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THE RELATIONSHIP OF CLASS SEX COMPOSITION, TEACHER SEX, AND SELECTED ATTITUINAL VARIABLES TO THE VERBAL CLASS PARTICIPATION OF FEMALE COLLEGE STUDENTS

A Dissertation Presented

By

ANGELIKA MADELON POHL ROBERTSON

Submitted to the Graduate School of the University of Massachusetts in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

August 1978

School of Education
THE RELATIONSHIP OF CLASS SEX COMPOSITION, TEACHER SEX, AND SELECTED ATTITUDINAL VARIABLES TO THE VERBAL CLASS PARTICIPATION OF FEMALE COLLEGE STUDENTS

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Approved as to style and content by:

Sheryl Riechmann, Chairperson of Committee
Mary R. Quilling, Member
Icek Ajzen, Member

Mario D. Fantini, Dean
School of Education
I dedicate this to the memory of my mother

Jutta Hart Pohl
1899 - 1959
PREFACE

I marvel at prefaces that suggest that the author has been continuously cushioned, supported, and encouraged along by armies of helpful people. This has not been the case for me.

Personal experience has its drawbacks as a source of generally valid insights, but my personal experience in laboring over this dissertation suggests some conclusions. For a woman like me, who in mid-life decides to take on a new career direction, whose bonds to husband and children lessen both the need and opportunities to foster bonds with fellow graduate students, this kind of work is very lonely work. The nature of my dissertation project made it necessary for me to acquire a wide range of new skills and knowledge and involve large numbers of people as sources of data. This meant a continuous dependence on people's willingness to give of their time, their expertise, and their good will. These were often not forthcoming -- especially not where they might have been most naturally expected.

Basically, I credit the successful completion of this dissertation to myself. I battled discouragement, loneliness, confusion, ambivalence, and ever-competing demands on my resources by myself. Nevertheless, no one can do it truly alone and I, too, was buoyed along by help and encouragement, often from unexpected sources, and often only after real dry spells.

First of all I want to express my deep appreciation for my beloved husband, who was not only my supportive mate all along, but who was forever willing to be the guinea pig for my preliminary research (in his capacity as college teacher). Also to my lovely daughters Heidi and Christina go many thanks for bearing with me throughout these many months. Next I wish to thank all those many students who willingly filled out questionnaires and so often shared their much-valued feelings and thoughts about the dissertation subject. I also am very grateful to the eight teachers who allowed me into their classes to carry out my mysterious scientific experiments, as well as to my teacher friends, especially Jerry Hyman, who welcomed me to their classes during the pilot stages of this study. Finally, I want to express deep appreciation to the following individuals whose willingness to be helpful at certain crucial points made a real difference: Icek Ajzen, Jacquelynne Parsons, Elizabeth Aries, Anne Bedlington, Fletcher Blanchard, and Peter and Ann Pufall. I hope I have not forgotten anyone.

All in all, it was an arduous task, but one that gave me great satisfaction. I learned very much and I hope to have made a contribution towards the better understanding of an issue especially relevant to women.
ABSTRACT

The Relationship of Class Sex Composition, Teacher Sex, and Selected Attitudinal Variables to the Verbal Class Participation of Female College Students

(September 1, 1978)

Angelika Madelon Pohl Robertson, B.A., Emory University
M.A., Emory University, Ed.D., University of Massachusetts

Directed by: Professor Sheryl Riechmann

This investigation assumed that the disadvantaged condition of women is often due to their more limited ability, as compared to that of men, to engage in assertive intellectual verbal argumentation. The study focused on women's participation behavior in the college classroom because skills exhibited here are likely to be related to skills exhibited in later-life settings where ideas compete. In addition, knowledge gained from this investigation may prove useful for college-level intervention programs to improve attitudes and skills related to argumentation.

Part I of the study examined the relationship between the amount and nature of female students' participation and class sex composition (all-female versus mixed-sex) and teacher sex. Part II examined the relationship between participation and attitudes.

For Part I students in four mixed-sex and four all-female classes were observed during two naturally-occurring class sessions. Classes were small (12 to 19 students), discussion-oriented, and in the social sciences. Observations were done with the Robertson Interaction Analysis System, developed by the author, providing data for each subject on number and length, addressee, conversational intent, initiative level,
and situational antecedent of each speaking turn. For Part II several participation measures were used: observation measures, self-reports, and teacher reports. Attitudinal data were gathered with multiple-choice questionnaires.

Results of Part I showed no effect of sex composition or teacher sex on amount of participation. However, the nature of interaction differed, such that participation in mixed-sex and in female-taught classes showed a greater incidence of high initiatives. Teacher-student discussion in mixed-sex classes tended to be more like conversations between equals. Students spoke to the teacher (and each other) with little prodding. Teachers were more likely to address individual students than the whole class, and students' comments tended to follow one another without the teacher's intervening sanction. Conversation consisted mostly of comments, rather than of questions and answers. In all-female classes participation was more teacher-dependent, being more often specifically invited and moderated by the teacher. Female teachers tended to act more as facilitators of, than participants in, the discussions. They extended more explicit invitations to speak and allowed others to respond to comments rather than responding themselves. Male and female students were also compared. Results showed a tendency for males to speak more and revealed sex differences in patterns of interaction which ran parallel to the class sex composition findings, such that sex-specific patterns of females tended to be more pronounced in all-female and lessened in mixed-sex classes.

Results of Part II showed moderate correlations between participation and general assertiveness (measured by the Rathus General
Assertiveness Schedule); a tendency of High participants to hold more feminist attitudes (measured by the Spence-Helmreich Attitudes Towards Women Scale); and a greater tendency to approach intellectual verbal conflict (measured by the Robertson Intellectual Verbal Conflict Approach/Avoidance Measure, developed by the author). In addition, the beliefs about consequences of speaking up (measured by a questionnaire based on the Fishbein-Ajzen model of the attitude-behavior relationship) of High participants differed from that of Low participants: High participants felt more confident that classmates would value their contributions, that the teacher would be impressed, and had more positive attitudes about being wrong and starting an argument. High participants also reported higher normative pressures to participate in discussions. Some of the subsidiary findings were that Low participants felt less at ease with classmates, were more likely to save comments for after class, earned lower final course grades (though not lower exam or paper grades), were less likely to have completed the readings, and reported lower talkativeness in task groups in general.

The relevance of this study was supported by the fact that 60% of females indicated a desire to participate more, and by a generally high rating by females and teachers of the severity of the participation problem.
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CHAPTER I
INTRODUCTION

Definition of the Problem and Review of Related Research

This investigation addresses the issue, or "problem," of sex differences in language use. The issue of language and sex has only recently become a focus for researchers but has already produced a considerable body of evidence to support the notion that men and women consistently demonstrate differences in how they use language. The recent collection of essays and extensive annotated bibliography entitled Language and Sex: Difference and Dominance (Thorne & Henley, 1975) not only establishes the existence of such differences in general but gives an overview of the wide range of manifestations of these differences.

Why do these differences constitute a "problem?" Since language is a fundamental tool of social interaction, it follows that differential access to, use of, and response to this tool will have deep consequences for the lives of men and women. Whether one looks at the microcosm of husbands and wives conversing, or the macrocosm of the board of directors of the Ford Motor Company debating a change of policy, an analysis of conversational style and content can reveal differences in status, power and role.

The most important and most consistently documented sex difference is that in a wide variety of mixed-sex group situations, men talk significantly more than women do (Aries, 1974; Bernard, 1972; Hilpert, Kramer, & Clark, 1975; Parker, 1973; Soskin & John, 1963; Strodtbeck & Mann, 1956; Ziman, 1974). This finding does considerably more than destroy an old myth about women's supposed garrulity. It points to what is perhaps a key variable responsible for the unfavorable
and inequitable conditions that women face in so many spheres of life. Common sense alone suggests that the less active a member of a group, the less likely he or she will exert influence on the group and its decisions. Research bears out this conclusion: the more a group member speaks, the more likely he or she will influence the group, be considered to demonstrate expertise, and be regarded as a leader (Bales, 1970; Lara, Vaughan, & McGinnies, 1960; Morris & Hackman, 1969; Richardson, Dugan, Gray, & Mayhew, 1973; Zdep, 1969).

The disadvantaged situation of women has been documented for a wide range of situations; what is relevant to this study is the massive evidence that women do not fulfill their potential in terms of status, power and economic success in the white-collar and professional worlds of work. While Bernard (1972) and Epstein (1970, 1971), for example, provide over-all views of the barriers that women face in pursuing careers, other researchers have focused on specific fields of white-collar work. Gould (1970) and Simpson (1970) demonstrate women's inequalities in the business world; Kanowitz (1969) and J. White (1967) show discrimination in the legal profession; Rossi (1965) and M. White (1970) in the world of Science; Bock (1967) in the clergy; Lamson (1968) in politics; and the group of papers contained in Graduate Comment (1969) outline the disadvantages suffered by women in the fields of publishing, medicine, higher education and architecture. An analysis of how one secures a desirable position in these spheres of work and of how one inches one's way up the hierarchy shows that although merit plays its role, such merit must be coupled with other skills, one of the most important ones being the skill of speaking
effectively. Bernard (1972) concludes this from her observation that "a very considerable proportion of modern white-collar and professional work is talk." Gilmer (1971), whose focus is more specifically the business world, is willing to be more specific: his research leads him to state that the amount of time spent by high-level managers in communication is, for executives, 60%; for managers, 55%; and for supervisors, 50%. All this suggests the desirability of moving beyond research that simply verifies the fact of women's disadvantaged positions or that provides broadly conceived explanations of this state of affairs, and embarking on more fine-grained analyses of the precise, day-to-day mechanisms by which women are hampered in their career advancement. If it is indeed the case, as so much research suggests, that women play a disproportionately less active role than men in determining the goals and outcomes of task groups, then it is perhaps not surprising that such groups, whether they be committees, or boards, or panels, or formal or informal decision-making groups of any kind, will not shape and carry out policies in the best interests of women.

The long-range purpose of this dissertation is to develop strategies for helping women to broaden their communication skills so they may be more effective in influencing policy decisions that affect their lives. The short-range and more immediate focus of this dissertation is the necessary preliminary step of gathering data to help define the problem of reticence and the variables associated with it more carefully. Not until some answers are found to the question
of why and under what circumstances women are likely to speak up, can specific change strategies be developed.

The literature on sex differences suggests some guiding hypotheses about why women participate less actively than men in talking groups. It is definitely not a case of women having inferior command of the language; on the contrary, women have consistently shown greater competence than men with the lexicon and grammatical rules of language (Kramer, 1974; Maccoby & Jacklin, 1974). What is at issue is therefore not some basic lack in linguistic competence, but rather in the skills of applying this competence in ways suited to the demands of various situations. Are women as able as men to speak up under pressure, to take risks in asserting themselves, to deal successfully with interruption, to pursue an argument against a forceful or even hostile opponent, to muster relevant facts under pressure, to sound persuasive even when in doubt, to retain composure and even take pleasure in verbal combat? It could be argued that women possess these skills but that men usually don't allow their manifestation because men determine the nature and direction of conversation with women. They interrupt more frequently than women do (Zimmerman & West, 1975) and they stifle conversation in which they are not interested by a kind of non-response and by abrupt topic-changing remarks (Soskin & John, 1963; Zimmerman & West, 1975). They very rarely just quietly listen, while women do this frequently (Chesler, 1971). But men show these various "ungracious" behaviors as much to other men--and other men deal with them more successfully than women do. Furthermore, when single-sex groups are compared, men exhibit even stronger tendencies to dominate,
to challenge and to engage in verbal sparring while women show no increase in assertive or argumentative style (Aries, 1974; Bernard, 1972; Hirschman, 1973; Legman, 1968; Mitchell-Kernan, 1972; Sears, Ray, & Alperüt, 1965; Ziman, 1974). The evidence suggests that it is not a question of men inhibiting women from doing what they wish to do, but rather that men and women perceive the nature and purpose of verbal exchange situations differently and develop different repertoires of skills for their different role conceptions. (This is not to suggest that these different roles are freely chosen and that men do not play an inhibiting role at some level.)

The different roles that men and women tend to play in small-group talk have been aptly labeled by Bernard (1972) as striking versus stroking. The above-mentioned research studies provide ample evidence that men tend to use language for striking: to argue, to match wits, to challenge, to aggress, to establish dominance, to play-fight, to excite. Women are much more likely to see language as a stroking device: to support, to acknowledge others' feelings, to facilitate harmony, to accommodate, to soothe. This contrast is, of course, analogous to the familiar polar opposites known as task orientation and socio-emotive process orientation, or to the dichotomy presumed to exist between impulses toward agency and impulses toward communion. However expressed, women tend to choose the second alternative in the mentioned pairs—in fact, these very predilections constitute the cornerstones of a widely-shared stereotype of "femininity." (Broverman, I., Vogel, Broverman, D., Clarkson, & Rosenkrantz, 1972.)
It is necessary to move beyond simplified and exaggerated contrasts between abstract images of stereotyped male and female behavior towards a recognition that both striking and stroking behaviors are useful and appropriate, depending on the situation and one's aims and that there is no evidence that both men and women cannot learn both these skills. Instead of focusing on the sex-appropriateness of these skills, it would be much more fruitful to look at the situation-appropriateness of striking versus stroking. No matter how much one may value and prefer the stroking mode, it must be recognized that situations abound in which such a mode is dysfunctional. The variety and complexity of modern life guarantees that people will constantly bring legitimate different, often clashing ideas and interests to bear on a situation. If women do not have a choice, supported by the necessary skills, as to whether they will play a supportive, accommodative, deferential role or a role of active leadership and persuasion towards protecting and securing their interests they are surely handicapped.

This dissertation tries to identify some factors that are conducive to women's assertive behavior in small task-oriented groups. The arena chosen for study is that of the college classroom. There are several reasons for this. First, the setting of the small college class or seminar is in several ways analogous to the kind of work groups that the student is likely to face early in his or her career. The agenda for these groups tends to be task-oriented, i.e. they are not primarily friendship-oriented groups concerned with personal, emotional needs. Also, these groups are hierarchically structured in
that someone is in charge of moving the group towards an imposed goal. Further, members of the group are subject to evaluation with concrete consequences for their progress. A second main reason for choosing to study the behavior of college students is that young men and women are at this point just at the threshold of their career lives and their behaviors and skills likely reflect their future ability to exercise analogous skills in the career setting. The third main reason is the fact that the college years are crucial in attitude formation in women (Douvan, 1970; Stein, 1973). If this study succeeds in delineating some situational and attitudinal factors responsible for the kind of instrumental competence described above, then there is reason to believe that some form of compensatory education in attitudes and skills at the college level will be fruitful (Baumrind, 1972).

**Overview of the Investigation**

The present study attempts to contribute knowledge about the role of certain sex-related situational factors and the role of certain personal and attitudinal factors in the class participation characteristics of female college students. The approach taken in this attempt was basically two-fold. College students were observed in natural classroom settings for the purpose of measuring a sample of their actual participation behavior.

A sample of these observed students then provided a large amount of attitudinal and other personal information in questionnaire form. These data provided the basis for studying two sets of questions.
The first set of questions is concerned with sex-related variables: the sex of the student, the sex of the teacher, and the sex of classmates, i.e. class sex composition. Student sex differences in participation were of interest for two reasons: first, because even though considerable evidence already exists that shows that male students participate more than female students, it was nevertheless thought useful to test this finding with a new sample of students; secondly, because the present study takes a finer, more multi-faceted approach to the measurement of participation and thereby attempts to define sex distinctions more precisely. The second and third sex-related variables, teacher sex and class sex composition, constitute two givens of the classroom situation that are hypothesized to have a significant relationship to participation behavior.

The second set of questions is concerned with a number of factors that the individual brings to bear on the classroom situation: attitudes, beliefs, previous behavior patterns, and demographic attributes. The study seeks to discover the nature and extent of the relationship of some of these personal factors to classroom participation. Classroom participation data comes from three sources: the observational measures gained in the course of the data collection for the first set of questions, self-reports by students about their participation behaviors in various contexts, and teachers' reports on students' participation in their class.

The measurement approach taken in the collection of participation data thus involved three sources. Direct observation of two samples of actual class participation behavior was the first source. In order
to go beyond a simple description of the amount of talk that students engage in, an observation technique was developed by the author for this and subsequent related studies, the Robertson Interaction Analysis System. This system makes possible a description of participation behavior in such terms as addressee of a remark (teacher or fellow student(s)), conversational intent of the remark (question, answer, or comment), length of the remark, level of initiative of the remark (was the remark specifically solicited or was it a "free" contribution), and specification of various relevant antecedents of the remark. While this observation technique has the advantage of yielding objective and relatively reliable information about participation on one or two particular occasions, this approach suffers from the disadvantage of measuring a very limited and possibly unrepresentative sample of participation behavior of individual students. This study assumed that students have developed a certain general tendency to participate at high, moderate, or low levels and that the particular circumstances of a course or a given class session bring forth a participation behavior which results from a combination of the student's general tendency and factors particular to the situation. In other words, an individual's history of experiences with task-oriented discussion situations produces a tendency to respond to such situations in certain ways, yet the specific stimuli at work in any given discussion setting elicit behaviors not necessarily typical of that tendency. It was useful therefore to have information about a wider range of participation responses than the direct observation measures could supply. The two additional sources of participation information were self-reports about participation at different levels
of specificity and reports from teachers who had observed their students over a wider sample of behaviors. These three sources of information about participation provided a richer data base for the testing of relationships between attitude and behavior and they also made possible a test of the assumption that participation tendencies exist.

The measurement approach taken in the collection of attitudinal and other personal data involved the use of paper-and-pencil questionnaires with multiple choice answers. Some of these attitudinal questionnaires were developed and tested by other researchers while other questionnaires used in this study were developed and tested by the author specifically for this and future related investigations. The use of personal interviews with open-ended questions was given some consideration. The decision to reject this approach and to use only the kinds of questionnaires just described was based on the fact that the available resources did not allow the kind of extensive, in-depth interviews on a sufficiently large sample to adequately test the range of hypotheses chosen for this investigation.

**Major Hypotheses and their Rationale**

The two sets of general questions which underlie this investigation gave rise to the formulation of nine specific hypotheses. The data collected was intended, however, not only to make possible the testing of these major hypotheses but also to provide answers to a number of subsidiary questions. The first three hypotheses made predictions about the effect of the three sex-related variables on
participation, while Hypotheses IV to IX made predictions about the relationship of attitudinal variables to participation.

**Hypothesis I** states that women participate less actively and demonstrate less initiative than men in mixed-sex college classes. Evidence that this is the case in pre-college level classes has been reported by Cherry (1975), Meyer and Thompson (1956), and Serbin, O'Leary, Kent, and Tonick (1973). For college-level classes, evidence for this relationship is reported in studies by Parker (1973) and Sternglanz and Lyberger-Ficek (1977). The latter study found that in a sample of 60 classes male students were more likely than female students to engage in verbal interaction, both when the teacher initiated such interaction and when students initiated it. The Parker study compared participation of males and females in 10 college discussion classes and found males to participate significantly more than females, particularly in categories relating to intellectual argumentation (as opposed to categories like recalling facts).

In addition to the cited evidence, all of which was gathered in the context of large state universities, the author gained considerable informal evidence for this sex difference in the course of pilot observations of classes in private liberal arts colleges and from almost unanimous reports about such differences by teachers at those colleges in the course of private conversations.

The purpose of testing this hypothesis once more was to ascertain more formally whether this sex difference exists in the setting of relatively small, private selective liberal arts colleges and to gain a more closely defined picture of sex differences in participation.
behavior. While the hypothesis made predictions for only two dimensions of participation, amount and level of initiative, the observation technique used provided data on a large number of additional dimensions of participation. These data made possible an exploratory analysis of sex differences in participation patterns and dynamics. No specific predictions were made for this analysis; it was intended more as a test of the usefulness of various descriptive categories in increasing understanding of interactional dynamics in a classroom. Findings from this analysis could subsequently lead to the formulation of specific hypotheses, to be tested in further investigations.

Hypothesis II sought to demonstrate that the main cause of women's lower participation levels cannot be ascribed to the inhibiting effect of the presence of male peers. It states that women show even lower participation levels in all-female groups than they show in mixed-sex groups.

This somewhat startling second hypothesis was first suggested by observation of about 15 classes in the course of an informal pilot study undertaken by the author in preparation for this study. Although this observation runs counter to expectations expressed in the arguments for women's colleges, a careful understanding of existing studies and theory will make such an hypothesis plausible. The structure and agenda of most college seminars call for the kind of task-oriented, initiative-taking, dominance-challenging and self-displaying behaviors with which women are generally less comfortable than men. In mixed-sex classes men tend to "get the ball rolling," to establish a baseline of participation level and to remove the group's general hesitancy to
confront the authority figure. Given this groundwork, it becomes easier for women to participate occasionally because they need not fear the taking on of "unfeminine" roles, for in comparison to the men's behavior they are still relatively quiet and subdued. In an all-female class it has to be women who take the initiative, who take the lead, who break down barriers of hesitation in the face of authority figures. These are not behaviors with which women are comfortable. Aries (1974) demonstrates that women in all-female groups tend to feel uncomfortable in leadership positions, tend to worry about taking up too much time and try to modify the impression of being too active by deliberately assuming lower participation levels. These tendencies are likely to inhibit the activity level in all-female college classes. Females also prefer addressing their peers singly to addressing a group as a whole, a preference which cannot be appropriately exercised in most classroom situations. Another explanation for the lowered activity rates of women in the all-female task group is suggested by the fact that women tend to seek consensus, prefer to talk about subjects of agreement rather than controversy and prefer interacting with like-minded peers, i.e. are motivated more by affiliation needs than mastery strivings (Aries, 1974; Hoffman, 1972). A lively classroom exchange of ideas is, however, more likely to result from the vigorous clash of opinions than from shared ideas. A basic technique of teachers for eliciting discussion is to play the role of devil's advocate: one would expect very different responses to this role from male and female students. Women also display a general reluctance to engage in competitive behavior with one another (Uesugi,
1963; Vinacke, 1964), yet much of what goes on in a lively classroom discussion can be seen as a competition between ideas. If women's tendency to seek consensus and accommodation is uninterrupted by men's desire to stir up debate, then discussions will be short-lived because when everyone agrees, or agrees to agree, there is not much left to say.

It must be pointed out that if the data support Hypothesis II one cannot therefore conclude that the answer to women's participation problems lies in seeking out mixed-sex groups. It should be clear from what has been said that women are seriously handicapped in mixed-sex as well as in single-sex task-oriented, hierarchical groups. The purpose of testing Hypothesis II is to remove one possibly explanatory variable from the situation in order to discover what other variables may be at work. If the data support Hypothesis II then there will be some basis for looking beyond situational variables toward attitudinal variables for explanations of sex differences.

As for Hypothesis I, this second hypothesis again only made specific predictions for two dimensions of participation: amount of total talk and level of initiative displayed in that talk. The observation data allowed a considerable amount of further exploratory analysis, with the aim of pinpointing differences in the interactional dynamics between all-female and mixed-sex classes which might account for the differences in the summary measures of the hypothesis. Even without confirmation of the main hypothesis, any findings of differences in the quality of the interaction could contribute to a
better understanding of sex-related behaviors in the context of intellectual verbal exchange.

**Hypothesis III** addressed the possibility that the participation behavior of female students is affected by the sex of the teacher, who is, after all, the one individual in classroom settings who can exercise the most control over the proceedings, who establishes certain expectations, and who can provide or withhold opportunities for participation by students. Hypothesis III states that the participation of female students in female-taught classes is more extensive and at higher initiative levels than in male-taught classes.

The literature on the effect of the teacher's sex on student participation is sparse and provides inconsistent results. Parker (1973) found no such effect operative for female students; she does report a marginally significant effect for male students, such that their participation was greater in female-taught classes than in male-taught classes. Sternglanz and Lyberger-Ficek (1977) report that the effect of student sex differences in non-science classes was diminished considerably when the teacher was female. It is not clear, however, whether females talked more or males talked less in these classes to bring about the lessened sex difference. Despite these limited and inconsistent findings, it appears that the hypothesized effect can be expected in light of the literature on general sex differences. The evidence which has been cited in support of the prediction in Hypothesis II (that women in all-female classes speak up less than women in mixed-sex classes) can be used to argue that female teachers may at some level be more aware than male teachers of the differing
needs and styles of female students and will attempt to create conditions more responsive to female needs than will male teachers. It might well be that female teachers create a climate in their classroom which is less competitive, less argumentative and less intellectual conflict-oriented and thus more conducive to the expression of the more process-oriented and accommodation-seeking skills of female students. There is some evidence to suggest that females are more successful in interpreting non-verbal messages (Henley, 1975). This might enable female teachers to read non-verbal cues of their students more effectively and thus better meet their needs. Such a teacher might be able to be more supportive to a shy student, might be better at avoiding the discouraging remark, might use the non-verbal feedback on the quality of her teaching for developing and trying out strategies to draw more women into participation. Female students are also likely to be less deferential to female authority figures (in this context a double-edged conjecture) and more likely to approach them. Whether the data support the hypothesis in terms of sheer amount of talk and level of initiative or not, the analysis of subsidiary participation measures will be undertaken with a view toward discovering interaction patterns that are distinctive of female or male-taught classes. It is possible that the effect of sex of teacher operates differently in single-sex and in mixed-sex classes, i.e. that there is an interaction between the variables of class composition (Hypothesis II) and sex of teacher (Hypothesis III) in their effect on women's participation levels. Although no specific hypothesis has been formulated, the data
analysis, as described in the next chapter, will look for such an interaction effect.

While Hypotheses II and III test the effect of situational variables on the participation level of women in college classes, they do not suggest any strategies for developing participation skills in women. The situational hypotheses do, however, point to the necessity of looking at women themselves for clues about how attitudes and role conceptions influence the development and exercise of participation skills.

Instead of analyzing the participation behaviors of men and trying to graft these, as it were, onto women, a more fruitful approach is to look at how some women have developed their own successful ways of assuming active, assertive, leadership roles in task groups. This study therefore identified women who have high participation tendencies and women who have low such tendencies in order to discover in what other ways these women differ. A number of hypotheses about attitudes which differentiate the high group from the low group were tested in the hope that these will provide clues for helping women overcome the attitudinal handicaps which underlie certain behavioral handicaps.

High participating women probably differ from low participating women on a wide range of personality indices. The choice of variables for this study was determined by the criteria of whether a variable, if proven significant, would be likely to be amenable to change and whether it could be measured easily. This therefore excluded such approaches as a psychoanalytic one, or a determination of birth order or ethnic background.
Hypothesis IV states that women who participate actively in college classes are generally more assertive than low participating women, as measured by the Rathus Assertiveness Schedule (Rathus, 1973). There is evidence that women are inhibited in their self-assertion in many spheres of life (Alberti & Emmons, 1974; Phelps & Austin, 1975) and that assertiveness training can develop assertive skills, especially when particular areas of deficiency are identified and receive special focus (Gambrill & Richey, 1975; Rathus & Ruppert, 1973). When women are silent in a classroom, they are failing to assert their needs and their rights and they increase the likelihood that the group's proceedings will not be on their terms.

Hypothesis V states that high participating women perceive their sex roles and rights in more liberal ways than low participating women do. Role perception of women will be measured by the Attitudes Toward Women Scale (Spence, Helmreich, & Stapp, 1973), which posits these attitudes along a bipolar dimension, the opposite poles of which are termed "liberal" and "traditional, conservative." If the data support this hypothesis, then the notion that many women have not developed certain verbal confrontation skills because these may be perceived as irrelevant or inappropriate to women's "proper" roles will have some additional support. Parker (1973) found that college students of both sexes considered certain verbal argumentation behaviors, such as disagreeing with other students or criticizing someone's ideas, as distinctly masculine and male-appropriate. Implicit in these findings is the desirability of designing consciousness-raising programs which heighten awareness of how a broadened view of women's
rights and roles implies a broadened range of behaviors and skills. On the other hand, it could be the case that some women are hesitant to adopt more liberal views of their roles precisely because they feel they do not have many of the skills necessary for the acting out of these more liberal, active roles. Therefore, in addition to developing programs for attitude change, it may be as useful to develop specific skill teaching programs to make liberal attitudes more realistic for many women.

Hypothesis VI predicts that high participants have a different attitude towards and understanding of the meaning of "intellectual verbal conflict" than do low participants. On the basis of extensive personal experience and thought as well as readings in the literature on conflict and game theory and behavior (Rapoport, 1960; Uesugi, 1963; Vinacke, 1964), on sex differences in verbal conflict situations (Thorne & Henley, 1975) and on male and female perceptions and behaviors in the academic setting (Lever & Schwartz, 1971; Parker, 1973; Schwartz & Lever, 1975), the author has developed a general construct about perception of such intellectual verbal conflict encounters. Such encounters tend to be perceived as either in the nature of a game, eliciting an approach response, or in the nature of a fight, eliciting an avoidance response. Approach is related to the attitude that such conflict is desirable and satisfying, and is reflected in a person's confidence, self-esteem, and trust in intellectual conflict situations. The question of winning or losing in such a game produces tension and excitement that is basically pleasurable and does not touch on a person's sense of fundamental worth and acceptance by others. Avoidance
of such encounters, on the other hand, is generally related to the attitude that such conflict contains strong elements of hostility and basically threatens a person's confidence, self-esteem and sense of security. The encounter is perceived as a fight, where the object is to "destroy" an opponent by attacking his basic sense of worth, and to prevent any further encounters.

The author developed an **Intellectual Conflict Approach/Avoidance Measure** in order to test the validity and coherence of the construct just outlined and in order to test **Hypothesis VI** of this study, which in more precise form states that female high participants demonstrate stronger approach tendencies towards intellectual verbal conflict situations than low participants. If this hypothesis is borne out by the data, a skill-building program for low participants could take into account the particular components of avoidance reaction contained in the approach/avoidance attitude scale.

The final three major hypotheses of this study arise from an investigative approach to the attitude-behavior relationship which differs substantially from the approach underlying Hypotheses IV to VI. Recent comprehensive reviews and critical discussions of research on the attitude-behavior (A-B) relationship (Fishbein & Ajzen, 1972, 1975; Schumann & Johnson, 1976) agree that attempts to make meaningful predictions of behavior on the basis of attitudinal data have largely been unsuccessful. The main explanation for this generally low level of success in predicting or explaining the A-B relationship is not sought in any fundamental error in the theoretical framework which posits such a relationship; rather, the main reason for unsatisfactory
results in most such investigations is seen to be inadequate methodological approaches to the problem. Schuman and Johnson identify four main areas that need clarification and refinement before A-B investigations can hope to attain more useful results: first, the definition and measurement of "attitudes;" second, the conceptualization and measurement of "behaviors;" third, the role and measurement of factors not strictly falling under the designation of attitudes, but relevant to the A-B problem; and fourth, the incorporation of immediate situational forces that may be hypothesized to hamper A-B relationships.

Fishbein and Ajzen (1972, 1975) largely echo these concerns and developed an approach to A-B investigations that attempts to avoid these common inadequacies. In the first place, their definition of attitude is limited to the evaluative meaning of the word, such that a person can be said to hold a positive or negative attitude (of a particular magnitude) towards some specified behavior. This evaluative attitude is, however, conceptualized as arising from a belief system which consists of a wide variety of responses to the behavior in question, which can take the form of expectations and evaluations of consequences or implications of engaging in that behavior. This belief system can be elicited and measured in such a way as to yield a summary score which is indicative of the overall positive or negative nature, as well as its magnitude, of the individual's stance towards the specified behavior.

The second methodological refinement developed by Ajzen and Fishbein concerns the definition and refinement of the notion of behavior. While previous research frequently chose an object as the
focus of attitude which was not in itself a behavior (a presidential candidate, Blacks, or discussion groups) and then tried to predict a particular behavior toward that object (voting for the candidate, inviting Blacks, or speaking up in a discussion), these researchers stress the necessity of defining the behavior as precisely as is meaningful and then measuring attitudes and beliefs towards performing this precisely defined behavior. A particular behavior of interest, such as participating in discussions, can also be studied as a combination of subsidiary behaviors, such as asking questions, voicing an opinion, or expressing disagreement, and each of these subsidiary behaviors can be the focus of attitudinal questions.

The third area identified as needing methodological improvement, the clarification of the role of factors not generally included in the category of attitudes, is also refined and incorporated into the Fishbein-Ajzen model. The role of normative pressures is seen to be an essential element in the A-B connection. Thus, Fishbein and Ajzen theorize that a person's attitude towards the performance of an act needs to be coupled with that person's perception of the pressures and expectations from significant others to perform that act before a successful prediction of behavior can be made.

Fishbein and Ajzen's treatment of the fourth area in need of refinement, the situational forces intervening in the A-B relationship, takes the form of specifying as closely as possible the possibly relevant situational elements in the definition of the behavior in question. They urge a specification of the time, place, and social context of the behavior under study, so that attitudes toward the
behavior can already incorporate as many of the influential circumstantial considerations as possible and so that the determination of whether the predicted behavior was, in fact, engaged in can be as reliable as possible.

Given this discussion of problems frequently associated with A-B investigations and this delineation of the Fishbein-Ajzen approach to the avoidance of these problems, it is clear that the formulation of and investigative approach toward Hypotheses IV to VI of this study followed more traditional lines and therefore invite a cautious stance towards the nature and usefulness of the results. Nevertheless, these more traditional approaches were considered appropriate for a study of this type, which is not known to have any precedent and therefore serves exploratory, rather than definitive purposes. Such exploratory intentions are, however, best coupled with an approach that is more narrowly and precisely conceived. This study therefore sought to gain an understanding of the relationship between class participation of female students and their attitudes by both methods, the more broad traditional one and the one suggested by Fishbein and Ajzen.

