

Gender in computer-mediated communication: an examination of JESSE, the Library / Information Science Education Forum electronic discussion list

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Rejecting technological determinism which is largely preoccupied with the effects of technology on society, gender scholars argue that social structures play an important role in the development and diffusion of technology as well as in technological practice. They also argue that technology is a multi-faceted construct and that gender is implicated in all facets. As part of a larger investigation the research presented here focused on one of the facets of a particular form of technology, namely, the practice of computer-mediated communication (CMC). The analysis of two subscription lists with a combined total of over 830 personal subscribers and 855 messages sent to JESSE, the Library / Information Science Education Forum, over a twenty-month period suggests that gender has important implications in the practice of CMC. Males are more active than female subscribers and their contributions exceed their proportional representation.

Introduction

To arrive at a greater understanding of the role of gender in computer-mediated communication (CMC) in the area of library and information studies, an electronic discussion list used primarily by educators and researchers was analyzed. The analysis focused on the characteristics of the subscribers and their participation as evidenced by the number of messages they had sent to the list over a period of almost two years. The list chosen was the *Library / Information Science Education Forum*, also known as JESSE.

In addition to reporting the findings, the sections that follow provide a detailed description of the methodology as well as the results of the different stages of the investigation. The details may prove useful to other researchers interested in the social aspects of CMC and lead to further refinements of the methodology.

The research reported here is expected to fulfill two objectives. The first, is to enhance the depth of a much larger investigation being undertaken on the subject of gender in CMC. The second, and probably more important from a theoretical perspective, is to seek evidence to support or refute the

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arguments put forth by gender scholars regarding the impact of social structures on technological innovations such as CMC.

The importance of this research is that it is not restricted to a brief time period. This increases the degree of confidence in that researcher bias has been reduced. Earlier investigations have often relied on relatively small samples of messages. Furthermore, previous investigators have neglected reporting crucial aspects of the methodology raising further concerns. This is also the first analysis of an electronic discussion list in the area of library and information studies.

Theoretical implications

When this investigation was initiated, it was hypothesized that if the arguments regarding technology as a gendered, multi-faceted construct are correct, a detailed analysis of an electronic discussion list would reveal that gender plays a significant role in the make-up of its community of subscribers. It was also hypothesized that gender would be implicated in the way the members of the electronic community support its existence by means of their contributions. In essence, if technology is, indeed, a "gendered," multi-faceted construct comprising the machine/tool, the knowledge and the practice, as argued by gender scholars such as Rakow (1988) and Wajcman (1991), one would expect to find supporting evidence in *any* of the three facets that are understood as being the constituent elements of technology.

At the onset it was also hypothesized that if gender is implicated in the practice of CMC, the central focus of this research, this would be revealed not only in the gender composition of the JESSE community, the level of participation or contributions made to the list but also in the migration to and from the list. That is to say, the expectation was that gender would be implicated in every type of activity involving the community being investigated.

Limitations

To reduce the scope of this research it was decided not to analyze the content of the messages themselves because this falls within the objectives of the second part of this still-ongoing investigation. However, the evidence presented here should lead to a greater understanding of the implications of gender in the application of communication technologies to the field of library and information studies.

Another limitation has to do with the nature of CMC and electronic discussion lists. These lists are very much like "real-life" communities. Conversations occur in such a way that the entire conversational group knows who is "talking" and on what topic. However, not everyone can or is necessarily interested in getting involved by actually taking the conversational floor. Because of the similarities between CMC and speech it is often the case that individual members choose to communicate with one another privately. At times, because of the sensitive or controversial nature of certain topics, members submit their requests for comments or information to the entire community but ask for private responses. This is the equivalent of real-life conversational partners moving on to a private area or meeting separately. This means that while a researcher could gather thousands of messages over the course of several months or even several years, the communication captured would by no means be a complete record of *everything* that has happened. Some gaps would remain. This limitation is similar to what would happen if one were to listen to conversations by strangers in public places. The conversations could be recorded using a variety of

methods and subsequently analyzed. However, the analysis would be limited in that it would reflect only a small portion of the spectrum of human communicative activity. Very little would be known about the participants' conversational behaviour in other settings.

Objectives

In the context of the theoretical concerns discussed earlier, this investigation was expected to provide some insight on the implications of gender in the following three areas of the activity in JESSE: a) the composition of the community; b) the migration patterns; and c) the participation of its members.

