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ABSTRACT

A study examined the variables that influence the use of electronic mail. The Uses and Gratifications perspective was employed to determine the antecedent factors that motivate individuals to engage in electronic mail communication. Subjects, 105 students enrolled in graduate-level courses at a small midwestern university and 252 individuals who worked in public and private organizations that had electronic mail systems, completed a self-report questionnaire. Results indicated that privacy was a major factor that influenced electronic mail use, that interpersonal communication factors influenced motivation to use electronic mail, and that individuals used electronic mail for a variety of purposes. Findings suggest that, since computers are increasingly being used for communication, failure to prepare students will result in a workforce that is ill-equipped for a technologically advanced work environment. (Contains 32 references and 4 tables of data.) (RS)

A Uses and Gratifications Approach To Examining Electronic Mail Use

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Abstract

This investigation attempted to examine the variables that influence use of electronic mail. The Uses and Gratifications perspective was employed to determine the antecedent factors that motivate individuals to engage in electronic mail communication. The results of the investigation indicate that privacy is a major factor that influences electronic mail use, that interpersonal communication factors influence motivation to use electronic mail, and that individuals use electronic mail for a variety of purposes. The implications of this investigation are presented.

A Uses and Gratifications Approach to Examining Electronic Mail Use

Introduction

Fear of technology has acquired many labels since the early 1980s. Some of the more prominent terms include technology aversion, computerphobia, technophobia, cryptophobia, and cyberphobia (Rogers, 1986; Rosen, Sears, & Weil, 1987). Scholars such as Brod (1984) have described fear of technology as part of a modern day disease. Technological innovations can have both physical and physiological effects; muscular stress induced from reading a screen, carpal tunnel syndrome, and a general fear of being replaced by a machine all are maladies that are experienced by the modern worker (Brod, 1984; Rosen, et al., 1987). Researchers have stated that those individuals who experience fear of a technology may be suffering a type of "future shock"; the inability to cope with rapid technological and sociological changes (Brod, 1984; Gengle, 1984; Knight, 1986).

Recently Clarke (1991) developed the computer-mediated communication apprehension construct (CMCA) that is defined as "an individual's tendency to feel apprehensive or anxious when using or anticipating using computing technology to communicate with another person or persons" (p. 134). Clarke examined previous literature, conversed with users of computer-mediated communication technologies, and questioned respondents of a preliminary survey in order to determine the domain of the computer-mediated communication apprehension construct. The

result of his investigation led to the construction of a 20 item instrument that had three factors: confidence in using computer-mediated communications, interest in communicating with others via the computer, and concerns about the privacy of computer-mediated communication. Clarke concluded that the results from his research provide evidence for the existence of a computer-mediated communication apprehension construct. "The CMCA measurement instrument exhibited strong internal consistency and proved sensitive enough to measure what appears to be a cross-situational tendency to either approach or avoid the use of computer-communications based upon an anxiety feeling state" (Clarke, 1991, pp. 136-137).

Although defining computer-mediated communication apprehension may be fairly straight-forward, understanding why an individual would choose to use a particular computer-mediated communication system merits investigation. Because the individual does choose (among a bevy of alternative sources) to use a computer communication technology, the uses and gratifications approach (commonly associated with media effects research) served as the theoretical grounding upon which a model of electronic mail behavior was constructed. The Uses and Gratifications approach has been used to explain media behavior (Rubin, 1986; Rubin & Rubin, 1989), computer-mediated communication (Williams, Phillips, & Lum, 1985), information motives (Rubin, 1983, 1984), political issues (Atkin & Heald, 1976; Garramone, 198- 1985; McLeod & Becker, 1974), and

explaining interpersonal communication motives (Rubin, Perse, & Barbato, 1988; Rubin & Rubin, 1989). Because this study employed the Uses and Gratifications perspective, there were three outcomes which this study addressed: an explanation of how electronic mail was used to gratify needs, an understanding of the relationship between interpersonal communication motives and use of electronic mail, and the outcomes of using electronic mail. The following section will review the variables included in this investigation and present the research questions posited.