Hypotheses VII to IX arise out of the theoretical model developed by Fishbein and Ajzen and the body of research based on that model. The hypotheses test the validity of that model in the context of this study. Hypothesis VII predicts that high female participants tend to have a more positive evaluative attitude towards class participation. Hypothesis VIII states that the relevant belief system of high female participants tends to be more positive than that of low female participants. Hypothesis IX states that high
female participants feel themselves to be subject to stronger expectations by significant others to engage in participation behaviors than do low female participants. The measurement guidelines suggested by Fishbein and Ajzen were followed as far as is practical. Thus, the behavior of "participation" was defined as: asking or answering a question, or expressing an idea or opinion in the particular class in which the student has been observed. The attitudinal questions which students were asked about participation also made this specific meaning explicit. The questionnaire form used to collect the attitudinal data follows the model set forth more precisely by Ajzen & Fishbein (in press) and is described in detail in Chapter II.

As these last three hypotheses are stated, they do not serve the explanatory purpose of this study very well. Their formulation really arises out of a model whose aim is the prediction of behavior from attitude. This study did not have such prediction as its aim: the behavior is already known when the measurement of attitude takes place. The intention of the study is to identify specific attitudes, beliefs, expectations, etc., which tend to be associated with high participation. Towards that end the Fishbein-Ajzen data collection procedures were used to identify the specific components of the belief system and of the normative pressures that appear to make a difference in an individual's participation behavior, as well as to identify those components that appear unrelated.

The identification of such salient beliefs, attitudes, and expectations should be an essential aid in the development of a well-focused and effective program to increase female participation. It
may well be that such a program should be aimed at teachers and students in general to encourage them to act in ways more conducive to the development of a positive belief system on the part of students reluctant to speak up.

In addition to testing the nine major hypotheses outlined above, this study sought to answer a number of subsidiary questions about class participation. These were chosen for a variety of reasons: because they are easily answered, or because they are frequently asked by persons interested in this general subject, because they address commonly-held assumptions, or because they provide preliminary indications to be studied in greater depth in subsequent research efforts. Examples of such questions are: what is the relationship of perceived class atmosphere to participation? Are low participants more likely to save their comments for after class? Are upper-classmen more likely to participate than freshmen and sophomores? Does participation vary with the degree to which a reading assignment has been finished? Is class participation considered to be a serious problem? Do low participants wish that they participated more?

Data on these questions, combined with the findings for the major hypotheses, should enhance our understanding of the problem which many women face in asserting themselves in class discussion groups and should provide a useful basis for decision-making in the development of strategies to help women to gain intellectual verbal assertive skills and to help teachers and students in general foster the exercise of those skills in their classmates.
While such skill-development for the context of the college classroom is in itself a worthwhile goal, the underlying assumption of this investigation is that a transfer of these skills to other contexts is possible and highly desirable. College students acquire skills and knowledge for purposes beyond the college context—indeed, a college education is fundamentally a preparation for the taking on of adult roles in professional and personal spheres. It is important to recognize that the components of that education range beyond "academics" and that more general habits of thought and communication are developed during the college years. Insofar as women can develop and exercise their verbal assertion skills in the college context, they will be better prepared to assert and defend their points of view in the context of their professional, political, and personal lives.
CH A P T E R  I I
METHODOLOGY

Design of the Study

This study basically sought to answer two sets of questions and was undertaken in two parts:

Part 1. How and to what extent is the classroom participation behavior of students related to several sex-related variables: sex of student, sex of teacher, and class sex composition?

Part 2. How and to what extent is the participation behavior of female students related to certain attitudes and other personal variables?

The experimental design chosen to investigate the first set of questions was as follows. The participation behavior of students in four mixed-sex and four all-female classes, with two classes in each category taught by female teachers and two classes taught by male teachers, was observed on two separate occasions. Figure 1 illustrates this design. Averaged participation measures were then submitted to two separate analyses of variance. First, a $2 \times 2$ (student sex $\times$ teacher sex) analysis of variance was performed on the top four (mixed-sex) cells. This analysis yielded answers to the questions of whether male and female students differed in participation and whether male and female students were differentially affected by male and female teachers. The main effect of teacher sex was not of interest at this stage, as this
FIGURE 1
Design of Part One of the Study

<table>
<thead>
<tr>
<th>Class Sex Composition</th>
<th>Teacher Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
</tr>
<tr>
<td>Mixed Sex</td>
<td>male students</td>
</tr>
<tr>
<td></td>
<td>Class 1 and 2</td>
</tr>
<tr>
<td></td>
<td>female students</td>
</tr>
<tr>
<td></td>
<td>Class 1 and 2</td>
</tr>
<tr>
<td>All Female</td>
<td>female students</td>
</tr>
<tr>
<td></td>
<td>Class 5 and 6</td>
</tr>
</tbody>
</table>

effect was the subject of an hypothesis for female students only, to be studied in conjunction with the effect of class sex composition so as to reveal possible interactive effects.

A second analysis of variance was a 2 X 2 (class sex composition X teacher sex) analysis, performed on all female students (the lower four cells in Figure 1). This analysis yielded answers to the questions of whether the class participation of female students was affected by the class sex composition, by the sex of the teacher, and/or by an interaction of these factors.

The second set of questions was investigated by collecting participation, attitudinal and other personal data, in questionnaire form, from female subjects in the eight classes described above, as well
as participation and other data from the teachers of those classes about the female subjects. The relationship between participation and attitudes was then analyzed by two approaches. First, subjects were divided into a high participant and a low participant group, on the basis of observed participation, and _t_ tests of group differences were performed on the various attitudinal and personal measures. Secondly, both observation measures and participation reports by the subjects themselves and by their teachers were submitted to correlational analyses with the various attitudinal and other personal measures.

The data collection procedures were complex and multi-faceted. For clarity's sake this chapter, as well as the next chapter, which reports and discusses the results of the investigation, is divided into two major parts. The first part will mainly deal with the methods employed for the study of the first set of questions, i.e. the observational study concerned with sex-related factors; the second part will mainly deal with the second set of questions, i.e. the study of the relationship between participation and attitudes.

**PART ONE: Collection of Observation Data**

**Introduction**

Part One of this chapter deals with the selection of subjects for class observation, with the development and implementation of an observation procedure, and with the attitudinal and other personal data collection which for methodological, though not substantive reasons, was carried out in conjunction with the class observations. The participation data gained through these observations provided the
basis, on the one hand, for testing of student sex and situational hypotheses of Part One of the study and, on the other hand, for the analyses of relationships between these participation data and attitudinal measures addressed in the hypotheses of Part Two. In addition, the self-reports of participation tendency and other personal information gathered in conjunction with the observations were utilized in the analyses carried out in Part Two.

Subjects

Subjects were the students enrolled in 8 different courses taught during the spring semester of 1977, drawn from the private colleges of the Five College group in Western Massachusetts. Of these 8 classes, 4 were all-female and 4 were of mixed-sex class composition, with the minority sex representing at least a third of the enrolled students. The all-female classes came from Smith and Mt. Holyoke Colleges, while the mixed-sex classes were drawn from Amherst, Hampshire, and Smith College. (The fact that students at the Five Colleges can take courses at a campus other than their own makes it possible to find mixed-sex classes at Smith College, an all-female college.) Students at these private colleges are comparable on such possibly relevant factors as academic ability, achievement motivation, and socio-economic background. Teaching approaches are also generally comparable in that faculties at these institutions tend to have a high commitment to the teaching of undergraduates and to the upholding of high academic standards.

By consulting course catalogues and department chairpersons, a list of possible classes to be included in this study was drawn up. Such classes had to meet the following criteria:
**Class size:** from 10 to 20 students. These parameters were chosen because the interactional dynamics of groups this size are relatively similar and because discussion-oriented classes tend to enroll this number of students.

**Subject matter:** disciplines within the social sciences. These disciplines tend not to fall into sex-associated interest areas and thus avoid a bias of this nature. Discussion tends to be a desired and important part of courses in these areas. It was also expected that teachers in these disciplines would tend to be cooperative with empirical research efforts because of their familiarity with and commitment to this mode of inquiry.

**Course goals:** the teacher must explicitly indicate that a considerable amount of time and importance is attributed to discussion and student participation.

**Level of course:** classes were to be above the introductory level, so as to avoid a preponderance of freshmen whose participation style could not yet be considered established.

When classes were identified that were likely to meet these criteria, an effort was made to contact their teachers by telephone to ask if they would allow observation of their class on two separate occasions and the distribution of brief questionnaires at those times. The purpose of this study, they were told, was to see if certain situational and attitudinal variables were related to certain aspects of student interactions in the classroom. Teachers were assured that they themselves were not the primary object of study and that all data would be treated confidentially. Teachers who then expressed interest in cooperating with the study were asked further questions to determine whether their class met the specified criteria.

It was very difficult to find classes with a combination of teacher willingness to cooperate and fulfillment of the specified criteria. The student sex ratios frequently fell outside the necessary range. Many supposedly all-female classes were "contaminated" by the presence of one or two male students from another
campus. Classes were often structured so that individual students or student groups were assigned to give presentations and lead discussions which would yield an unbalanced picture of students' opportunity to speak. A number of possible classes were team-taught, thus making their dynamics not readily comparable to classes led by a single teacher. The specified class size was also rare; upper level seminars tended to enroll fewer than 10 students, while other courses usually had more than 20 students. Among introductory course discussion sections the class size parameters tended to fit, yet these classes were avoided for reasons stated above.

Teachers had to fit the design requirements in terms of their sex. For the few class slots for which there was more than one class available, the choice as to which class would be part of the final sample was made on the basis of age and rank considerations, such that no cell of the design was taught exclusively by senior faculty while another cell was taught exclusively by junior faculty.

The result of the search for appropriate observation groups was that classes could not be found for every teacher sex and student sex condition which also fit precisely within the specified criteria. The decision was therefore made to be somewhat more flexible about the subject matter criterion and to include one class in philosophy and one class in Russian literature in translation, many of whose students were majoring in Russian Studies. It was felt that these subject areas did not violate the rationale that possible sex preferences for certain interest areas should be avoided.
Once a list of eight appropriate and possible classes had been established, teachers were visited in person to discuss further the research. Teachers were advised at this point as to the procedures involved. They were told that one or two observers would attend their class on three separate occasions. The first occasion served to gain some familiarity with the spatial arrangement of the classroom and student seating patterns and to ascertain whether indeed the specified criteria were met. The second and third occasions served to record, in an unobtrusive fashion, the interactions during that class session and to distribute, during the final 5 minutes of class time, brief questionnaires to the students. Teachers were also told about the passing around of coded seating charts during the two recording observations. Finally, teachers were asked to permit the researcher to return briefly on a fourth occasion, at which time students would be asked to participate in the second, attitude data-gathering stage of the research.

As to the hypotheses of the study, teachers were given only the most general information. They were told that classroom dynamics were the subject of interest and that the goal of the study was to make recommendations for the improvement of the college classroom climate. Teachers were promised an abstract of the study upon its completion. They were assured of complete confidentiality.

Before the final sample of classes could be determined, it was also necessary to receive permission from participating students to be observed systematically for research purposes. Several teachers indicated a preference for asking for this permission themselves,
without the presence of the researcher. These teachers were instructed to summarize the purpose of the study as gathering data about college classroom climates in various settings at various colleges, with the goal of making recommendations for the improvement of college teaching. Students were also to be assured of complete confidentiality. Those student groups who were not asked for permission by their instructor were asked this permission on the day of the first orienting observation. They were given the information just outlined for professors. All students who were asked agreed to participate.

The final sample of classes and students used in this study is described below:

Mixed-sex classes taught by female teachers:

CLASS 1: 10 female students, of whom 2 were present for only one observation; 9 male students, of whom 1 was present for only one observation; Subject field: Russian literature in translation Campus: Amherst College

CLASS 2: 7 female students, of whom 2 were present for only one observation; 6 male students, of whom 1 was present for only one observation; Subject field: Latin American history Campus: Amherst College

Mixed-sex classes taught by male teachers:

CLASS 3: 8 female students, of whom 4 were present for only one observation; 10 male students, of whom 4 were present for only one observation; Subject field: public policy (political science) Campus: Hampshire College
CLASS 4: 8 female students, of whom 1 was present for only one observation; 4 male students, all of whom attended both observations; Subject field: contemporary philosophy
Campus: Smith College

All-female classes taught by female teachers:

CLASS 5: 13 female students, of whom 3 attended only one observation;
Subject field: European history
Campus: Smith College

CLASS 6: 16 female students, of whom 4 attended only one observation;
Subject field: public policy (political science)
Campus: Smith College

All-female classes taught by male teachers:

CLASS 7: 19 female students, of whom 6 attended only one observation;
Subject field: political theory
Campus: Mt. Holyoke

CLASS 8: 15 female students, of whom 4 attended only one observation;
Subject field: anthropology of the Far East
Campus: Smith College

To sum up, 125 students were observed at least once, of whom 29 were male and 96 were female. Because of the opportunity to take courses at campuses other than their own, students were not necessarily from the campus at which the courses were given. Primary campus affiliation information was available for 78 female students: 42 from Smith, 17 from Mt. Holyoke, 6 from Hampshire, 9 from Amherst, 3 from the University of Massachusetts, and 1 from another, non-specified college. Similar information was available for 23 male students: 6 from Hampshire, 13 from Amherst, and 4 from the University.
Instrumentation

Part One of this study utilized four instruments. The first, the Robertson Interaction Analysis System (RIAS), served to measure participation in the classroom through direct observation. The second was a coded seating chart which made possible the identification of subjects from one observation to the next and for later attitude data gathering. The third and fourth instruments were brief questionnaires, filled out by subject after the two observations.

Robertson Interaction Analysis System (RIAS)

A complete and detailed description of this instrument, with coding and final processing examples, can be found in Appendix A. A summarized description of the instrument follows below.

Development. This system was developed by the author for the purpose of recording in a reliable, simple-to-use and simple-to-learn fashion such facets of verbal interaction in the classroom setting as are relevant to the theoretical background and specific hypotheses and general interests of this study, as well as to related future investigation. The form of the instrument is based on Flanders' (1970) interaction observation instrument, in that it uses live, paper and pencil continuous coding of events on a three-second duration basis. The content of the instrument, i.e. the specific choice of categories, is built on a model of turn-taking in conversation developed by Sacks, Schegloff and Jefferson (1974) and by Zimmerman and West (1975). Guiding assumptions of this model are that the seizing of a turn to speak is an exercise of power, that such a seizure is more or less difficult, depending on who has been speaking and who has been addressed (creating different expectations), and that the length, content, and addressee of a speaking turn can all serve as indices of dominance and influence within a group.

The RIAS was developed and refined by observing about 15 lives classes and testing out the feasibility and usefulness of various possible categories and codes. When the system had reached the point where it could adequately reflect the relevant dynamics of classroom verbal exchange, the investigator trained two observers to use it. Informal assessments of inter-rater reliability showed that the system could be learned in two hours of explanation and practice and that after three hours of joint observation about 80% of three-second intervals were coded identically.
Description. The observer occupies an unobtrusive position in the classroom and assigns a code to each student present. All statements made, except very brief remarks that are clearly not intended as "speaking turns," and statements made by two or more persons simultaneously, are coded according to speaker, addressee, nature of remark, and length. The rationale for identifying the speaker and the length of the "turn" is self-evident. The purpose of identifying the addressee is two-fold: first, as an index of the likelihood that the addressee will be the next person to seize a speaking turn. The higher the likelihood, the less initiative this addressee displays, when indeed he or she takes the next turn to speak, and the more initiative is displayed by any other member of the group who might, instead, seize the next turn to speak. The second reason for identifying addressee is that it is of interest whether students address the teacher or a fellow student. Addressing fellow students implies a getting away from teacher-centeredness and teacher dependency toward assertion of the student's right to influence the course of events in a classroom. The coding of the nature of the remark is according to the intent, in terms of conversational dynamics, of the speaker to move the flow of interaction: response elicitors, such as explicit questions or invitations to speak, are distinguished from answers or responses to such invitations. A third category is that of comments made with no discernible explicit invitation to do so. The level of inference necessary to make these distinctions is very low when contrasted with categorizations that make affective or intellectual content distinctions.

This observation instrument is not designed to record non-verbal, affective or cognitive level components of classroom interaction. These components are possibly of importance and certainly of interest, but for practical reasons neither this observation instrument, nor the basic approach of this research encompasses all these dimensions. However, the RIAS does afford the opportunity to record a limited number of interactional events that are not clear speaker turns. Events such as laughter, confusion, interruption attempts and the raising of hands can be coded to round out the picture of the discussion context. (The utilization of these measures was, however, considered beyond the scope of the present investigation.)

The RIAS data lend themselves to the construction of an interaction matrix which can reveal sequential patterns of interactions. Such matrices were not constructed for this research, however, because the analysis and interpretation of such matrices was, once again, considered beyond the scope of this investigation. Nevertheless, the coding system of the RIAS makes possible a ready determination of the specific antecedent of each student speaking turn and this information is utilized in the determination of the level of initiative displayed in any given speaking turn. The precise operationalization of the 5 levels of initiative is described in Appendix A. These levels of initiative are determined by three factors: the identity of the previous speaker (it takes less initiative to seize a speaking turn following another student's remark than following a teacher's remark);
the addressee of the previous speaking turn (it takes less initiative to speak when the speaker has been specifically addressed than when some other person has been addressed); and the conversational content of the previous turn (it takes less initiative to reply to an explicit invitation to speak than to speak up without such solicitation).

Scoring. The RIAS raw data is summarized to provide the following measures for each individual student:

a. number of speaking turns
b. total amount of talk (in three-second units)
c. mean length of speaking turn
d. mean level of initiative of speaking turns
e. number of turns at each level of initiative
f. number and percentage of turns that were questions, answers or comments
g. number of turns that were addressed to fellow students

A summary description is also made for groups of students, such as all students in a class, or all students of one sex, etc., according to the following features:

a. number and percentage of students who participated at least once; number and percentage of students who remained silent
b. mean and/or summary measures of items a. to g. listed above
c. ratio of student talk to teacher talk

Given the above measures, many additional descriptive measures of individuals or groups are possible, such as a calculation of the number or percentage of speaking turns that were teacher-initiated, as opposed to being self-initiated.

Training of observers. Two research assistants (a male undergraduate and a female graduate student) were hired to learn to use the RIAS and do six of the sixteen necessary observations. Training began with three hours of joint observation of several videotaped discussion classes. During these sessions the methodology was explained, discussed and refined. Then each assistant visited a number of live classes that were not part of the sample for this study and practiced using the instrument. Finally, a joint observation of three discussion-oriented classes by the two research assistants and the author was arranged. This observation was done through a one-way mirror in the psychology department laboratory at Smith College. The first two observations could not serve the purpose of checking inter-rater reliability because technical difficulties made exact comparability impossible. These additional practice sessions did have the effect of making the third, and successful joint observation reach acceptable inter-rater reliability.
During the observation period of 30 minutes, 36 separate student speaking events were coded. Each of these speaking turns demanded four judgments: the identity of the speaker, the length of the speaking turn in three-second units, the addressee of the turn, and the conversational content (question, answer or comment). There were therefore 144 judgments made, in all. All three observers had 100% agreement on 111 judgments, or 77% of judgments. The category which had the lowest agreement, exact number of three-second units (perfect agreement was reached for only 63% of judgments) was then subjected to further analysis. The RIAS does not, in fact, provide for exact timing, in that a speaking event is recorded at the moment that it takes place, whether that has occurred at the end of the previously recorded three-second unit or somewhere during its span. This means that unless three observers are in complete synchronization in their three-second cut-off times, which is a technically almost impossible task, the onset and ending of a particular speaking turn may fall neatly within three-second intervals for one observer, while for another observer the same turn may overlap into another, already assigned interval, causing two events to be recorded within that interval. Such situations will yield a three-second unit discrepancy. Given this consideration the time data was checked for the number of codings which were in agreement within one three-second unit. Such agreement occurred in 32 (or 89%) of the 36 time judgments. Given this re-definition of perfect agreement, the three observers achieved such perfect agreement in 125 out of 144 judgments, or 87% of the time. This was considered sufficient inter-rater reliability to proceed with the data collection for the study.

Seating Chart

Since students were observed on two separate occasions and since the observation data were later to be related to attitudinal data, students needed to be identified in some fashion. Students had been assured of anonymity during the observations, so names could not serve that purpose. Instead, the author devised a system whereby each student assigned him or herself an easily determined code which maintained anonymity while it provided useful information. During each observation the observer drew and passed around a schematic diagram of the seating arrangement of the individuals in the class, with written directions for students how to determine and fill in their code. (Appendix B contains an example of such a coded seating chart, including directions to students for its use.) The code students were to assign themselves consisted of three elements: the initial of their first name, the month of their birthday (i.e., the number 8 for August), and the last two digits of the year of their birth. Thus, for example, a student named Ann Smith, whose birthdate is June 4, 1961, has the code A661. This code was subsequently used on the various questionnaires and other forms and thus made it possible to deal with students as distinct, identifiable individuals, without jeopardizing their anonymity. The code incidentally also provided information about the age of subjects.
Observation I Questionnaire and Observation II Questionnaire

After each observation students were asked to answer a brief questionnaire, which took about 5 minutes to fill out. The purpose of these questionnaires was manifold. Since only a selection of the originally observed students were expected to donate their time to fill out the Long Questionnaire, which contained the lengthy attitudinal measures relating to the major attitudinal hypotheses, it was thought useful to collect a limited amount of personal and attitudinal information from all observed subjects. In order also to gain some information about the reliability with which students report their own participation, as well as about the perceived typicality of the observed session, these brief questionnaires were used. In addition, certain questions about students' general participation tendency were asked twice in order to gain some information about the consistency with which students answer these questions. Other information gained through these questionnaires was whether students had done the assigned readings for the observed class session, how they evaluated the observed class session, how they felt toward the most active members in their class, and finally, their class level and home campus.

These two brief questionnaires constitute Appendices C and D.

Procedures

Once the subject groups had been selected and the teachers and their students had been given the necessary preliminary information (described in the Subjects section), observation dates were established. These fell into the middle and last third of the spring semester. The two research assistants and the author then chose their share of observations according to scheduling constraints, with the result that the assistants each did three of the 16 necessary observations, while the author did the rest. It was arranged that 6 out of the 3 observed classes had the two observations done by two different observers so as to avoid consistent observer bias. The initial orientation session was attended in those classes by both observers.

As described previously, the observer took a seat among the students in such a way as to afford the best possible view of all
persons in the room, without however drawing undue attention by sitting in too obvious an observer's position. During about the first ten minutes of class time the observer drew two diagrams of the seating arrangement, one for his or her own reference for participation coding purposes and the other on the seating chart that was then quietly passed around among students. Ten minutes after the start of the class the observer began to record the interactions, coding every three-second unit of time as described in the RIAS section. Thirty minutes later this coding was stopped. Then the observer waited for the professor to indicate his or her readiness to have the Observation Questionnaires passed around. This usually happened about 5 minutes before the class was formally to end. Students returned these questionnaires to the observer as they finished and left the classroom. No difficulties in these procedures were encountered.

PART TWO: Collection of Attitudinal and Other Personal Data

Introduction

Part Two of this chapter deals with the selection of subjects for in-depth attitudinal and other personal data gathering, with the development of two major attitude measuring instruments, with a description of other questionnaires, and with the procedures involved in the collection of these data. As described previously in greater detail, these attitudinal and personal data were then coupled with the participation data gathered primarily in Part One of this study in order to discover the nature and extent of certain relationships between attitudes and other personal variables and class participation.
Subjects

As no funds were available to pay students for their time and effort involved in providing extensive personal information, and teachers were unwilling to give up the necessary 60-75 minutes of class time for administration of this Long Questionnaire, it was necessary to find a method of solicitation to participate which would assure a wide and sufficiently large sample of subjects to allow adequate testing of the hypotheses of the study. Thus all subjects who attended both observation sessions were asked to participate in this stage of the research. Even though the attitudinal hypotheses related only to female students, all such students, male and female, were asked to participate. The researcher wished to avoid an obvious focus on female students and also hoped to gain some preliminary findings about male students for possible future research purposes. The decision to request the participation of only those students who attended both observation sessions was made with the rationale that the discussion behavior data for these individuals would be more reliable, and allow more confident conclusions, than for students who had been observed only once. Not until after the class participation data had been analyzed at a later point did it become clear that this selection procedure resulted in a skewed sample, in that low participants were significantly more likely than high participants to have been absent for one of the observations. (This point will be dealt with in greater detail in Chapter III).

The result of the various solicitation procedures, described below, was that out of 93 students who were asked to participate, 63
The Long Questionnaire (see Appendix F) consisted of the following parts:

a. Rathus Assertiveness Schedule
b. Spence-Helmreich Attitudes Toward Women Scale
C. Robertson Intellectual Conflict Approach/Avoidance Scale
d. Attitude/Beliefs/Norms Inventory
e. Miscellaneous Information

A description of each of these parts follows.

Rathus Assertiveness Schedule. In order to test Hypothesis IV, which states that high participants are more assertive in general than low participants, an assertiveness schedule developed by Rathus (1973) was used. This schedule is a 19-item short version of an original 30-item schedule which draws its validity from the impressions that respondents make on other people and from their indications of how they would behave in specific situations in which assertive, outgoing behavior can be used with profit. The scale was tested on 68 undergraduate college men and women and showed a test-retest reliability correlation of .78 ($p < .01$) and a split-half (odd-even) reliability correlation of .77 ($p < .01$). Validity in terms of indications of how subjects would behave in specific situations in which assertive, outgoing behavior can be used with profit ($r = .70; p < .01$) was satisfactory. A list of the 19-item short version is presented in Appendix F.

Spence-Helmreich Attitudes Towards Women Scale. This instrument, presented in Appendix F, was used to test Hypothesis V, which states that high participants hold more liberal, or feminist, views on roles appropriate to women in modern society. Spence, Helmreich and Stapp (1973) describe a 25-item short version of an original 55-item scale which presumes to measure the degree to which an individual holds traditional or liberal views about the rights and roles of women in such areas as vocational, educational, and intellectual activities, dating behavior and etiquette, sexual behavior and marital relationships.

The correlation between the 55-item scale, tested on a sample of 710 male and 754 female college students, and the 25-item short version was .96. The scale was factor analyzed and proved to be essentially unifactorial, with the first unrotated factor accounting for 67.7% of the variance for females and 69.2% of the variance of males.

Robertson Intellectual Conflict Approach/Avoidance Measure. This instrument was developed by the author in order to test Hypothesis VI, which states that high participants have a greater approach tendency than low participants toward encounters which involve intellectual verbal
conflict. The 35 items of this measure are listed in Appendix F. An account of the development and pre-testing of this instrument follows.

Theoretical Background: Readings in the literature on conflict and game theory and related behavior (Rapoport, 1960; Uesugi, 1963; Vinacke, 1964) on sex differences in verbal conflict situations (Thorne & Henley, 1975) and on male and female perceptions and behaviors in the academic setting (Lever and Schwartz, 1971; Parker, 1973; Schwartz & Level, 1975), integrated with the information gained by the author in the course of many formal and informal interviews with students led to the development of a general construct about perception of intellectual verbal conflict encounters.

Such encounters tend to be perceived as either in the nature of a game or a fight. When they are seen as a game they are considered a pleasing, exciting, satisfying and productive experience and they evoke an approach response. Games in this context, and in the context of conflict theory developed by Rapoport (1960), are not frivolous amusement but are a competitive matching of skills which is subject to rules and in which winning has no implications about a person's character or worth. Games can be played over and over again. A fight in this context is an encounter marked by hostility whose aim is to destroy the opponent's capacity to engage in further encounters. Fights elicit an avoidance response.

From this guiding model intellectual verbal conflict can be perceived as a positive, skill-developing, fair game, to be sought out and frequently repeated. Attitudes associated with such an approach tendency would be self-confidence, trust in others, and pleasure in fair competition. On the other hand, intellectual verbal conflict can be perceived as attempts by participants to criticize, to denigrate, to put down and silence the opponent. Attitudes associated with the resultant avoidance tendency are feelings of inadequacy, hostility and mistrust towards others and a preference for the more solitary and non-competitive modes of expression, such as writing papers. These polarities of games versus fights are, of course, conceived of as being the end-points of a spectrum, along which different individuals fall.

Development: The author initially made up 43 statements to which respondents could reply with one of four choices: agree strongly, agree mildly, disagree mildly, and disagree strongly. These statements were of the nature of attitudes, beliefs and self-reports of behavior and were reflective of the kinds of statements made by students in interviews with the author, on preliminary written questions, and in reports by other authors. These 43 items were all related to situations of intellectual verbal encounters, both in the academic setting and outside of it. A pilot scale
consisting of these 43 items was then submitted to a sample of 148 college students, 89 of whom were females and 59 of whom were males. The scale was administered during class time in four different courses, taught at three different private colleges. The final 35-item scale used in this research was composed of the 35 items which showed the highest item to total score correlations for females only. (The scale's use in this study is for an analysis of female attitudes only.) These 35 items achieved a Cronbach's alpha of .91 and were thus considered to constitute a coherent, reliable scale. Preliminary indications of external validity were gained by calculating a Pearson product moment correlation between total scores and self-reports of general tendency to participate in classroom discussions; this correlation was .46 (p < .01).

Attitude/Beliefs/Norms Inventory. This instrument, presented in Appendix F, was developed by the author in order to see whether an understanding of students' participation behavior could be enhanced by taking a different theoretical approach to the problem of relating behavior to attitude. This approach is based on the work by Fishbein and Ajzen (1973, 1975), which posits two basic components in the linkage between attitude and behavior: attitude toward the act and normative pressures from the environment to engage in the act. The overall attitude toward the act, which is measurable as a summary feeling having a particular positive or negative magnitude, is itself a result of beliefs held about the consequences of the act; the normative pressure is a result of expectations by significant others to engage in that act, coupled with the degree of motivation to comply with such expectations.

In somewhat modified form this approach led to the formulation of Hypotheses VII, VIII, and IX. Hypothesis VII states that the overall evaluative attitude for high participants is more positive than for low participants; Hypothesis VIII states that the belief system of high participants is more positive than for low participants; and Hypothesis IX states that high participants feel themselves to be subject to stronger expectations by significant others to participate than do low participants.

The rationale and development of the Attitude/Beliefs/Norms Inventory is outlined below.

Theoretical Background: Fishbein and Ajzen (1975; Ajzen & Fishbein, 1977) developed their approach to the task of linking attitude to behavior in response to the widely-noted lack of strong evidence for such a linkage. They criticize traditional research approaches as conceiving of relevant attitudes and behaviors in too global a fashion. Thus, instead of speaking of class participation in general, their model leads to a specification of the kinds of behaviors that constitute class participation (raising a question,
expressing an idea or opinion) and a specification of the setting in which these specific behaviors are expected (a particular class taught by a particular teacher and attended by a particular group of classmates). The general and loosely used notion of attitude is, in turn, broken down into more precisely defined categories of evaluative attitude (i.e. whether the behavior is considered good or bad, pleasant or unpleasant, etc.) and beliefs about consequences of the behavior (i.e., how likely are certain consequences and how desirable are they). These attitudes and beliefs are explicitly focused on the precisely defined behavior. In addition, this theoretical model includes a component about normative expectations or pressures to engage in the behavior under investigation (how much does the teacher or do classmates expect the subject to raise questions or express ideas in class) and the subject's motivation to comply with these pressures. Only when these various components of attitude (evaluation of the behavior, beliefs about the behavior, pressures to engage in the behavior, and motivation to comply with these pressures) are known can a successful prediction be made about the subject's intention to engage in the specified behavior. The relationship between the intention and the actual carrying out of the behavior is ideally a perfect identify, for in the ideal case all relevant factors that will affect the carrying out of the intention have been identified and calculated into the intention.

Development and Description: The Attitude/Beliefs/Norms Inventory sought to measure the components described above, with the aim of explaining as much of the variance in actual participation, as well as in intention to participate, as possible. For the measurement of evaluative attitude the usual Fishbein-Ajzen method of semantic differential measurement developed by Osgood, Suci, and Tannenbaum (1957) was used with five pairs of polar adjectives and seven answer choices. Subjects were asked to "evaluate or describe raising a question, or expressing an idea or an opinion in the class in which they had been observed" on the following five dimensions: good--bad, harmful--beneficial, pleasant--unpleasant, punishing--rewarding, and productive--unproductive. (See items F-1 to F-4 and F-7 in Appendix F; items F=5 and F-6 were included for other purposes). Answer choices were assigned the values of +3 to -3, with the mid-point given a value of zero. For each subject an average of the five items was computed and this figure represented the subject's evaluative attitude score.

The measurement of the belief system of subjects toward raising a question or expressing an idea or an opinion in the target class was accomplished by presenting the subjects with 15 different possible consequences of such an act and asking subjects two questions about each such consequence: how likely or unlikely is this to happen and how good or bad would this
consequence be. (Items B-1 to B-15 in Appendix F ask the first question; items C-1 to C-15 ask the second question.) These 15 consequences were the 15 most commonly mentioned items among those elicited from a pilot sample of 38 female college students. These 38 respondents were students in two college psychology classes, unconnected with this research, whose teachers had agreed to ask their students to fill out a brief questionnaire. The core item of this questionnaire asked students to think about classroom situations in which they have considered speaking up and to write down freely what came to their mind when asked the following questions: what might happen if they do? What possible desirable effects will ensue; what kinds of results do they fear? The 38 subjects gave a wide range of responses. The content of these responses was analyzed and grouped according to similar themes. The 15 most commonly mentioned themes were identified and the most frequently chosen wording of the theme was selected to be the representative item for each theme.

