some support for H2: both postal mail and telephone contact are associated with

relational closeness, with telephone usage explaining variance in closeness beyond that predicted by postal mail.

For the 2002 data, the regression analysis was constructed similarly (see Table 4). Both postal mail and email usage were entered as independent variables in the first step. A significant amount of variance was explained by the first step of the regression ($R^2 = .63$, adjusted $R^2 = .60$, R^2 change = .63, F change [2, 30] = 25.15, $p < .01$), with both email ($\beta = .61$, $t = 5.23$, $p < .01$) and postal mail ($\beta = .35$, $t = 2.98$, $p < .01$) emerging as significant predictors. Telephone contact was added in the second step, with a significant change in variance between steps 1 and 2 ($R^2 = .77$, adjusted $R^2 = .75$, R^2 change = .15, F change [1, 29] = 18.81, $p < .01$). Email ($\beta = .31$, $t = 2.63$, $p = .01$), postal mail ($\beta = .21$, $t = 2.08$, $p = .05$) and telephone ($\beta = .54$, $t = 4.34$, $p < .01$) were all significant predictors in this step, with telephone contact a particularly strong predictor of relational closeness. Face-to-face contact was entered in the third step, which did not produce a significant change in variance ($R^2 = .78$, adjusted $R^2 = .75$, R^2 change = .005, F change (1, 28) = .67, $p = .42$). In this final model, only telephone ($\beta = .68$, $t = 3.17$, $p < .01$) and email ($\beta = .30$, $t = 2.53$, $p = .02$) contact were significant predictors.

The regression analysis above supports H3's assertion that telephone usage would explain a significant amount of variance beyond that predicted by postal mail and email. In the final step, H4 is also supported: while postal mail contact is associated with relational closeness, it does not make a unique contribution once other contact modalities are taken into account. Furthermore, since face-to-face interaction did not make a unique contribution to closeness in either 1987 or 2002, RQ2 is answered negatively. However, the strong correlation between telephone contact and CRQ score

• Table 4 Hierarchical regression equation predicting relational closeness, 2002

Step	Variables entered	Std. β	t	R^2 Change	F Change (*df*)	Total R^2	F Total (*df*)
1	Postal mail	.35	2.98**	.63	25.15 (2,30)**	.63	25.15 (2,30)**
	Email	.61	5.23**				
2	Postal mail	.21	2.08*	.15	18.81 (1,29)**	.77	32.99 (3,29)**
	Email	.31	2.63*				
	Telephone	.54	4.34**				
3	Postal mail	.16	1.43	.005	0.67 (1,28)	.78	24.62 (4,28)**
	Email	.30	2.53*				
	Telephone	.68	3.17**				
	Face-to-face	−.14	−0.82				

†$p < .10$; *$p < .05$; **$p < .01$

in 2002 suggests that the inclusion of the telephone predictor may confound the results of the regression due to multicollinearity (Cohen et al., 2003). To investigate this possibility, the 2002 regression model was recomputed, this time entering face-to-face contact instead of telephone contact at step 2. This model generated a significant change in overall variance accounted for in step 2 ($R^2 = .70$, adjusted $R^2 = .67$, R^2 change = .07, F change [1, 29] = 7.00, $p = .01$), with the beta weights of all three independent variables statistically significant (email: $\beta = .46$, $t = 3.73$, $p < .01$; postal mail: $\beta = .36$, $t = 3.37$, $p < .01$; face-to-face: $\beta = .31$, $t = 2.65$, $p = .01$). Coupled with the strong correlations between telephone, face-to-face and closeness in both 1987 and 2002 (see Table 2), these results suggest that the telephone and face-to-face may be somewhat interchangeable means of maintaining close relational ties.

DISCUSSION

This study used media niche theory to formulate hypotheses about the use of interpersonal communication media across time. Three issues were of central concern in this investigation. The first focus of this study considered how modality use changed in these friendships between the 1987 and 2002 phases of the study. H1 predicted that postal mail usage would decline between 1987 and 2002. While face-to-face, telephone and postal mail contact all decreased significantly between the two phases, the decline in postal mail contact was the most precipitous. This finding provides some support for H1. Additionally, the descriptive statistics tentatively suggest that the adoption of email may help to explain this decline in postal mail usage.

The second focus of this study, examined in RQ1, was the consideration of patterns of modality use within these friendships. Several significant correlations between modality use were found. In particular, a strong link emerged between face-to-face and telephone contact in both 1987 and 2002. However, these results cannot address precisely why face-to-face and telephone contact tend to occur together within a single relationship. Media richness theory (Daft and Lengel, 1986) might suggest that these rich media are used in the same relationship because their ability to convey emotions and intimacy lead to use in more intimate relationships. Alternatively, friends who live geographically closer to one another may use both face-to-face and the telephone more because both media tend to cost less when the distance separating interactants is small.

