COMPUTER-BASED FOREIGN LANGUAGE GROUP ACTIVITIES AND GENDER DIFFERENCES

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This research investigates the issue of gender differences and group effect in computer-based foreign language activities. Sixty subjects were asked to volunteer from intermediate French language classes at the University of Arizona. Subjects participated in pre-training and pre-test sessions. Then they went through a computer-based French cooperative task in dyads for 30 minutes. There were ten female pairs, ten male pairs and ten mixed-gender pairs. The computer-based interaction was followed by a post-test, the results of which were compared to the results of the pre-test in order to gauge the instructional efficiency of the software across genders and group types. Results suggest that females tend to acquiesce to male factual preferences and to lower their interest of the descriptive part of the software in mixed-gender groups. Overall, however, this study indicates that humanity courses using computer-based tasks might be less biased than computer-assisted courses traditionally seen as more male oriented.

INTRODUCTION

The issue of gender differences in cooperative computer-based activities has been widely addressed in science classes, but never studied in cooperative Computer Assisted Language Learning (CALL). Considering that foreign language educators advocate the use of group work not only in classroom settings but also in computer assisted instruction (CAI), there is a need to address the issue of interaction in computer-based tasks. More specifically, this paper outlines the effects of single-gender and mixed-gender pairings in cooperative CALL. It investigates: 1) the impact of single or mixed pairing on learning, and 2) the interaction patterns of mixed- and single-gender groups during a computer-based foreign language task.

COOPERATIVE CAI AND GENDER DIFFERENCES

Studies investigating gender differences in the use of computers have indicated that males tend to be more interested in computers than females and that males use computers more than females (Collis, 1985a; Collis, 1985b; Felter, 1985; Fisher, 1984). However, male and female preferences for typically gender-specific interests are often due to tacit tracking processes stemming from a hidden curriculum (Davies & Meighan, 1975; Fennema, 1987; Holmes, 1989; Sunderland, 1992). Studies show that parents are more likely to buy a computer and video game for their son than for their daughter (Levin & Gordon, 1989). Other studies indicate that the female's attitude toward computers stems from a lack of societal reinforcement of girls' interest in computers, since girls have been reported to show an equally positive attitude toward computers when given equal opportunity to use them (Forsyth & Lancy, 1989). When enrolled in computer classes, for instance, girls are as skilled as boys in programming (Webb, 1985).

Gender differences have been mentioned to occur in some social contexts but not in others (Feldman, Fish, Friend & Bastone, 1991). The classes that Feldman et al. observed in their study had a majority of females, and one class was exclusively female. In this context, the authors suggest that the social climate may be different when there is a majority of males or

females in a class. They also suggest that humanities courses using computer-based tasks might be considered less gender biased than the science courses traditionally seen as more male oriented, implying that specific academic disciplines can have an effect on classroom communication and gender interaction.

Anthropological studies indicate that females prefer interpersonal interactions to purely factual exchanges (Steinem, 1991). In the classroom, many females are reported to speak among themselves about off-task topics which are relevant to them. However, such interactions are frequently viewed by both teachers and researchers as an "intrusion of irrelevancies" (Cummings, 1985: 157). What is termed "irrelevancies" may be a matter of gender-specific interactive behavior. However, Cummings' conclusion about gender differences during a computer-based cooperative task in English studies clearly indicates that gender-specific conversational patterns are not fully understood:

> While not wishing to adopt a chauvinist stance [...] it must be admitted that across all age ranges, it was found that not only did the girls utter more words than the boys but that their talking tended to incorporate a range of issues which were, albeit interesting, not altogether relevant. The remarkable ability to depart temporarily from a reasoned argument, and shortly to return to it with equal facility, seems to be an exclusively female phenomenon. Boys [...] tend to pause more frequently and thereby give themselves more thinking time. Girls, it would appear, have less need of silence to develop their inner thoughts and are not distracted if they all talk at the same time or overlap, as happened occasionally. (Cummings, 1985: 157)

Teachers often judge female students as talkative and off-task, whereas males are depicted as better students, i.e. more analytical and on-task. This is a perfect example of how the hidden curriculum affects education. Teaching practices are not put into question because the values that constitute the hidden curriculum (such as subconscious or conscious gender biases) lead to a prejudgment even though there is the appearance of an objective argumentation.