Subjects were asked to make two separate judgments about each of these 15 consequences: how likely and how desirable its occurrence would be. Judgments were made on a 7-point (+3 to -3) scale. The Fishbein-Ajzen model then calls for multiplying the likelihood score by the desirability score in order to arrive at the belief measure attached to each consequence. Thus, for example, if a consequence was considered desirable (e.g., +2), as well as likely (e.g., +3), the subject's belief about that consequence of speaking up in a discussion was positive (+6). If, on the other hand, a particular consequence was held to be desirable (e.g., +3), but unlikely, (e.g., -2), the subject's stance toward speaking up in a discussion was a negative one (-6). Further, if a consequence was judged to be undesirable (e.g., -3), but also unlikely to occur (e.g., -3), the resultant belief, or attitude, towards speaking up was positive (+9). The belief system as a whole was determined by summing the cross-products of the likelihood and evaluation scores of the 15 individual consequences. This measure reflected the direction (positive or negative) and the magnitude of a subject's expectations about what might happen upon speaking up in a class discussion and, according to the theory, the subject's likelihood of engaging in the behavior.

The normative component of this Inventory (items D-1 to D-6 and E-1 to E-5 of the Long Questionnaire, Appendix F) consisted of two parts. In the first part students were asked to indicate, on a seven-point scale (+3 to -3), the degree to which each of the following reference groups think that they, the subjects, should engage in the participation behaviors specified previously: female friends, male friends, female classmates, male classmates (where applicable), the teacher of the target class, and "most people who are important to me." These questions measured the expectancy component of the normative measure; the next set of questions measured the motivation to comply with these
expectations. For each of the mentioned reference groups, except for the last item, which by definition would elicit a high compliance motivation, subjects were asked to indicate, on a 7-point scale (0 to +6) how much they wanted to do what these groups or individuals want them to do. Answers to the two questions for each reference group (except the final group) were multiplied to arrive at the normative pressure measure for each group. Thus, for example, if the subject reported that male friends very much wanted him or her to participate in class discussions (+3), but that he or she felt very little motivation to comply with the wishes of male friends (2), the resultant normative pressure from male friends would have a magnitude of +6; if, however, the desire to comply had been reported at a high level (6), the normative influence would have attained a magnitude of 18. On the other hand, if male friends were reported as not wishing the subject to participate in discussions (e.g., -2), and the motivation to comply was reported as moderately high (e.g., 4), then the resultant normative pressure would have a negative magnitude of -8, indicating moderately strong pressure not to engage in class discussion behavior. The normative pressure measures for all reference groups were summed to arrive at a total normative influence measure for each subject.

Miscellaneous Information. The Long Questionnaire contained a number of items which were not directly related to the major hypotheses of this study but which were of interest nevertheless. The cover page of the Long Questionnaire asked students to give their sex, their major field of study, their home campus, their religious background, and their mailing address (for the purpose of mailing out abstracts of this study, as had been promised). The sixth page of the Long Questionnaire alerted students to the fact that questions would be asked of them which were specific to three classes: first, the class in which they had been observed (Class A), and second and third, two additional classes which they were currently or recently enrolled in (Class B and Class C). The purpose of collecting data about these other specific classes was to make comparisons and check on participation consistencies across a wider range of data than was available from the single course observed. However, these data on Class B and Class C were not subjected to any analyses for this study because of limited time and resources.

Questions about Class A (the class in which students had been observed) which were not part of the already described Attitude/Beliefs/Norms Inventory are found on pages 6 and 7 of the Long Questionnaire and are designated as items A-1 to A-17. These questions, not all of which were utilized in the analysis of the data for this study, included such items as asking subjects to rate their participation level in the class (A-7 to A-8), to describe the class atmosphere in terms of formality, competitiveness, and teacher-centeredness (items A-9 to A-11), to indicate the degree of ease they felt with their classmates, the
extent to which they expected their participation to affect their grade, and the likelihood that they would save a question or a comment for after class (A-12 to A-14). Item A-17 asked students to indicate their general intention, or likelihood to speak up in the target class; this measure later served as one of the major participation indices.

The final items of the Long Questionnaire (section G) asked students to rate the extent of the problem of participation at their home campus. Self-reports were also collected on the "talkativeness" of students in various non-classroom settings. Finally, students were asked to give formal permission to the teacher of the target class to release grade information about them. (All but one student gave this permission.)

Teacher Questionnaires I and II

At the end of the semester each participating teacher was sent two questionnaires by mail, accompanied by xeroxed copies of all their students' signed grade-release permission statements, and by a thank-you note for cooperating with this research. Teacher Questionnaire I consisted of a separate information sheet for each individual student who had given permission to release information about him or her. Appendix G contains such a student information form. On this form teachers were asked to evaluate the student on several dimensions: quantity and quality of participation, oral reports, written reports and papers, written exams, and final course grade. The Teacher Questionnaire II (see Appendix H) asked teachers to indicate their general satisfaction with the amount and quality of student participation, the degree to which they take participation into account in the assignment of student grades, and the extent to which they feel that class participation is a problem at their college. Teachers were also invited to provide any additional information which might be of interest to the study.

Teachers had not been told ahead of time that they would be asked these questions because the author wished to avoid making them self-conscious and possibly causing them to alter their own or their students' discussion behavior. All eight teachers readily filled out the questionnaires, however, to the extent possible. Thus, data was not available for one student who refused to give permission to provide it; three other students had not finished their course requirements at the time of this data collection and teachers did not provide data on them. The result was that teachers provided Questionnaire I information for 59 out of 63 students.

The data collected in these teacher questionnaires did not relate to the major hypotheses of this study but were nevertheless considered useful towards a better understanding of high or low participation.
Procedures

After the selection of subjects, described in the "Subjects" section above, the Long Questionnaire was administered according to procedures also outlined in that section. The teacher questionnaires were mailed out to the participating teachers and information on 57 of the 62 students, for whom it had been requested, was provided.
CHAPTER III

RESULTS AND DISCUSSION: PART I

PARTICIPATION AND SEX-RELATED VARIABLES

Introduction and Overview

Before the results of hypothesis testing and other analyses are reported, it is useful to provide some descriptive data on the overall participation picture, so that specific findings can be understood in its context. It is also necessary to review and elaborate on the various measures of participation which were used in this study.

The two classroom observations yielded a total subject population of 125 students, of whom 29 were male and 96 were female. Ninety-three students were present for both observations; the absentee rate came to 25.6%, with no significant differences between male or female subjects, mixed-sex or all-female classes, or male or female-taught classes. Of all subjects, 60% spoke up at least once, while 40% never had anything to say at all. There was no significant difference between male participation (62%) and the female rate (59%). Students who attended both observed classes were significantly more likely to have spoken up at least once than were students who attended only once (67.7% of double attenders talked, while only 37.5% of once-only attenders talked; \( \chi^2(1) = 7.86, p < .005 \)).

For the first observation there were 112 students, while for the second observation there were 102 students present. Of the 93 subjects who attended both sessions, 73 (78.5%) displayed consistent behavior, in that they talked, or were silent at both sessions, while only 20
subjects (21.5%) were not consistent. This was an important finding, in that it provides evidence for the assumption, underlying most of this research, that students display relatively consistent tendencies in their class participation.

**Participation Measures**

A large number of measures were used in this study to describe the participation behaviors of individuals and groups. Some of these measures describe the sheer quantity of talk exhibited, while others describe qualitative aspects of that talk. Table 1 gives brief definitions of these various measures; the measures are discussed in greater detail in the following sections. Table 2 shows both the overall amount of participation and the breakdown figures, in percentages of total speaking turns, of the various categories of subjects, grouped according to sex of subject, sex of teacher, and sex composition of class. The Ns give both the number of individuals observed as well as, in parentheses, the number of individual observations. That is, because classes were observed on two occasions, but not all individuals were observed twice, the number of observations totals less than double the number of subjects.

**Quantitative Measures**

The first measure, *total talk*, is given in three-second units (TSU's), as this was the method of tallying amount of talk (see description of the RIAS). This measure represents the total amount of talk observed over two 30-minute observation sessions for eight classes. Theoretically available time for talking can thus be seen as coming to
TABLE 1
Definitions and Interrelationships of Major and Subsidiary Measures of Observed Participation

DEFINITIONS

Major Participation Measures for Individual Subjects:

AVERAGE TALK. The average amount of time, over two observations, spent in talking; expressed in three-second units (TSU's).

AVERAGE HIGH INITIATIVES. The average number of times, over two observations, that Categories 4 and 5 occurred.

MEAN INITIATIVE LEVEL. The average initiative level of all speaking turns.

Subsidiary Participation Measures for Individual Subjects:

Determined by precedent of speaking turn:

CATEGORY 1. The teacher has directly asked a question or extended an invitation to speak to the student speaker.

CATEGORY 2. The teacher has directly addressed the student speaker with a comment.

CATEGORY 3. The teacher has asked a question of or extended an invitation to speak to the class as a whole.

CATEGORY 4. The teacher has addressed a comment to a student other than the student speaker.

CATEGORY 5. The teacher has lectured or expounded on a subject to the class as a whole.

CATEGORY 6. A student has directly addressed the student speaker.

CATEGORY 7. A student has addressed another student, but not the student speaker.

CATEGORY 8. A student has addressed the teacher.

Determined by degree of choice in speaking turn:

CATEGORY 9. The choice to speak has been freely made, i.e., without initiation by the teacher or another student. (A sum of Categories 4, 5, 7 and 8.)

CATEGORY 10. The teacher has initiated the dialogue through questions or invitations to speak. (A sum of Categories 1 and 3.)

CATEGORY 11. The possibility for remaining silent is low because the student speaker has been directly addressed. (A sum of Categories 2 and 6.)

Determined by addressee of speaking turn:

CATEGORY 12. The student speaker has addressed another student.

Determined by conversational intent of speaking turn:

CATEGORY 13. The student has asked a question.

CATEGORY 14. The student has answered a question.

CATEGORY 15. The student has made a declarative statement.

INTERRELATIONSHIPS

WHO SPOKE BEFORE:

<table>
<thead>
<tr>
<th>Initiative Level</th>
<th>Teacher</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1:</td>
<td>Cat. ➀</td>
<td>Cat. ➄</td>
</tr>
<tr>
<td>Level 2:</td>
<td>Cat. ➁</td>
<td>Cat. ➃</td>
</tr>
<tr>
<td>Level 3:</td>
<td>Cat. ➂</td>
<td>Cat. ➂</td>
</tr>
<tr>
<td>Level 4:</td>
<td>Cat. ➃</td>
<td>—</td>
</tr>
<tr>
<td>Level 5:</td>
<td>Cat. ➄</td>
<td>—</td>
</tr>
</tbody>
</table>

- □ = Cat. 9 (free turns)
- O = Cat. 10 (teacher-initiated turns)
- △ = Cat. 11 (low avoidance turns)
### TABLE 2

Summary of Major Participation Measures

<table>
<thead>
<tr>
<th>Major Participation Measures</th>
<th>STUDENT SEX</th>
<th>SEX COMPOSITION</th>
<th>TEACHER SEX</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Students</td>
<td>Females</td>
<td>Males</td>
</tr>
<tr>
<td>Number of subjects (number of individual observations)</td>
<td>125(218)</td>
<td>96(166)</td>
<td>29(52)</td>
</tr>
<tr>
<td>Sum of Talk in TSU's</td>
<td>2778</td>
<td>2082</td>
<td>696</td>
</tr>
<tr>
<td>Sum of Speaking Turns</td>
<td>790</td>
<td>578</td>
<td>212</td>
</tr>
<tr>
<td>Mean Average Talk (all students)</td>
<td>11.7</td>
<td>11.5</td>
<td>12.5</td>
</tr>
<tr>
<td>Mean Average Talk (participants only)</td>
<td>19.5</td>
<td>19.3</td>
<td>20.1</td>
</tr>
<tr>
<td>Average Initiative Level of all Speaking Turns</td>
<td>2.74</td>
<td>2.65</td>
<td>2.99</td>
</tr>
</tbody>
</table>
a total of 8 hours, or 480 minutes, or 9600 three-second units (TSU's). The total actual talk of 2778 TSU's therefore means that 28.9% of class time was spent in student talk, while about 71.1% of the time the teacher talked: (The only other alternative, silence, represented a negligible percentage). Considering the fact that all classes studied were relatively small (attendance ranged from 10 to 18, with an average attendance of 14.8) and all classes were explicitly discussion-oriented, this ratio of student talk to teacher talk is surprisingly low.

In order to best describe the participation behaviors of individuals, it is appropriate to use average measures for subjects who attended twice and single observation measures for subjects who attended only once. (An elaboration of this rationale can be found in the section dealing with Hypothesis Testing.) Amount of talk by individual students is therefore represented by the measure of average talk, a measure that will be used in most of the subsequent statistical analyses. Table 2 shows that the average amount of talk for a 30-minute class session was, per individual, 11.7 TSU's, or about 35 seconds, with a standard deviation of 17.1 TSU's. The distribution of average talk was skewed in a highly positive direction, with a median of 4.5 TSU's, accounted for by the fact that 40% of subjects said nothing at all. The maximum value of average talk was 75 TSU's (about 3.75 minutes). Any student who spoke about a whole minute or longer during a 30-minute class session was already in the 82nd percentile; a total of about 2 minutes of talk placed the student in the 92nd percentile.

Another way to look at the average talk measures is to take into account only those subjects who spoke up at least once, and thus to
arrive at an average talk per participant measure. Thus, among talkers the mean average talk was 19.5 TSU's (about one minute's worth), with a standard deviation of 18.3 and a median of 12.1 TSU's. Among participants, any student who spoke for as long as about 2 minutes stands at already the 90th percentile.

A separate, but closely related measure of participation is the number of times a student spoke up, referred to as total turns. From Table 2 it can be seen that subjects spoke up a total of 790 times, or about 50 times per 30-minute observation. This seems like a lot, but when the mean length of each speaking turn is taken into consideration, which is calculated to be 3.51 TSU's (about 10.5 seconds), it becomes clear that most of these contributions were of very short duration and do not, in general, represent any lengthy expounding of ideas by students. The fact that for about 80% of participants the average length of their remarks fell below 5 TSU's (or shorter than about 15 seconds of duration) is an interesting finding in itself. It seems to indicate that little development of complex ideas, opinions or questions, which generally would demand more than about 15 seconds of exposition, could have taken place in the observed classes.

The total turns measure is used in subsequent analyses for the calculation of the various components of participation. That is, the amount of high initiative participation or the number of times a question or a comment was made are expressed as the number of speaking turns to fall into a given category (rather than as the percentage of total time spent in talking in those categories). Beyond this use, the total turns measure will not be used as an index of participation, as
it is highly redundant with the total or average talk measure. The correlation between the average talk and average turn measures was $r(125) = .93$, $p < .001$. In addition, the average talk measure is regarded as a better total index of participation, insofar as an individual who spoke up fewer times, but at greater length, should be regarded as no less active than an individual who spoke up more frequently, but for very brief duration. Nor will the mean length of speaking turn measure be used in subsequent analyses, because its variability was too low (the standard deviation was only 1.58 TSU's) to allow for the detection of any significant differences or patterns.

Qualitative Measures

As has been explained in detail previously, this study seeks to discover the possible differential effects of student sex, class sex composition and teacher sex not only in quantitative terms, i.e. on the sheer amount of participation, but also in qualitative terms, i.e. on the type of interaction that this participation represents. A number of categories of differentiation have been chosen to provide the basis of qualitative analyses. Speaking turns are analyzed as to whether they are questions, answers or comments, as to whether they are addressed to fellow students, as to their level of initiative, and as to what antecedent event prompted the participation.

The reader is referred to Table 1 for a listing, with definitions and clarification of interconnections, of the various qualitative categories. Table 3 gives a summarized picture of the occurrence and distribution of these participation categories for subjects grouped by sex, class sex composition, and teacher sex. These figures are given
<table>
<thead>
<tr>
<th>Participation Categories</th>
<th>All Students</th>
<th>STUDENT SEX</th>
<th>CLASS SEX COMPOSITION</th>
<th>TEACHER SEX</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Females</td>
<td>Males</td>
<td>All Female</td>
</tr>
<tr>
<td>Cat. 1 Teacher-direct invitation</td>
<td>10.4</td>
<td>11.9</td>
<td>6.1</td>
<td>15.5</td>
</tr>
<tr>
<td>Cat. 2 Teacher-direct comment</td>
<td>17.3</td>
<td>16.3</td>
<td>20.3</td>
<td>14.3</td>
</tr>
<tr>
<td>Cat. 3 Teacher-general invitation</td>
<td>12.9</td>
<td>14.4</td>
<td>9.0</td>
<td>15.8</td>
</tr>
<tr>
<td>Cat. 4 Teacher-comment to different students</td>
<td>9.9</td>
<td>8.3</td>
<td>14.2</td>
<td>5.0</td>
</tr>
<tr>
<td>Cat. 5 Teacher-lecture to whole class</td>
<td>15.8</td>
<td>13.8</td>
<td>21.2</td>
<td>10.3</td>
</tr>
<tr>
<td>Cat. 6 Student-direct comment</td>
<td>12.5</td>
<td>13.1</td>
<td>10.8</td>
<td>17.5</td>
</tr>
<tr>
<td>Cat. 7 Student-comment to different student</td>
<td>4.4</td>
<td>4.7</td>
<td>3.8</td>
<td>5.8</td>
</tr>
<tr>
<td>Cat. 8 Student-comment to teacher</td>
<td>16.7</td>
<td>17.5</td>
<td>14.6</td>
<td>15.8</td>
</tr>
<tr>
<td>Cat. 9 Free turns</td>
<td>46.8</td>
<td>44.3</td>
<td>53.8</td>
<td>36.8</td>
</tr>
<tr>
<td>Cat. 10 Teacher-initiated turns</td>
<td>23.3</td>
<td>26.3</td>
<td>15.1</td>
<td>31.3</td>
</tr>
<tr>
<td>Cat. 11 Low-avoidance turns</td>
<td>29.9</td>
<td>29.4</td>
<td>31.1</td>
<td>31.8</td>
</tr>
<tr>
<td>Cat. 12 Student addresses</td>
<td>21.6</td>
<td>24.2</td>
<td>14.6</td>
<td>28.0</td>
</tr>
<tr>
<td>Cat. 13 Questions</td>
<td>9.1</td>
<td>10.0</td>
<td>7.1</td>
<td>10.3</td>
</tr>
<tr>
<td>Cat. 14 Answers</td>
<td>19.5</td>
<td>21.3</td>
<td>14.6</td>
<td>24.3</td>
</tr>
<tr>
<td>Cat. 15 Comments</td>
<td>71.4</td>
<td>68.9</td>
<td>78.3</td>
<td>65.4</td>
</tr>
<tr>
<td>Initiative Level 1 (categories 1 &amp; 6)</td>
<td>22.9</td>
<td>25.1</td>
<td>17.0</td>
<td>33.1</td>
</tr>
<tr>
<td>Initiative Level 2 (categories 2 &amp; 7)</td>
<td>21.8</td>
<td>20.9</td>
<td>24.0</td>
<td>20.1</td>
</tr>
<tr>
<td>Initiative Level 3 (categories 3 &amp; 8)</td>
<td>29.6</td>
<td>31.8</td>
<td>23.6</td>
<td>31.6</td>
</tr>
<tr>
<td>Initiative Level 4 (category 4)</td>
<td>9.9</td>
<td>8.3</td>
<td>14.2</td>
<td>5.0</td>
</tr>
<tr>
<td>Initiative Level 5 (category 5)</td>
<td>15.8</td>
<td>13.8</td>
<td>21.2</td>
<td>10.3</td>
</tr>
</tbody>
</table>
for descriptive purposes only; the testing of hypotheses about group
differences, reported in a later section, used individual students as
the units of analyses. Within-class comparisons between males and
females (in mixed-sex classes) is also dealt with in a later section.

From the figures in Table 3 it can be seen that for all groups
considered, more than two thirds of speaking turns represented
comments (Cat. 15, from 65.4% for all-female classes to 78.3% for
males in mixed sex classes). Questions (Cat. 13) were asked relatively
rarely (as low as 6.3% of the time in classes taught by female teachers,
ranging up to 12.8% in classes taught by male teachers) and answers
(Cat. 14) were given (to questions asked primarily by teachers) from
14.6% of turns by male students to 24.3% of turns by females in single
sex classes. The low percentage for questions is surprising in that
teachers were observed to invite questions on frequent occasions and
further, in that small classes would appear to be an environment
conducive to the asking of questions, i.e. to the utilization of the
resource of knowledge and clarification that teachers represent. On the
other hand, the percentages for comments indicate that these
discussion groups went beyond simple "teacher asks questions; students
answer questions" sessions and contained a large amount of short
expository dialogue.

Figures on Cat. 12, speaking turns which were addressed to fellow
students, as opposed to the teacher, indicate that the discussions were
largely teacher-centered. Male students and students taught by female
teachers were least peer-oriented (only 14.6% of remarks were addressed
to peers), while students taught by male teachers addressed almost a third of their remarks to fellow students.

The operationalization of levels of initiative is described in detail in Appendix A (RIAS). Briefly, the highest level, Level 5, represents the situation of the teacher lecturing to the class as a whole and a student interrupting with a comment or question. Level 4 is assigned to the situation of a student speaking up when the teacher has just addressed a different student. The middle level, Level 3, is assigned to such situations as the teacher inviting comments or questions, or asking a question, of the class as a whole and a student responding to the invitation. Level 2 initiatives are those in which either the teacher has just addressed a comment directly to the student speaker, and those in which another student has just spoken but has not specifically addressed the speaker. The lowest level, Level 1, represents the case where the teacher has specifically addressed a question or an invitation to participate to the student speaker, or where a fellow student has directly addressed the student speaker.

Table 3 shows that the average level of initiative of all speaking turns in all classes was 2.74, relatively close to the midpoint of Level 3, which suggests that the operationalization of levels had been well conceived. The lowest level of initiative was displayed in all-female classes, while the highest level is found among male students. The measure of average level of initiative is limited in its usefulness, however, in that it does not reflect the distribution of levels. For example, when female-taught classes are contrasted with male-taught classes, female teachers elicit initiatives that are almost half a level
FIGURE 2

Distribution of Participation Categories as Percentages of Total Speaking Turns
higher than the initiatives elicited by male teachers. However, upon looking at the breakdown data for each level it is discovered that this higher mean level is not due, as one might have thought, to a notably higher incidence of high-level initiatives (Levels 4 and 5), but rather to an incidence at the medium level (Level 3) which is twice that found in male-taught classes, and an incidence at the lowest level (Level 1) which is less than half that found in male-taught classes. Attention is therefore turned to the distribution of the individual levels. Table 3 lists the percentages of initiatives found at each level, while Figure 2 provides a graphic representation of this distribution. The level which shows the least variability is Level 2, while Levels 1 and 3 show a variability of more than 20 percentage points.

In order to have a more refined picture of the kinds of interactions that students engaged in, and in order to gain a more concrete understanding of what type of interaction the various levels of initiative represent, a further qualitative breakdown of participation is provided. Eleven categories of participation were designated. Eight of these are subsumed under the five levels of initiative described earlier; three others combine these categories according to different criteria.

The first eight categories are determined by the nature of the precedent to the student's participation:

**teacher-precended speaking turns**

Cat. 1: Direct question or invitation; the teacher has asked a question of or invited a comment from the student speaker (Level 1)
Cat. 2: Direct comment; the teacher has made a comment specifically to the student speaker (Level 2)

Cat. 3: General question or invitation; the teacher has asked a question of or invited comments from the class as a whole (Level 3)

Cat. 4: Comment to other student; the teacher has made a comment to a specific student, but not the student speaker (Level 4)

Cat. 5: Lecture or exposition; the teacher has expounded to the class as a whole (Level 5)

student-preceded speaking turns

Cat. 6: Direct student comment; another student has specifically addressed the student speaker (Level 1)

Cat. 7: Student comment to other student; a student has addressed a student other than the student speaker (Level 2)

Cat. 8: Student comment to teacher; a student has addressed the teacher (Level 3)

The next three categories are determined by the degree of choice involved in responding to the above eight situations:

self-initiated or "free" speaking turns

Cat. 9: The sum of Categories 4, 5, 7, and 8; in these situations the student has made a relatively free choice to participate

teacher-initiated speaking turns

Cat. 10: The sum of Categories 1 and 3; the teacher has taken the initiative in verbal exchange, thus reducing somewhat the student's choice to speak or remain silent

"low-avoidance" speaking turns

Cat. 11: The sum of Categories 2 and 6; the student has been specifically addressed, though not explicitly invited to respond, by either the teacher or another student, thus reducing further the degree of choice about remaining silent
Categories 12 to 15 are described in a previous section. All of the 15 subsidiary participation categories are presented in Table 1.

Table 3 presents the percentage distributions of these various categories. They show, for example, that Cat. 1 (teacher explicitly invited response from student speaker) occurred with least frequency in mixed-sex classes and greatest frequency in single-sex classes. For female students, a reply to such an invitation represented almost twice the percentage of their total participation as compared to male students. When Cat. 2 (teacher commented directly to student speakers) is compared with all the other subsidiary categories (Categories 1 - 8), it is found to show the highest or second highest percentage loadings in all but one grouping. It thus appears that in most class situations this type of interaction, i.e. a student speaking up in response to having been specifically addressed by the teacher, represents an important and fairly steady percentage of participation. The only apparent difference is between all-female and mixed-sex classes, such that in all-female classes Cat. 2 has the lowest and in mixed-sex classes the highest percentage figure. Cat. 3 (another student has addressed the teacher) shows about a five percentage point higher loading for the following groups: all-female over mixed-sex; female students over male students; female-taught over male-taught classes. Cat. 4 (teacher addressed a different student) shows the following differences: lower incidence in all-female than mixed-sex classes, and for female over male students. Cat. 5 (teacher has been lecturing to class as a whole) occurred proportionately more frequently in mixed-sex classes and for male students.
Cat. 6 (student speaker has been addressed by fellow student) occurred considerably more frequently in all-female classes and in classes taught by male teachers. Cat. 7 (other students were speaking to one another) has a very low frequency in all groupings; i.e. students very rarely entered into a dialogue being carried out by other students. Cat. 8 (another student has addressed the teacher) shows moderately high loadings for all groupings except for the groupings by teacher sex. There it is found that for female teachers this kind of interaction represented the highest percentage of all categories, while for male teachers this category had the proportionately lowest incidence.

Cat. 10 sums up all speaking turns which were teacher-initiated (Categories 1 and 3) and shows that overall, fewer than a fourth of all speaking turns happened through the explicit invitation of the teacher to speak. The percentages are even considerably lower for mixed-sex classes and for male students. The percentage of speaking initiatives that students took on the basis of no recognizable invitation or pressure to speak is given in Cat. 9. Overall, about 50% of contributions took place under this condition, but the percentages differ somewhat for the different groups. Thus, the lowest percentage (36.8%) was in all-female classes and the highest (57%) in mixed-sex classes. The final category, Cat. 11, shows the percentage of speaking turns which, while not specifically invited, had low avoidance possibilities, in that the speaker had been specifically addressed (Categories 2 and 6). About one third of all student contributions arose from such situations, with relatively little difference for the various groups. Only the difference between male-taught and female-taught classes is noteworthy: male-
taught classes had a noticeably higher such percentage than female-taught classes.

This outline of percentage distributions is not intended to invite any conclusions about group differences. Such conclusions will be sought when the appropriate statistical tests are performed on the appropriate comparison groups. The purpose of this limited description is to provide the reader with an introduction to the categories and their most general distributions, so that further, more refined analyses will be understood in the larger context.

**Hypotheses Testing**

**Introduction**

The hypotheses to be examined in this part of the study are:

Hypothesis I: Male students demonstrate higher participation levels than do female students in mixed-sex classes.

Hypothesis II: Female students in mixed-sex classes demonstrate higher participation levels than do female students in single-sex classes.

Hypothesis III: Female students demonstrate higher participation levels in classes taught by female teachers than in classes taught by male teachers.

Before tests of these hypotheses are reported, certain issues need to be clarified. The hypotheses speak of participation levels in a general sense. The specific dimensions of participation for which the predictions were made are the amount of participation and the level of initiative displayed. The qualitative Categories 1 to 15 were not subject to specific predictions but were used for exploratory analyses,
the results of which will be reported after the treatment of major hypotheses.

A major measurement issue needed to be faced before hypothesis testing could begin: how to relate the participation data from the two observations. The tactic of using a repeated measures design was rejected because such an approach would permit the inclusion of only those students who were present at both observations. Not only was the absentee rate relatively high (25.6%), but the exclusion of that percentage from the subject pool would have severely biased the sample, because the students present for only one observation were significantly more often the silent students, while the "perfect attendance" students were much more likely to participate in discussions. (While only 16% of talkers missed one observation, 40% of non-talkers did so.) The decision was therefore made to describe the participation of students in average terms: thus, for subjects who attended twice, the measures used represent an average of the two observed measures, while for subjects who attended only once, those single measures are taken as "average" measures.

The measure for amount of participation was thus average talk, expressed in three-second units (TSU's). For level of initiative two separate measures were used: the average number of initiatives taken at Levels 4 and 5 (i.e., above the mid-point of Level 3) became the high initiatives measure; the average level of initiative of all speaking turns is represented by the mean initiative level measure. (For silent students both initiative measures produce a score of zero.) Both of these initiative measures were used because the first measure
reflected the absolute number of high initiatives, regardless of the occurrence of low initiatives, while the second measure provided a summary index of all initiatives taken.

While Hypotheses I to III deal with all students meeting the specified criteria (i.e. male or female students, female students in mixed-sex classes, etc.), and the means for various groups reflect the range from students who spoke a great deal to students who did not participate at all, it is also possible, and of interest, to test the hypotheses as they refer to participants only. The underlying question is then transformed from "how do students differ?" to "how do participants differ?" Thus, some differentiation is possible between the condition where few students talk, but those who talk do so at very high levels, and the different condition where almost everyone has something to say, but at relatively low levels. The hypotheses will therefore be tested twice, once for all subjects and once for participants only.

The participants-only approach is also the only meaningful approach when the series of subsidiary questions, those relating to the nature of participation according to the categories outlined in the previous section, is under investigation. Thus, after presentation of the results of the major hypotheses, statistical analyses to determine the extent and nature of the differences, if any, in the quality of interactions will be reported.

Interactions of the factors of student sex, teacher sex, and class sex composition are of interest, of course, and will be discussed, but no specific predictions have been offered in this regard.
Hypothesis I

Male students demonstrate higher participation levels than do female students in mixed-sex classes.

Major Participation Measures

For Hypothesis I a series of three univariate 2 X 2 (student sex X teacher sex) analyses of variance of subjects in mixed-sex classes only (once for all subjects and once for participants only) for the three indices of participation (outlined above) were performed. Table 4 reports the results for all subjects; Table 5 reports the results for participants. The figures show no significant main effects of interactions for either factor. While the available data therefore do not support the hypothesis about student sex differences, it is instructive to look at more detailed figures for male and female students.

While the hypothesis refers only to subjects in mixed-sex classes, because males and females in the same sex composition condition seem most comparable, group differences between all females in the study (in mixed and single-sex classes) and all males (found, by design of the study, only in mixed-sex classes) are of interest. The various male and female groups were therefore compared by t tests, using a computer program whereby group variances were checked using F tests and, when unequal, t's were calculated by using separate estimates of variance rather than the normal pooled variance procedure. (The calculation of t's using separate variance estimates results in degrees of freedom which contain decimals rather than whole numbers.) Alpha was set at .05 and one-tailed probabilities were used since the direction
**TABLE 4**

Summary of Analysis of Variance (Student Sex X Teacher Sex) for All Subjects in Mixed-Sex Classes with Three Participation Indices as Dependent Measures

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>AVERAGE TALK</th>
<th></th>
<th>HIGH INITIATIVES</th>
<th></th>
<th>MEAN LEVEL INITIATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>F</td>
<td>MS</td>
<td>F</td>
<td>MS</td>
</tr>
<tr>
<td>Student sex (A)</td>
<td>1</td>
<td>93.99</td>
<td>.39</td>
<td>1.74</td>
<td>.66</td>
<td>.09</td>
</tr>
<tr>
<td>Teacher sex (B)</td>
<td>1</td>
<td>494.48</td>
<td>2.04</td>
<td>3.65</td>
<td>1.38</td>
<td>.65</td>
</tr>
<tr>
<td>A X B</td>
<td>1</td>
<td>85.58</td>
<td>.35</td>
<td>1.58</td>
<td>.59</td>
<td>1.02</td>
</tr>
<tr>
<td>Error</td>
<td>58</td>
<td>242.65</td>
<td></td>
<td>2.65</td>
<td></td>
<td>3.18</td>
</tr>
</tbody>
</table>

**TABLE 5**

Summary of Analysis of Variance (Student Sex X Teacher Sex) for Participants Only in Mixed-Sex Classes with Three Major Participation Indices as Dependent Measures

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>AVERAGE TALK</th>
<th></th>
<th>HIGH INITIATIVES</th>
<th></th>
<th>MEAN LEVEL INITIATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>F</td>
<td>MS</td>
<td>F</td>
<td>MS</td>
</tr>
<tr>
<td>Student sex (A)</td>
<td>1</td>
<td>68.20</td>
<td>.25</td>
<td>1.54</td>
<td>.54</td>
<td>.14</td>
</tr>
<tr>
<td>Teacher sex (B)</td>
<td>1</td>
<td>304.23</td>
<td>1.11</td>
<td>1.54</td>
<td>.54</td>
<td>1.14</td>
</tr>
<tr>
<td>A X B</td>
<td>1</td>
<td>125.08</td>
<td>.46</td>
<td>2.39</td>
<td>.85</td>
<td>.62</td>
</tr>
<tr>
<td>Error</td>
<td>33</td>
<td>273.46</td>
<td></td>
<td>2.82</td>
<td></td>
<td>.53</td>
</tr>
</tbody>
</table>
of difference was predicted. The results of these $t$ tests are reported in Tables 6 and 7.

As far as male/female comparisons for mixed-sex classes are concerned, the figures in Table 6 reflect the results of the analyses of variance, i.e. no significant differences on any of the three measures of participation. However, in all but one of the comparisons (mean initiative level, for participants only) the direction of difference is as predicted, i.e. males demonstrate higher participation levels. On the measure of average talk, male students showed greater variability than females in both groupings (all students and participants only).