Computer-Mediated Communication Apprehension

Clarke's (1991) Computer-Mediated Communication Apprehension Scale examines three factors (confidence in use, interest in communicating with others via computer-mediated communication technologies, and concerns about privacy issues) that are thought to influence electronic mail behavior. The scale contains three dimensions and uses eight items to measure confidence, seven items to measure interest, and five items to measure concerns about privacy.

Clarke (1991) indicated that failure to use computer-mediated communication technologies may result from apprehension. The dimensions of confidence, interest, and privacy concerns likely would influence an individual's choice to use an electronic mail system. Clarke's scale was included in the present investigation because CMCA would influence the user's gratification sought when engaged in electronic mail communication.

Locus of Control

Locus of control refers to an individual's perception of his/her authority over the events that happen in life (Levenson, 1974), and is consistent with the uses and gratifications concept of an active audience (Rubin & Rubin, 1989). Internally controlled people tend to be more assertive, self-disclosive, and extroverted, believing that they control the events that occur in their life (Levenson, 1974). Externally controlled people attribute the events that occur in their world to luck, chance, powerful others, fate, or the result of living in an unjust world (Levenson, 1974).

An individual's perception of control is important when examining computer-mediated communication behavior. Rubin (1986) has argued that locus of control (alone or in combination with other variables) produces variations in motives for and consequences of using personal and mediated information channels. Researchers have reported that control is related to communication apprehension (Arntson, Mortensen, & Lustig, 1980; Rubin & Rubin, 1989), loneliness (Bell, 1987), interpersonal communication motives (Rubin, Perse, & Barbato, 1988), mediated communication behavior (Rubin, 1986), and computer behavior (Chesebro, 1985; Rice & Bair, 1984; Rogers, 1986). These findings indicate that locus of control influences communication motivation and thus locus of control should be included in the present investigation. The locus of control scale contained three dimensions (powerful others control, internal control, and

chance control), and used eight items to represent each dimension.

Interpersonal Communication Motives

Rubin, Perse, and Barbato (1988) summarized communication motive research by stating that people communicate for the need dimensions of inclusion, affection, and control (Schutz, 1966), dominance and love (Leary, 1957), control, trust, and intimacy (Millar & Rogers, 1976), affiliation, responsiveness, relaxation, distress, intimate position, ingratiation (Mehrabian & Ksionzky, 1972), and control, intimacy, emotional arousal, composure, similarity, formality, and task-social orientation (Burgoon & Hale, 1984).

The motives that a person may have when communicating are important when examining electronic mail behavior. Rubin and Rubin (1989) have found that interpersonal communication motives have been related to mass media consumption. Rubin and Bantz (1987) reported that VCR use serves as a functional alternative to interpersonal communication. Because of the potential social nature of electronic mail as well as their influence in a variety of contexts, interpersonal communication motives were included in the present investigation and measured using Rubin, Perse, and Barbato's (1988) Interpersonal Communication Motives Scale. The scale contains six dimensions (pleasure, affection, inclusion, escape, relaxation, and control), and uses three items from each dimension to measure interpersonal communication motives.

Use of Electronic Mail

Because a part of this investigation influenced the outcomes of the above behaviors, it was necessary to examine the amount that individuals used electronic mail. The Rice and Case (1983) self-report measure that examines the frequency and duration of electronic mail use was used in this investigation. Users are asked to indicate their daily level of usage by checking either 0-15 minutes, 16-60 minutes, or more than 61 minutes. Although Rice and Case (1983) could not compute internal reliabilities for these questions (they were singular questions), they did report that both measures were reliable across time, correlating significantly (r = .67 for frequency, r = .45 for duration, both $p < .001$).

Purposes of Electronic Mail

This investigation also sought to examine any relationship between an individual's communicative predispositions and the purposes for which he/she used electronic mail. The purposes for which an individual engaged in electronic mail was measured using Rice and Case's (1983) categories for examining the purposes for which users employ a computer-mediated communication technology. The categories include exchanging information, asking questions, exchanging opinions, staying in touch, generating ideas, decision-making, exchanging confidential information, resolving disagreements, getting to know someone, and bargaining/negotiating.

Research Questions

The first research question was posited in an attempt to explain the antecedent needs that influence use of electronic mail systems. The variables examined include demography, locus of control, interpersonal communication motives and computer-mediated communication apprehension:

RQ_1: How does an individual's perception of locus of control, interpersonal communication motives and computer-mediated communication apprehension relate to use of electronic mail?