In a study conducted among ESL students, gender differences were recorded and interpreted as follows: "in the mixed pairs, the female assumed the role of typist, perhaps encouraging the male to dominate the discussion and decision making" (Abraham & Liou, 1991: 93). In Abraham's study, there were two mixed pairs and one female pair. In the first mixed pair, the male uttered 57% of the total words and the female 43%; in the second mixed group, the male uttered 79% of the total words, and the female 21%. In the female group, however, little difference was noticed between the partners' number of utterances (51% and 49%). A similar study (Guntermann & Tovar, 1987) indicated that partners in female groups agree more among each other than partners in male groups--males showed more antagonism towards each other, and focused more on seeking information for the sake of information not for communication.

Siann & Macleod (1986) found that boys are socially dominant when working with girls around computers, and that girls in turn become less motivated and less successful. This gender difference in computer use was explained by the authors as "computer-phobia." What Siann failed to mention, however, was that males naturally tend to be dominant in mixed-gender conversations, as has been shown by anthropological research (Zimmerman & West, 1975; Steinem, 1991). For reference, Zimmerman et al. (1975) investigated mixed-gender conversations for examples of gender-specific styles. Thirty-one conversations were taped in public places such as libraries, coffee shops, drug stores, and the campus of the University of California. The data were composed of eleven mixed-gender conversations, ten male-only and ten female-only conversations. The findings indicated significant differences between same-gender pairs and mixed-gender pairs regarding the use of overlaps and interruptions. Overlaps are defined as an act of anticipating the end of a sentence spoken by an interlocutor while articulating it with a topic-related response. An interruption, on the other hand is considered a violation of turn-taking rules whereby topical disarticulation is flagrant. Results showed that females use more overlaps than interruptions and that 96% of the interruptions result from men

interrupting women. Interestingly, men rarely interrupted each other, primarily using interruptions when speaking to women. Women use fewer overlaps with men than with women because men react to overlaps as interruptions: "Male interruptions of women bring less social punishment than female interruptions of men" (Steinem, 1991: 302). Zimmerman and West (1975) observed that in mixed-gender conversations the men tend to infringe on the women's right to speak. The same study indicated that as a result of male interruptions, women tend to be more silent than men. While silent periods in single-gender pairs averaged 1.35 seconds, in mixed-gender groups they averaged 3.21 seconds.

Female computer-phobia has been traced by Culley (1988) to an early tracking system which leads to a lack of equity in schools. The situation is cumulative to the point of hindering those female students who, eventually, must attend required computer-based classes. But computer-phobia need not be irremediable; female students usually need only a little more attention and help to overcome their "fear of the computer." Cully's research shows, however, that instructors often devote their time to the most skilled students, ignoring the needs of students who most require assistance and encouragement:

> Computer rooms in most schools were regarded as male territory and girls reported being made to feel uncomfortable by the attitudes and behavior of boys [...] Classroom observations showed that very little effort was made to counteract the tendency of boys to dominate lessons [...] In the practical part of lessons boys would typically acquire the newest computers, those with disc drives and color monitors. Often girls would be elbowed out of the way and left standing in the rush, without access to a computer at all. (Culley, 1988: 4, 6)

In the classes depicted above, the female's enthusiasm for computer courses was very low, a finding that was reached via questionnaire. However, when Culley visited two girls' schools, class observations indicated that "computer studies was a popular option and computer clubs thrived" (Culley, 1988: 7). The survey on attitudes toward computers in those single-gender schools also indicated a high level of motivation for computer classes.

Other studies have indicated that males "tend to hold more stereotyped attitudes about who is capable of using computers" (Levin & Gordon, 1989: 69), which may explain why males tend to assert themselves more in computer labs. Watson (1991) mentions a possible correlation (although not formally investigated) between the girls' poor attitude toward computers and the way teachers fail to "promote girls' success in using computers" (Watson, 1990-91: 10). Dalton, Hannafin & Hooper (1989) studied the interaction across instructional methods (individualistic and cooperative CAI, gender, and ability), and the results of the study conducted among same-gender groups indicated the following:

> Students who worked cooperatively significantly outperformed those who worked individually [...] High ability males and females reported comparable attitudes toward each instructional method, but ratings for low-ability students were differentiated according to the instructional method: Low ability males responded most favorably, while low-ability females responded least favorably to individualized methods, and low-ability females responded most favorably and low ability males least favorably to cooperative methods. (Dalton, et al., 1989: 15)

Because of males' competitive interactive behavior, low-ability male students are not likely to be helped by high-ability males whose goal is, in fact, to impose themselves. As for females, their natural search for cooperation and harmony may explain why positive results were reached among those with low ability. Dalton's study, however, only investigated single-gender groups.