When females and males in all classes were compared (see Table 7), significant differences in the predicted direction were found in number of high initiatives for all students, as well as for participants only. The mean initiative level for male participants was also significantly higher than for female participants. Non-significant results, on average talk for both groupings and on mean initiative level for all students, were in the predicted direction. Variability in high initiatives was significantly greater for males than for females.

The hypothesis that male students demonstrate higher participation levels than female students is thus supported only in part. For the average talk dimension, results were consistently in the predicted direction but failed to achieve a significance level of .05. Male students were shown to make significantly more high initiative statements than females in only some of the analyses, yet all analyses showed differences in the predicted direction. The mean initiative
TABLE 6

Differences in Participating Measures between Male and Female Subjects in Mixed-Sex Classes Only

<table>
<thead>
<tr>
<th></th>
<th>Females (33)</th>
<th>Males (29)</th>
<th>F^a</th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Average Talk</td>
<td>10.0</td>
<td>12.6</td>
<td>12.5</td>
<td>18.5</td>
<td>2.14*</td>
</tr>
<tr>
<td>High Initiatives</td>
<td>1.1</td>
<td>1.5</td>
<td>1.4</td>
<td>1.7</td>
<td>1.28</td>
</tr>
<tr>
<td>Mean Initiative Level</td>
<td>1.96</td>
<td>1.81</td>
<td>2.04</td>
<td>1.71</td>
<td>1.11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Females (19)</th>
<th>Males (18)</th>
<th>F^a</th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Average Talk</td>
<td>17.4</td>
<td>12.1</td>
<td>20.1</td>
<td>20.0</td>
<td>2.71*</td>
</tr>
<tr>
<td>High Initiatives</td>
<td>1.8</td>
<td>1.6</td>
<td>2.3</td>
<td>1.7</td>
<td>1.11</td>
</tr>
<tr>
<td>Mean Initiative Level</td>
<td>3.40</td>
<td>.78</td>
<td>3.28</td>
<td>.71</td>
<td>1.22</td>
</tr>
</tbody>
</table>

^aWhen group variances were unequal, t's were calculated using separate variance estimates, resulting in degrees of freedom which are not whole numbers.

*p < .05
TABLE 7
Differences in Participation Measures between Male and Female Subjects in All Classes

### ALL CLASSES (All Subjects)

<table>
<thead>
<tr>
<th></th>
<th>Females (96)</th>
<th>M</th>
<th>SD</th>
<th>Males (29)</th>
<th>M</th>
<th>SD</th>
<th>F^d</th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Talk</td>
<td></td>
<td>11.4</td>
<td>16.7</td>
<td></td>
<td>12.5</td>
<td>18.5</td>
<td>1.22</td>
<td>-.28</td>
<td>123</td>
</tr>
<tr>
<td>High Initiatives</td>
<td></td>
<td>.7</td>
<td>1.1</td>
<td></td>
<td>1.4</td>
<td>1.7</td>
<td>2.42**</td>
<td>-2.05*</td>
<td>35.3</td>
</tr>
<tr>
<td>Mean Initiative Level</td>
<td></td>
<td>1.68</td>
<td>1.53</td>
<td></td>
<td>2.0</td>
<td>1.71</td>
<td>1.25</td>
<td>-1.06</td>
<td>123</td>
</tr>
</tbody>
</table>

### ALL CLASSES (Participants Only)

<table>
<thead>
<tr>
<th></th>
<th>Females (57)</th>
<th>M</th>
<th>SD</th>
<th>Males (18)</th>
<th>M</th>
<th>SD</th>
<th>F</th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Talk</td>
<td></td>
<td>19.3</td>
<td>17.9</td>
<td></td>
<td>20.1</td>
<td>20.0</td>
<td>1.25</td>
<td>-.17</td>
<td>73</td>
</tr>
<tr>
<td>High Initiatives</td>
<td></td>
<td>1.2</td>
<td>1.2</td>
<td></td>
<td>2.3</td>
<td>1.7</td>
<td>1.90***</td>
<td>-2.91***</td>
<td>73</td>
</tr>
<tr>
<td>Mean Initiative Level</td>
<td></td>
<td>2.84</td>
<td>.81</td>
<td></td>
<td>3.28</td>
<td>.71</td>
<td>1.31</td>
<td>-2.10*</td>
<td>73</td>
</tr>
</tbody>
</table>

^a When group variances were unequal, _t_'s were calculated using separate variance estimates, resulting in degrees of freedom which are not whole numbers.

* _P_ < .05
** _P_ < .01
*** _P_ < .005
level demonstrated by male participants was significantly higher than that of all female participants. Other analyses of this measure showed inconsistent results. A further examination of the data, focusing on sex differences within each mixed-sex class, was undertaken in order to clarify the mixed results reported so far.

Table 8 shows that participation differed considerably among the four mixed-sex classes, ranging from a total of 177 TSU's (about 9 minutes) to 552 TSU's (about 28 minutes) of total talk during a total of 60 minutes of observation time. In three out of the four classes, a greater percentage of men spoke up at least once than of women. In the single class in which this did not hold true, it was a case where everyone in the class spoke except one single-attendance male. When mean average talk per student present and mean average talk per participants for females and males are compared, it is found that in three out of four classes, male students had notably higher mean talk figures. The single exception, Class 1, was a situation in which, in fact, only 40% of the females spoke, but one of those females accounted for 43.5% of the total female participation and spoke more than two and one half times as much as the most talkative male. A parallel pattern is true for the average number of high initiatives taken by participants in each class. In all classes but Class 1, male students took a greater number of high initiatives than female students. In Class 1 the single very high female participant accounted for 41.7% of all female high initiatives. When figures are compared for mean initiative level, three out of four classes once again showed results consistent with the hypothesis, i.e. in all classes but Class 2 did
### TABLE 8

Participation Measures and Category Distributions for Each Mixed-Sex Class

<table>
<thead>
<tr>
<th>Summary Measures</th>
<th>FEMALE TEACHER</th>
<th>MALE TEACHER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CLASS 1</td>
<td>CLASS 2</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>Males</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>Males</td>
</tr>
<tr>
<td>Number of students</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Number of participants</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Percentage of participants</td>
<td>40%</td>
<td>55.6%</td>
</tr>
<tr>
<td>Total talk (2 sessions) in TSU's</td>
<td>191</td>
<td>291</td>
</tr>
<tr>
<td>Total speaking turns (2 sessions)</td>
<td>57</td>
<td>32</td>
</tr>
<tr>
<td>Mean initiative level (all subjects)</td>
<td>1.42</td>
<td>1.81</td>
</tr>
<tr>
<td>Mean average talk (all subjects)</td>
<td>9.55</td>
<td>6.17</td>
</tr>
<tr>
<td>Mean average talk (participants only)</td>
<td>23.8</td>
<td>11.1</td>
</tr>
<tr>
<td>Mean high initiatives (participants only)</td>
<td>2.75</td>
<td>1.90</td>
</tr>
</tbody>
</table>

| Percentage Distribution of Categories |                |              |                |                |                |                |                |                |
|---------------------------------------|                |              |                |                |                |                |                |                |
| Cat. 1 Teacher-direct invitation      | (1.8)          | (6.3)        | 3.9            | 8.1            | 0             | 0             | 9.1           | (5.3)         |
| Cat. 2 Teacher-direct comment         | 19.3           | 9.4          | 18.4           | 15.3           | 23.1          | 29.0          | 27.3          | 36.8          |
| Cat. 3 Teacher-general invitation     | (3.5)          | 0            | 17.1           | 14.4           | 23.1          | (6.5)         | (6.1)         | (2.6)         |
| Cat. 4 Teacher-comment to different student | 17.5          | 18.8         | 18.4           | 13.5           | 15.4          | 16.1          | (6.1)         | 10.5          |
| Cat. 5 Teacher-lecture to whole class | 21.1           | 31.3         | 15.8           | 9.0            | 23.1          | 38.7          | 36.4          | 34.2          |
| Cat. 6 Student-direct comment         | 10.5           | 9.4          | 0              | 13.5           | 0             | 9.7           | 0             | (5.3)         |
| Cat. 7 Student-comment to different student | (1.8)         | (3.1)        | (2.6)          | 6.3            | (7.7)         | 0             | 0             | 0             |
| Cat. 8 Student-comment to teacher     | 24.6           | 21.9         | 23.7           | 19.8           | (7.7)         | 0             | 15.2          | (5.3)         |
| Cat. 9 Free turns                     | 64.9           | 75.1         | 60.5           | 48.6           | 52.8          | 54.8          | 57.6          | 50.0          |
| Cat. 10 Teacher-initiated turns       | 5.3            | 6.2          | 21.1           | 22.5           | 23.1          | 6.3           | 15.2          | 7.9           |
| Cat. 11 Low-avoidance turns           | 29.8           | 18.8         | 18.4           | 28.8           | 23.1          | 38.7          | 27.3          | 42.1          |
| Cat. 12 Student addresses             | 21.0           | 12.5         | 13.2           | 19.8           | (7.7)         | 9.7           | 15.2          | (5.3)         |
| Cat. 13 Questions                     | 0              | 0            | 9.2            | 6.3            | (7.7)         | 12.9          | 24.2          | 10.5          |
| Cat. 14 Answer                        | (1.8)          | 0            | 26.3           | 26.1           | (13.4)        | (3.2)         | 9.1           | (2.6)         |
| Cat. 15 Comments                      | 98.2           | 100.0        | 64.5           | 67.6           | 76.9          | 83.9          | 66.7          | 86.8          |

Note. Numbers in parentheses indicate negligible percentages derived from only one or two occurrences of the category.
males show a higher mean level of initiative than females. The disparate results for Class 2 can be accounted for. Note that this class produced substantially more student participation than any other class and that males had higher participation rates than females. The context of a very active discussion makes the occurrence of high level initiatives (as would follow upon lecturing, for example), increasingly less likely and the occurrence of low initiative levels (such as direct student-to-student and student-to-teacher exchanges) increasingly more likely, thereby reducing the overall mean initiative level necessary to engage in discussion. The high participation activity of males in this class took place predominantly at these low, flow-of-conversation levels, while women apparently needed to make greater efforts to enter the dialogue and thus showed higher mean levels of initiative.

A final point to be made is that in three out of the four mixed-sex classes a male student was the most talkative single individual; the only class in which this was not the case involved Class 1 which had the previously-mentioned very highly talkative female. In fact, when all 96 females and 29 males in the study are taken into account, it is found that a male student holds the record for speaking up most frequently.

Hypothesis I has been tested by various means: analyses of variance, t tests, and within-class comparisons. Results showed that confident inferences about the population of male and female college students in selective liberal arts institutions are not warranted. Nevertheless, results consistently pointed in the direction of hypothesized differences about the amount of participation and about
the display of high initiatives. That is, males tended to speak up more and they tended to make more statements requiring a high initiative level than did females.

There was inconsistent evidence regarding mean levels of initiative displayed by males and females. A possible explanation for this lies in the fact that while high initiatives are often necessary to enter the class dialogue, much of the subsequent give-and-take takes place, by definition, at low levels of initiative. This combination of initiatives tends to "dilute" the mean level of initiative. The mean level measure is therefore not as useful for describing students' initiative-taking as is the high initiatives measure.

A discussion of further problems in measurement, as well as an interpretation of the findings regarding Hypothesis I, is reserved for a later point (see p. 103). At that point the major and subsidiary findings for all three sex-related hypotheses will be integrated and measurement limitations, common to all these analyses, will be summarized.

**Subsidiary Participation Measures**

In addition to testing the major hypothesis of student sex differences on the measures of average talk, high initiatives, and mean level of initiative, the subsidiary measures (Categories 1 to 15) described earlier (see p. 64) were analyzed for student sex and teacher sex differences. The question was whether the nature of the participation differed for these groups. Analyses of variance, using a 2 X 2 (student sex X teacher sex) design, applied to all participants in
mixed-sex classes, were performed for the 15 subsidiary participation measures. (These measures are described on p. 55 and in Table 1.)

While such extensive statistical analyses entailed the risk of obtaining significant results by chance alone, they were undertaken for exploratory, rather than definitive reasons. In fact, only one significant effect for student sex (for Cat. 6) was found and, because this result was an isolated finding, it was ignored in this analysis. (However, subsequent analyses for Hypotheses II and III showed this finding to be coherent with other findings; an elaboration of this point can be found on p. 98.)

Several of the analyses revealed significant main effects for sex of teacher, but these results are not of interest here. The reason for including the factor of teacher sex in these analyses was to detect possible interaction effects only. Any main effects for teacher sex might be confounded by interaction effects with class sex composition, a possibility which is analyzed in the testing of Hypotheses II and III, where only female students are studied. The important question at this stage was whether teacher sex effects act differentially upon male and female students. However, in none of the 15 analyses was a significant teacher sex X student sex interaction found. This in itself is an interesting finding, in that it provides no evidence that teachers give differential encouragement to male or female students according to their own sex.

The lack of a significant main effect for student sex on all the dependent variables specifically reflective of teacher initiation to participate (Categories 1, 2, 3 and 9) lends further evidence to the
point of view that teachers in general treat male and female students in mixed-sex classes in similar fashion. The single student sex main effect found was for a category of participation in which the teacher is relatively uninvolved.

Before these findings of no sex differences can be accepted with confidence, it is useful once more to look briefly at the participation patterns in each mixed-sex class. These classes differed considerably in their overall participation levels; thus it is possible that student sex differences within classes were obscured by the large variance produced by grouping all males and all females together. The small number of classes studied (i.e., only 4 mixed-sex classes) made inferential statistical tests, using the class as the unit of analysis, impossible. The following class-by-class analyses thus serve the purposes of description and suggestions for future studies. Table 8 shows the occurrence of participation categories, expressed as percentages of total turns, for each mixed-sex class, broken down by male and female students.

For Cat. 1 (direct teacher question/invitation) the percentages are very low for all classes and groups and any search for apparent sex differences is not meaningful.

Cat. 2 (direct teacher comment) constitutes a larger percentage of total turns and differs rather widely from class to class. In the two male-taught classes the overall incidence of this type of interaction is higher than in the two female-taught classes, and male students have higher percentages than female students. Whether this means that male teachers addressed more comments directly to individual
students, especially male students, or whether all teachers addressed individual students at about the same rate but students of male teachers, and particular male students, were simply more prone to responding to such direct addresses is a question that this data does not allow to answer. The picture of percentage differences does, however, suggest a focus of investigation in further studies.

Cat. 3, a measure of the number of times students responded to a general invitation to speak, yields higher percentages for females in all classes, even though those percentages differ widely. Since by definition, these invitations from the teacher could have been answered equally likely by anyone present in the class, and in three out of the four classes the absolute number of such turns was higher for females than males, these results suggest a greater willingness on the part of female students to respond to the teacher's invitation to speak.

Cat. 4, the number of times a student spoke up when the teacher was addressing a different student, does not show any pattern of sex differences.

Cat. 5, the number of times a student "interrupted" an exposition by the teacher to the class as a whole (representing the highest initiative level), does not show any pattern of sex differences either. In three out of four classes this very self-initiated way of speaking up represented a substantial percentage of total speaking turns, when compared to the other eight possible ways. In fact, for male students this category had the heaviest loading in three out of four classes. The only class in which this was not the case was Class 2,
which had more than twice the number of total speaking turns than the
next most active class. This suggests that the teacher spent very
little time in expository speech to the whole class and therefore did
not provide the opportunity, or necessity, to interrupt such speeches.

Cat. 6, the number of times a student spoke after having been
specifically addressed by another student, had relatively low loadings
in all four classes. In fact, in all classes but the one in which
females were more talkative than males overall, female students never
once responded to such an address. Was this because females had no
such opportunity, i.e. because they were not addressed by classmates?
A look at Cat. 12, the number of times females addressed fellow
students rather than the teacher, reveals that females compare well
with males. It is possible that females did not address one another
during those instances—the available data do not allow us to distinguish
between turns addressed to same-sex and opposite-sex class mates. No
firm conclusions can therefore be drawn, but the two possible
explanations, that either females did not address one another or that
females did not reply to addresses by fellow students, reveal a
reluctance by female students to engage in student-to-student exchanges.

Cat. 7, the number of times a student entered the dialogue being
carried out between other students, had only minimal loadings in
general. This reveals a general, not sex-specific, reluctance by
students to carry out discussions among themselves as a group. It may
be, of course, that the teacher's interference in student-to-student
dialogue makes such joining-in difficult. But the relatively low
loadings on Cat. 12, number of times students addressed one another,
seem to indicate a general orientation which is very predominantly teacher-centered.

Cat. 8, the number of times a student spoke up following another student's remark to the teacher, differs widely over the four classes. However, females in all classes show larger percentages than males. It appears that following on the heels of another student's remark, which has "broken the ice," as it were, provides a welcome opportunity for females to have their say.

Categories 9 - 11 show the distribution of "free" contributions, i.e. those speaking turns for which there was no antecedent event pressuring the student to speak (Categories 4, 5, 6, and 8); teacher-initiated contributions, i.e. those contributions preceded by a specific or general invitation by the teacher to respond (Categories 1 and 3); and "low-avoidance" speaking turns, in which the antecedent event made it likely, though not necessary, that the student speak (Categories 2 and 6). The percentages in Cat. 9 indicate that generally half or more of student contributions were made freely. No relationship between the varying levels of percentages with other participation indices are apparent. Nor is the inconsistent pattern of sex differences amenable to any meaningful interpretation. For Cat. 10 we find that percentages range widely and that sex differences are not uniform. If the percentage figure for females in Class 3 is understood to represent only three turns and therefore deflated in importance, the conclusion can be reached that teacher initiation accounts for a very low percentage of participation, except in a class where there is a very high overall level of participation (Class 2). Invitations to speak by male
teachers account for a greater percentage of female students' contributions than of male students. This finding, of limited statistical significance in the context of this study, does suggest an interesting hypothesis for further studies.

The next category, Cat. 11, representing the percentage of contributions judged to be not easily avoided, allows some interesting conclusions. In all classes where males spoke more frequently than females, the males had higher percentages in Cat. 11; in the single class where females had a higher overall participation rate, the females did more of their participating in low-avoidance categories. In order to interpret this finding, it is useful to recall the situations that elicit low-avoidance contributions: when either the teacher or a fellow student has personally addressed the speaker. Although the data do not specifically reveal this, it may be conjectured that a student does not generally find him/herself specifically addressed unless he or she has first made a statement of some sort. The question then becomes whether the high participant is more likely, because of the nature or quality of the initial remark, to evoke a direct reply by the teacher or a student, to which he/she then responds in turn, or whether both high and low participants evoke about equal direct responses but choose not to follow them up with an additional exchange. Phrased differently, do high participants have more "interesting" things to say, and are therefore rewarded more readily with a direct response, or do high and low participants get equally rewarded with direct responses, but high participants have a greater
desire or need to seize the opportunity to speak again? These questions might provide fruitful guides for future data collection.

Cat. 12, which describes the incidence of speaking turns that were addressed to fellow students, rather than the teacher, has been discussed in conjunction with Categories 6 and 7. Except for Class 1, student-addressed statements were relatively rare and sex differences followed no consistent pattern.

Categories 13 - 15 describe the percentages of speaking turns which were questions, answers, and comments, respectively. Questions (Cat. 13) were asked rarely in general, except by females in Class 4. Responses to teachers' or students' questions (Cat. 14) were also rare, except for Class 2, the most talkative class. It is likely that the high level of participation in Class 2 was precisely due to frequent questioning by the teacher as well as questions asked by students, to which other students responded. The final category, percentage of comments (Cat. 15), was consistently higher for males than for females. A possible interpretation for this finding is that male students had a more independent stance towards discussion, not inclined as heavily as females towards the more dependent type of interaction, which the asking and answering of questions represents.

In conclusion, it should be pointed out again that this within-class analysis of sex differences in subsidiary participation categories was carried out with exploratory and experimental, rather than definitive intentions. The author wished to test the usefulness of these categories for detecting sex-differentiated trends in the interaction dynamics of class discussions. Several such trends were identified and suggest
hypotheses for further study.

The participation of female student, as opposed to that of male students, was more often triggered by general invitations from the teacher and followed more often on the heels of another student's remark to the teacher. For males, on the other hand, the most frequent mode of entering into a class discussion was by interrupting the teacher's exposition to the class as a whole, a mode characterized by the highest initiative level. A greater percentage of male participation was in the form of comments, as opposed to questions or answers, than it was for female participation. A further sex difference trend was found in participation that was in response to having been directly addressed by a fellow student: in 3 out of 4 classes females never once engaged in this type of interaction, while males did so occasionally. Taken as a whole, these sex differences suggest a pattern of interaction which is somewhat more teacher-dependent and teacher-oriented for female students than for male students. Any firm conclusions in this regard, or inferences about males and females in general, are not warranted; rather, these possible patterns suggest hypotheses for further studies.

A further discussion of these findings, integrated with findings about the additional sex-related factors of class sex composition and teacher sex can be found at the end of this chapter.
Hypotheses II and III

Female students in mixed-sex classes demonstrate higher participation levels than do female students in single-sex classes.

Female students in classes taught by female teachers demonstrate higher participation levels than do female students in classes taught by male teachers.

Major Participation Measures

For Hypotheses II and III the factors of interest were class sex composition and teacher sex. The subject population included female students only. While the factor of teacher sex was already analyzed once in Hypothesis I, that analysis included only mixed-sex classes and students of both sexes. The rationale for having included teacher sex in the analysis of variance for Hypothesis I was to discover student sex X teacher sex interactions, if any, so that the subsequent analyses of variance, for Hypotheses II and III, would be undertaken with an understanding of possible differential effects of teacher sex on male and female students. Since the analyses of variance for Hypothesis I did not reveal any interaction effects, however, no such complications of interpretation need be addressed.

Tables 9 and 10 show the results of two sets of three $2 \times 2$ (class sex composition X teacher sex) analyses of variance of all females in the study and of female participants only, with average
talk, average high initiatives, and mean initiative level as dependent variables. Table 9, referring to all females, whether they participated or not, reveals no significant main effects or interactions for the measure of average talk. For the measure of number of high initiatives, class sex composition is a significant main effect, such that in mixed-sex classes the occurrence of high level initiatives is more frequent. Another main effect is revealed for the measure of mean level of initiatives: classes taught by female teachers have higher such mean levels. No other main effects nor any interactions were found for students in general.

When the participation of only talkers is studied, a generally similar picture emerges. From Table 10 it can be seen that for the measure of average talk, again no effects were significant. For the number of high initiatives, again only the factor of class sex composition was significant, in the same direction. For the measure of mean level of initiative, however, the participants-only approach (which avoided the use of a zero level of initiative) showed both main effects and their interaction to be significant. Higher mean initiative levels were found in mixed-sex classes and for female-taught classes. However, the magnitude of the effect of sex of teacher is dependent upon the sex composition of the class, such that when the class is all female, female teachers evoke higher initiative levels than when the class is of mixed-sex composition. The magnitude of the effect of class sex composition is dependent upon the sex of the teacher, such that when the teacher is male, students in mixed-sex classes show
```markdown
## TABLE 9

Summary of Analyses of Variance (Class Sex Composition X Teacher Sex) for All Female Subjects with Three Major Participation Measures as Dependent Variables

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>MS</th>
<th>F</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex composition (A)</td>
<td>1</td>
<td>103.23</td>
<td>.37</td>
<td>6.61</td>
<td>5.71**</td>
<td>3.82</td>
<td>1.71</td>
</tr>
<tr>
<td>Teacher sex (B)</td>
<td>1</td>
<td>232.22</td>
<td>.82</td>
<td>1.90</td>
<td>1.64</td>
<td>12.37</td>
<td>5.53*</td>
</tr>
<tr>
<td>A X B</td>
<td>1</td>
<td>282.38</td>
<td>1.00</td>
<td>3.18</td>
<td>2.75</td>
<td>9.68</td>
<td>9.17***</td>
</tr>
<tr>
<td>Error</td>
<td>92</td>
<td>282.21</td>
<td>1.16</td>
<td>1.16</td>
<td></td>
<td>1.16</td>
<td></td>
</tr>
</tbody>
</table>

* *p < .05
** p < .02

## TABLE 10

Summary of Analyses of Variance (Class Sex Composition X Teacher Sex) for Participating Females with Three Major Participation Measures as Dependent Variables

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>MS</th>
<th>F</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex composition (A)</td>
<td>1</td>
<td>101.37</td>
<td>.31</td>
<td>12.67</td>
<td>9.68**</td>
<td>9.17</td>
<td>22.15***</td>
</tr>
<tr>
<td>Teacher sex (B)</td>
<td>1</td>
<td>.51</td>
<td>.00</td>
<td>.41</td>
<td>.31</td>
<td>3.15</td>
<td>7.60**</td>
</tr>
<tr>
<td>A X B</td>
<td>1</td>
<td>588.23</td>
<td>1.80</td>
<td>3.83</td>
<td>2.93</td>
<td>2.24</td>
<td>5.41*</td>
</tr>
<tr>
<td>Error</td>
<td>53</td>
<td>326.08</td>
<td>1.31</td>
<td></td>
<td></td>
<td>.41</td>
<td></td>
</tr>
</tbody>
</table>

* *p < .05
** p < .01
*** p < .001
```
higher initiative levels than when the teacher is female. The lowest initiative levels occur in all-female classes taught by male teachers.

What then may be concluded about the major hypotheses regarding class sex composition and teacher sex? The total amount of talk has not been shown to be greater in mixed-sex classes, nor in classes taught by female teachers. The number of high initiatives taken by female students have been shown to support Hypothesis II: such high initiatives are more frequent in mixed-sex classes than in all-female classes. While the data do not support Hypothesis III, which predicted that such high initiatives would be more frequent in classes taught by female teachers than in those taught by male teachers, they do suggest the possibility of an interactive effect, such that in mixed-sex classes female teachers elicit more high initiatives than male teachers. For the interaction, the analysis of variance showed the following results: $F(1, 92) = 2.75, p < .10$ (for all females) and $F(1, 53) = 2.93, p < .10$ (for female participants only). Given a larger sample and better measuring techniques, this interactive effect may well reach significance.

The final measure, mean initiative level, yielded results that supported Hypothesis II, when only participants were considered, but did not reach a sufficient significance level when all female subjects were considered. Thus, the participation that took place was shown to be at a significantly higher overall level of initiative in mixed-sex classes than in all-female classes; yet the mean level of initiative demonstrated by all female students (with zero levels assigned to non-speakers) did not differ according to the sex composition of the class.
Hypothesis III predicted that mean initiative levels would be higher in female-taught than in male-taught classes. The data supported this hypothesis for both approaches: when all subjects were studied and when participants only were studied. In addition, an interactive effect was demonstrated for the participants-only analysis, such that the mean level of initiative was lowest in the combination of all-female sex composition with a male teacher.

To sum up, the sheer amount of participation was not shown to differ in mixed-sex versus all-female classes, or in female-taught versus male-taught classes. The nature of that participation did differ, however, in partial accordance with the predictions made. There were no findings of main effects in a direction contrary to the hypotheses. The data thus support the conclusion that female students show more initiative in discussions when the class is of mixed-sex composition, rather than all female, and when the teacher is female rather than male.

At this point it is interesting to examine further details of the discussion picture in the various conditions of class sex composition and teacher sex, both in order to discover additional differences and in order to understand more fully the discussion contexts in which the demonstrated differences manifested themselves. The guiding question for the subsequent analyses is: do the dynamics, rather than the total amount of discussion, differ according to the situational variables of class sex composition and teacher sex.
Subsidiary Participation Measures

Just as the search for student sex differences (Hypothesis I) extended beyond testing the major participation measures and included an exploratory analysis of the 15 subsidiary measures, the examination of differences due to class sex composition (Hypothesis II) and to teacher sex (Hypothesis III) extended to a further exploratory analysis of these subsidiary measures. The intent here was, as for Hypothesis I, to detect differences in the patterns of interaction which, while not constituting definitive findings, will suggest trends which subsequent studies of female participation might well prove to be stable. The intent was also to discover whether indeed those subsidiary categories provide a meaningful way to talk about various aspects of classroom interactions.

Analyses of variance, using a 2 X 2 (class sex composition X teacher sex) design, were performed for all participating females on each of the 15 subsidiary measures described earlier. Such an extensive series of analyses ran the risk, of course, of producing significant results by chance alone. For this reason the results of these analyses are presented as tentative findings only, whose credibility depends to a large extent on their coherence and on supportive descriptive class-by-class analyses. The following account of the analyses of variance therefore aims to demonstrate such coherence among different measures (where appropriate) and buttresses findings by reference to descriptive data.

Table 11 shows the results of the analyses of variance. Table 12 provides descriptive participation data for females in each sex
<table>
<thead>
<tr>
<th>Cat.</th>
<th>Description</th>
<th>SEX COMPOSITION (A)</th>
<th>TEACHER SEX (B)</th>
<th>A X B</th>
<th>ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>F</td>
<td>MS</td>
<td>F</td>
</tr>
<tr>
<td>1</td>
<td>Teacher-direct invitation</td>
<td>6.63</td>
<td>6.96**</td>
<td>2.71</td>
<td>2.84</td>
</tr>
<tr>
<td>2</td>
<td>Teacher-direct comment</td>
<td>.79</td>
<td>.73</td>
<td>.20</td>
<td>.19</td>
</tr>
<tr>
<td>3</td>
<td>Teacher-general invitation</td>
<td>1.06</td>
<td>1.46</td>
<td>1.74</td>
<td>2.38</td>
</tr>
<tr>
<td>4</td>
<td>Teacher-comment to different students</td>
<td>2.84</td>
<td>6.31*</td>
<td>.05</td>
<td>.10</td>
</tr>
<tr>
<td>5</td>
<td>Teacher-lecture to whole class</td>
<td>3.51</td>
<td>6.45**</td>
<td>.18</td>
<td>.32</td>
</tr>
<tr>
<td>6</td>
<td>Student-direct comment</td>
<td>7.38</td>
<td>2.30</td>
<td>15.23</td>
<td>4.74*</td>
</tr>
<tr>
<td>7</td>
<td>Student-comment to different student</td>
<td>.49</td>
<td>1.76</td>
<td>1.57</td>
<td>5.62*</td>
</tr>
<tr>
<td>8</td>
<td>Student-comment to teacher</td>
<td>.71</td>
<td>.53</td>
<td>11.36</td>
<td>.54**</td>
</tr>
<tr>
<td>9</td>
<td>Free turns</td>
<td>13.69</td>
<td>3.34</td>
<td>7.58</td>
<td>1.85</td>
</tr>
<tr>
<td>10</td>
<td>Teacher-initiated turns</td>
<td>13.00</td>
<td>5.70*</td>
<td>.11</td>
<td>.05</td>
</tr>
<tr>
<td>11</td>
<td>Low-avoidance turns</td>
<td>3.34</td>
<td>.68</td>
<td>11.93</td>
<td>2.44</td>
</tr>
<tr>
<td>12</td>
<td>Student addresses</td>
<td>5.93</td>
<td>.94</td>
<td>22.11</td>
<td>3.50</td>
</tr>
<tr>
<td>13</td>
<td>Answers</td>
<td>3.86</td>
<td>1.68</td>
<td>1.34</td>
<td>.58</td>
</tr>
<tr>
<td>14</td>
<td>Comments</td>
<td>.43</td>
<td>.03</td>
<td>.63</td>
<td>.04</td>
</tr>
</tbody>
</table>

Note. For all analyses degrees of freedom are 1,53.

* P < .05

** P < .01
composition and teacher sex condition. The subsidiary Categories 1 to 15 are presented as percentages of total speaking turns. The use of percentage figures not only serves to give a picture of the distribution of the various categories, but insofar as the total amount of participation was shown, in the testing of the major hypotheses, to be similar for all groups considered, these percentage figures make possible a valid comparison across groups, whose N's are different enough to make a comparison of absolute frequencies misleading. While the analyses of variance use the individual student as unit of analysis, the figures in Table 12 use whole groups (cells) as the unit of analysis.

For Cat. 1 (direct teacher invitation) Table 11 shows a significant main effect for class sex composition, such that this occurred more frequently in all-female classes. The percentage figures bear out this greater reliance by teachers in all-female classes on direct invitation to specific students for stimulating discussion. In mixed-sex classes this category represents a very minimal percentage. The earlier analysis of student sex differences in mixed-sex classes (Table 8) showed that this finding holds true for teachers' invitations to students of both sexes.