Methodology

The methodology involved a series of steps. They included obtaining a list of those who make up JESSE and identifying their gender using a reliable method. Also, collecting a sufficiently large number of messages so as to draw tentative generalizations as to the role of gender in the practice of CMC in the community investigated.

The subscribers' list was obtained from the server (listserv@utkvm1.utk.edu) using the "review" command in two different occasions, some twenty months apart.² This was for the purpose of having a record of the "virtual" JESSE community as it evolves over the course of time. This was necessary to understand whether the composition of the community remains relatively constant with respect to the proportionality of the gender representation of its members.

The list includes the subscribers' names and their e-mail addresses.³ There are no standards regarding the use of spelled-out names, initials, capitalization or addition of institutional affiliations because each subscription statement is simply recorded as sent by the individual subscribers. Most subscribers enter their first name followed by their surname.

Although the subscribers' list is very useful when trying to establish who subscribes to a particular list, its use in the format delivered by the server can prove difficult unless the names in the list are entered into a database using certain standards. This is because the list is alphabetized by e-mail domain. The result of this peculiarity is that *sierpe@gslis.lan.mcgill.ca* is filed under the "g" of "gslis" before *inaw@musicb.mcgill.ca* which is filed under the "m" of "musicb". This can make the task of locating the name of a particular individual extremely difficult if not impossible, especially when a list can have thousands of subscribers and hundreds of different domains.

The JESSE lists and the database

For this research two lists were requested from the server. The first was obtained on March 5, 1997. The second on November 4, 1998. The data in these lists were analyzed using a database. The database included fields pertaining to the identity of the subscribers and their nature, that is, personal or institutional. Also included were fields for e-mail addresses and the subscription status

² At the time of this writing JESSE's server was changed to jesse@listserv.utk.edu.

³ The list sent by the server includes the names of everyone who is subscribed to the list at the time the list is requested. It does not, however, include those who have chosen to conceal their identity. This can pose a problem for this type of research. However, in the case of JESSE only 2 subscribers chose to remain anonymous as shown by the statistics sent by the server.

on the two lists. The database was also designed with fields to record whether a subscriber had contributed to the discussion and how many contributions he or she had made.

The identification of subscribers' gender

The most important objective of this investigation was to establish whether gender relates to the practice of CMC. Fulfilling this objective required the identification of the gender of those making up the community being investigated. This was accomplished using a panel of three individuals with considerable experience on naming conventions and whose first language was English. The decision to recruit these individuals was based on the assumption that because JESSE is based in North America the majority of its subscribers are of North-American origin.

Because it was believed that the most recent list (November, 1998) would relate more closely to the activity in the period during which JESSE was monitored, the analysis of this list was conducted first. The reasoning at this point was that in the absence of knowledge regarding migration patterns to and from JESSE the analysis of the most recent list would make it possible to account for the great majority of the messages sent to the list. This, however, proved incorrect to some extent because of the fluid composition of the community.

The procedure used to identify the subscribers' gender was as follows: the three judges were asked to review the list and to provide a statement regarding the gender of each subscriber. The judges were instructed to provide these statements based on their knowledge of the gender of first names. For instance, if based on their knowledge someone named "John" was with near total or absolute certainty male, they would provide a statement indicating the person in question was male. The opposite would be the case for a "Mary". They were also asked to clearly state situations of uncertainty. This approach was based on the assumption that naming practices are gendered. The identification of the subscribers' gender was performed by all three judges independently. They did not confer with one another and they were not informed of the fact that others had been recruited to perform this task.

The November, 1998 list

The November, 1998 list had a total of 668 subscription statements. Of these, 30 (4.49%) were duplicates where a particular individual or institution had more than one subscription.⁴ The remaining 638 were distributed as follows: 623 (97.64%) were personal and 15 (2.35%) were institutional.

The judges were able to identify with total agreement 505 subscribers as female or male. That is, all three issued identical judgements independently. The breakdown for this group was 308 (60.99%) females and 197 (39.00%) males. All three judges were unable to identify 40 subscribers and disagreed in 78 cases. The disagreements involved situations where at least one judge was

⁴ It is possible for individuals to subscribe more than once using the same address although this is rare. Sometimes subscribers use different e-mail addresses to maintain access from different settings. Duplicate subscriptions can also occur when individuals change their affiliation and do not cancel their initial subscription.

unable to tell one way or the other while the remaining had provided a female/male statement or instances where the statements conflicted, i.e., male versus female.