Underwood & McCaffrey (1990) conducted a study including both mixed- and single-gender pairs to find out about the effect of gender-specific interaction patterns in cooperative CAI. Students had three sessions: Session 1 was an individual CAI session, Session 2 was a cooperative CAI session, and Session 3 was another individual CAI session. The effect of

cooperative work was measured by comparing the results of Session 3 with those of Session 1. The results indicated that both types of single-gender pairs improved individual performance in Session 3, but mixed-gender pairings did not lead to any improvement of individual abilities. The authors explained the poor performance of the mixed-gender groups by stating that partners had difficulty cooperating and that females tended to be dominated by their partners who competed for keyboard control. Other studies (Culley, 1988; Siann & Macleod, 1986) indicate that females show lower results when working with males, even though the same females have no disadvantage in similar tasks when working individually or in single-gender groups. Siann and Macleod's observations of mixed-gender group interactions are revealing:

> Mixed-gender pairs showed clear social differences in that the boy, despite the girl's protests, continually leant over and pressed the keys when she was at the console but the reverse pattern was not observed. When girls seek help from boys, they resent it when the help was given practically (i.e., by pressing the appropriate keys) rather than verbally. Girls suffer from both implicit and explicit sexism which disadvantages them until they enter professional life. (1986: 137)

COOPERATIVE CALL AND GENDER DIFFERENCES

The issue of gender differences in cooperative computer-based activities has been addressed in the context of mathematics, and the sciences, but is barely mentioned in English studies and never studied in cooperative computer-based foreign language tasks. Because foreign language educators advocate the use of group work not only in classroom settings but also in Computer Assisted Language Learning, there is a need to address this issue. The goal of the present study is to examine the effects of single-gender and mixed-gender pairings in cooperative computer-based foreign language tasks. The objective of this study is stated in the following research questions: Do single or mixed pairing effect post-test performance? The null hypothesis is:

H_O: There will be no significant differences between males and females as to how much they learn.

Method

The present study investigated the issue of gender-difference in computer-based foreign language activities as follows: Sixty subjects from intermediate French classes at the University of Arizona were asked to volunteer for the study. Subjects participated for two hours: approximately one hour for pre-training and pre-tests, 30 minutes for a French cooperative task at the computer, and approximately 30 minutes for post-tests. Each student was offered a $10 incentive. Each subject was randomly assigned to a partner of the same or opposite sex. There were ten female pairs (FF), ten male pairs (MM), and ten mixed pairs (FM). Students worked with Macintosh computers. Subjects were asked to play the French version of the computer game "Carmen San Diego" for thirty minutes. This computer game involves 1) understanding language, 2) making decisions, and 3) manipulating computers. In addition, this game offered two kinds of learning: 1) descriptive vocabulary, and 2) cultural facts. Pre-tests and post-tests were designed to reflect both types of knowledge and were composed of two parts: 1) recognition of the descriptive vocabulary, and 2) knowledge of cultural facts introduced in the computer-game. Videotape records of the sessions provided data on the nature of the interactions during the group activities. A camera was set up with no operator in order to maximize ecological validity.

Results

1. *General comparisons between male and female results:*

Table I:
General Comparisons between Male and Female Learning (regardless of group)

	N	Mean	Std. error	t-value
Overall F Learning	30	17.63	1.34	
Overall M Learning	30	15.20	1.32	1.42
F Learning Cult. Facts	30	15.62	1.33	
M Learning Cult. Facts	30	17.63	1.74	1.01
F Learning descr. vocab.	30	19.72	2.24	
M Learning descr. vocab.	30	12.89	1.79	*2.62

* significant at $p < .01$

The difference between post- and pre-test scores was first established for all males and all females, regardless of the groups they were in. Results were subdivided into three categories: 1) overall learning, 2) learning of descriptive vocabulary, and 3) learning of cultural facts. The results of the *t*-test performed on the overall learning quota indicated that the difference between males and females was not statistically significant (Table I): Females had an overall learning mean of 17.63 points, and males had an overall learning mean of 15.20 points. The rate of overall learning was then broken down into 1) cultural facts, and 2) descriptive vocabulary. Males outperformed females in learning cultural facts, but differences were not significant. Females outperformed males in learning descriptive vocabulary (*t*-value = 2.62; p value <.01)

2) Group Effect: The results of the statistics performed on 1) overall learning, 2) the learning of cultural facts, and 3) the learning of descriptive vocabulary a) for each gender, and b) within each group are summarized in Table II.