The current investigation also sought to determine the relationship between interpersonal communication motives and use of electronic mail:

RQ_2: What interpersonal communication motives best predict use of an electronic mail system?

The third research question examines the relationship between demography, locus of control, interpersonal communication motives and computer-mediated communication apprehension and the purposes for which he/she uses a electronic mail technology in an attempt to determine the outcomes of electronic mail use:

RQ_3: What is the relationship between an individual's chronological age, education, gender, perception of locus of control, interpersonal communication motives and computer-mediated communication apprehension and the purposes for which an individual uses electronic mail?

Results

The data for this study were gathered by using self-report questionnaires. The reliabilities for the various scales used in the investigation can be found in Table 1.

Insert Table 1 About Here

Sample

Participants for the study were 309 people who work in the midwest. The subjects for this study were drawn from several populations. The first group was enrolled in graduate-level courses at a small mid-western university and solicited for participation by placing a survey in their school mailbox. Of the 263 surveys that were distributed, 105 respondents filled out the questionnaires (giving a response rate of 40%).

Participation also was solicited from individuals working in public and private organizations that had electronic mail systems. The data were collected by making contact with a person in the organization who was willing to distribute and collect surveys. A total of 252 surveys were distributed, and 204 surveys were returned (giving a response rate of 81%). Combining both populations, a total of 309 subjects completed surveys that were used.

Their ages ranged from 17 to 57 (M = 33.0; median = 33.0; SD = 9.59). There were 33 respondents (10.7%) between the ages of 17 and 24; 113 respondents (36.5%) were between 25 and 32; 88

respondents (28.5%) were between 33 and 40; 51 respondents (16.5%) were between 41 and 48; and 16 respondents (5.2%) were 49 years and older. Eight of those surveyed (2.6%) did not indicate their age. Females accounted for 159 of the respondents (51.4%) while males accounted for 147 of the respondents (47.6%), and three people did not indicate their gender (1%).

The participants also were asked to indicate their highest educational degree attained. The respondents indicated that 38 (12.3%) had completed high school, 22 (7.1%) had attended a professional trade school, 198 (64.1%) had graduated college, 33 (10.7%) had received a master's degree, 13 (4.2%) had completed a doctorate, two (.6%) had completed post-doctorate work, and three participants (1%) did not indicate their education.

There were 138 managers (44.7%) and 145 nonmanagers (46.9%) in the sample. Additionally, 23 people (7.4%) indicated they held a position other than management or nonmanagement, and three people (1%) did not indicate their position.

The participants also were asked to indicate the type of organization for which they work: 47 (15.2%) indicated they worked for the government, 37 (12.0%) worked in manufacturing, 12 (3.8%) were involved in retail, 63 (20.4%) were in a service industry, three (1%) worked in education, 33 (10.7%) indicated they were involved in finance, seven (2.3%) were accountants, 43 (13.9%) were in the communication industry, ten (3.2%) were technicians, and 51 (16.5%) indicated they were in some field

other than the choices provided. Three participants (1%) did not indicate their position.

Testing for Sample Differences

~~Questionnaire Order~~

A one-way multivariate analysis of variance was computed to determine whether ~~the ordering of the scales influenced participant response~~. There were differences b/n the samples The results indicated that the ~~order of presentation had no influence on the way that the participants responded to the questionnaire~~ samples were not significantly different (Wilks lambda = .90, $\underline{F}$ (~~30, 584~~ 12, 296) = 1.06, $\underline{p} > .35$).

Keep

Research Question One

Discriminant analysis was employed to examine how an individual's perception of locus of control, interpersonal communication motives and computer-mediated communication apprehension relate to use of electronic mail. Those who indicated they used electronic mail 0-16 minutes per day were classified as low volume users, those who indicated they used electronic mail 17-60 minutes were classified as medium volume users, and those who indicated they used electronic mail 61 minutes or more per day were classified as high volume users. Two significant functions resulted (Function One: Wilks Lambda = .76, $X^2 = 84.1$, df = 24, $\underline{p} < .001$; Function Two: Wilks Lambda = .88, $X^2 = 39.12$, df = 11, $\underline{p} < .001$). Table 2 presents the means, univariate $\underline{F}$, structure coefficients, and the classification results of the analyses.