Because of the high number of unidentified personal subscribers, it was decided to have all three judges meet to go over these conflicts. During this meeting some of the disagreements were quickly resolved because of personal knowledge of the person in question by one or two of the judges or through the correction of mistakes. The remaining cases were reviewed and resolved on the basis of a general consensus.

The final results for the 623 personal subscribers in the 1998 list were 334 females (53.61%), 224 males (35.95%), and 65 of unknown gender (10.43%). In total, 558 subscribers (89.56%) were identified as male or female. Of those identified, 59.85% were female and the remaining 40.14% were male.

Although it would have been possible to decrease the number of unresolved cases it was concluded that the time and effort required would not be well justified. Almost 40% of the remaining names were names of Chinese origin. These names pose considerable problems even for those who are fully competent in Chinese written language and Chinese naming conventions.

Following the identification of the subscribers in the most recent list, their names were matched against the 855 messages sent to JESSE in the period between March 11, 1997 and November 3, 1998. This process was able to account for 210 (70.94%) of the 296 personal and institutional subscribers responsible for these contributions and for 670 (78.36%) of the 855 messages collected. Of the 210 subscribers accounted for, 209 were personal subscribers. Their gender distribution was 104 females (49.76%), 95 males (45.45%), and 10 unknown (4.78%).

While some conclusions could have been drawn from the sample of messages that were matched, it was decided that the first list would be reviewed as well. This review had two objectives. The first was to eliminate the number of unmatched messages. However, the expectation was that, perhaps, not all messages would be accounted for. This was due to the possibility of some messages having been sent by individuals whose presence and activity had not been captured in the two subscribers' lists. It was hypothesized that this would be due to migration to and from the list. For example, anyone who had subscribed and contributed *after* March 5, 1997, but who had then cancelled his or her subscription *before* November 4, 1998, the date when the most up-to-date list was obtained, would not be accounted for. There was also the possibility that at least some of the messages had been sent by "concealed" subscribers.

The analysis of the first list also had the objective of revealing the migration patterns. What is meant by this is that the presence of individuals in one or both lists would lead to an understanding of composition of the community over time.

The November, 1997 list

The November, 1997 list included 662 subscription statements, a number almost identical to that of the most recent list. Of these, 623 (94.10%) were personal and were distributed as follows: 337 or 54.09% were female, 222 or 35.63% were male, and 64 (10.27%) unidentified. Within the group that was identified, 60.28% were female and 39.71% were male. These figures are almost identical to the ones obtained following the analysis of the most recent list and suggest a relatively stable gender distribution over time.

Combining the subscription statements found in both lists led to a total of 834 unique subscription statements. Of these, 772 were personal (92.56%), 42 were duplicates (5.03%), and 20 institutional (2.39%). Of the 772 personal subscriptions, 687 (88.98%) were identified as female or male. The breakdown for those identified is 412 (59.97%) females and 275 (40.02%) males.

The analysis of the 1997 list reduced the number of contributors, personal or institutional, who remained unaccounted for from 86 to 67. These 67 subscribers were later found to consist of 35 females, 18 males, 7 of unknown gender, and 7 institutional subscribers. These are the individuals or institutions who joined JESSE *after* the first list was obtained and who cancelled their membership *before* the second list was obtained. Their inclusion in the analysis of JESSE's membership made it possible to establish the source of all the 855 messages collected. The final figures for all subscribers are shown in Table 1.

TABLE 1
Statistics for JESSE Community
March, 1997 - November, 1998

	March 1997 List	November 1998 List	Not Listed in 1997 or 1998	Overall Totals
Subscription statements	662	668	--	834
Duplicates	24	30	--	42
Unlisted (concealed)	2	2	--	--
Overall				
Institutional	15	15	7	27 (3.14%)
Personal	623	623	60	832 (96.85%)
Total	638	638	67	859 (100%)
Gender				
Unknown	64	65	7	92 (11.05%)
Female	337	334	35	447 (60.40%)*
Male	222	224	18	293 (39.59%)*
Total identified	559	558	53	740 (88.94%)

* Percentages of those identified as female or male.