Two longitudinal associations were found: postal mail use in 1987 is associated with postal mail use in 2002; and telephone use in 1987 is associated with telephone use in 2002. However, no such longitudinal association was found for face-to-face contact. The first association suggests that, while some of the social functions once served by postal mail now may be fulfilled by

other media (cf. discussion of H1 above), the relational niche of postal mail has not disappeared entirely: some still maintain some contact by postal mail, and the statistically significant correlation between 2002 postal mail and 2002 relational closeness (see Table 2) suggests that such contact may help to maintain closeness in the relationship. The lack of such an association for face-to-face contact suggests that the frequency of face-to-face interaction may be less stable, significantly curtailed by the limitations of geographical proximity. However, the importance of the longitudinal association found for telephone use enhances our understanding of another intriguing finding from the correlational analysis: telephone usage in 2002 is strongly associated with contact across every 2002 modality and with 2002 relational closeness. It is plausible that the telephone is an ideal medium for maintaining relational closeness, offering intimacy that is relatively unfettered by the need for spatial proximity.

The third focus of this study considered the relationship between modality usage and relational closeness. H2, H3 and H4 predicted that, in 1987, telephone usage would explain the variance in closeness beyond that explained by postal mail usage; in 2002, telephone usage would explain the variance in closeness beyond that explained by email usage; and taking into account the variance in closeness explained by other media, postal mail usage would not predict closeness in 2002. At least some support was found for each of these hypotheses. This finding is particularly noteworthy, given the strong association between postal mail and closeness in 1987, eclipsing the predictive power of both face-to-face and telephone contact in the final model of the regression. While association of postal mail with relational closeness seems to have diminished, the association of the telephone with relational closeness seems to have grown between 1987 and 2002. It is plausible that the decreasing expense of long-distance calls and the diffusion of cellphones may explain this gain partially in the ability of telephone contact to predict relational closeness (see Ling and Yttri, 2002). Whatever the cause, the telephone's niche for maintaining relational closeness seems to have grown across the years of this study.

RQ2 asked whether face-to-face contact would account for variance in closeness beyond that explained by the other media. Regression analyses indicate that, when controlling for contact across other media in the final steps of each regression, face-to-face contact did not explain a significant amount of variance in either 1987 or 2002. This casts doubt on theories such as social presence theory (Short et al., 1976), media richness theory (Daft and Lengel, 1986), and the cues-filtered-out perspective (Sproull and Kiesler, 1986), which suggest that face-to-face contact ought to be a major predictor of relational closeness. In contrast, media niche theory explains this finding adequately: the convenience offered by media such as the telephone and

email supersedes face-to-face interaction, giving the latter a more potent niche for interaction in a greater variety of relationships. Alternatively, it is possible that this finding results from the multicollinearity found between 2002 face-to-face contact, telephone contact and CRQ scores. However, even if this alternative interpretation is correct, it still contradicts media richness theory, suggesting that face-to-face and telephone contact are somewhat interchangeable means of sustaining relational closeness.

Taking this study as a whole, three claims regarding the niches occupied by specific media seem tentatively consonant with these results: email is partially, although not completely, supplanting postal mail as a temporally and spatially convenient medium of communication; telephone contact is a particularly potent predictor of relational closeness; and although face-to-face communication is associated with relational closeness, its inconvenience makes it a less stable predictor than the telephone and possibly email. Examining these three results as a whole, two key constructs seem to emerge as central components defining a medium's niche: a medium's perceived intimacy and a medium's perceived efficiency (or convenience). Indeed, the gratification niches identified by Dimmick et al. (2000) seem to fit neatly into these two categories. Given these results, then, it seems plausible that a medium's capacity for intimacy and level of efficiency or convenience intersect to define the interpersonal niche that the medium will occupy. Further research is needed to test this proposition and expand media niche theory to account for these changes over time. If such research chooses to emulate this study's longitudinal nature, it would benefit from many advances in interpersonal theory, media choice or use theory, and statistical methods that have occurred during the last 25 years.

CONCLUSION

This dataset's primary limitation is the small sample size. Admittedly, it would have been preferable to have a larger sample. This would have enabled more sophisticated regression or structural equation modeling analyses to be performed. The small size of the sample suggests tentativeness in interpreting and generalizing these results, especially those obtained from the multiple hierarchical regression analyses. Still, even although the sample size is small, the rate of return is remarkably high, especially given the 19 years that elapsed between the first and third phases of the study. Even more importantly, despite the low power in the dataset, the large effect sizes obtained in the regression analyses suggest that these results may be valid.

While any methodology has limitations, this study's methodological strength is that it provides a rare glimpse into how friendships spanning decades have adjusted to the adoption of new media technologies. It tracks media usage in friendships across the period of time when email became widely diffused for relational communication, and in so doing, suggests that

media niche theory can be employed to explain changes in media use across time. Of course, the broad statistical methods used here cannot capture the precise relational meanings attached to the use, and patterns of use, of these media (cf. Sitkin et al., 1992). More detailed work is needed to expose how niches for a variety of gratifications may change across time. Qualitative research could be a useful next step for investigating further these patterns of modality use (cf. Baym, 2003). This line of research would be strengthened by studies that consider shifting patterns of multimodality within other relationship types (e.g. family or romantic relationships).

Interpersonal relationships are fundamentally multimodal. Each medium occupies a niche in the fabric of relational life, and a medium's niche is reciprocally defined and redefined by its multiple interfaces with other media. If new interpersonal communication media continue to be deployed as frequently and rapidly as they have during the last half of the 20th century, theories will be needed which explain how existing relationships adapt to the presence of new media. Media niche theory seems well suited to this task, capable of explaining shifts in media niches as they occur across spans of time in relationships.

Acknowledgements

I would like to thank Em Griffin for his help with this project, and Glenn Sparks for his valuable input on previous versions of this article.

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