Insert Table 2 About Here

As can be seen in the table, concerns about privacy was substantially related to use (with those having fewer concerns about privacy using systems more), and interest in computer communication, confidence in computer communication, and not communicating interpersonally for relaxation and inclusion were moderately related to use in the first function. In the second function, believing that chance events did not affect outcomes, confidence in computer communication, having few concerns about privacy, and interpersonally communicating for escape and control were moderately related to use. Correct classification into groups was 57% (prior probabilities were 33%).

Research Question Two

Discriminant analysis was used to examine specifically the relationship between an individual's interpersonal communication motives and his/her use of electronic mail. Two significant functions resulted (Function One: Wilks Lambda = .94, X^2 = 17.20, df = 6, $p < .01$; Function Two: Wilks Lambda = .97, X^2 = 7.74, df = 2, $p < .05$). Table 3 presents the means, univariate F, structure coefficients, and the classification results of the analyses.

Insert Table 3 About Here

As can be seen in the table, communicating interpersonally to relax was strongly related to use, communicating interpersonally for pleasure was strongly related, and communicating interpersonally for affection was moderately related to use of electronic mail in the first function. In the second function, communicating interpersonally for escape was substantially related, while communicating interpersonally for pleasure and control was moderately related to use of electronic mail. Correct classification into groups was 44% (prior probabilities were 33%).

Research Question Three

The third research question employed canonical correlation to determine the relationship between locus of control, interpersonal communication motivation, computer-mediated communication apprehension, and the purposes for which an individual uses electronic mail communication. Table 4 summarizes the results.

Insert Table 4 About Here

Root 1. The first canonical root (R_c = .56, R_c^2 = .32, lambda = .25, $F(150, 2383) = 2.89$, $p < .001$) found that the first set included positive loadings for asking questions and exchanging confidential information, and negative loadings for getting to know someone and staying in touch. The second set included a positive loading for internal control and negative

loadings for powerful others, chance control, and interest in computer communication. For the predictor variate, getting to know someone was substantially related, exchanging confidential information, asking questions, and staying in touch were moderately related. For the criteria variate, internal control, chance control, powerful others, and interest were moderately related.

Root 2. The second canonical root (R_c = .47, R_c^2 = .22, lambda = .36, $F(126, 2176) = 2.44$, $p < .001$) found that the first set included positive loadings for exchanging information, decision making, and resolving disagreements, and negative loadings for staying in touch and exchanging confidential information. The second set included positive loadings for gender and interest in computer communication, and negative loadings for pleasure and relaxation. For the predictor variate, exchanging information, decision making, resolving disagreements, staying in touch exchanging confidential information were moderately related. For the criteria variate, gender, interest in computer communication, pleasure, and relaxation were moderately related.

Root 3. The third canonical root (R_c = .43, R_c^2 = .19, lambda = .47, $F(104, 1967) = 2.20$, $p < .001$) found that the first set included a positive loading for exchanging confidential information, and negative loadings for resolving disagreements and bargaining/negotiating. The second set included positive loadings for internal control, pleasure, and affection. For the

predictor variate, bargaining/negotiating was substantially related, while exchanging confidential information and resolving disagreements were moderately related. For the criteria variate, affection was substantially related, while internal control and pleasure were moderately related.

Root 4. The fourth canonical root (R_c = .40, R_c^2 = .16, lambda = .58, $F(84, 1754) = 1.96$, $p < .001$) found that the first set included positive loadings for exchanging opinions, generating ideas, decision making, exchanging confidential information, resolving disagreements, and bargaining/negotiating, and a negative loading for exchanging information. The second set included positive loadings for interest in computer communication and privacy concerns. For the predictor variate, generating ideas and exchanging opinions were substantially related, while decision making, exchanging confidential information, resolving disagreements, and bargaining/negotiating were moderately related. For the criteria variate, privacy concerns were substantially related and interest in computer communication was moderately related.