For Cat. 2 (direct teacher comment) the analysis of variance revealed no significant effects. Examination of percentage loadings in Table 12 shows that in 3 out of 4 conditions female students responded to such teacher comments about equally often. The exceptional condition, that of mixed-sex class composition with a male teacher, shows a substantially higher loading. A review of the Cat. 2 loadings
TABLE 12
Participation Measures and Category Distributions for Females in Each Class Sex Composition X Teacher Sex Cell

<table>
<thead>
<tr>
<th>Summary Measures</th>
<th>ALL- FEMALE</th>
<th>MIXED-SEX</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female Teacher</td>
<td>Male Teacher</td>
</tr>
<tr>
<td>Number of subjects</td>
<td>29</td>
<td>34</td>
</tr>
<tr>
<td>Number and percentage of participants</td>
<td>20(69.0%)</td>
<td>18(52.9%)</td>
</tr>
<tr>
<td>Total talk (2 sessions) in TSU's</td>
<td>685</td>
<td>787</td>
</tr>
<tr>
<td>Total speaking turns (2 sessions)</td>
<td>169</td>
<td>230</td>
</tr>
<tr>
<td>Mean average talk (all subjects)</td>
<td>12.5</td>
<td>11.9</td>
</tr>
<tr>
<td>Mean average talk (participants)</td>
<td>18.2</td>
<td>22.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentage Distribution of Categories</th>
<th>ALL- FEMALE</th>
<th>MIXED-SEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat. 1 Teacher-direct invitation</td>
<td>13.0</td>
<td>17.4</td>
</tr>
<tr>
<td>Cat. 2 Teacher-direct comment</td>
<td>17.2</td>
<td>12.2</td>
</tr>
<tr>
<td>Cat. 3 Teacher-general invitation</td>
<td>23.1</td>
<td>10.4</td>
</tr>
<tr>
<td>Cat. 4 Teacher-comment to different student</td>
<td>3.0</td>
<td>6.5</td>
</tr>
<tr>
<td>Cat. 5 Teacher-lecture to whole class</td>
<td>13.6</td>
<td>7.8</td>
</tr>
<tr>
<td>Cat. 6 Student-direct comment</td>
<td>3.0</td>
<td>28.3</td>
</tr>
<tr>
<td>Cat. 7 Student-comment to different student</td>
<td>(1.2)</td>
<td>9.1</td>
</tr>
<tr>
<td>Cat. 8 Student-comment to teachers</td>
<td>26.0</td>
<td>8.3</td>
</tr>
<tr>
<td>Cat. 9 Free turns</td>
<td>43.8</td>
<td>31.7</td>
</tr>
<tr>
<td>Cat. 10 Teacher-initiated turns</td>
<td>36.1</td>
<td>27.8</td>
</tr>
<tr>
<td>Cat. 11 Low-avoidance turns</td>
<td>20.1</td>
<td>40.5</td>
</tr>
<tr>
<td>Cat. 12 Student addressees</td>
<td>10.1</td>
<td>41.3</td>
</tr>
<tr>
<td>Cat. 13 Questions</td>
<td>8.3</td>
<td>11.7</td>
</tr>
<tr>
<td>Cat. 14 Answers to questions</td>
<td>30.8</td>
<td>19.6</td>
</tr>
<tr>
<td>Cat. 15 Comments</td>
<td>60.9</td>
<td>68.7</td>
</tr>
</tbody>
</table>

Note. Numbers in parentheses indicate negligible percentages, i.e., 3 or fewer occurrences of the category.
in Table 8 shows that male teachers in mixed-sex classes did elicit such responses more often from both male and female students than did female teachers. The possibility thus remains that a teacher sex main effect would be detected in further studies. That is, male teachers may be more prone to engage students in direct give-and-take exchanges than female teachers.

For Cat. 3 (general teacher invitation) the analysis of variance revealed a significant interaction, such that the magnitude of this category was greatest in the female teacher X all-female class condition. When the percentage figures are examined, it can be seen that almost a fourth of all student talk in that condition was of this nature, while under the other conditions only about 11% of student talk was of this nature. This finding supplements conclusions drawn for student sex differences (see p. 82), i.e. that females responded to such invitations more often than males. The greater occurrence of this type of interaction thus appears to be sex-specific for both teachers and students.

Cat. 4 (teacher addressed a student other than the student speaker), indicative of a high level (Level 4) of initiative, occurred most frequently in mixed-sex classes. In addition, there was an interactive effect, such that the magnitude of this main effect was greatest when teachers were female. These findings are in accordance with the results of major hypothesis testing of the measure of high initiatives, which was a sum of initiatives at Levels 4 and 5 (see p. 91). The setting of a mixed-sex class, taught by a female teacher, thus appears most conducive to this type of high initiative.
Cat. 5 (the student has interrupted the teacher's exposition to the class) represents the highest initiative. The analysis of variance again echoes the major hypothesis finding for high initiatives: such interaction occurred more frequently in mixed-sex classes. It should be recalled, however, that male students in these classes used this mode of interaction more often than did female students (see Table 8).

Cat. 6 (direct student address) appeared in the analysis of variance to be subject to a sex-of-teacher main effect, such that with male teachers this category of interaction occurred most frequently. When the percentage figures are examined, however, it can be seen that such an effect is detectable only in the single-sex condition. The $F$ ratio for the interaction had only reached a significance level of .06 however, thus no strong conclusions are warranted. In fact, when the data for each of the two male-taught, all-female classes are examined, it is found that in one class this category accounted for only 4.4% of speaking turns, while in the other it accounted for 41.5%! In the other all-female classes it represented less than 5% of the interaction and in three of the four mixed-sex classes no such interaction at all took place (the single exception showing a 10.5% share). The class with the 41.5% share therefore was highly unusual and it can be said that for female students this type of interaction is generally extremely low. The single student sex difference which the analyses of variance of subsidiary categories for Hypothesis I revealed was in this category: male students carried on this type of exchange significantly more frequently ($F(1, 33) = 3.97,$
What had been considered an isolated, and therefore weak finding, now takes on greater credibility.

Cat. 7 (discussion among other students) showed results similar to those just described for Cat. 6 and is subject to the same interpretation. Once again it can be said that this mode of entering the discussion is generally very rare; it accounted for less than 5% of the interaction in 7 out of 8 classes. Even in the exceptional class only 14.3% of the interaction was of this type, indicating a general reluctance by students to join in a dialogue being carried out by and among fellow students. (Male students exhibited the same general reluctance as female students.)

Cat. 8 (another student has addressed the teacher) was subject to a significant main effect of sex of teacher, such that this occurred more frequently in female-taught classes. The percentage figures confirm this finding: a greater percentage of speaking turns fell into this category when the teacher was female than when the teacher was male. This greater tendency by students in female-taught classes to make their comments on the heels of another student's comment may well be due to female teachers allowing more opportunity for this to happen by not immediately responding themselves to a female student's remark. Male students were shown, in the earlier analysis (p. 84), to use this mode of interaction much less frequently, regardless of teacher sex.

Cat. 9 sums up all categories of participation in which the student was relatively free to speak or remain silent (Categories 4, 5, 7, and 8), that is, in which no recognizable pressure to speak was evident. The analysis of variance revealed a sex composition main
effect at an alpha level of .07, insufficient for any confident claims. However, the percentage figures clearly point in the direction of a conclusion that this category was more frequent in mixed-sex than in all-female classes. For exploratory reasons, a separate analysis of variance, using percentage figures for individuals, rather than absolute frequencies, was performed. This analysis revealed significant main effects for class sex composition \( F(1, 53) = 12.39, p < .001 \) and for sex of teacher \( F(1, 53) = 4.73, p < .05 \), such that the percentage of interactions that were "free," or self-initiated, was highest in mixed-sex classes and in female-taught classes. This higher loading of "free turns" for females in mixed-sex classes matched the high loading for males (see Table 8).

Cat. 10 sums up the two categories in which the teacher explicitly invited students to speak (Categories 1 and 3) and gives a picture of how much interaction was thus not entirely "free" or of a low-avoidance nature (see Cat. 11). The analysis of variance showed a main effect for class sex composition, such that there were more such teacher-initiated interactions in single-sex than in mixed-sex classes. A look at the percentage figures confirms this finding. The relatively low occurrence of teacher-initiated speaking turns in mixed-sex classes was generally true for both female and male students (see Table 8).

Cat. 11 sums up the number of speaking turns which cannot clearly be called a result of free choice to speak up, or of explicit pressure by the teacher to respond, but which are part of the flow of verbal exchange with relatively low avoidance possibility (Categories
The analysis of variance revealed no main or interaction effects. The percentage figures are comparable, except for the male teacher X all-female class group, in which a considerably higher percentage is found. This figure, however, can be accounted for by reference to the unusually high incidence of Cat. 6 (student to student exchange in the exceptional class described.) When the percentage figures of Cat. 11 in Table 12 are compared to those in Table 8 (describing each mixed-sex class)—and the distorting effect of the one exceptional single-sex class is kept in mind—it can be seen that a considerably larger proportion of male talk tends to fall into this category than of female talk. This suggests that classroom interaction for males tended to be more of a series of connected back-and-forth verbal exchanges with teachers or peers, while interaction for females tended to consist more of isolated comments, questions, and answers.

Cat. 12 does not concern precedents of speaking turns but describes the number (or percentage) of speaking turns which were addressed to peers, rather than the teacher. The analysis of variance showed a significant interaction, such that the most frequent occurrence of this category was in single-sex classes taught by male teachers. This finding, however, needs to be considered with caution, as most of the variance can be accounted for by the one exceptionally peer-active class (see discussion of Cat. 6). The percentage figures generally indicate a relatively low share of the total interaction for student-to-student exchange. This held true for female and male interaction (compare Table 8).
Categories 13-15 indicate the nature of the contribution by students: whether it was a question, an answer to a question, or a comment. The analyses of variance revealed only one effect: an interaction such that comments (Cat. 15) were most frequent in female-taught mixed-sex classes. The percentage figures echo this finding. They also show that the asking of questions (Cat. 13) was relatively rare, except in the mixed-sex X male-taught group, where females appear to choose this mode of interaction relatively more frequently. The answering of questions (Cat. 14) took up a larger proportion of total talk in single-sex classes than in mixed-sex classes, especially in the female-taught group. This fact probably has its explanation in the figures for Cat. 3, number of responses to teachers' invitations to speak, many of which must have been in the form of questions. Thus, even though no inferences for the larger population are warranted, the classes observed did reveal a pattern of relatively less spontaneous exchange of ideas and information and relatively more exchange of the question and answer type in all-female than in mixed-sex classes. Again, this conclusion is buttressed by the figures in Table 8, which revealed that the proportion of male talk which fell into Cat. 15 (comments) was consistently higher than the proportion of female talk in that category.

These findings will be summarized and integrated in the discussion in the next section.
Summary and Discussion of Sex-Related Findings

The following discussion will summarize and integrate the findings for all major and subsidiary participation measures examined in relation to Hypotheses I, II, and III. This appears to be the most appropriate and meaningful approach for several reasons. All three hypotheses made predictions about the same group of female subjects; the participation data were derived from the same discussion observations; and the participation measures are all interrelated in that they describe various aspects of organically whole events. First, however, certain methodological limitations common to all these analyses will be discussed.

Methodological Limitations

The findings of the various analyses can only lead to tentative conclusions for a number of reasons. First, the sample of students was drawn from a particular group of colleges, whose academic selectivity and histories of single-sex education do not allow them to stand as representative of all college student bodies and environments. Inferences about college men and women in general must therefore be regarded with caution. Second, the sample of students was not drawn at random, although no systematic bias was evident. Third, the behavior of the subjects was not independent, in that students attending a particular class certainly affect one another's participation choices. Fourth, the various participation measures are interrelated because they describe aspects of a series of events that largely depend on one another. Fifth, the live observation method of data collection and
the various steps of data processing were sure to produce errors in measurement. Sixth, the size of the subject pool, the number of classes, and the number of observations constituted a very limited sample of subjects and behaviors. Finally, the large number of variables and the large number of analyses increased the likelihood for experiment-wise error, reducing the credibility of positive findings.

These methodological limitations imply that any findings are best regarded as tentative and exploratory. However, to the extent that findings combine to produce a coherent picture of the dynamics of participation and to the extent that they are consistent throughout different statistical analyses, they can be regarded as strongly indicative of trends which subsequent studies are likely to replicate.

Summary and Conclusions

As far as sheer amount of participation is concerned, the data failed to support the prediction that female students talk more in mixed-sex than in all-female classes (Hypothesis II), or in female-taught rather than male-taught classes (Hypothesis III). While no conclusive evidence was established to support the hypothesis that male students talk more than female students (Hypothesis I), the various analyses consistently pointed in that direction.

The major strength of this part of the study was to be found in the analyses of the nature of participation, rather than of the amount of participation. While the specific prediction for student sex differences in initiative levels was not supported, the more fine-grained analyses of subsidiary participation measures revealed important
sex differences in participation patterns. The specific predictions regarding females' initiative levels in mixed-sex versus all-female, and in female-taught versus male-taught classes were supported: higher initiative levels were found in mixed-sex and in female-taught classes. But here, too, the analyses of subsidiary measures revealed more fine-grained differences in interaction between these conditions. The following discussion attempts to tie the many findings together into a coherent account.

The 15 participation categories have essentially three different foci: 1) the source of the initiative to speak (a further refinement of the notion of "level of initiative"), 2) the addressee of the student speaker, and 3) the conversational intent of the contribution. The initiative to speak was located as coming either from the student him/herself (Cat. 9: "free turns"), from the teacher (Cat. 10: "teacher-initiated turns"), or arising out of a situation which left little choice about responding (Cat. 11: "low-avoidance turns"). The addressee could be either the teacher or a fellow student (Cat. 12). The conversational intent was either a question (Cat. 13), an answer to a question (Cat. 14), or a comment (Cat. 15).

The data showed that speaking turns which the teacher had explicitly initiated, either by addressing the specific student speaker, or by addressing the class as a whole, were more frequent in all-female than in mixed-sex classes. Teachers very rarely extended direct invitations to speak to either female and male students in mixed-sex classes. When teachers extended invitations to the mixed-sex classes as a whole, females relied more than males on this mode of entering the
class dialogue. Female teachers were more likely, in both mixed-sex and all-female classes, to use this method of drawing students out.

As far as "free" student contributions were concerned, i.e., contributions which allowed students maximum choice to speak or remain silent, females in mixed-sex classes made more such free choices to speak than females in single-sex classes. Such freely chosen participation represented a large share of total participation for both males and females in mixed-sex classes. Even though females in all-female classes made fewer such free choices to speak than females in mixed-sex classes, they were more likely to do so, in both types of classes, when the teacher was female.

Such free choices to speak up could follow upon four types of antecedents, requiring varying levels of initiative. The highest initiative was required in the situation where the teacher was engaged in exposition to the class as a whole. While females took such high initiatives more often in mixed-sex than in all-female classes, they nevertheless did so less often than their male classmates.

The next highest level of initiative was conceptualized as being required in the situation where a teacher was addressing another student. Such "interruptions" of a teacher-student address also occurred more frequently in mixed-sex than in all-female classes, especially in mixed-sex classes taught by female teachers. Within the mixed-sex classes, however, there was no student sex difference.

The next lower level of initiative (Level 3) was assigned to the situation where another student had just made a comment to the teacher.
Female students were more likely to seize this opportunity to "follow on the heels" of another student's contribution than were male students, especially in classes taught by female teachers. Female students thus seemed to rely more on another student having "broken the ice" first. It is also possible that female teachers provided more opportunity to students to follow up on each others' remarks by not immediately seizing the floor themselves. (Yet male students took less advantage of that opportunity.)

The final category characterized by free choice to speak applied to the situation where other students were addressing each other and the student speaker entered that student-to-student dialogue. (It was assigned an initiative Level 2.) This occurrence was very rare in 7 out of 8 classes and showed no sex-related effects.

The "low-avoidance" speaking turns arose in situations where the student had been specifically addressed, though not explicitly invited to respond, by either the teacher or another student. Such exchanges with the teacher constituted the bulk of back-and-forth flow of conversation. It was more frequent for females in mixed-sex classes than in all-female classes, but represented a smaller share of mixed-sex participation for females than for males. Back-and-forth exchanges with other students was very rare in 7 out of 8 classes, showing no sex-related effects. In fact, the overall share of participation which was addressed to fellow students rather than to the teacher was very low in general, revealing no sex-related patterns.

As far as the conversational intent of student contributions was concerned, results indicated that expository statements or comments,
rather than questions and answers, represented a larger share of female student participation in mixed-sex and in female-taught classes. Within mixed-sex classes, however, male students did less asking and answering of questions than their female classmates.

What general conclusions can be drawn from these findings? It appears that females in mixed-sex classes displayed more independence and initiative in participation than in all-female classes, even though their male classmates often outdid them. In most participation categories that revealed a student sex difference, this sex difference was intensified in all-female classes. This supports the rationale outlined for Hypothesis II in the introductory chapter (pp. 12-14), which argued that males tend to set the tone for discussions, making them here more vigorous, argumentative, and teacher-independent than females might make them. Yet females can pick up on and participate in this discussion mode, even though with lesser intensity than males. Students in all-female classes tended to rely more on the initiative of the teacher to draw them out and manifested a more deferential stance vis-à-vis the teacher by engaging in the question-and-answer mode of communication more frequently than in mixed-sex classes.

But students alone do not determine the qualitative fabric of discussions: teachers exercise great influence in shaping the nature of the class dialogue. Hypothesis III predicted that female teachers would be more likely to elicit high initiatives from female students than male teachers. The results showed only an interactive effect, such that this was the case in mixed-sex classes only. In those situations female students' participation in the generally more
initiative-demanding discussion was enhanced by the presence of a female teacher. However, when the average level of initiative was examined, females in female-taught classes demonstrated a higher average level than females in male-taught classes. This may only indicate that females engaged in less give-and-take with their female teachers, such "low avoidance" exchanges being characterized by low initiative levels and causing a dilution effect of the overall average level of initiative. The only clear difference in approach between male and female teachers manifested itself in the greater use by female teachers in all-female classes of explicit invitations to speak directed to the class as a whole, and in female teachers receiving more strings of comments from different students (Cat. 8). This latter finding is possibly due to female teachers' greater willingness to give students a chance to comment on each others' remarks before "jumping in" with their own comment.

A picture of discussion emerges which shows discussions in mixed-sex classes being more of a vigorous exchange of ideas between students and the teacher, with female students aided by the presence of a female teacher in competing well with—though not quite attaining—the intensity of male students. The teacher in those settings is more of an active participant, rather than a facilitator of the discussion. On the other hand, discussions in all-female classes, especially those taught by female teachers, appear to be characterized by a more traditional student-teacher relationship, in which the teacher acts more as facilitator of the exchange of ideas, rather than as party to
the intellectual dispute, and in which the Socratic method using questions and answers plays a larger part.

Implications of these findings for structural or personal intervention, with 'the aim of strengthening and expanding female students' repertoire of discussion skills both for academic and non-academic settings will be discussed in the final chapter. In conclusion, it may be said that the participation categories used in these analyses proved to be useful and productive ways of describing classroom interaction and of pin-pointing differences in the patterns of interaction of male and female students in varying classroom settings.
CHAPTER IV
RESULTS AND DISCUSSION: PART II
PARTICIPATION AND ATTITUDINAL VARIABLES

Introduction

While the first part of this study was concerned with the relationship of the situational variables of class sex composition and teacher sex, as well as the personal variable of student sex, to the participation behavior observed on two distinct occasions, this second part of the study assumed that there are a number of attitudinal factors that the student brings to bear on the situation which will affect participation behavior. In addition, the notion that students can be characterized as having a general tendency to participate at a certain level was explored and relationships between such a tendency and certain personal variables were examined.

At this stage the focus is, however, on female subjects only. This limitation was chosen for two reasons: first, because the design of the study yielded a relatively small number of male subjects and thus provided only limited data for conclusions about both sexes; and second, because the interest of this project is in intellectual verbal assertion as a particular problem or issue for women. The basic question addressed in this part of the study is thus: what attitudes and other personal characteristics tend to differentiate those women who are more likely to speak up in a classroom setting from those women whose tendency it is to remain comparatively quiet. When the underlying question is phrased in this way it also becomes
clear that this study does not so much seek causal explanations as it tries to identify a limited number of variables that tend to be associated with high or low participation tendencies. A tentative profile of the female student who tends to participate actively in class discussions has been the aim.

Before the results of the testing of major hypotheses and additional findings are reported, the following section will deal with certain issues of measurement. The question will be addressed as to whether indeed one may speak of high or low participation as a relatively stable characteristic. Various measures of participation, with their relative strengths and weaknesses, will be discussed.

**Participation Measures**

The first issue that arises in the attempt to relate participation to attitudes is the question as to what measure or measures of participation will yield the most meaningful results. Part One of this study dealt with participation measures that were gained from direct observation of two separate segments of class sessions that provided the opportunity to participate. It will be recalled that a large number of such measures were taken: total talk (in three-second units, or TSU's), total number of speaking turns, mean level of initiative, number of turns in various subsidiary categories, etc. A choice had to be made about which of these measures would serve best as participation indices that could be related meaningfully to attitudinal and other personal variables.
Two measures were chosen; 1) average talk and 2) average high initiatives. The average talk measure was chosen because it is the best overall measure of "talkativeness." While this measure correlated very highly with the average speaking turn measure, it has the advantage of not overstatesing participation, as might happen when a subject made many very brief comments interspersed by another person's comments. The high initiative measure represents the average number of speaking turns which were taken at Levels 4 and 5 combined and is the best available single indicator of high initiative in participation. As discussed previously, turns taken at Levels 3 and lower involved lower degrees of initiative and/or free choice about whether to speak up or not. The measure of mean initiative level was not chosen for this part of the study because it tended to be unduly "diluted" for high participants who also spoke frequently at low levels. (A more complete explanation of this point can be found on p. 64).

While the two chosen measures have the advantage of being objective and of having been taken in real and live classroom situations, they have certain disadvantages as well. The interest of this study lies in general class participation tendency, a tendency presumed to manifest itself over many kinds of classroom situations, rather than in the specific behavior displayed in a very particular instance which might be influenced by many variables not controlled for, such as the subject of discussion on that particular day, or the physical or psychological well-being of the student or the teacher. Thus the objective participation measures were likely a result of not only the specific influences posited in this study, but of many unknown inter-
vening variables. In any given semester the average student has perhaps 60 hours of class time in which she has opportunity to exhibit her tendency to speak up (i.e., two non-lecture courses, each meeting about 2\(\frac{1}{2}\) hours per week). Two time samples of 30 minutes each, which this study measured, are not likely to be highly representative of general participation tendency.

For these reasons, a number of additional measures of participation were taken. Although these additional measures are all either self-reports or reports by the class teacher, and therefore have the weaknesses generally associated with such subjective reports, they are useful nevertheless. They lend themselves to various cross-validations which provide data on their reliability and validity and can thus be used with some awareness of their relative value. The measures thus taken can be classified according to their specificity, i.e. whether they relate to a) the specifically observed class session, b) the target course in general, or c) all classes in general.

Subjective Measures Related to Specific Class Sessions

After each observation, subjects were asked the following question: "How frequently did you speak up in class today?" (Appendix C, item 2 and Appendix D, item 4), with answer choices of very often, fairly often, occasionally, rarely, and never. When these measures were correlated with the number of times the subject was observed to have spoken up during the session to which the self-report referred, the results were Pearson's \(r(112) = .73, p < .001\) for the first observation and \(r(102) = .66, p < .001\) for the second observation. While these correlations are a satisfactory indication that students report their
behavior with reasonable reliability, they are not a completely fair index of reliability. The observed measures account for only the targeted 30-minute section of the whole class session, which lasted from 50 to 60 minutes. Whatever was spoken outside the 30-minute observation would be reflected in the self-report but not in the objective measure, thus reducing the correlation. Seen in this light, the correlations indicate that the middle 30 minutes were generally highly representative of the whole class session.

To answer a related question, that of the typicality of the particular class session observed, students were also asked after each observation how frequently they usually speak up in the target course (Appendix C, item 3 and Appendix D, item 5). Answer possibilities were: more than today, about the same as today, less than today, and it varies too much to say. The last alternative was chosen by only 10 subjects (8.9%) after Observation 1 and by only 2 subjects (2%) after Observation 2. This indicates that the vast majority of subjects perceive in themselves a participation tendency that remains relatively constant throughout a course. After Observation 1, 56.9% of subjects (58.1% of females) claimed that the class had been typical, while 40% of subjects (37.8% of females) said they usually spoke more and 2.9% (4.1% of females) said they usually spoke less. After Observation 2, 59% (58.4% of females) judged the session to have been typical, while 29% (29.9% of females) claimed they usually spoke more and 12% (11.7% of females) claimed they usually spoke less. However, the overall results strengthened the need for measures of participation that would avoid unwarranted conclusions on the basis of an untypical sample of
behavior and that would give a better picture of general participation tendency.

**Subjective Measures Related to the Target Course**

Male and female students who took the Long Questionnaire were asked to consider their general participation level in the course in which they had been observed and were then asked to classify themselves in one of four participation groups, designated as "very active," "moderately active," "rarely active," and "never participate" (Appendix F, items I-7 and I-8). Of the 63 subjects who answered this question, 18 (28.6%) placed themselves in the first group, 29 (46.0%) in the second, 12 (19%) in the third, and 4 (6.3%) in the least active group. For female students only, the results were 15 (28.8%), 25 (39.7%), 10 (15.9%), and 2 (3.8%) respectively. The correlation of this measure with the self-report for Observation 1 was \( r(63) = .47, p < .001 \); the correlation with the self-report for Observation 2 was \( r(63) = .63, p < .001 \). Two conclusions may be drawn from these figures: one, that the generalized self-classification bears a reasonable relationship to the specific self-reports, and two, that the observed sessions were moderately typical. To further check on the reliability of the self-classification for the course, a correlation was computed with the actually observed average talk, resulting in \( r(63) = .57, p < .001 \). Table 13 shows the correlations between selected objective and subjective participation measures.

Another measure of students' tendency to participate in the target course was a question about their general intention, or likelihood to speak up in the target course, answered on a 7-point Likert-type scale (Appendix F, item A-9). The correlations of this
<table>
<thead>
<tr>
<th>Participation Measure</th>
<th>OBSERVED MEASURES</th>
<th>COURSE-SPECIFIC REPORTS</th>
<th>GENERAL SELF-REPORTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Talk</td>
<td>High Initiatives</td>
<td>Self Classification</td>
</tr>
<tr>
<td>Average talk</td>
<td>--</td>
<td>.66(125)</td>
<td>.57(63)</td>
</tr>
<tr>
<td>High Initiatives</td>
<td>.47(63)</td>
<td>.44(59)</td>
<td>.45(63)</td>
</tr>
<tr>
<td>Self-classification</td>
<td>.68(59)</td>
<td>.84(63)</td>
<td>.73(63)</td>
</tr>
<tr>
<td>Teacher-classification</td>
<td>.59(59)</td>
<td>.60(59)</td>
<td>.64(58)</td>
</tr>
<tr>
<td>Intention</td>
<td></td>
<td></td>
<td>.73(63)</td>
</tr>
<tr>
<td>General tendency</td>
<td></td>
<td></td>
<td>.79(102)</td>
</tr>
</tbody>
</table>

Note. All correlations are significant at the .001 level. Numbers in parentheses indicate N's.
course-specific intention measure with the self-classification into one of four groups mentioned above was $r(63) = .84$, $p < .001$. This again pointed to a high degree of reliability in self-reports.

Another approach to gathering data on subjects' tendency to participate was to ask their teacher in the target course to classify them into one of four groups, described in terms similar to the self-classification groups (Appendix G, item 1). The phrasing of the least active category ("never participated") must have been too limiting because none of the teachers placed any student in this category. The correlation of this teacher-classification with the student self-classification was $r(59) = .68$, $p < .001$, indicating a relatively high degree of agreement between teachers and their students. This is echoed in the correlation between the teacher-classification and the student's intention declaration which was $r(59) = .59$, $p < .001$. Another useful examination was to see whether there was a strong relationship between the teacher-classification and the actually observed amount of average talk. In this test $r(59) = .59$, $p < .001$, indicating that there was a moderately high validity to both measures. (These correlational findings are presented in Table 13.)

Subjective Measures Related to Courses in General

Subjects were asked twice, i.e. after each observation, how active or quiet (on a 5-point Likert-type scale) they tend to be in their courses in general (Appendix C, item 4 and Appendix D, item 7). The correlation of one self-report with the other was $r(89) = .78$, $p < .001$. An average of these two self-reports was computed for all students present at both observations; for subjects who because of
absence rated themselves only once, this single rating was used as an average. Once again correlations were computed between this overall general tendency measure and the more specific subjective and objective measures. The purpose in this case was to see if a perceived general tendency was strongly reflected in the more specific contexts and their measures. The correlations of general tendency with the self-classification in the target course was $r(63) = .73$, $p < .001$, with the teacher-classification $r(59) = .60$, $p < .001$, and with the observed amount of average talk $r(125) = .38$, $p < .001$. (See Table 13.) While this last correlation is relatively low, it is still strong, when one considers that the behavior sample which is being related to a general behavioral trend is very limited. (It should especially be noted that for 25.6% of the subjects, only one observation was possible.)

A final self-report measure took yet another approach: subjects were asked to compare their own general participation tendency with that of their classmates in general. Subjects indicated whether they tended to speak much more, somewhat more, about the same, somewhat less, or much less than classmates (Appendix D, item 6). It was reasoned that a subject's self-perception of how active or quiet he/she tends to be is influenced by the norm established by his or her classmates. It is possible, for example, that at a college where students in general are very quiet, a moderately active student will come to see him or herself as very active, by contrast. When this general peer-comparison measure was correlated with general tendency, $r(102) = .79$; with self-classification, $r(63) = .73$; with intention to speak, $r(62) = .71$; with teacher-classification, $r(58) = .62$; and with
observed average talk, \( r(102) = .36 \). All of these correlations were significant at the .001 level. These results indicate that students rate themselves, and teachers rate students, with a strong sense of how they compare to other students. (As this comparison of self with other students in general is correlated with measures that reflect more specific contexts of participation, the correlations naturally are diminished.)

To return to the initial question raised in this section on participation measures: which measures are the most appropriate for relating behavior to attitude? From the discussion it is clear that the various measures offer distinct advantages and disadvantages. The objective measures of average talk and average high initiatives have the advantage of being relatively reliable and precise records of how much students actually participated during a given one or two class segments. But they have the disadvantage of uncertainty about how validly they reflect a subject's general participation tendency. The various subjective reports, while suffering the inherent disadvantages of being subjective, can be considered adequate, though not highly reliable measures of general tendencies. It appears most useful, therefore, to utilize both kinds of measures in subsequent statistical analyses, looking for consistencies in the results. In addition, consideration will be given to the specificity of the measures, such that general attitudes will be related to the most general participation measure, while attitudes about the particular course will be related to reports about participation in that course, and attitudes about the specific
class session observed will be related to measures concerning that particular session.

**Testing of the Major Hypotheses**

The major hypotheses (IV to IX) are all concerned with the relationship between attitudes and the participation tendency of female students only. Thus, in all subsequent reports references to "subjects," "students," "participants," etc. are to be understood as referring to females only, unless an explicit indication is given that male students are under consideration as well.

The phrasing of the hypotheses calls for an examination of the possible differences between High participants and Low participants. Before such testing could be undertaken, a decision was necessary about how to partition students into different participation groups. One possible interpretation of the adjectives "high" and "low" was to posit a third group, the "medium" participants, and then look for differences between the outer extreme groups. This approach was rejected on theoretical grounds, namely that the interest of this study is not in the truly unusual groups but rather in the whole range of students. This offered the possibility of modifying the original hypotheses to search for attitudinal differences across three groups. Such a tri-partite division was deemed to be inappropriately fine, in that conclusions about a relationship between rather globally conceived attitudes and behavior displayed on only two sample occasions could hardly be warranted. It is unlikely that a reliable categorization of a student's general participation tendency (over all courses and
situations, over several years of college) could be made from such limited observations. Nor would it be appropriate to test the hypotheses primarily on the basis of subjective classifications. The decision was therefore made to partition all subjects into the two groups: High and Low participants. One such partitioning device would have been to divide the subjects according to whether they said nothing at all or spoke up at least once. This approach would have yielded a 40%/60% division and would have certain intuitive merits. However, because of the relatively higher absentee rate among silent students, and ensuing lower representation among those who took the Long Questionnaire—the main source of attitudinal data—such a division would have yielded very skewed samples (37 participants; 15 non-participants).

All male and female subjects were therefore ranked according to average talk scores and then divided in half, with the top 50% of the entire observed sample being designated as "highs" and the lower 50% being designated as "lows." (The division was not made among the Long Questionnaire takers only, as that would not have reflected as accurately the students' actual participation standing.) The cut-off point, in terms of average talk, was 4.5 TSU's; i.e., students who spoke more than about 13.5 seconds qualified for High participant status. The sample sizes for females who took the Long Questionnaire came out to be: 27 Low participants and 35 High participants; the sample sizes for all observed female subjects was: 47 Low participants and 45 High participants.
The hypotheses are expressed in a manner so as to predict differences between these High and Low participation groups and therefore imply the use of *t* tests of the group means. There is, however, implicit in each of the hypotheses a related hypothesis about the relationship between participation and attitudes: a correlational prediction that the attitude varies positively with participation tendency. Due to the information lost by collapsing average talk scores into two categories, the magnitude of the relationship of an attitudinal variable to participation level is obscured. A correlational analysis uses the entire distribution along the dimensions measured and can reveal not only the presence, but the magnitude of the relationship between these measures. Especially in the case of the various non-objective participation measures, it would have been inappropriate to collapse their range into only two categories; correlations between these measures and attitudinal/personal measures were the most appropriate indices of their relationship.

In subsequent testing of hypotheses, and in the examination of the relationship of participation to a number of additional personal variables, both approaches, that of *t* tests for High and Low participants and that of Pearson's correlational analyses between appropriate participation measures and personal/attitudinal measures, will be undertaken. Conclusions about the results will take into account frequently the consistency of the results.
Hypothesis IV

High participants are more assertive in general than Low participants, as measured by the Rathus Assertiveness Scale.

The results of the various analyses provided only weak support for the hypothesized relationship. Table 14 shows the t test data for the major hypotheses; the figures show no difference between the assertiveness score means of High and Low participants. Table 15 shows the correlations between major attitude scores and the following participation measures: average talk, average high initiatives, intention to participate (self-report), teacher-classification, and general tendency (self-report). The figures show low but significant correlations between the assertiveness score and only two measures: intention and general tendency. While the relationship of assertiveness to the most general participation measure is the most relevant pairing of variables and does reveal a significant positive relationship, the problems inherent in self-reports limit the confidence with which this finding can be accepted. The positive relationship between assertiveness and professed intention to participate increases this confidence; however, the lack of corroboration by the teacher report of participation level introduces caution. Therefore the hypothesis as specifically stated cannot be accepted, while the possibility of a positive relationship between general assertiveness and general participation tendency received some limited support. Further studies may support this finding.