Migration patterns

The overall number of subscribers remained relatively constant as shown by the number of subscribers in the two lists (662 to 668). However, these numbers conceal the fluidity of the community. Only 484 or 56.34% of the 859 subscribers, personal or institutional, retained their subscription for the entire period investigated. In this category, of the 430 identified as personal subscribers and whose gender was established, 60.23% were female and the remaining 39.76% were male.

The personal subscribers in the 1997 list who were *not* listed in the 1998 list include 78 females, 51 males, and 20 of unknown gender. Of the 129 identified, 60.46% were female and 39.53% were

male. These are the individuals who cancelled their subscriptions after the first list was obtained. The figures for those who subscribed after the first list was obtained are almost identical: 75 females, 53 males, and 21 unknown. Of those identified, 58.59% were female and 41.40% were male. These results help explain the stability of the gender ratios in the period during which the list was monitored. They also suggest that the existing distribution is likely to remain unchanged in the foreseeable future. The table that follows shows the migration patterns.

TABLE 2
Migration in the JESSE Community
March, 1997 - November, 1998

	Present in March 1997 List	Present in November 1998 List	Total Number of Subscribers	Institutional	Female	Male	Unknown
More than 20 months	Yes	Yes	484	10	259 60.23%	171 39.76%	44
Arrived after March, 1997	No	Yes	154	5	75 58.59%	53 41.40%	21
Left after March, 1997	Yes	No	154	5	78 60.46%	51 39.53%	20
Arrived after March, 1997 and left before November 1998	No	No	67	7	35 66.03%	18 33.96%	7

Personal contributions

The analysis of the personal contributions led to some interesting results. Of the 772 personal subscribers who appeared in the 1997 *or* 1998 list, only 228 or 29.53% contributed at least 1 message. This calculation excludes the 60 personal contributors who did not appear in the lists that were analyzed. This leads to a more accurate calculation because it is simply impossible to establish precisely the number of *non-contributing subscribers* missing from the lists obtained. Their inclusion would increase the total number of personal subscribers to 832, a figure that would not be correct, and result in a misleading increase in the number of personal contributors from 228 to 288 or from 29.53% to 34.61%. However, this group can be included in the distribution of *contributors* by gender. And it is precisely in this area where some evidence of the implications of gender in CMC emerges.

The results shown on Table 3 below suggest that males are more active than female subscribers. Although they constitute 39.59% of the community they represent over 45% of the contributors. The only exception is in the relatively small group of contributors who were members of JESSE for a brief period. Although their overall rate of participation may not seem disproportionately high, additional evidence needs to be considered before dismissing the argument regarding "gendered"

technologies. This leads to the analysis of the gender distribution of the messages sent to JESSE in the period studied.

TABLE 3
Personal Contributors to JESSE
March, 1997 - November, 1998

	Total number of personal subscribers	Total number of contributors and %	*Female contributors and %	*Male contributors and %	Contributors of unknown gender
More than 20 months	474	152 32.06%	77 52.38%	70 47.61%	5
Arrived after March, 1997	149	57 38.25%	27 51.92%	25 48.07%	5
Left after March, 1997	149	19 12.75%	9 50%	9 50%	1
Arrived after March, 1997 and Left before November 1998	na	60 na	35 66.03%	18 33.96%	7
Overall (Including those missing from both lists)	832	288 34.61%	148 54.81%	122 45.18%	18
Only listed in 1997 or 1998 subscribers' lists	772	228 29.53%	113 52.07%	104 47.92%	11

* Percentages of those identified as female or male

Table 4 suggests that male contributors, overall, send a larger volume of messages than female contributors. They consistently exceed their numerical representation in the community and exceed female contributors in three of the four categories of subscribers. The only exception is in the category of those who had subscriptions to JESSE for a relatively short time. And there is an explanation for this exception. Most of the messages sent by the subscribers who joined JESSE briefly were sent by assistants or secretaries for the sole purpose of passing on information regarding upcoming events, scholarships, or to make announcements originating from the institutions to which they were affiliated at the time. Given the gendered nature of the workforce it is not at all surprising that most of them were female.

Additional evidence of how gender relates to CMC is found by the examination of the gender of the most prolific contributors to JESSE, that is, the individuals who contributed the *highest* number of messages. Of the 12 personal contributors who sent more than 10 messages to JESSE, 8 or 66.66% are male. Furthermore, the 4 most active contributors are *all* male. These 4 individuals

sent between 22 and 48 messages for a combined total of 131 messages. In other words, 1.38% of all contributors produced 15.59% of the 840 contributions sent to JESSE.