Table II:
Comparison of Learning Rate Across Genders and Groups:

	Overall Learning	Learning of Cultural Facts	Learning of Descriptive Vocab.
Females/FF Groups	17.65	14.56	20.75
Females/FM Groups	17.60	17.75	17.65
Males/MM Groups	14.12	15.30	13.23
Males/FM Groups	17.35	21.29	12.20

Females show no difference in overall learning between same and mixed-gender groups, and there is no negative effect of the mixed-gender group on either males or females. However, male-only groups experienced a negative effect on overall learning, although it is not statistically significant. Both males and females tend to learn more cultural facts in mixed-gender groups, indicating a positive effect, especially for males. There is no group effect on the learning of descriptive vocabulary. Females tend to learn more descriptive vocabulary in same gender groups, although the difference is not significant.

DISCUSSION

The data from the experiment indicate that females and males tend to focus their attention on particular types of information: Females tend to learn more vocabulary pertaining to descriptions, and males tend to learn more facts. This observation is in accordance with findings in anthropological studies showing that females are more interpersonal and use a more descriptive and discursive language than males. Men exhibit more knowledge of facts during conversations. Anthropological studies also imply that women are most comfortable with affective and social interaction, whereas men prefer referential and factual discourse (Coates, 1986; Holmes, 1992; Scarcella et al., 1992; Tannen, 1990). Since computers are particularly well suited to handling facts, many CALL programs may be unintentionally biased against females. This observation has already been made by Chisholm et al. (1981) who stated that many computer programs tended to be "sexist." But *Carmen San Diego* is a program which promotes both facts and a descriptive language. Thus it may appeal to both sexes: to females with its descriptive component, and to males with its factual component. Considering gender-specific trends toward certain types of knowledge, this hypothesis deserves further research.

The data from the experiment also show that females are not negatively affected by mixed-gender groups, which seems to disconfirm the findings reported by Culley (1988) and by Siann et al. (1986). However, the videotapes from the experiment indicate that females adjust when interacting with males: In mixed-gender groups females tend to acquiesce to male factual preferences and to lower their interest of the descriptive part of the software. On the other hand, while males tend to assert themselves with facts in mixed-gender groups, there is no adjustment on their part to female interests, i.e. descriptions. This trend confirms findings from anthropological studies showing that females are more likely to adjust to male-specific topics, and that males are more likely to speak as experts on topics they accept to discuss; males consider it trivial to speak on more personal, i.e. more female-specific topics, showing no adjustment (Steinem, 1991). Interestingly, males in the same gender groups of this experiment showed significantly lower results in the learning of factual knowledge. Videotapes revealed much less cooperation in MM groups as opposed to the other groups (FF and FM). Females were more receptive to cooperation and discussions with their male or female partner. In MM groups, however, males did not interact as much, and the one who controlled the mouse often took branching decisions without consulting his partner.

The results of this study show interesting trends that merit further investigation with a larger number of subjects. At the very least, this study gives us insights regarding possible negative or positive effects the group may have on the individual. This study also indicates that specific computer programs may fit some types of personalities and not others, and that designing software to address more than one type of information gives more flexibility and may interest a larger audience. This study also established that females are not at a disadvantage in a CALL group activity at the university level. This study confirms Feldmann's hypothesis (1991) that humanities courses using computer-based tasks might be considered less biased than computer assisted courses traditionally seen as more male oriented.

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Lydie Meunier-Cinko has degrees in German, Applied Foreign Languages, FL translation and interpretation from the University Lyon II, France. She has an M.A. in French from Pennsylvania State University, and she is now a doctoral candidate in SLAT at the University of Arizona. Her primary research interest is in the use of technology and its role in efficient language learning. Her most recent article, "Interactive French Language Curricula of the Future: A Study of Computer and Video Potential", appeared in the Fall issue of the *French Review* in 1992. Starting August 1993, Lydie Meunier-Cinko is a professor of language and pedagogy at the College of William and Mary in Williamsburg, Virginia.

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