Hypothesis V

High participants hold more feminist attitudes towards women's roles, as measured by the Attitude Towards Women Scale, than do Low participants.
TABLE 14

Differences on Attitudinal Measures of Major Hypotheses between Low and High Female Participants

<table>
<thead>
<tr>
<th>Variable</th>
<th>LOW PARTICIPANTS (N = 21)</th>
<th>HIGH PARTICIPANTS (N = 31)</th>
<th>t</th>
<th>df&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assertiveness</td>
<td>53.8 10.4</td>
<td>55.0 12.6</td>
<td>-.36</td>
<td>49</td>
</tr>
<tr>
<td>Feminism</td>
<td>63.3 7.5</td>
<td>67.2 5.8</td>
<td>-2.10&lt;sup&gt;*&lt;/sup&gt;</td>
<td>48</td>
</tr>
<tr>
<td>Verbal Conflict Approach</td>
<td>94.8 23.8</td>
<td>105.4 11.5</td>
<td>-1.86&lt;sup&gt;*&lt;/sup&gt;</td>
<td>24.8</td>
</tr>
<tr>
<td>Evaluative Attitude</td>
<td>1.88 1.02</td>
<td>2.25 .79</td>
<td>-1.49</td>
<td>50</td>
</tr>
<tr>
<td>Belief System</td>
<td>25.0 12.4</td>
<td>36.0 25.0</td>
<td>-2.11&lt;sup&gt;*&lt;/sup&gt;</td>
<td>46.5</td>
</tr>
<tr>
<td>Normative Pressure</td>
<td>2.54 .87</td>
<td>2.70 .71</td>
<td>-.72</td>
<td>50</td>
</tr>
</tbody>
</table>

<sup>a</sup>When group variances were unequal, t's were calculated using separate estimates, resulting in degrees of freedom which are not whole numbers.

<sup>*</sup>p < .05 on one-tailed t tests
<table>
<thead>
<tr>
<th>Attitudinal Variable</th>
<th>OBSERVATION MEASURES</th>
<th></th>
<th>COURSE-SPECIFIC REPORTS</th>
<th>GENERAL REPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Talk</td>
<td>High Initiatives</td>
<td>Teacher Classification</td>
<td>Intention to Participate</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>.08</td>
<td>.20</td>
<td>.12</td>
<td>.31**</td>
</tr>
<tr>
<td>Feminism</td>
<td>.14</td>
<td>.09</td>
<td>.19</td>
<td>.31**</td>
</tr>
<tr>
<td>Verbal Conflict Approach</td>
<td>.26*</td>
<td>.30*</td>
<td>.40**</td>
<td>.45***</td>
</tr>
<tr>
<td>Evaluative Attitude</td>
<td>.29*</td>
<td>.23*</td>
<td>.34**</td>
<td>.54***</td>
</tr>
<tr>
<td>Belief System</td>
<td>.22</td>
<td>.27*</td>
<td>.33**</td>
<td>.50***</td>
</tr>
<tr>
<td>Normative Pressure</td>
<td>.24*</td>
<td>.11</td>
<td>.30</td>
<td>.40**</td>
</tr>
</tbody>
</table>

Note. N = 52 except for teacher classification, where N = 48.

* p < .05

** p < .01

*** p < .001
The examination of the relationship between feminist attitudes and participation revealed inconsistent results. The hypothesis, as specifically stated, can be accepted according to the figures in Table 14. The correlations in Table 15, however, do not show feminist attitudes to vary consistently with the amount of participation (average talk). The finding of a significant difference between groups but the lack of a significant correlation might indicate that only among subjects in the outer ends of the distribution of participation scores are there significant differences in feminist attitudes. The positive correlations between feminism and the two self-reported measures of intention and general tendency do, however, support the hypothesized relationship. The lack of concordance in the correlation with the teacher-classification raises some doubts about the reliability of the self-report of intention. In sum, the hypothesis can be accepted in its strict sense and there is limited support for the expectation of a positive relationship between participation and feminism.

Hypothesis VI

High participants have a higher approach tendency towards intellectual verbal conflict situations, as measured by the Robertson Intellectual Verbal Conflict Approach/Avoidance Measure, than do Low participants.

The predicted relationship, both in its narrow sense as stated in the hypothesis and its wider correlational sense, was confirmed by the data. Table 14 shows that High participants attained significantly higher scores on the Robertson measure than did Low participants. The measure of average talk is shown in Table 15 to have a low positive relationship to the conflict approach measure ($r = .26$), while the high
The initiative measure shows a higher positive correlation ($r = .30$), indicating that students with greater intellectual conflict approach tendencies will engage in more initiative-demanding participation than students with more conflict-avoidance tendencies. The consistent and, relatively speaking, moderately high correlations between the Robertson measure and the other self-reports of participation (with intention $r = .45$; with general tendency $r = .43$), corroborated in turn by a comparable correlation involving the teacher's report ($r = .40$), all lend consistent support to the general conclusion that participation has a significant positive relationship to the general tendency to approach or avoid verbal conflict situations.

**Item Analysis of the Robertson Intellectual Verbal Conflict Approach/Avoidance Measure**

As the Robertson measure has been constructed specifically for this study (and possible subsequent studies of class participation), it is of interest to see how individual items on this 35-item scale (listed in Appendix F) relate to participation measures. Seven of the items (2, 5, 6, 7, 14, 15, 30) differentiated significantly between High and Low participants (one-tailed $t$ tests attained an alpha level of less than .05). Indeed, when males and females were taken into account, eleven items yielded significant mean differences (the previously mentioned items plus items 1, 9, 12, 15). Correlational analyses of individual items with participation measures are reported in Table 16. From the table it can be seen that out of 35 items, 14 items attained significant correlations with the most general, and most appropriate, measure of participation: general tendency. Eight of these items' significant
TABLE 16

Pearson Correlations between Items on Robertson Intellectual Verbal Conflict/Avoidance Measure and Three Participation Measures

<table>
<thead>
<tr>
<th>ITEM</th>
<th>AVERAGE TALK</th>
<th>HIGH INITIATIVE</th>
<th>GENERAL TENDENCY</th>
<th>ITEM</th>
<th>AVERAGE TALK</th>
<th>HIGH INITIATIVE</th>
<th>GENERAL TENDENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.17</td>
<td>.24*</td>
<td>.23</td>
<td>19</td>
<td>D -.11</td>
<td>-.07</td>
<td>.19</td>
</tr>
<tr>
<td>2</td>
<td>.29*</td>
<td>.28*</td>
<td>.61***</td>
<td>20</td>
<td>D .07</td>
<td>.07</td>
<td>.09</td>
</tr>
<tr>
<td>3 a</td>
<td>.08</td>
<td>-.04</td>
<td>.10</td>
<td>21</td>
<td>.15</td>
<td>.32**</td>
<td>.25*</td>
</tr>
<tr>
<td>4 D</td>
<td>.07</td>
<td>-.07</td>
<td>.22</td>
<td>22</td>
<td>D -.08</td>
<td>.11</td>
<td>.14</td>
</tr>
<tr>
<td>5</td>
<td>.24*</td>
<td>.22</td>
<td>.17</td>
<td>23</td>
<td>-.07</td>
<td>.11</td>
<td>-.08</td>
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<td>6</td>
<td>.33**</td>
<td>.26*</td>
<td>.26*</td>
<td>24</td>
<td>.20</td>
<td>.28*</td>
<td>.29*</td>
</tr>
<tr>
<td>7 D</td>
<td>.33**</td>
<td>.11</td>
<td>.32**</td>
<td>25</td>
<td>.13</td>
<td>.11</td>
<td>.19</td>
</tr>
<tr>
<td>8</td>
<td>.20</td>
<td>.18</td>
<td>.38**</td>
<td>26</td>
<td>.13</td>
<td>.15</td>
<td>.18</td>
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<tr>
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</table>

Note. \( N = 52 \)

\( a \) D indicates that disagreement with item was given a high score

* \( p < .05 \)

** \( p < .01 \)

*** \( p < .001 \)
correlations were echoed in significant or marginally significant correlations \( (p < .07) \) with the objective participation measure of average talk, while nine of these items were similarly supported by significant or marginally significant correlations with the measure more reflective of high initiative: average high initiatives.

An internal factor analysis of the whole Robertson Scale was not undertaken because it was felt to be more meaningful to look for groupings of items according to how they relate to the external measures of participation, and to submit the items thus empirically selected as belonging together to an intuitive content analysis. (Further analyses on larger samples are needed to confirm these conclusions.)

What then do the 14 significantly correlated items reveal in the way of common themes and concerns? Four major themes can be detected in the items: 1) enjoyment, 2) self-confidence, 3) liking controversy, and 4) openness with peers. While some of the items contain more than one of these elements, it is possible to group them according to these major themes:

**Enjoyment of discussion:**

(1) I like classes in which there is a lot of student discussion

(2) I enjoy speaking up in class.

(6) I get more satisfaction from participating in the discussions during a course than I get from writing a paper at the end of the course.

\( ^1R \) (4) I prefer writing a paper to making an oral presentation.

---

\( ^1R \) designates reversed items
These items show not only a generally positive attitude towards discussion by others and by self, but items 4 and 6 also reveal a general preference of the oral mode of presenting and discussing ideas in a group setting over the more private mode of developing and expressing ideas in an uninterrupted and completed fashion and setting them down on paper.

**Self-confidence:**

R(17) In an intellectual dispute I worry a lot about sounding stupid.

R(27) I would come across as less knowledgeable on an oral exam than on a written exam.

These items seem to reflect a general confidence on the part of the subject that she has something to say and can say it well, not only in the pressured setting of a dispute, but that she can also do well under pressure of being examined and evaluated by her superiors.

**Liking controversy:**

(21) I like to test out my ideas by discussing them with people who are likely to disagree with me.

(24) I prefer submitting my ideas to open criticism rather than sharing them with people who will be mostly accepting and supportive.

(8) I am rarely afraid to express an opinion in class which differs from the opinions voiced by the professor.

These items reveal a non-defensive attitude about one's own ideas; more than that, they reflect the opinion that disagreement can serve a good purpose. Not only is there a lack of fear of disagreement by peers, but also a readiness to match wits with an authority figure, such as the professor.
Openness with peers:

R(7) I often think that students in my classes might as well have kept their opinions to themselves without any loss to anyone.

R(9) Students that dominate class discussions really turn me off.

(12) If I disagree with what another student says in a discussion, I tend to say so.

R(14) I prefer making my comments to the professor after class to expressing them in class.

(15) I would not mind if a student argued against something I have said in the course of a class discussion.

Subjects who answered these items in a negative fashion seem to convey a kind of hostility and lack of respect for their peers' opinions and rights that is perhaps a reflection of how they fear they themselves are perceived by their fellow students, therefore preventing them from speaking up comfortably. The High participant, on the other hand, is ready to challenge, as well as be challenged by, her peers. Item 14 seems to reflect an attitude that fellow students are an integral and appropriate part of the exchanging of ideas and opinions in a class setting; those students who wait to speak to the professor alone seem to see no value or reward for themselves or others in speaking to the class as a whole. It is noteworthy that the heaviest loading of significantly correlated items occurs under this heading. The notion that relationships with peers is a factor highly related to class participation will be explored in subsequent analyses and will be seen to find further support.

In the section in Chapter III which describes the construction of the Robertson Scale, it was pointed out that items were selected for
inclusion into the final scale on the basis of whether they met a standard of intercorrelation with other items, thus demonstrating internal consistency and reliability. Only upon comparing the Robertson Scale results with participation indices can anything be said about external validity, i.e. the issue of whether the attitudes about participation tapped in the scale items are, in fact, related to participation behavior. While no attempt is made at this point to revise the scale to include only items meeting a test of external validity, the data from this study can serve as a partial basis for such a revision of the scale for future use. It would be of interest to see whether the items that failed to show any relationship to participation in this study continue to show no relationship for another larger pool of students. Such an analysis would provide useful insights about what attitudes appear not to be related to participation.

Introduction to Hypotheses VII to IX

Hypotheses VII to IX relate to the three components of the Attitude/Beliefs/Norms Inventory (see description in Chapter II and Appendix F, sections B through F). These hypotheses arose from the Fishbein-Ajzen theory of attitude-behavior relationships, also outlined in Chapter II. The summary attitude towards participation in the target course, measured by means of five semantic differential items, and resulting in a score indicating degree of positive or negative overall evaluation, was hypothesized to have a significant positive relationship to participation. This evaluative attitude arises, according to the theory, as a result of specific beliefs held about the
consequences of participation. These beliefs were thus hypothesized to be more positive for High than for Low participants. The theory further holds that participation is also related to the normative expectations felt to be imposed on the subject by significant others to participate in class discussions. The relationship of normative expectations to participation thus constituted the final hypothesis suggested by the Fishbein-Ajzen theory.

As was the case for the previous three attitudinal hypotheses, the hypotheses take two forms: a prediction about differences between High and Low participants and a correlational prediction that the attitude in question is related positively to the appropriate participation measures. The Attitude/Beliefs/Norms Inventory is concerned explicitly with participation in the target course; therefore the participation measures most appropriate for correlational analyses are the observation measures and two subjective reports: the subject's professed intention and the teacher-classification of the subject into the highly active, moderately active, or rarely active group. In addition, it is of interest to examine whether the attitude in question has a positive relationship to self-professed general tendency to participate, i.e. whether this most general tendency relates to how a student views participation in a particular course.

Hypothesis VII

High participants in the target course have a more positive evalulative attitude towards participation in that course, as measured by the five semantic differential items of the Attitude/Beliefs/Norms Inventory, than do Low participants in that course.
Table 14 shows that the $t$ test of mean differences fell short of the necessary significance level (the probability was .07) to accept the hypothesis as stated. The correlational hypothesis was, however, supported consistently (see Table 15). Not only did the observation measures (average talk and high initiatives) show a significant positive relationship to this attitude, but the intention measure in particular showed a relatively high positive correlation ($r = .54$). Even the most global measure, general tendency was shown to be positively related to evaluation of participation in the particular class studied. The hypothesis that participation tendency is related to the degree that a positive overall evaluative attitude is expressed toward participation can therefore be accepted with confidence.

**Hypothesis VIII**

High participants in the target course have a more positive belief system about participation in that course, as measured by the Beliefs section of the Attitude/Beliefs/Norms Inventory, than do Low participants.

When summary Belief scores are examined, a significant difference is found, in the predicted direction, between High and Low participants. Table 14 shows these results. The primary hypothesis can therefore be accepted. The correlational prediction is also supported for every participation measure, in particular for the intention measure, which showed a correlation of .50. (Table 15 gives correlational results.) These results justify an acceptance of the hypothesis.
Item Analysis of the Belief Measure

It is instructive to examine the relationship of the various components of this summary belief measure to participation. It will be recalled that this summary measure was derived from several subsidiary measures: 1) the subject's perception of the likelihood that a particular consequence would occur upon participating; 2) the subject's evaluation of the desirability of that consequence; and 3) the cross-product of these two measures for each consequence. (See Chapter II for a detailed treatment of this measure.) If an expectation as well as its evaluation are given a positive rating, then the cross-product will be positive, indicating a positive belief or attitude towards that consequence, i.e. the subject's belief is that this desirable outcome is also likely to occur. If the expected consequence and its evaluation are both negative, a positive belief will likewise result, indicating that while the consequence is judged to be an undesirable one, it is also considered unlikely to occur. On the other hand, if a consequence is judged positively but its occurrence judged unlikely, the cross-product is negative, indicating a negative attitude; if a consequence is judged to be undesirable but its occurrence likely, again a negative overall belief is attached to that consequence. When all the fifteen individual belief cross-product scores are summed, the belief system score used in the testing of Hypothesis VIII is arrived at.

It is interesting not only to ascertain whether participation is related to the degree to which a positive overall belief system is attached to that behavior, but also to determine which of the individual component expectations and evaluations of consequences are significantly
related to participation. As explained previously, no single participation measure can be used to provide a satisfactory answer. In this case the most reasonable measures seem to be the observation measure average talk and the intention to participate measure. If both of these measures are significantly correlated with a given Belief system component, the existence of such a relationship may be concluded with some confidence. If only the subject's intention to participate, but not the actually observed behavior, correlates with a belief component then the existence of such a relationship is only tentatively confirmed. It is possible, after all, that the intention to participate did not manifest itself in actual participation behavior on the particular observation day(s) for unknown reasons, yet such actual behavior may have regularly occurred in the target course. In such tentative cases it appears reasonable to look to a third measure for confirmation: the professor's report of subjects' participation levels. If the teacher-classification as well as the intention measure reveal a significant relationship (in the same direction), then the finding of a relationship will be considered as valid. If only the actual behavior observed, but not the general intention to participate is correlated with a belief component, additional support for any claim about a relationship will again be sought from the correlation between the teacher-classification and the attitude in question. If the teacher's report yields a parallel relationship, the finding will be considered valid. Table 17 summarizes the correlations of belief system components and participation measures.
| TABLE 17 |
| Pearson Correlations between Belief System Components and Participation Measures |

<table>
<thead>
<tr>
<th>AVERAGE TALK</th>
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<th>TEACHER REPORT</th>
<th>AVERAGE TALK</th>
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**Note.** N = 52

*Beliefs were a product of likelihood X evaluation of consequence.

* P < .05

** P < .01

*** P < .001
Likelihood of Consequences. Given the guidelines for the acceptance of correlational findings just outlined, what consequence expectations appear to be related to participation? High participants judge the following consequences as more likely to happen than do Low participants:

(B-2) I will make a good impression on the teacher.
(B-3) I will start up an argument.
(B-8) I might help to clarify a concept.
(B-15) My classmates will think I made a good point.

High participants judge the following consequences as less likely than Low participants:

(B-9) The teacher will ask me to follow up on what I said and I won't be able to.
(B-14) My comments will be seen as repetitive, trivial, or irrelevant.

Desirability of Consequences. How does participation appear to vary with the desirability of the 15 outcomes? Only one rating meets the acceptance standard outlined above: it appears that High participants tend to consider the starting up of an argument (C-3) a more desirable consequence than do Low participants. Three additional evaluations showed significant relationships with the intention measure only and can therefore only be accepted as tentative findings. Such tentative findings were that High participants tended to regard the possibility of the class laughing in derision (C-1) as worse than did Low participants. On the other hand, High participants thought that being wrong (C-5) was not as bad as did Low participants and that clarifying a concept was a more desirable outcome than did Low participants.
Summary Attitudes about Consequences (Likelihood and Desirability). Finally, how is the degree of positive or negative attitude about each of the fifteen consequences related to participation? Given the acceptability standards outlined earlier, six consequences were found to be significantly related to participation. The higher the participation level, the more positive were the attitudes about impressing the teacher (B-2), about starting up an argument (B-3), about being wrong (B-5), about being ignored (B-6), about clarifying a concept (B-8), and about classmates thinking that a good point had been made (B-15).

High participants' greater likelihood of holding a positive attitude towards the possibility of impressing the teacher can be mainly accounted for by the greater tendency of High participants to believe that this might actually happen, as compared to Low participants. All students, regardless of their participation, rated this outcome as mildly desirable.

The belief attached to the starting of an argument was related in both its components to participation, as already noted. High participants tended to rate both the desirability and the likelihood of this outcome more highly than Low participants. It is interesting to compare this finding to the findings attached to the belief and its components concerned with the possibility of starting a discussion (B-70). The words "argument" and "discussion" have different enough connotations to cause students to respond quite differently to them. There is little evidence that High participants tend to rate the likelihood or desirability of "discussions" more highly than Low participants—all subjects rated
the desirability of discussions very highly. However, the mention of an "argument" elicited clearly different responses from students according to their participation level. High participants tended to not only regard "arguments" as more likely, but also considered them more desirable than did Low participants.

The more positive attitude with which High participants tend to regard the possibility of being wrong (B-5) can probably be accounted for by the desirability component of that attitude. Low participants appeared to regard being wrong as a worse consequence than did High participants. There was no evidence that they regarded the likelihood differently.

While students in general regarded the possibility of being ignored as moderately unlikely and as very undesirable, the cross-product attitude tended to be less positive as participation level decreased (B-6).

The belief attached to the possibility of clarifying a concept by speaking up (B-8) varied positively with participation level, a finding that can be primarily accounted for by the positive relationship between judged likelihood of this consequence and participation level. The data also provide limited evidence that High participants tend to judge the clarifying of a concept to be more desirable than do Low participants.

Finally, the positive relationship between the attitude attached to classmates thinking that a good point was made (B-15) and participation can be accounted for by a higher judged likelihood that this will happen on the part of High participants. The evaluation of this
outcome was high for all subjects, independent of their participation level. The belief concerned with starting a discussion (B-7) has already been elaborated on in connection with the findings for belief B-3 (arguments) above. The attitude towards the possibility that ignorance or misunderstanding of the assigned readings might be revealed as a result of speaking up (B-13) demonstrates a positive relationship to participation largely because of the lower likelihood rating given by High participants; students in general rated such an occurrence as moderately bad. The tentative finding of a relationship of participation to the confidence felt about making an irrelevant or trivial point (B-14) appears to be due to the negative relationship observed between judged likelihood of this occurring and participation level. Students in general rated this consequence as being very undesirable.

Conclusion of Item Analysis. In conclusion of the analysis of items on the Belief Inventory, what areas of concern appear to be definitely related to the intention to participate and actual participation behavior? The fifteen consequences at issue can be divided into four distinct foci:

Reaction of classmates:

(B-1) The class might laugh at me.
(B-10) The class might think I'm trying to earn "brownie points."
(B-12) The class might think I'm talking only to be noticed.
(B-15)*2 The class might think I made a good point.

---

2 These items were shown to have a significant relationship to participation.
Reaction of teacher:
(B-2)* I might make a good impression on the teacher.
(B-4) The teacher might respond in a negative manner.
(B-6)* What I have to say will be ignored.
(B-9) The teacher might ask me to follow up on what I said and I won't be able to.

Intellectual competence:
(B-5)* I might be wrong.
(B-11) I might not make myself understood.
(B-13) I might show that I haven't done or understood all the reading.
(B-14) My comment or question might be seen as repetitive, trivial, or irrelevant.

Process of discussion:
(B-3)* It might result in an argument.
(B-7) It might stimulate discussion.
(B-8)* It might help clarify a concept.

These classifications were made on the basis of an intuitive primary content analysis. Several of the items could be included under more than one heading. Given this classification, each of the foci contains one or more salient item.

As far as the reaction of classmates is concerned, only the positive consequence, that the class will think a good point has been made, was positively related to participation. Fear or confidence in the face of the other three negative consequences was not shown to be related to participation. Nevertheless it should be recalled that these non-related items were included in the questionnaire because a random sample of students mentioned these possible consequences with
sufficient frequency. It appears therefore that these concerns, while not hindering or encouraging participation, are on students' minds.

Two out of four items related to the reaction of the professor appeared to make a difference in participation levels. Students' beliefs about making a good impression on the teacher and about being ignored played a role in their participation. Fears about being responded to in a negative manner and being put on the spot after a remark did not appear to be related to the actual decision to speak up.

Only one of the items concerned with the demonstration of intellectual competence appeared to make a difference in participation level: participation decreased as the fear of being wrong increased (i.e. the attitude was less positive). The other three items, all descriptive of undesirable consequences, evoked relatively unsanguine responses from students in general, regardless of their participation.

The three items which could be said to relate to the process of discussion yielded two areas which appeared to be related to the decision to speak up. While the possibility of stimulating discussion evoked a moderately positive response from students in general, regardless of their participation level, the possibility of causing an argument and of clarifying a concept was regarded more positively as participation level increased.

From this discussion it can be seen that no single area of concern appears to make the difference in a student's willingness to participate. Instead, both components of the task group, the teacher and classmates, have a bearing on participation and both components of the task at hand, demonstrating intellectual competence and contributing
to the group process of discussion, are related to participation levels.

**Hypothesis IX**

High participants feel greater expectancy on the part of significant others for them to participate in class discussions than do Low participants, as measured by the Norms section of the Attitude Inventory.

Initially this hypothesis was tested strictly within the framework of the Fishbein-Ajzen theoretical model, according to which two factors, normative expectancy ("my teacher probably thinks I should/I should not speak up in class") and motivation to comply with this expectancy ("How much do you want to do what your teacher wants you to do?") are multiplied to arrive at a normative influence measure for each reference group. These cross-product measures are then summed to arrive at an overall normative influence measure. Neither this summary measure nor the individual cross-products for each reference group produced any of the hypothesized results regarding group differences or correlations. Upon closer examination of the data, it was discovered that the expectancy measures alone did support the correlational hypothesis, while the compliance measures bore no discernible relationship to participation. Further examination of the data revealed very low compliance measures for all students on all of the reference groups. That is, students tended to claim only a very slight desire to do what the reference groups might want them to do. A possible explanation for this is that the wording of the compliance items did not so much tap the intended attitude as the subject's desire to proclaim herself independent of pressures by authority figures and peers.
This possible contamination of the items by the appeal to give socially desirable answers led to the decision to disregard the compliance component altogether and to consider the normative expectancy items alone as sufficiently indicative of normative influence to allow conclusions to be drawn about its relationship to participation. It seems reasonable to assume that subjects are generally not indifferent to the expectations of their peers and their teachers: the significant relationships found between these expectations and participation support this view.

Subjects were asked about the degree to which the following reference groups wanted them to participate in the target course: female and male friends (D-1, D-2), female and male classmates (D-3, D-4), the teacher of the target course (D-5), and "most people who are important to me" (D-6). As only about half the students could answer the question about male classmates (i.e., only subjects in mixed-sex classes), the composite measure of normative expectancy was an average, rather than a sum, of the normative items answered by each subject. (Thus for 27 subjects this composite measure included data on item D-4, while for 25 subjects it did not.)

When High and Low participants were compared on this averaged normative expectancy measure, no significant differences were obtained (see Table 14) and the hypothesis cannot, as stated, be accepted. However, this measure was significantly and positively correlated with the observation measure of average talk and with the class-specific participation reports of intention and teacher-classification. In addition, a significant positive correlation was found with the general
tendency measure (for correlations, see Table 15). The conclusion is therefore warranted that High participants are more likely to feel expectations by significant others to participate in class discussions than are Low participants and the correlational hypothesis can be accepted.

**Item Analysis of the Normative Expectancy Measure**

Once again, it is instructive to examine the pattern of individual items on the normative expectancy measure. Which of the reference groups appear to make a difference to participation and which do not? Each of the six reference items was submitted to separate correlational analyses with the observation measure of average talk, with the intention measure, and, where the intention measure failed to show a significant correlation, with the teacher-classification. The results, reported in Table 18, show that female friends' expectations were definitely related to participation, while the evidence for the expectations of male friends is conflicting.

At this point it is interesting to ask whether the expectations felt from female friends differed significantly from those felt from male friends. No such difference was revealed by t tests that compared all subjects, that compared only High participants, and that compared only Low participants. Thus, neither female students in general, nor High participants only, nor Low participants only, believe that male friends hold significantly different standards or expectations for them, than do female friends.
### TABLE 18

Pearson Correlations between Individual Normative Pressure Items and Participation Measures

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<th>TEACHER CLASSIFICATION</th>
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<tr>
<td>NORM 2 - Male friends</td>
<td>.00</td>
<td>.27*</td>
<td>.11</td>
</tr>
<tr>
<td>NORM 3 - Female classmates</td>
<td>.34**</td>
<td>.32**</td>
<td>.31*</td>
</tr>
<tr>
<td>NORM 4 - Male classmates</td>
<td>.36*</td>
<td>.54**</td>
<td>.37*</td>
</tr>
<tr>
<td>NORM 5 - Teacher</td>
<td>.24*</td>
<td>.36**</td>
<td>.23*</td>
</tr>
<tr>
<td>NORM 6 - Important People</td>
<td>.12</td>
<td>.30*</td>
<td>.28*</td>
</tr>
</tbody>
</table>

Note. N = 52 for Average Talk and Intention, except for NORM 4, where N = 27.

N = 49 for Teacher Report, except for NORM 4, where N = 25.

* \( p < .05 \)

** \( p < .01 \)
The expectations of classmates, both male and female, were positively related to participation. The question was raised once more, whether the expectations differ according to the sex of the classmate. The tests again failed to reveal any significant differences and no support was found for the often-held notion that male students inhibit female students' participation by their lower expectancy, as opposed to the expectancy by female students, that females speak up in class.

The expectation on the part of the teacher for participation was related positively to both the student's intention and actual demonstrated behavior. Here it is of interest to see whether the expectations felt from male teachers are different from those felt from female teachers. Again, the widely-held belief that males in authority wish to keep females quiet is not supported by this data, for no such differences were in evidence.

The final and most general reference group, "most people who are important to me," was also felt to have expectations that varied positively with both intended and actual participation. The hypothesis that participation is positively related to expectations by salient reference groups is therefore supported not only in general terms, but in terms of each of the groups examined.

Additional Findings

In addition to the major hypotheses dealt with in the previous section, a number of related questions were investigated in this study. It was considered of interest, for example, whether students' participation was related to how they perceived the atmosphere of the
target course in terms of formality, competitiveness and teacher or student-centeredness. Data was also collected to answer the question of whether not having done the assignment was related to participation, and whether the degree of ease felt with fellow students was related to participation. Further areas of investigation were the relationship of reported "talkativeness" in non-class settings to talkativeness in class, of grades received in the target course and participation in that course, and the relationship of certain demographic variables, such as student class, major field, and home campus, to participation. Finally, students' perception of whether class participation was a "problem" in general and their satisfaction with their own level of participation were examined in relationship to such variables as subjects' actual and reported participation levels, their home campus, and their sex.

Participation and Class Atmosphere

Subjects were asked to rate the atmosphere of the target course on the following dimensions (Appendix F, items A-1 to A-3):

1) formal--informal
2) competitive--cooperative
3) teacher centered--student centered

Each of these ratings were then submitted to correlational analyses with the two observation measures of average talk and average high initiatives and with the intention to participate measure. Results of these analyses and of analyses discussed in sections below are reported in Table 19. From the figures it can be seen that the intention to speak is related inversely to how formal the atmosphere is
<table>
<thead>
<tr>
<th>Class Atmosphere Ratings</th>
<th>Average Talk</th>
<th>High Initiatives</th>
<th>Intention</th>
<th>General Tendency</th>
</tr>
</thead>
<tbody>
<tr>
<td>formality--informality</td>
<td>-.18</td>
<td>-.28*</td>
<td>-.30*</td>
<td>-.23*</td>
</tr>
<tr>
<td>competitiveness--cooperativeness</td>
<td>-.23*</td>
<td>-.34**</td>
<td>-.16</td>
<td>-.03</td>
</tr>
<tr>
<td>teacher-centeredness--student-centeredness</td>
<td>-.18</td>
<td>-.26*</td>
<td>-.32**</td>
<td>-.08</td>
</tr>
<tr>
<td>Other Target Class Variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>preference for teacher-centered or student-centered instruction</td>
<td>-.12</td>
<td>-.20</td>
<td>-.27*</td>
<td>-.06</td>
</tr>
<tr>
<td>degree of ease felt with classmates</td>
<td>.39**</td>
<td>.36**</td>
<td>.53***</td>
<td>.35**</td>
</tr>
<tr>
<td>likelihood of saving comment for after class</td>
<td>-.10</td>
<td>-.25*</td>
<td>-.11</td>
<td>.02</td>
</tr>
<tr>
<td>likelihood of discussing subject with friends outside of class</td>
<td>.10</td>
<td>.15</td>
<td>.24*</td>
<td>.21</td>
</tr>
<tr>
<td>impression of degree of influence of participation of final course grade</td>
<td>-.03</td>
<td>.10</td>
<td>.20</td>
<td>.02</td>
</tr>
</tbody>
</table>

Note.  \( N = 52 \)

On bipolar items, the first-mentioned alternative received the high score.

\* \( p < .05 \)

\** \( p < .01 \)

\*** \( p < .001 \)
judged to be. In addition, the high initiative measure was negatively
correlated, indicating that high initiatives are more readily taken by
students who judge the atmosphere of a class to be relatively less
formal. The question as to which variable influences the other can be
tentatively considered by looking at the relationship of professed
general tendency to participate with perception of formality. The
correlation of these measures was \( r(52) = .23, p < .01 \), leading to the
tentative conclusion that high participants in general are more likely
to judge the atmosphere of a class as more informal, than low participants.

Results for the competitive--cooperative dimension showed that
actual participation was related inversely to how competitive the
atmosphere was judged to be. However, as there was no significant
correlation with the intention measure, it is difficult to draw any
conclusions.

Results for the dimension of teacher or student-centeredness show
that low participants, both in terms of intention and observed high
initiatives, are more likely to perceive the class dynamics as teacher-
centered than are high participants. This result is perhaps not
surprising, as one would expect students who participate in (and thereby
affect) the proceedings of a course to judge the course to be more
student-centered than students who do not participate in or affect the
proceedings.

Participation and Other Attitudes about the Target Course

Subjects were also asked questions regarding 1) how much at ease
they felt with their classmates, 2) how teacher or student-centered they
would ideally like the course to be, 3) to what extent they felt that their participation affected their grade in this course, 4) how likely they were to save a comment or question for after class, and 5) how likely they were to discuss the subject matter of the course with friends outside of class (items A-4 to A-8). Each of these questions is discussed in turn below; Table 19 provides relevant data.

[For the question about degree of ease felt with classmates, correlational analyses showed that both participation intention and actual participation were consistently and strongly related to degree of ease with classmates.] The fact that general tendency also correlated significantly and positively with the reported ease felt with classmates in the target course leads to the possible conclusion that the tendency to be an active participant predisposes students to regard their classmates with ease, which in turn is related to high participation levels in the particular class in which this predisposition is manifested. A related question of interest was whether the degree of ease felt with classmates was related to the extent to which those classmates were felt to have expectations for the student to speak up. Indeed such a positive relationship was found: the correlation of reported ease with expectations by female classmates to participate was $r(52) = .27$, $p < .05$ and with male classmates $r(27) = .55$, $p < .005$.