TABLE 4
Personal Contributions to JESSE
March, 1997 - November, 1998

	Total Personal Contributions	*Contributions by Female Subscribers	*Contributions by Male Subscribers	Contributions by Subscribers of Unknown Gender
More than 20 months	529	257 49.23%	265 50.76%	7
Arrived after March, 1997	139	60 46.15%	70 53.84%	9
Left after March, 1997	83	16 19.51%	66 80.48%	1
Arrived after March, 1997 and Left before November 1998	89	46 57.5%	34 42.5%	9
Overall (Including those by subscribers missing from both lists)	840	379 46.56%	435 53.43%	26
Only listed in 1997 or 1998 subscribers' lists	751	333 45.36%	401 54.63%	17

* Percentages of those messages sent by those identified as females or males

Relationship to other findings

To understand the implications of the findings reported here and how these findings relate to the broader question of gender and technological practice in CMC, it is necessary to review the evidence gathered by other researchers. Although this evidence is somewhat limited it should help in delineating a link between existing social structures and communications technologies. This may be of interest to those in areas where the transfer of information is of paramount importance. The most important question in this area is whether communication systems as a whole, however sophisticated and promising, are being used, as Rakow (1988) suggests, to "complete the communication systems of men in the public sphere" (p. 65).

In their study of gender and power relationships, Selfe and Meyer (1991) focused on Megabyte University or MBU, an electronic discussion list on the subject of computers and the teaching of English composition with a total community of about 200 subscribers. The results showed that in the period investigated males contributed, on the average, a higher number of messages. In that period, 18 males contributed over 70% of all the messages received. This represents a gross disproportion because males constituted just over 50% of the 33 contributors in the period

investigated. They concluded that “the dominance of the conference conversations by men and higher-profile members of the community suggests that the conference is not as egalitarian as we might wish” (p. 186).

Two years later, Herring (1995) turned her attention to MBU as well. At that time the gender distribution of its community was 42% female and 58% male. Herring monitored the discussions taking place for a 6 month period. In this period female participation was typically at a level of about 15 percent of the total. The only exception was an extended and heated discussion which involved 242 messages sent by 59 people in a one-month period. Of these, 70% were sent by males.

In a related investigation, Herring (1993) also found evidence of male domination in the electronic discussion list known as Linguist. This list is used primarily by academics making it of particular relevance for comparative purposes. The gender distribution of its subscribers at the time (June, 1992) was 63% male and 37% female. In this instance, 79% of all contributors were male and they contributed 80% of all the messages gathered. Although Herring’s observations were limited to a sample of only 261 messages sent in a randomly selected two-week period and two extended discussion the results are suggestive and provide additional evidence of the implications of gender in CMC practice.

Herring’s investigations also support the findings of the study reported here with respect to the fact that a small minority of males contributes an extremely high number of messages. Recall that in this study 1.38% of all contributors sent 15.59% of the 840 personal contributions sent to JESSE. In her study of Linguist, Herring (1993) found that a small group contributed more than eight times the average. The only exception to the overall pattern is the Women’s Studies list, also known as WMST. In this list, Herring (1996) found that women contribute at a rate equal to their numerical representation, approximately 88%.

Conclusion

The argument regarding the gendered practice of technology and the rejection of technological determinism are at the center of the feminist critique of technology. This critique situates technology in the context of a patriarchal society and emphasizes the fact that technology does not occur in a social or ideological vacuum and that technologies as knowledge systems and as social practices are in their essence representations of particular sets of dominant values, ideas, and goals. As Rakow (1988) points out, “it does not take a social scientist to make the observation that in most contemporary cultures women and men have different access to the creation of technology, have different access to decision making about the development of technology, and have different experiences with technology” (p. 57).

While many continue to highlight the promise and potential of technological innovations in the age of information, it is difficult to ignore the existent evidence. The influence of society on new technological expressions leads to a seemingly unavoidable preservation of existing social power structures. Although these structures may involve variables other than gender, the social aspects of technology should be of concern to researchers, in particular those in the area of information studies, given the widespread implementation of these systems for the purpose of transferring or disseminating information.

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