Root 5. The fifth canonical root (R_c = .34, R_c^2 = .12, lambda = .69, $F(66, 1536) = 1.68$, $p < .001$) found that the first set included a positive loading for staying in touch and negative loadings for exchanging confidential information and getting to know someone. The second set included positive loadings for powerful others, chance control, and escape, and negative loadings for interpersonal control, interest in computer

communication, and concerns about privacy. For the predictor variate, staying in touch, exchanging confidential information, and getting to know someone were moderately related. For the criteria variate, powerful others, chance control, escape, interpersonal control, interest in computer communication, and concerns about privacy were moderately related.

Discussion

Electronic mail communication allows users to exchange information in a manner very different from any previous form of communication, and rapidly is becoming a primary cultural, political, and economic force (Clarke, 1991). The present study was an attempt to understand the characteristics of electronic mail users, the relationship between interpersonal communication and electronic mail use, and the purposes for which people engage in electronic mail communication.

The findings of this investigation indicate that electronic mail use is influenced by a variety of psychological and communication factors. Individuals who use electronic mail systems in general tend to: believe that they are in control of their environment, enjoy communication (both interpersonal and electronic), be interested in computer communication, confident in their abilities as a computer communicator, and not be concerned about security issues when using a computer for communication.

The results also support findings in computer-mediated communication research in that electronic mail communication enables the individual to exercise greater control over his/her message, that individuals who enjoy electronic mail communication also enjoy interpersonal communication (early hypotheses were that individuals who disliked interpersonal communication would thrive when using electronic mail systems...these results when coupled with other studies indicate that individuals who like communication like it regardless of the form), that privacy concerns play a major role in determining electronic mail use (this finding seems to be especially important for design engineers...those who feel that the system is safe use it while those who are unsure of the security of the system use it less), and users use electronic mail systems for a variety of reasons.

The present investigation examined some of the variables that influence electronic mail behavior. The findings hold implications for individuals in system design, education, and the communication practitioner.

For those individuals who design electronic mail system, the message is rather clear: design a system that users perceive as secure, and people will use it. Thus it is important for designers not only to design secure systems, but also to tell the users about the security features. It is suggested that when an electronic mail system is introduced that the manufacturer not only train individuals on how to use the system, but also to detail some of the features that make the system secure. In

doing so, individuals will have their fears allayed with regards to security, and thus may use the system more.

The fact that people increasingly are using computers for communication leads to an educational implication for those who are involved in both secondary and higher education. Compaine (1988) stated that increased computer-mediated communication is forcing people to acquire a new form of literacy. Although it is true that the transmission of computer-communication is different from any type of communication transmission in the past, the form that the communication takes is the written word. It appears that now, more than ever before, writing skills are going to be essential if an individual wants to be successful in a workplace that uses computer-mediated communication. Because the focus of computer communication is on the written word, and use of computers for communication is increasing, high school and college curricula need to emphasize writing skills if their graduates are to be successful in a technologically advanced workplace. Failure to prepare students will result in a workforce that is ill-equipped for a technologically advanced work environment.

The present study has elucidated some of the variables that influence computer-mediated communication, but this area merits further research attention. Rogers (1986) assures us that the race for bigger, better, and faster technologies will continue since there is growing pressure to communicate at an increasingly rapid rate. Because of the potential impacts that computer

communication can have on human communication in the 21st century, scholars must continue to examine why people engage in computer communication, how computer communication fulfills needs, and the consequences of engaging in computer communication.

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Table 1

Reliabilities for Multi-Item Scales

	n	Items	Mean	SD	Alpha
Locus of Control					
Internal	309	8	27.12	3.51	.72
Powerful Others	309	8	17.48	3.86	.72
Chance Control	309	8	18.48	4.16	.76
Interpersonal Communication Motives					
Pleasure	309	3	11.21	1.81	.76
Affection	309	3	11.59	1.67	.77
Inclusion	309	3	9.18	2.59	.77
Relaxation	309	3	10.02	2.21	.77
Escape	309	3	7.04	2.42	.75
Control	309	3	7.98	2.73	.78
Computer-Mediated Communication Apprehension					
Confidence	309	8	33.43	5.70	.93
Interest	309	7	26.95	4.70	.83
Privacy	309	5	18.43	3.86	.81