When asked about their preference for teacher or student-centered instruction in the target course, a low but significant correlation was found between preference for student-centeredness and the intention to participate. Neither the observed participation nor the teacher's
report of participation correlated with this measure, however, so no clear conclusions can be reached.

The impression that students reported about the effect their participation would have on their final grade was not related to any participation measures. The finding that students did not take into account possible consequences for their final mark when deciding whether to participate or not becomes more meaningful when the related question is asked: just how much did students in general feel that their participation would affect their grade? The mean for all female subjects was 4.78, with a standard deviation of 1.67. On the 7-point bipolar scale, with poles labeled "no effect" and "strong effect," that was used for this item, the results seem to indicate that most students expected their participation to have no more than a moderate effect on their grades. How appropriate was students' judgment about this effect? The eight teachers in the target courses were asked to indicate, on the same scale, how much they did, in fact, take participation into account. Four teachers chose the scale level 5 while the levels 3, 4, 6 and 7 were each chosen once. The correlation between student impression and teacher report was \( r(52) = .38, p < .001 \), suggesting that students' guesses were not very reliable.

The question about how likely a student was to save a comment or a question for after class was asked in an effort to discover whether subjects who failed to participate in class did perhaps have something to say, but chose to say it outside the class setting, or whether Low participants tended not to have anything to say in any case. The correlational analyses revealed two negative relationships: between
likelihood to save comments and the taking of high initiatives and the professor's report of participation (see Table 19). It is therefore probably the case that the more silent students do have something to say but prefer to say it outside of class. How much is this tendency to prefer making comments without the presence of classmates related to the degree of ease felt with these classmates? A negative correlation of $r(52 = -.26, p < .05$ was obtained for these two indices, leading to the conclusion that students who save their comments for after class are indeed less likely to feel at ease with their classmates.

The final question in this section is concerned with the possibility that high participation is a reflection of the subject's greater interest in or involvement with the topic of the course and will manifest this greater involvement by speaking about it outside of class with peers. Subjects were therefore asked to rate the likelihood with which they discuss the subject matter of the course with their friends outside of class. Only one positive relationship was discovered; this was with the intention measure (see Table 19). This isolated finding is insufficient to allow any clear conclusions to be drawn.

**Participation and Preparedness on Assignments**

The question was investigated whether a subject's participation at a particular class session was related to whether the subject had done the assignment for that session. Subjects present at the first observation were divided into those who remained silent and those who spoke up at least once. A $t$ test of group differences on reported assignment completion (item Q1-6) revealed that the silent group
completed a significantly smaller portion of the assignment than did the group that spoke up ($t(82) = 2.48, p < .01$). When the same procedure was used for Observation 2 (Q2-10), the $t$ value reached only a .06 level of significance; however when males and females were taken into account, such a difference attained the $t$ value of 2.13, significant at the .02 level. These findings tend to support the notion that preparedness on assignments is related to participation level. The next question is whether students don't speak up because they have not done the assignment or whether students who tend to remain quiet also tend not to do their assignments. A tentative answer comes from the fact that students who spoke up during Observation 1 did significantly greater portions of the assignment for Observation 2 than did silent students ($t(67) = 2.98, p < .002$).

**Participation and Satisfaction with Class Session**

After each class observation students were asked to rate their satisfaction with that class session to them (items Q1-7, and Q2-11). The question of interest was whether active involvement in the class process was related to perceived value of the class. Subjects in each observation were partitioned according to whether they participated or not and $t$ tests of group differences on the evaluation score were computed. The results showed that students who participated during Observation 1 reported significantly more satisfaction with the class than subjects who did not participate ($t(82) = 1.84, p < .05$). The results for Observation 2 were in the same direction but reached only a .07 level of significance. Again a question can be raised whether
students who generally tend to participate also generally tend to rate their classes more highly. A correlational analysis between general tendency and the averaged class evaluation revealed no systematic relationship.

**Participation and Talkativeness in Other Settings**

The question was addressed whether class participation tendency is a reflection of a more general participation or "talkativeness" tendency manifested in various life situations. Subjects were asked (item G-2) about how talkative or reticent they tended to be with a) friends, b) family members, c) professors on a one-to-one basis, and d) in task groups. When these self-ratings of "talkativeness" were correlated with the most appropriate measure here, general tendency, the results showed low but significant correlations with all of these measures, except the family measure. (Correlations were: general tendency with talkativeness with friends, r(52) = .23, p < .05; with talkativeness within the family r(52) = .10, not significant; with talkativeness with professors outside of class r(52) = .26, p < .05; with talkativeness in task groups r(52) = .39, p < .005.) The highest correlation was with the measure pertaining to task groups. It thus appears that a small, but significant amount of the variance in general class participation can be accounted for by a more fundamental tendency to verbally interact in groups.

**Participation and Grades Earned in Target Course**

The purpose of the questions in this section was to see if there existed any relationship between various grades received in the target
course and a) participation in that course and b) general participation tendency. It will be recalled that the professor in each of the sample classes was asked to place each student in one of four participation categories (from "high participant" to "never participated"). The professor was also asked to indicate the grade or evaluation each student received in the course in the following areas: 1) quality of participation, 2) papers, 3) exams, 4) oral reports, and 5) overall course grade (Appendix G, item 4). The data on oral reports were ignored in the subsequent analysis as very few subjects received an evaluation in this category. The participation measures for the course which were chosen for the correlational analysis were average talk, teacher-classification and intention. Table 20 shows that consistently high correlations were obtained between the professor's perception of the student's participation and the grades given by the professor, that only two grade categories correlate with the observed talk measure, while no significant correlations at all are discovered with students' intention to participate. These results lead to the conclusion that professors' perception of how much students participate is closely tied to how they grade students. To the extent that the observed participation measure can be considered a reliable index of participation in the course, a look at correlations between observed talk and grades received might shed some light on how "objective" the professor's participation ratings are. From Table 20 it can be seen that significant correlations were obtained with the exam mark and the final mark. While these results seem to indicate that the High participant tends to be a more successful student in terms of grades on exams and the final
TABLE 20
Pearson Correlations between Teacher Evaluation of Course Work and Participation Measures

<table>
<thead>
<tr>
<th></th>
<th>Average Talk</th>
<th>Teacher Classification</th>
<th>Intention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of participation (N = 47)</td>
<td>.21</td>
<td>.50 ***</td>
<td>.13</td>
</tr>
<tr>
<td>Grades of papers (N = 49)</td>
<td>.20</td>
<td>.48 ***</td>
<td>.00</td>
</tr>
<tr>
<td>Grades on exams (N = 23)</td>
<td>.60 ***</td>
<td>.60 ***</td>
<td>.01</td>
</tr>
<tr>
<td>Final course grade (N = 49)</td>
<td>.32 **</td>
<td>.61 ***</td>
<td>.10</td>
</tr>
</tbody>
</table>

* < .05
** < .01
*** < .001

TABLE 21
Differences in Observed Participation between Females for whom Target Course Was in Their Major Field of Concentration and those for whom Course Was Outside Major

<table>
<thead>
<tr>
<th></th>
<th>MAJORS</th>
<th>NON-MAJORS</th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Talk</td>
<td>12.60</td>
<td>22.29</td>
<td>-1.74</td>
<td>44</td>
</tr>
<tr>
<td>Average High Initiatives</td>
<td>.88</td>
<td>1.24</td>
<td>-.85</td>
<td>44</td>
</tr>
</tbody>
</table>

*p < .09 with two-tailed test
course grade, it appears that professors will tend to perceive their "better" students as participating more frequently than they actually do, and/or tend to underestimate the amount of participation from a student whose contributions are not valued as highly.

Do students who generally tend to participate more also tend to receive higher marks than students who generally participate less? The correlations of grades with general tendency were low but significant: self-professed High participants tend to have their verbal contributions evaluated more highly by the professor than Low participants, and the higher the participation level, the higher does the final course grade tend to be. The negative findings are of interest as well: the ability to write good term papers or good exams does not seem related to general participation tendency. This leads to the tentative conclusion that High and Low participants in general show about equal proficiency in the subject matter of courses but that in the calculation of final grades it is the higher participants who tend to come out on top. Participation does seem to make a difference!

**Participation and Demographic Variables**

Data was collected on subjects' class level (i.e. freshman, sophomore, etc.), subjects' home campus and subjects' major field of study in order to determine whether these variables were related to class participation. (Data were also available on subjects' age, but a coding imprecision made analysis of this variable impractical.) The variable of student class was found to correlate significantly with three key measures of participation: average talk \( r = .31, N = 78, p < .005 \), general tendency \( r = .22, N = 78, p < .05 \), and teacher classification
(r = .60, N = 48, p < .001). It may therefore be concluded that the more experienced (and usually older) college student is more likely to participate in class discussions than the less experienced and younger college student.

A question of interest was whether students' participation was related to whether they were in a class at their home campus or at another campus. Unfortunately the small identifiable sample of cross-campus exchange students did not warrant any analysis.

A final demographic variable of interest was whether a subject was observed in a class that was in her major field or not. It was reasoned that a student might feel less confidence and/or involvement with the subject matter if the course was not in her major field and that this attitude would be reflected in lower participation. The t tests between majors and non-majors on participation measures did not, however, reveal any significant differences in the predicted direction. On the contrary, two-tailed significance tests produced marginally significant results pointing in the opposite direction, i.e. non-majors came out ahead of majors, both on the average talk measure and the "high-low" categorization derived from this measure. See Table 21 for results. From these results it appears that non-majors do not tend to be handicapped in their participation by their non-major status; on the contrary, non-majors appear more likely than majors to participate in discussions.
Is Class Participation a Problem?

The author had a particular interest in the question whether students perceive class participation as a problem for themselves as individuals and at their home campus, i.e., whether the "problem" chosen for study in this investigation is indeed a problem. Thus, subjects were asked the following question about themselves (Appendix D, item 8):

How satisfied are you with your current general participation level?

1) I would like to participate more than I do now.
2) I am just about satisfied with my present rate.
3) I feel I participate too much.

Certainly one of the most fascinating findings in this study was the fact that not a single subject chose alternative 3, i.e. no one, male or female, thought he or she talked too much. Out of the 78 female subjects who answered this question, 31 (39.7%) were satisfied with their current rate, while 47 (60.3%) indicated they would like to participate more than they do now. This unsatisfied group certainly represents a substantial percentage!

To what extent is a student's satisfaction with her current level of participation related to the magnitude of that level? The correlation between general tendency and satisfaction was found to be moderate ($r(78) = .43, p < .005$). The correlation with the observation measure of average talk was about the same (.41), as was the correlation with the class-specific intention measure (.44). These results allow not only the conclusion that a lower level of satisfaction
is associated with low participation, but the results also are heartening in that students with low levels of participation tend to profess a desire to improve their level of participation.

An important related question is whether participation is only a personal problem or whether it is seen to be a general problem on campus. Subjects were asked to rate the extent of the problem at their college on a 7-point scale, with the polar dimensions labelled "a large problem" and "no problem" (Appendix F, item G-1). Statistics for female subjects were $N = 52, \overline{M} = 5.19$, s.d. = 1.40 and mode = 6.0 ($N = 21$). This certainly indicates that women students were in general agreement that class participation is a problem of fairly large proportions at their schools.

Do campuses differ in the perceived degree of severity of the problem? To answer this question, a one-way analysis of variance was performed on all subjects (males and females) from the four major campuses represented in the sample. Table 22 shows the results. The figures show that subjects at the single-sex institutions, Smith and Mt. Holyoke, rate the problem as higher than subjects at the coeducational colleges of Amherst and Hampshire. A $t$ test between these two categories confirms the result (see Table 23 for results).

These findings may be interpreted as a tentative confirmation of one of the original hypotheses of this study: that class participation is perceived to be a more serious problem at all-female institutions than at mixed-sex institutions. Even though our student sample did not confirm this hypothesis in terms of their own behavior (i.e. in Hypothesis II), the data under present discussion certainly point in that direction.
### TABLE 22

One Way Analysis of Variance of Rating of Severity of Participation Problem between Four Major Campuses

<table>
<thead>
<tr>
<th>Campus</th>
<th>M</th>
<th>SD</th>
<th>SS</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMITH (all female)</td>
<td>5.60</td>
<td>.89</td>
<td>23.20</td>
<td>30</td>
</tr>
<tr>
<td>MT. HOLYOKE (all female)</td>
<td>5.40</td>
<td>1.51</td>
<td>20.40</td>
<td>10</td>
</tr>
<tr>
<td>HAMPSHIRE (co-educational)</td>
<td>3.71</td>
<td>1.80</td>
<td>19.43</td>
<td>7</td>
</tr>
<tr>
<td>AMHERST (all male until 1975; now co-educational)</td>
<td>3.92</td>
<td>1.85</td>
<td>40.92</td>
<td>13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SS</th>
<th>df</th>
<th>MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>39.03</td>
<td>3</td>
</tr>
<tr>
<td>Within groups</td>
<td>103.95</td>
<td>56</td>
</tr>
<tr>
<td>Total</td>
<td>142.98</td>
<td>59</td>
</tr>
</tbody>
</table>

\[ F = 7.01 \]
\[ p < .0004 \]

### TABLE 23

Difference between Subjects from All-Female and Mixed-Sex Classes on Rating of Severity of Participation Problem

<table>
<thead>
<tr>
<th>STUDENTS AT ALL FEMALE COLLEGES (40)</th>
<th>STUDENTS AT MIXED COLLEGES (22)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Rating of participation problem at student's home campus</td>
<td>5.55</td>
</tr>
</tbody>
</table>

*** \[ p < .001 \]
To what extent is a student's rating of the general problem of class participation simply a projection of the personal problem? To shed light on this question, a correlation was computed between professed general tendency and the rating of the problem. Results failed to show a significant relationship. The conclusion may therefore be drawn that class participation is perceived as a moderately large problem by students, independent of their own participation level.

Teachers of the eight sample classes were also asked to rate the severity of the class participation problem. While this sample is too small to allow any inferences to be made about the teacher population in general, their judgments are nevertheless of interest.

Ratings of the severity of the participation problem by the six teachers whose home campus was all-female averaged out to be 5.17. The ratings of 7, 6, and 3 were given by one teacher each, while three teachers chose a rating of 5. Thus all but one of these teachers rated the problem to be above the mid-point of severity. The two teachers whose home campus was a mixed-sex institution rated the problem 4 and 3; these ratings are additional evidence that participation is a more serious problem at all-female institutions.

The Effect of Sex Composition and Teacher Sex on Attitudes Related to Class Participation

It will be recalled that a large set of attitudinal questions about class participation and related subjects was asked with specific reference to the target course. These data make possible an analysis as to whether not just class participation itself, but the attitudes towards the target class differ according to whether the class was
single-sex or mixed-sex, and male-taught or female-taught. A series of analyses of variance was therefore undertaken for the attitudes measured. No effect of either sex composition or teacher sex, nor any interactions were found for Long Questionnaire items A-3 to A-5, and A-7 to A-9. Thus, the degree of teacher/student centeredness, the degree of ease felt with peers, the anticipated effect of participation on grades, the likelihood of discussing the subject matter outside of class and the intention to speak up did not appear to be affected by either the factor of teacher sex or the factor of sex composition of the class.

However, significant effects were found for the atmosphere questions regarding formality (item A-1) and competitiveness (item A-2), as well as for the likelihood that the subject will save her question or comment for after class (item A-6). Table 24 reports these results in detail. It can be seen from the figures that while no effect was evident for teacher sex, single sex classes were judged to be more formal and more competitive than mixed-sex classes and were more likely to find the subject saving her remarks for after class.

The individual consequence items (items B-1-15: "how likely?") and the consequence evaluation items (items C-1-15: "how good/bad?") were also submitted to separate analyses of variance. Significant results were found for a number of items. Table 24 reports the results in detail. These results show that on all consequences where sex composition had a significant effect, it was a case of undesirable consequences being judged as more likely to ensue upon speaking up in
### TABLE 24
Summary of Analyses of Variance (Sex Composition x Teacher Sex) for Female Subjects with Course-Specific Attitudes as Dependent Variables

<table>
<thead>
<tr>
<th>Consequence</th>
<th>MS</th>
<th>F</th>
<th>MS</th>
<th>F</th>
<th>MS</th>
<th>F</th>
<th>MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formality</td>
<td>8.98</td>
<td>4.12*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competitiveness</td>
<td>16.77</td>
<td>10.35**</td>
<td>2.67</td>
<td>1.65*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Save Comment for After Class</td>
<td>15.69</td>
<td>4.40*</td>
<td>.71</td>
<td>.20</td>
<td>.11</td>
<td>.03</td>
<td>3.56</td>
</tr>
<tr>
<td>Consequence 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>2.48</td>
<td>1.03</td>
<td>12.73</td>
<td>5.27*</td>
<td>9.80</td>
<td>4.06*</td>
<td>2.42</td>
</tr>
<tr>
<td>Evaluation</td>
<td>.02</td>
<td>.01</td>
<td>7.79</td>
<td>3.84*</td>
<td>5.58</td>
<td>3.04</td>
<td>2.03</td>
</tr>
<tr>
<td>Consequence 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>19.71</td>
<td>8.88**</td>
<td>2.81</td>
<td>1.27</td>
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All analyses have df (1, 48)

**Definition of Consequences:**

Consequence 3: An argument might result
Consequence 4: The teacher might respond in a negative manner
Consequence 9: The teacher might ask me to follow up on what I said and I won't be able to
Consequence 11: I might not make myself understood
Consequence 12: The class might think I'm talking only to be noticed
Consequence 13: I might show that I haven't done or understood all the reading
Consequence 14: My comment or question might be seen as repetitive, trivial, or irrelevant
a single-sex class than in a mixed-sex class. The five items to fall into this category were:

(B-4) The teacher might respond in a negative manner.

(B-9) The teacher might ask me to follow up on what I said and I won't be able to.

(B-12) The class might think I'm talking only to be noticed.

(B-13) I might show that I haven't done or understood all the reading.

(B-14) My comment or question might be seen as repetitive, trivial or irrelevant.

All but one of the 15 consequences were regarded about equally desirable or undesirable by females in single-sex and mixed-sex classes. The one exception was for item C-9: females in single-sex classes judged the event of having to follow up and not being able to as significantly worse than subjects in mixed-sex classes. This evaluation was also subject to an interaction effect: the evaluation was most negative when a single-sex class was coupled with a male teacher.

Which consequences and their evaluations were affected by the sex of the teacher? Significant main effects were found for four items: with male teachers females thought the following consequences were more likely:

(B-3) My comment might result in an argument.

(B-14) My comment might be seen as repetitive, irrelevant or trivial.

Subjects also felt that causing an argument to start was more desirable (item C-3) and not making oneself understood was more undesirable (C-11) in classes taught by male teachers than by female teachers.
Interaction effects were found for items B-3 and C-9. That is, arguments were felt to occur most likely in single-sex classes taught by male teachers, and the inability to follow up was judged to be most undesirable in mixed-sex classes taught by male teachers.

However, the analysis of variance of the single overall belief measure revealed no main effect for teacher sex or for sex composition of the class.

In conclusion, it can be said that a number of individual components of the belief system indicate more positive attitudes and beliefs about participation in mixed-sex classes. There appears to be less worry about undesirable consequences which is likely to be related to, or even a result of, the less formal and less competitive atmosphere considered to prevail in mixed-sex classes. The greater judged likelihood of negative consequences of speaking up may explain why subjects are more likely in single-sex classes to save their remarks for outside the context of that atmosphere. These conclusions must, however, be regarded with caution, for the large number of analyses increased the likelihood that findings were due to chance rather than the experimental effect.

**Summary and Discussion of Attitudinal and Personal Variables**

This chapter has reported and discussed the findings regarding the relationship of a wide variety of attitudinal and other personal variables of female college students to their observed and reported class participation tendencies. The large number of variables for a relatively small and specialized sample of female students implies certain
methodological difficulties in interpretation. In addition, the attempt to tie all these diverse findings together into a coherent summary account presents a difficult challenge. The following sections will deal with these two areas.

Methodological Limitations

In the effort to draw as thorough as possible a profile of the High participant female vis-à-vis the female who participates little or not at all, a wide variety of attitudinal and personal data were gathered. This necessitated such a large number of statistical analyses that the possibility of experiment-wise error demands a cautious stance towards acceptance of their results. On the other hand, the approach of checking results by relating dependent variables to several different indices of participation compensated somewhat for this limitation. In fact, the use of several sources of information about students' participation tendency increased the reliability of participation data considerably.

The attempt to go beyond findings about this particular sample of female students to inferences about female students, or even all females, in general, is hampered by a number of factors. First, the sample of observed students was not drawn at random. Whole existing classes in the social sciences were enlisted for this study and thus excluded the type of female who doesn't enroll in such classes. More fundamentally, however, these classes were drawn from colleges that are probably not representative of colleges in general: these colleges are all highly selective in their admission policies, and three out of the
four have long histories of single-sex education which probably make their student bodies and their educational environment different from other colleges.

Additional caution about accepting results with confidence is dictated by the fact that the sample of female subjects who took the Long Questionnaire, i.e., the source of the bulk of the data, was again not random. Students volunteered to take this time-consuming questionnaire. It is possible that those students who chose not to take it have certain attitudinal and personal characteristics regarding participation which, had these been included in the data analyses, might have changed the results.

The summary of findings and conclusions below must therefore be taken as tentative only, suggesting, however, a series of hypotheses for further studies which have good potential of being validated.

Summary and Conclusions

A basic assumption underlying the notion of High participant versus Low participant was that students are characterized by a general tendency to participate at high or low levels, i.e. that participation in any given situation is determined by a combination of situational factors and a basic proclivity for verbal interaction. This assumption was validated to a considerable extent by the high consistency of the various participation measures.

The cross-checking of the various participation measures (drawn from direct observation, from student self-reports, and from teachers' reports) also warrants the conclusion that students are reasonably
reliable in their own assessment of participation tendency. This finding is particularly useful in that it implies that future studies of participation do not necessarily need to gather direct observation data to establish participation levels, but that they could profitably use students' (and teachers') reports.

The most effective way of summarizing findings about attitudinal and personal variables is perhaps to draw up a profile of the typical High participant female student, with indications of how this profile differs from the profile of the typical Low participant. Such an approach is presented below.

While there is only limited evidence that the High participant tends to be generally more assertive and hold more feminist ideas about the rights and roles of women in general, the evidence is strong that she shows a greater tendency to approach intellectual verbal conflict situations in general, as compared with the Low participant. This greater eagerness for such situations appears to be a function of her greater enjoyment of such encounters, her stronger feeling that intellectual controversy can be productive, and her relative lack of discomfort in the face of contrary opinions. She is also generally less worried about revealing intellectual short-comings.

As far as intellectual verbal encounters in the classroom setting are concerned, the High participant attaches greater value to the argumentative mode than does the Low participant. She feels more comfortable in exchanges with her peers, reflected in both her greater willingness to hear their opinions, whether contrary to hers or not, and her greater confidence that her comments will be valued by her listeners.
She is also more confident of the teacher's approval of her contributions. Her overall opinion of the value of speaking up in class is more positive, as is her belief system about possible consequences of speaking up.

Her motivation to be an active participant seems to be partly due to the greater expectations for participation that she feels coming from friends, classmates, and teachers. She does not appear influenced by considerations of how this will affect her grade; in fact, her guess as to how strong an influence her participation will have on her grade is rather weak. Nevertheless, she tends to be awarded a better final grade than her Low participant peer, even though it is not clear that any of the major components of that grade are related to her participation level.

The High participant tends to perceive greater informality in her courses and possibly less competitiveness. She also judges her class to have been more student-centered than does her Low participant peer. There is also limited evidence that she prefers her classes to be more student-centered than teacher-centered.

She tends to report greater satisfaction with class sessions than does the student who does not participate. She is also more likely to have completed the assignment. Finally, she tends to be a more experienced student, in terms of her class level.

The importance of this investigation into participation levels and associated factors is demonstrated by the fact that female students, and especially those at single-sex colleges, regarded class participation as a general problem of at least moderate severity,
regardless of their personal participation tendency. Teachers, too, tended to echo this assessment of the problem. The hope that a better understanding of factors associated with low participation will help to alleviate this problem situation is given encouraging support from the finding that, in fact, about 60% of female students profess a desire to become more active in class discussions.
CHAPTER V
CONCLUSIONS AND IMPLICATIONS

Review of the Rationale of this Study

As stated in Chapter I, this investigation was undertaken for two purposes: the short-range purpose of identifying situational and attitudinal variables associated with class participation by female students; and the long-range purpose of providing data useful in the development of strategies to help college women to broaden their communication skills. The study largely accomplished these goals. While these goals were concerned with women in the academic setting, they were chosen because of the author's more fundamental interest in contributing knowledge that might ultimately be useful for women in all life settings. Chapter I dealt in detail with the difficulty that many women experience in expressing themselves, thus hampering their effectiveness in shaping policies that affect their lives.

In order to make a beginning in alleviating this difficulty the author chose to focus on a particular arena in which this difficulty often manifests itself: the academic setting. This choice of arena was suggested by the fact that women, during their college years, are undergoing an important formative stage, during which many skills vital to their post-academic lives are developed. It was reasoned that an identification of factors operative in developing and limiting intellectual verbal self-assertion during this life stage might well suggest intervention strategies to enhance such development. The college setting is potentially particularly suited to the development
and implementation of such intervention programs. Thus, the results of this study, while warranting conclusions only in regard to the college classroom setting, are expected to have ultimate implications for women's lives in general.

**Overview of the Concluding Discussion**

Due to the large number of hypotheses and subsidiary questions dealt with in this study, detailed results and summary discussions of findings were presented at the end of Chapters III and IV. This chapter will briefly summarize and build on those discussions to deal with implications of the findings. This will be done in two parts: the first part will focus on the sex-related situational factors, while the second part will focus on attitudinal and other personal factors. Each of these parts will include discussions of methodological contributions and suggestions for further research. The chapter will conclude with an exploration of the relationship of this study to women's lives in general.

However, before these discussions are undertaken, it is interesting to set the context by repeating some of the simplest and most fundamental findings:

- 41% of female subjects never said anything at all
- 82% of students talked for a total of less than one minute during 30 minutes of class time
- 80% of student speaking turns lasted no more than 15 seconds
- 78% of student speaking turns were addressed to the teacher, rather than fellow students
- 71% of all classroom talk was done by the teacher
These statistics are evidence that the widely-held goal of involving students in active participation in classroom discussions is not being met. The author's designation of this situation as a "problem" worthy of investigative attention is verified not only by the above-cited data, but received additional support by the fact that students and teachers alike rate the severity of this problem rather highly (5.2 on a seven-point scale). In fact, 40% of female students gave a rating of "6" to this problem and all but one of the teachers rated the problem "5" or higher.

While on the one hand these data give a discouraging picture of class participation, another finding provides encouragement: 60% of female students indicated that they would like to participate more than they do. The long-range purpose of this study being the improvement of female students' participation, this finding makes it more likely that this goal, now known to be widely shared, will be attained.

**Sex-Related Findings**

This study began with an assumption concerning basic sex differences in verbal participation in task groups in general, and in the college classroom in particular, such that women participate less actively than men. This assumption was tested in Hypothesis I. The second and third hypotheses were formulated out of an interest in whether the participation of females, even if generally less than that of males, is enhanced by the presence of male students and female teachers.
"Participation" was measured on three dimensions for these hypotheses: the total amount of talk, the number of times a "high initiative" was taken, and the average level of initiative displayed over all contributions made. Thus these hypotheses predicted differences not only in overall amount of participation, but in the quality of "vigor" of that participation. These measurements were made possible through the use of an observation system developed by the author, the Robertson Interaction Analysis System (RIAS). The RIAS provided for considerably more extensive description and analysis of interaction than even these three measures allow. This more detailed approach revealed participation differences in the various groups which enhanced the understanding of the findings of the major hypotheses.

Hypothesis I

Female students participate less actively than male students in mixed-sex classes.

When all males were compared with all females in mixed-sex classes, the differences in participation were all in the predicted direction, but were not of magnitudes to allow confident inferences to be made about the larger population. When males and females within the same class were compared, three out of four classes revealed the predicted differences. The teacher of the fourth class expressed her own amazement at the relative reticence of the male students, which she found to be very unusual in her own experience. The insufficient overall magnitude of the results can be accounted for by additional unusual circumstances. For example, in one of the other classes, the by far most talkative female was a woman in her forties; it is possible that she provided a
strong role model for her female classmates. In that same class the usually most talkative male student was dramatically subdued during one observation due to illness and was absent the following observation. As he was one of only four males present, this certainly reduced the male participation (and yet, males talked more in this class). The sex difference in another class was of small magnitude because the total amount of participation in that class was less than half of the average of the other three.

In conclusion, the data from this study provide only a limited contribution to the existing evidence for sex differences in class participation. Nevertheless, the results suggest that a larger more representative sample of classes, more extensive sampling of their participation patterns, and a methodological approach which allows comparisons within rather than across classes might well lead to the hypothesized findings.

Hypothesis II

Female students participate more actively in mixed-sex than in all-female classes.

The differences found in this comparison were all in the predicted direction, however only the initiative level-related measures were of a magnitude to allow inferences to be made about the larger population. Thus the sex differences noted for Hypotheses I were more pronounced in the all-female setting.
Hypothesis III

Female students participate more actively in female-taught than in male-taught classes.

As with Hypothesis II, the results were in the predicted direction, but only the initiative level-related measures supported the hypothesis. Female teachers, and especially in the mixed-sex class condition, elicited participation in female students which was characterized by higher initiative taking than did male teachers.

Conclusions about Major Hypotheses I to III

The fact that none of the sex-related factors made significant difference in the total amount of participation that took place invites some explanatory attempts. The participation variance among individual students and among the eight classes studied was very large and thus made the establishment of significant between-group variance difficult. In fact, the method employed in this study, which regarded individual students as the units of analysis, rather than whole classes, caused basic problems. Eight classes, however, was not a sufficiently large sample for a meaningful comparison of whole classes. Yet because each of these classes was a unique interaction system, with widely differing characteristics, it was of questionable validity to draw students from these very differing experimental settings, as it were, and to group them into cells according to only two of the many possibly relevant dimensions.

Despite these methodological problems which might account for the weak findings on the sheer quantity of participation, the more refined analysis of the quality of interaction, in terms of initiative level,
produced the hypothesized results for class sex composition and teacher sex. The weak student sex differences on this dimension suggest that females can adapt their participation styles to some extent to the differing initiative-taking demands of mixed-sex classes. It does appear, however, that it was the male students, with their more active participation styles, who set the differing tone in these classes, for in the absence of males, females tended to display less initiative taking. While one might wish to argue that it is the teacher in all-female classes who creates conditions less conducive to behavior characterized by high initiative, this argument loses force when the definition of "high initiative" participation is recalled: interrupting the teacher's comment or lecture to the whole class or speaking up when the teacher has addressed a different student. These particular behaviors are, in principle, just as possible in all-female classes as in mixed-sex classes because they depend solely on the student's decision to engage in them.

In sum, it appears that the combination of mixed-sex classes with female teachers is most desirable when the goal is to foster active participation by female students. The factors affecting that decision are, on the one hand, the class climate established by the teacher and, on the other hand, the attitudes and expectations that students hold about such behaviors. The sex-differentiated teacher effects are discussed below. The attitudes and expectations of female students will be dealt with in a further section.

Female students were less reluctant to engage in these assertive behaviors when the teacher was female. Perhaps the female teacher was
perceived as less formidable an authority figure and thus more approachable and receptive to interruption. Perhaps also the female teachers conveyed through non-verbal and other non-recorded means a subtle invitation to students to speak up. Such previous invitation would, however, reduce the initiative level properly assigned to the response. Perhaps female teachers rewarded high level initiatives more satisfactorily than male teachers. The data were not analyzed with this question in mind, but such an analysis is possible and desirable.

Conclusions about Subsidiary Findings

In order to obtain a better understanding of the interactional dynamics responsible for the summary participation measures, fifteen different categories of participation were established and examined. The search for student sex differences within mixed-sex classes and for differences between females in mixed-sex and all-female classes revealed that distinctively female patterns of interaction tended to be more pronounced in all-female classes and lessened in mixed-sex classes.

Discussion in mixed-sex classes tended to be more of the nature of lively conversations between equals. Students spoke to the teacher and to each other with little prodding or invitation to do so. Teachers were more likely to address individual students than the class as a whole and student comment followed upon student comment without the teacher's intervening sanction. Most of the conversation was a series of comments, rather than an exchange of questions and answers. In all-female classes the participation of students was more often specifically elicited, guided, and moderated by the teacher. The teacher's orchestration of the
discussion was more frequently done through the use of questions and answers than the free flow of comments.

The sex of the teacher also affected the quality of the interaction. Female teachers tended to act more as facilitators than as participants in the discussion. They were less ready than male teachers to actively enter the discussion, but preferred instead to "throw the ball back to students." They extended more explicit invitations to speak and encouraged others to respond to comments rather than responding themselves. It appears that a frequently-postulated sex difference was in evidence here: female teachers were more process-oriented, while male teachers were more content, or product-oriented. These teacher sex differences were in evidence towards male and female students alike.

The hypotheses concerning sex-related situational factors predicted effects on the actual participation behavior of students. It is also possible, on the basis of the available data, to provide some answers to the question of whether these situational factors affected attitudes about participation. Since the attitudes in question have been shown, in this study, to be related to participation tendency, any significant effects of these situational variables on these attitudes can be taken as an indication that participation, too, is affected by these attitudes.

In keeping with the results of the analysis of actual behavior, the all-female classes were judged by students to be more formal and more competitive than the mixed-sex classes. Students also reported greater likelihood of saving comments for after class, not surprisingly, since a
number of negative consequences of speaking up were judged significantly more likely in the all-female classes. These negative consequences involved mostly the teacher's unfavorable reactions. These results fit well with the overall conclusion drawn earlier that all-female classes were structured in more traditional ways than mixed-sex classes. Some of these traditional features are: greater formality, more concern with getting the teacher's approval, more anxiety about competitive display of knowledge, more worry about follow-up exchanges with the teacher.