Table 2

Discriminant Analysis Results for RQ One

Discriminating Variables	Usage Low	Med	High	Univariate F	Structure Coefficients Root 1	Root 2
Privacy	17.20	18.45	19.95	12.93***	.64	.39
Interest	26.07	26.96	28.05	4.27*	.33	.28
Confidence	31.97	33.83	34.68	6.01**	.35	.39
Pleasure	11.16	11 51	10.83	3.49*	-.32	.22
Affection	11.57	11.74	11.40	1.02	-.17	.13
Inclusion	9.17	9.36	8.95	.60	-.25	.22
Relaxation	10.18	10.25	9.48	3.55*	-.38	.04
Escape	6.63	7.33	7.15	2.46	.07	.34
Control	7.71	8.23	8.00	1.01	-.04	.33
Internal Ctrl	26.91	27.62	26.67	2.08	-.20	.24
Powerful Other	17.34	17.50	17.62	.13	.05	.05
Chance Ctrl	19.16	17.40	19.14	6.73**	.25	-.50

* $p < .05$ ** $p < .01$ *** $p < .001$

Classification Results

Actual Group	# of Cases	Predicted Group Membership 1	2	3
Low Users	106	60 (56.6%)	24 (22.6%)	22 (20.8%)
Medium Users	118	31 (26.3%)	66 (55.9%)	21 (17.8%)
High Users	85	19 (22.4%)	16 (18.8%)	50 (58.8%)

Table 3

Discriminant Analysis Results for RQ Two

Discriminating Variables	Usage Low	Med	High	Univariate F	Structure Coefficients Root 1	Root 2
Pleasure	11.16	11.51	10.83	3.49*	.69	.55
Affection	11.57	11.74	11.40	1.02	.36	.23
Inclusion	9.17	9.36	8.95	.60	.30	.30
Relaxation	10.18	10.25	9.48	3.55*	.85	.14
Escape	6.63	7.33	7.15	2.46	-.21	.76
Control	7.71	8.23	8.00	1.01	-.08	.35

* $p < .05$ ** $p < .01$ *** $p < .001$

Classification Results

Actual Group	# of Cases	Predicted Group Membership 1	2	3
Low Users	106	44 (41.5%)	35 (33.0%)	27 (25.5%)
Medium Users	118	32 (27.1%)	56 (47.5%)	30 (25.4%)
High Users	85	31 (36.5%)	19 (22.4%)	35 (41.2%)

Table 4

Canonical Correlation Analysis for RQ 3

Set 1	ROOT 1	ROOT 2	ROOT 3	ROOT 4	ROOT 5
AGE	-.08	.17	.27	.01	.19
GENDER	.16	.31	.08	-.22	-.19
EDUCATION	-.11	-.06	-.03	-.18	-.04
POWERFUL OTHERS	-.36	-.14	-.24	.18	.32
CHANCE CONTROL	-.52	-.15	.03	-.04	.42
INTERNAL CONTROL	.56	.27	.36	.18	-.06
PLEASURE	.00	-.56	.59	.24	-.16
AFFECTION	-.29	-.01	.63	.11	-.22
INCLUSION	-.14	-.29	-.19	.01	.03
ESCAPE	-.15	.01	-.19	.21	.34
RELAXATION	.01	-.32	.01	-.09	-.05
CONTROL	-.07	.05	.21	-.06	-.36
CONFIDENCE	-.12	.18	.29	.27	-.24
INTEREST	-.42	.31	.14	.51	-.34
PRIVACY	.16	-.01	.05	.66	-.45
Set 2					
EXCHANGING INFO	.15	.43	.05	-.51	-.06
ASKING QUESTIONS	.31	-.27	.08	.01	-.05
EXCHANGING OPINION	-.25	-.13	-.08	.63	.13
STAYING IN TOUCH	-.35	-.38	.14	.28	.54
GENERATING IDEAS	-.29	.30	.17	.61	.18
DECISION MAKING	.17	.41	-.05	.41	-.26
XCHNG CONFID INFO	.35	-.48	.37	.35	-.43
RESOLVING DISAGREE	.13	.31	-.46	.58	-.13
ACQUAINTANCESHIP	-.68	-.30	-.14	.05	-.54
BARGAIN/NEGOTIATE	.27	-.23	-.66	.34	.06