An effect of the sex of the teacher on attitudes was evident on only a few items; all but one such item showed an effect such that the more positive attitude was elicited in female-taught classes. The one exception was that students felt that "starting an argument" was more desirable in male-taught than in female-taught classes, which may reflect the perception by students that male teachers enjoy and foster such arguments more than female teachers.

Implications of Sex-Related Findings

The fact that the study's results failed to provide sufficient support for the hypothesis that male students show higher participation levels than female students raises a serious question about this whole study. Is class participation not really a problem unique to female students? The discussions of methodological problems associated with the observational part of this study (pp. 103-104, p.81 and p.178) made clear that conclusions from this limited and probably unrepresentative sample of female and male students in mixed-sex classes (33 and 29,
respectively) are not really warranted. More extensive studies of class participation (Parker, 1973; Sternglanz & Lyberger-Ficek, 1977) and of sex-differences in verbal interaction in task groups in general (discussed in Chapter I) do, however, support the assumption of this study, namely, that the kinds of problems that females often experience in expressing themselves in task group settings are largely a function of sex-related factors. That is not to deny that many males, too, have difficulties in speaking up. It appears, however, that the causes of their problems are not, on the whole, identical with the causes of females' problems. A verification of this assumption is not possible from the data of this study, though additional data collection on males' attitudes related to verbal participation would make such comparisons possible. But regardless of the extent of the differences in males' and females' difficulties, a participation problem for females can be said to exist. It is appropriate therefore to try to understand the situational and attitudinal factors related to their difficulties. If this understanding will also prove to contribute to the understanding of males' difficulties, so much the better.

Despite the lack of strong findings for student sex differences in participation, the very fact that in the mixed-sex classes only 19 out of 33 females ever spoke at all supports the notion that there is a "problem." These 19 students were mostly students regularly enrolled in a mixed-sex institution and thus more practiced in asserting themselves in mixed-sex classes. The finding that participation style, though not amount, differed in mixed-sex and all-female classes does not, unfortunately, allow us to answer the question of whether the same
females who demonstrated more dependent participation in all-female classes can readily adapt their style to the more independent style prevalent in mixed-sex classes. Why is such adaptability desirable?

If sheer amount of participation is the goal, the findings of this study do not make a convincing case that the situational variables of class sex composition and teacher sex make a difference. In the introduction to this study, however, a case was built that women in general tend to be handicapped in asserting themselves in task-oriented groups, in which members arrive at decisions on the basis of their discussions. What type of classroom interaction is more akin to these situations, where interests compete to influence the outcome? It seems that the interactions in mixed-sex classes provide better training for such situations than those in the all-female classes. This conclusion has serious implications for the value of all-female institutions. Is the type of dynamic, self-assertive and independent verbal interaction advocated here impossible to establish without the presence of male peers? Obviously different styles of interaction are learned and, in principle, learnable by all. But such teaching and learning of a variety of styles, to be applied according to the demands of the situation, requires several steps: first, the identification of specific component differences. The detailed analyses undertaken in this study and reported above are meant to contribute to that first step. Second, the identification of attitudes, beliefs, expectations, and normative pressures that influence the preference for a certain participation style. In this respect, too, this study has attempted to
make a contribution. The results of further such analysis will be summarized in the next section.

What practical implications are there for the finding that female teachers tend to foster participation at a higher level of initiative than men? Again, a more detailed look at the specific teacher behaviors which might account for this difference has been attempted. The greater skill of female teachers in facilitating without dominating the interactions is, of course, learnable by male teachers. It might also be argued that a good balance of male and female teachers provides students with practice in dealing with different styles of leadership, just as later-life task groups will present them with a variety of leaders.

While any specific suggestions for change strategies are beyond the scope of this paper, the simple fact of awareness of the effects of certain situational factors on the participation behavior of female students can perhaps already contribute to desirable changes.

Suggestions for Further Research on Sex-Related Factors

The design of this study did not make possible any definitive conclusions about the effect of class sex composition and teacher sex on the participation of female students. Ideally a subsequent study would observe a larger sample of females in several controlled class simulations, such that the same females would be observed in mixed-sex and all-female conditions, with male and female instructors teaching both sex composition conditions. The observation techniques of this study should then reveal more clearly the amount and kind of adaptation that takes place on the part of female students and male and female
teachers. Such a study might lead to more focused suggestions for improvement of teaching techniques and for student attitude change.

Subsequent studies might also test several hypotheses suggested by the detailed analysis of subsidiary participation categories found in Chapter III. The use of interaction matrix analysis might reveal, for example, whether female students tend to address their comments more to, or are addressed less often by, male classmates than female classmates. Also, the greater reliance by females on making a contribution that follows upon another student's contribution raises the question of whether the previous student contribution tends to be that of a female or male. Another example of an hypothesis suggested by the earlier analysis is the possibility that males evoke more frequent direct teacher addresses because they have initiated such a dialogue with the teacher more frequently. Finally, a more refined content analysis of teachers' responses to student contributions might reveal whether males and females are rewarded differently by male and female teachers.

Methodological Contributions

The observation instrument developed for this study, the Robertson Interaction Analysis System (RIAS), proved to be a useful way of collecting direct observation data about verbal group interaction. The fine-grained categorization of interactions which it made possible contributed considerably to the identification of different patterns of interaction. The amount of descriptive data which this simple-to-use system provided was so large that only some of the possible analyses of these data were actually undertaken for this study. Depending on the
researcher's focus, this observational system allows a wide variety of data analyses. A particularly useful aspect of this system is its ability to supply data on individual students' behavior. Although this aspect was not fully utilized in this study, the system makes possible a determination of which specific student interacted with which specific other student, and a description of the nature of that interaction.

Finally, the trained RIAS user can step into any existing small group interaction situation and, without preparation or intervention, collect useful data about the group's verbal behavior.

A minor methodological contribution was made to the collection of data in situations where subjects' anonymity needs to be preserved, yet coded identification is necessary for relating various data for each subject. The author's coded seating charts, in which students provided their own codes according to their first name initial and their birth date, can be used in a variety of research situations.

**Attitudinal Findings**

This study sought to identify attitudes and other personal factors that are associated with levels and styles of participation of female college students. The measures used as indices of participation were of several kinds: total amount of talk and number of high initiatives demonstrated during actual observation; self-report of verbal activity level in a specific course; the teacher's report of students' activity level in that course; and self-report of verbal activity level in college courses in general. These several measures were more or less appropriate for correlational analyses as the attitudes in question were more or less
context-specific. The attitudes chosen for testing were of three kinds: rather more general and global attitudes, such as assertiveness and feminism, measured by existing scales; a more specific attitude toward verbal intellectual conflict situations, both within and outside of the academic context, which was measured by a scale developed by the author; and attitudes which constituted a "belief system" and "normative pressure system," the components of which were first elicited from a pilot sample of students. In addition, a number of other attitudinal and personal variables were tested.

**Hypothesis IV**

High participants are more assertive in general than Low participants.

The results of correlational analyses showed that a moderate relationship existed between course-specific and more general participation and assertiveness, such that high participants are more likely to assert themselves in a wide variety of situations.

**Hypothesis V**

High participants have more feminist attitudes towards women's roles than Low participants.

The results of the correlational analyses showed only a moderate positive relationship between such an attitude and participation in the specific course. The more appropriate participation measure, general tendency, failed to reach a significant level. Nevertheless, a comparison of observed High and Low participants revealed a significant difference on this attitude in the predicted direction. The conclusion to be drawn from these findings is that the degree of feminism does not
vary predictably with participation levels, but that High participants do tend to have more feminist attitudes than Low participants.

**Hypothesis VI**

High participants have a higher approach tendency towards intellectual verbal conflict situations in general than do Low participants.

This new attitudinal construct, defined and measured by the Robertson Intellectual Verbal Conflict Approach/Avoidance Measure, was found to correlate consistently and moderately highly with all participation measures except those derived from the observations, where the correlations were only moderate. These different levels of correlation were to be expected because the attitude in question is about a more general context than two specific class participation occasions. These findings indicate that the Robertson measure is validated by external behavioral measures and that, indeed, High participants tend to have a different understanding of and approach toward intellectual verbal conflict than Low participants.

It is useful to summarize some of the components of this attitude toward verbal conflict. High participants were more likely than Low participants to enjoy discussions, to prefer the oral mode of exchanging ideas to the written mode, to seek out controversy, to value open criticism, to feel intellectually competent in verbal conflict situations, to value the verbal participation of their classmates, and to welcome argumentation with their peers.
Hypothesis VII

High participants have a more positive evaluative attitude toward participation in the specific course studied than do Low participants.

This evaluative attitude, which was a sum of responses to semantic differential items such as good--bad, pleasant--unpleasant, productive--unproductive, was found to correlate most highly with students' professed intention to participate in the specific course. It also had moderate correlations with all other participation measures, whether these were the most context-specific (observation measures) or the most general (self-report of general tendency). A general evaluative attitude towards participation can thus be said to exist independently of specific circumstances and to influence the decision to participate.

Hypothesis VIII

High participants have a more positive belief system about participation in the specific course than do Low participants.

The overall belief system was found to correlate most highly with the intention/self-report measure specific to the course, but was also related positively to the teacher's report, the general tendency self-report, and the observed number of high initiatives taken. The components of the belief system which accounted most strongly for this overall positive relationship can be described by four different themes.

Concern over the reaction of classmates was different for High and Low participants only in the greater confidence by High participants that classmates would think they had made a good point. Other worries, such
as being laughed at, or being suspected of speaking only to draw undue attention, were shared by everyone.

Concern over the reaction of the teacher was different for High and Low participants in the greater confidence by High participants that their contribution would make a good impression, and in the greater worry by Low participants that the teacher would simply ignore their contribution.

While students in general tended to have fears about their intellectual competence, the worry over "being wrong" tended to be more pronounced for Low participants.

Finally, the effect that participation was believed to have on the process of discussion differed for High and Low participants, in that High participants felt more positive about starting an argument and about clarifying a concept. It is particularly noteworthy that the terms "discussion" and "argument," used in separate items, evoked different responses, such that everyone tended to agree that "discussion" was likely and desirable, while High participants were more likely than Low participants to respond to "argument" in this way. This finding echoes the results of Hypothesis VI, which showed that High participants scored more highly on the Robertson scale, which measures the extent to which argumentation is perceived as an enjoyable, worthwhile activity.

**Hypothesis IX**

High participants feel greater expectancy on the part of significant others to participate in the specific course than do Low participants.
This hypothesis, too, was supported by moderate positive correlations with four out of five participation measures. Some of the variance in participation can thus be explained by the different expectations to which students feel themselves subject. The effect of expectations by classmates and the teacher appeared most strong, while the effect of friends and "important people" was less influential. No differences were found in the expectations felt from male or female classmates, or male or female friends, or male or female teachers. Female students cannot therefore be said, on the basis of these data, to be inhibited by sexist expectations on the part of males that they, because they are female, should remain quiet in discussions. It is, of course, possible that male and female students and teachers have lower expectations for females than for males. The limited number of males studied in this investigation did not claim to feel subject to stronger such expectations; on the contrary, their normative pressure scores were significantly lower than those for females! Are female students already generally aware of the participation problem they tend to have and do they discern strong pressures around them to remedy this traditional short-coming, yet do not have the necessary skills and attitudes to comply with these pressures?

Implications of Attitudinal Findings

Attitudes and skills found to be associated with class participation can be grouped into several categories: those not specifically pertaining to class participation but to life in general, and those pertaining to intellectual argumentation in the academic setting. In the latter sphere three different components can provide the foci for
discussion: peers, teachers, and the nature of the task. Each of these areas will be discussed below.

**General Attitudes and Skills**

The finding that college women who are relatively inactive in class discussions tend to be less assertive than their more active female counterparts in life situations in general confirms the idea, outlined in Chapter I, that speaking up in a classroom situation is a form of self-assertion. Just as training programs for greater assertiveness have had success when focused on behaviors outside the realm of academic and intellectual endeavors (Gambrill & Richey, 1975; Rathus & Ruppert, 1973), assertiveness training for the behaviors relevant in task group discussions may well succeed. The literature on assertiveness training is extensive and many different approaches have been tried.

The single most effective method appears to be modeling of the desired behavior while verbal reinforcement by itself tends not to result in behavior improvement (Young, Rimm, & Kennedy, 1973). Such a desirable modeling effect for classroom participation may already be operative in female-taught classes, where students have been shown to engage in more initiative taking. It has also been suggested that the higher initiative level demonstrated by females in mixed-sex classes can be explained by the modeling effect of the often more assertive males in the class. Why do not the highly assertive females have such a modeling effect on their less assertive female classmates? Research on the effectiveness of models suggests that "rewarding models," i.e. those persons who dispense something of value to the trainees, are most
effective (Hartup & Coates, 1967; Mowrer, 1960). Perhaps female High participants do not dispense such rewards, while female teachers and male High participants do. The beginnings of an answer to the question of how Low participants perceive their High participant peers, and why they might lack motivation to imitate them, can be found in sections below.

The finding that college women who tend to be inactive in class discussions tend to see more limitations in the "proper" roles and rights exercised by women than their more active female peers suggests that vigorous self-assertion in classroom settings is related to roles and rights not deemed entirely appropriate to the female sex. As outlined in Chapter I, such active self-assertion may well be understood by many women as incompatible with such qualities as modesty, deference to authority, accommodation to the group, and emotionality—qualities traditionally associated with proper femininity. If the basic assumption of this paper, namely that argumentative skills are essential to women in the modern world, is accepted, then these attitudes which stand in the way of acquisition of these skills must be changed. The wide-spread use of "consciousness raising" to increase women's awareness of their needs and capabilities and of the internal and external forces which hamper their self-actualization may well furnish guidelines for such attitude change. Certainly one component of the task of developing a consciousness raising program about intellectual verbal assertion will be to identify specific components of that attitude: beliefs, fears, normative pressures. Again, this investigation has made a first step in the identification of such components.
The specific attitudes which are revealed through the Robertson Scale and the inventory of beliefs and normative pressures to differentiate High participants from Low participants and thus have implications for the directions that assertiveness training, consciousness raising, and other improvement strategies should take, are best discussed in conjunction with the additional and subsidiary findings of this study, which are integrated into the discussion below.

The Relationship with Peers

High participants tended to feel considerably more at each with their classmates than Low participants. Why? Few of the specific consequences related to peer reactions were found to correlate significantly with participation. Only the expectation that peers might think that a "good point" had been made showed such a relationship. The negative reactions asked about tended to be feared equally by all. And yet, such negative reactions as "the class might laugh," or "the class might think I'm only trying to draw attention to myself," were included in the questionnaire because so many students in the pilot sample had mentioned these and related fears. Perhaps the straight-forward questions about such negative reactions did not tap entirely honest answers out of students' desire to respond in socially acceptable ways. The fact that these and other negative reactions by peers were so widely on students' minds suggests the need for further investigations, using different questioning techniques and a wider sample of students. Certainly fear of and hostility towards classmates who participate actively was a common theme in items that loaded heavily on the Robertson scale and in initial conversations with students. Why then do High
participants still report that their classmates want them to speak up? It appears that High participants are somehow more immune to, or oblivious of, their classmates ambivalence about their participation. The rewards that they tend to expect from participation, on the basis of past experience, must outweigh these peer-related concerns.

The improvement of attitudes related to peers might be accomplished by an airing of these possibly tangled feelings. Perhaps the Low participants could be told of the good rewards that can ensue upon their participation, which might increase the ease that they will come to feel with their classmates. The discovery that peers will appreciate a good point, that they will not laugh in derision, that they do not mind being disagreed with, will help to dispel some of these vague fears. Another approach to the improvement of attitudes towards peers might be to clarify the nature and purpose of class discussions, which will make certain reactions of peers appear more appropriate and even satisfying.

The Relationship with Teachers

High participants were more confident of making a good impression on the teacher and were less afraid of simply being ignored. Clearly, teachers could be encouraged to give more explicit rewards to their Low participating students. The problem is, however, how to get them to speak up in the first place, so that such rewards can be forthcoming. While most teachers do profess a desire for active participation by students and admonish students to engage in it, they fail to make clear the extent to which such participation will be rewarded. The
correlation between students' impression of the degree to which their participation will affect their grade and their teachers' report of how much they actually took participation into account was quite low. Perhaps even teachers themselves are not aware of the extent to which they value and reward participation. This study found relatively high correlations between teachers' evaluations of different components of class performance and of the final grade with the teacher's report of how actively students participated. No significant correlations were found with the student's report of participation activity. This suggests that teachers associate good grades with high participation. The finding that the teachers' report of the amount of participation correlated .50 with his/her evaluation of that participation should encourage students greatly. Obviously teachers tend to think highly of most of what is said by students.

These findings suggest that teachers ought to make amount of participation an explicit, well-defined contingency in the grading system. Perhaps the writing of papers and the taking of written exams should be dramatically de-emphasized in certain courses. A controlled study of learning outcomes in such a course, as compared with a more traditionally rewarded course, would be most useful.

As in the discussion about relationships with peers, a clarification of the nature of the task and its rewards might help students to choose more appropriate behaviors.

One minor finding that concerns teachers is the fact that students who have read the assignment are more likely to participate than those who have not. It is possible that teachers have unrealistic
expectations of students' ability to complete assignments and/or that teachers fail to clarify the extent of their tolerance for uninformed comments and questions.

The Nature of the Task and its Rewards

The discussion of the relationship of peers and teachers to students' decision to participate in class discussions was concerned with external forces and rewards. It is also possible to approach the participation issue with an analysis of the intrinsic motivation and the intrinsic rewards attached to intellectual verbal argumentation. Results of the Robertson scale and of the other attitudinal measures suggest that High participants have a different understanding of and purpose in such argumentation than Low participants. High participants tend to feel that argumentation, controversy, and open criticism are legitimate and fruitful modes of inquiry. They see the classroom setting as an appropriate arena for testing out ideas. They are more comfortable than their Low participant peers with the oral mode of expression. Their greater confidence in their intellectual competence is perhaps due to a different interpretation of the responses that they elicit. If they are disagreed with, or found to be wrong, or asked to justify an opinion, they are perhaps less likely to regard it as an attack on their intellectual competence or as an indication of hostility. On the contrary, they might feel rewarded by their own increased understanding of an issue or they might feel pleasure for simply having articulated a thought. Is it possible that the reactions of peers and teachers is of minor importance to these students because they are
more task-oriented, the task being not to win friends or impress the 
teacher, but to conduct an intellectual inquiry?

These considerations bring up the question of whether High 
participants are predominantly the more intellectually involved and more 
knowledgeable students. This does not appear to be the case. The 
fact that Low participants report considerably greater likelihood to save 
their comments for after class suggests that they, too, have something 
to say, but are inhibited in the group setting. While positive 
correlations were found between participation level and final course 
grade, as well as with likelihood of discussing the course material 
with friends outside of class, these correlations were very low and do 
not explain much of the variance in participation. Additional indicators 
that intellectual competence does not have a strong relationship to 
participation are the lack of significant correlations between partici-
pation and grades earned on papers or exams. It was also interesting to 
find that students who were observed in a course that was not in their 
major were more likely to participate than those who were observed in 
their major concentration and, presumably, in an area in which they 
would be more knowledgeable. Perhaps this presumption puts inhibiting 
pressure on students.

What causes some students to construe the nature of the task 
differently from others? This difficult question is quite beyond the 
scope of this study. But perhaps it is possible to change female 
students' understanding of the purpose and rewards of college instruction, 
so that they will worry less about the socio-emotive aspects and take 
more intellectual risks. One approach to such change might be a series
of college-wide mini-courses in which the importance of developing argumentation skills is presented, fears and anxieties can be aired, experiences can be shared, and a climate of expectations can be developed which is more conducive than the current one to the open battle between conflicting ideas. Ideally, a wide range of teachers would participate in these mini-courses, so that students would come to recognize just how widely-shared is the desire by teachers for students' active involvement in class discussions. In addition, the presence of older students who have themselves learned to overcome their reluctance to participate might give added information and impetus to the venture.

Suggestions for Further Research on Attitudinal Factors

This study focused on a relatively small sample of students (52 females) from a limited college population and could thus attempt no more than an exploratory analysis. It is possible that a larger and wider sample of college women would reveal additional salient attitudes and beliefs on the Robertson scale; it is also possible that the inventory of relevant consequences used in this study was not exhaustive of the consequences which students have in mind when they make a decision to participate in class discussions. Several of the currently-used consequence items might also attain significant correlation levels with a better-selected sample and reveal effects which for this study failed to reach such levels. It would also be desirable to do a systematic analysis of the free comments given by students in this study to the researcher; these comments might harbor insights into the
participation problem which the measuring techniques of this study could not detect.

It would also be desirable to subject the data of this study to different methodological analyses. For example, instead of looking at each attitudinal variable in isolation, a profile analysis of High and Low participants might better reveal the presence of clusters of attitudinal variables which explain variance in participation.

Methodological Contributions

The author developed a scale to measure a new construct about attitudes towards intellectual verbal argumentation: the Robertson Intellectual Verbal Conflict Approach/Avoidance Measure. The fruitful use of this construct and measure in this study suggests that they do indeed tap a meaningful set of attitudes and beliefs about verbal confrontation, and that use of this measure in subsequent studies is warranted. In addition, the construction of the Attitude/Beliefs/ Norms measure, inspired by the Fishbein-Ajzen approach to the attitude-behavior relationship, also provided meaningful results for this study. The further use of this inventory in studies of class participation is also warranted.

The Relationship of this Study to Women's Lives

This study succeeded in delineating the effect of class sex composition and of teacher sex on certain aspects of verbal class participation in a small sample of college classes. It also succeeded in identifying a number of attitudinal variables that are related to female students' tendency to participate in class discussions. In
addition, the use of and cross-validation of several participation measures supported the notion that students have a relatively stable class participation tendency.

The hypotheses of this study and the data collected to test them were all limited to the sphere of the college classroom. The practical implications of the findings were also related almost exclusively to the enhancement of females' discussion skills in the college classroom context. Such enhancement of active participation in classroom discussions is a desirable goal for many reasons. A considerable amount of evidence has been reported that such active participation is positively related to the development of critical thinking skills (Smith, 1977), to intellectual independence (Mann, 1970), and to a general stance towards education which is intellectually, artistically, and politically involved (Wilson & Gaff, 1975).

Yet the impetus for this study does not come from the desire to attain these worthwhile goals. An additional goal has been specified: the goal of aiding women in developing communication skills that will serve them throughout their lives. If women can be taught better verbal self-assertion skills at this threshold of their adult lives, they will be better able to express and defend their needs and views in decision-making groups encountered throughout their lives.

An empirical investigation of the precise relationship of verbal self-assertion skills in the college classroom to the exercise of such skills in other contexts would be of great use. Thus, a longitudinal follow-up study of these college women, which relates their current participation levels and styles in the academic setting to their later
professional development could yield useful information. Such information could establish the extent of the validity of the rationale of this study and could contribute to a better-focused, more refined effort to develop and implement strategies to help women broaden their communication skills. The ability to express needs, share knowledge, criticize faulty policies, and persuade decision-makers is surely essential to women's efforts to gain fuller control of the conditions of their lives.


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APPENDIX A

ROBERTSON INTERACTION ANALYSIS SYSTEM (RIAS)
The ROBERTSON INTERACTION ANALYSIS SYSTEM (RIAS)

The purpose of the RIAS is to measure and describe verbal participation in a classroom setting in such a way as to reveal certain patterns of verbal interaction. The analysis is guided by the model of conversational interaction developed by Sacks, Schegloff and Jefferson (1974), and Sacks (1972), which provides a systematic approach to turn-taking or speaker alternation in uncontrived conversation. All speech exchange situations are seen to be guided by two organizing principles: 1) one person speaks at a time, and 2) speaker change is possible. Different kinds of verbal exchange situations, e.g., conversation at a dinner party versus a formal debate, are distinguished by their variability in the distribution of turns, turn size, and turn content. A turn consists not merely of the temporal duration of an utterance but of the right (or obligation) to speak which is allocated to, or seized by, a particular speaker. As the number and length of possible turns are limited, there arises a kind of competition for these turns, the outcome of which reflects, among other things, certain patterns of power and dominance between the potential speakers (Zimmerman and West, 1975).

The RIAS instrument is designed to yield systematic data on the actual exchange of speaker turns and certain circumstances surrounding such exchanges in the context of a classroom teacher-led discussion. A speaker turn is defined as an utterance that is intended to be heard and listened to by the group to the exclusion of any or all other simultaneous utterances by other persons. This means that certain minimal remarks, such as "uh-huh," or "I know," which are usually "private" responses to what someone else has said and the functional equivalents of head-nodding or other non-verbal expressions of agreement or disagreement, and which are not intended as speaking turns directed to the exclusive attention of the group, are not considered to be "turns". Similarly, background mumbling, laughter, and several persons addressing the group simultaneously are not considered "turns." However, a number of events not considered 'speaker turns' but possibly bearing a significant relationship to the seizure of actual speaker turns are included in the observation and analysis system of the RIAS.
The RIAS is designed so that a single observer can classify and record all speaker turns according to identity of speaker, person(s) addressed, length of turn, and conversational intent, as well as certain other events, occurring during a chosen segment of a live class session. The observer does this by classifying and writing down the appropriate code for each three-second interval of the observation period. This recording system is based on the model of interaction analysis developed by Flanders (1970). If several distinct recordable events occur within a three-second interval these are recorded as well and considered to have lasted three seconds, as in Flanders' system. In addition, a number of non-turn taking events are recorded if and when they occur, without an indication of their length, as duration is not relevant to the hypotheses of this study; for example, laughter, background mumbling, students raising hands, etc.

The categories of events used in this analysis are thus of two general types. Type 1 events are those in which an identifiable speaker has seized a turn to speak and is, for the duration of that turn, the recognized and presumably listened-to speaker. Type 2 events describe certain verbal and non-verbal events which happen between and simultaneously with type 1 events and thus record selected aspects of the dynamics of transition between and background of type 1 events.

Type 1 Events Coding System

Type 1 events are encoded in two or three unit fashion, containing 3 informational elements.

First unit: this unit contains informational element #1, namely the identity of the speaker who has seized a turn. This information is encoded by use of either the letter "T", standing for teacher, or a one or two digit numeral that corresponds to the code number given at the beginning of the observation to each student in the class. A seating chart is used as an aid in identifying student speakers and, through appropriate rankings, also yields information on the sex of each student for later analysis.

Rationale for informational element #1: the RIAS is designed for studies which concern the distribution of speaker turns; thus it is necessary to identify specific speakers.

Second unit: this unit contains informational element #2, namely the content or conversational intent of an utterance as well as, in most cases, informational element #3, namely the person(s) to whom a speaker turn is addressed.
Informational element #2 is encoded as follows:

**group A:** explicit response elicitors; this includes all remarks that invite a response,

- Q or q = question (what is the relationship between x and y? When did x or y happen?)
- I or i = invitation to speak (Any comments? I’d like to hear what you think? Will someone review the chapter for us?)

**group B:** remarks that are neutral as to expectation of a response; this includes all utterances that do not imply an expectation for a response, though speaker change is possible.

- A or a = answer to a specific question
- C or c = comment on what someone has said
- E or e = exposition, lecturing (the distinction between C and E is useful only to teacher talk)
- D or d = explicit disagreement, characterized by tense, argumentative tone

Rationale for informational element #2: the choice of categories makes possible two kinds of analyses: first, to classify student speaking turn seizures according to degree of initiative according to operationalized rules described below. For example, a student answering a specific question posed by the teacher displays less initiative than a student making a comment on lecture content. Second, the above categories make possible an elementary description of interaction styles within different classrooms. For example, a class in which many speaker turns take the form of TQ 13a TQ 6a indicates an environment very different from a class segment coded as TE 13c Tc 8c 12c 10d 12d Tc. In the first instance, the teacher has posed questions to the class, dutifully answered by students. In the second instance, the teacher’s exposition has elicited comments by students who take turns with one another to join in the discussion.

Informational element #3 is usually contained in the second coding unit for efficiency; when this is not possible, the third coding unit gives the necessary information (see next section). The second coding unit can be written as a small-case or large-case letter. Large case letters always indicate that the addressee of the remark is the class group as a whole. Small case letters indicate that an individual is being addressed and, depending on whether the letter is written next to the first unit in normal writing fashion, or above as a kind of superscript, the identity of the addressee is given (see below).

Third unit: this unit conveys information about the addressee of a speaker turn, when such information cannot adequately be given through the second unit. It takes the form of small case letters or markers being added to the second unit. The table below describes the complete system of addressee coding:
Complete system of informational element #3 (addressed) coding

A. When the teacher is the speaker and addresses:

1. Class as a whole: informational element #2 is written in large case letters. E.g.: TQ, TE, TI

2. Individual students:
   a. When the student addressed is the last previous speaker, the identity of that student need not be made explicit, but can be inferred. Coding consists of the informational element #2 written in small case letters, in normal writing position. E.g.: TC, TI, TQ
   b. When the student addressed was not the last previous speaker, his or her identity is made explicit by adding the student's identification number to the code described in 2 a. above. E.g.: TC21, TQ3

3. Two or more specific students:
   a. If the students have been a part of the ongoing previous discussion, their specific identity need not be made clear. Coding in this case consists of informational element #2 in small case letters with addition of a "+" sign. E.g.: TC+, TI+
   b. If the students' identity cannot be inferred from the immediately previous context, their identifying numbers are added to the informational element #2. E.g.: TC21,4,16

4. Attention primarily directed to class as a whole, but with gestures indicating that a particular student is specially intended to hear remarks: the informational element #2 is coded in large case letter, with a student identifying number added. If the particular student was previous speaker, then an "s" instead of the identifying number suffices. E.g.: TC21, TA13, TCs, TAs

5. Attention primarily directed to an individual student, but with gestures indicating that the class as a whole is also the addressee: the informational element #2 is coded in small case letter, along with student identifying number, if necessary, plus the letter "w" (for "whole class"). E.g.: TC21w, T1w

B. When a student is the speaker and addresses:

1. The class as a whole: informational element #2 is written in large case letters. E.g.: 21C, EQ

2. The teacher: informational element is written in small case letter E.g.: 21e, 7q, 13d

3. Another student: informational element #2 is written in small case letters and positioned as a superscript. Unless the previous student speaker was the addressee, the student identifying number is also added. E.g.: 12c, 427, 5q, 12d
4. More than one other student: as in case B.3 above, but "±" is added, or identifying numbers, if possible. E.g.: 12±, 3±6, 7

5. The teacher primarily, but a specific other student, or other students, as well: as in case B.2 with the symbol "±" added, for single other student, or "±" for several other students, or with identifying numbers, where possible. E.g.: 14±4, 1δ±, Eds

6. Another student or students primarily but with partial attention to teacher or class as a whole: this is coded as directed at fellow student only.

Rationale for informational element #3 coding: the primary purpose of identifying to whom a statement has been addressed is to allow a determination of the degree of initiative displayed in the subsequent turn seizure. It makes a considerable difference to know whether, for example, a student is answering a question that the teacher has specifically addressed to that student or whether all students had an equal psychological chance to seize the turn to speak. The guiding principle for determining the addressee is not whether the content of a remark speaks to something that someone else has said previously, but whether the non-verbal gestures of the speaker indicate that attention is focused on and primarily directed to a particular speaker or the group as a whole. To the extent that information about the addressee of a remark becomes relevant only for interpreting a subsequent speaker change, the observer has some leeway in the care he or she needs to take to record this information. For example, if a teacher is addressing several individual students and one of those students then takes a turn to speak, the relevant information is that indeed this student had been previously addressed -- while it is not important to know specifically which other students had been addressed. The other students had an equal chance, presumably, at seizing the next initiative but did not do so. This study is concerned only with what happened -- not with what did not happen and why it might not have happened, though that would be a worthwhile study in itself.

Because the observer is sometimes faced with situations whose complexity does not allow full and explicit recordings as described above, several short-hand indicators have been developed to deal with such more complex situations:

**supplementary informational element #3 codes:**

1. \(\rightarrow\) = an arrow is used to precede the first unit (identity of speaker) in cases where the speaker has been specifically addressed. This is useful in situations where the did not allow recording of this information in the previous three-second coding and in situations where more than one specific person had been addressed and a listing of all addressees proved too cumbersome

2. \(\_\) = a horizontal line beneath the identity of a speaker indicates that the current speaker was not specifically addressed, whereas other individual(s) in fact were addressed. This is useful in situations where time constraints did not allow a listing in the previous three-second code of precise addressee(s).

3. \(\sigma, +, w, t\) = these letters are used to indicate a change in addressee(s) in the course of the speaker's turn. Thus, if attention has shifted to an individual student, use "\(\sigma\)",
attention has shifted to several individual students, use "*", for the class as a whole, use "w" and for the teacher, use "*".

4. -- = a horizontal line by itself is used to indicate that three seconds of an event have passed which has been explicitly coded previously; thus these are continuation marks and save the observer from having to write elaborate codes literally every three seconds. E.g.: Tc21 -- -- -- = the teacher has commented to student i/21 for a duration of 15 seconds. If the only change in an event is a change of addressee, then only the letters indicated in 3. above, or a student identification number is used. E.g.: TC -- -- -- 21 -- -- + -- -- w -- -- = the teacher has commented to the class as a whole for 12 seconds, then turned his attention to student i/21 for 9 seconds, then to other students as well for 12 seconds, and finally back to the class as a whole for 12 seconds.

5. etc. = this mark is used in cases where the teacher has been doing the same thing for more than 30 seconds and it is pretty clear that he or she will continue with the same. This means that this instrument does not record the length of every speaker turn by the teacher, which is appropriate insofar as student talk is the focus of interest. E.g.: TE -- -- -- -- -- -- = the teacher has lectured for more than 30 seconds and was, at some point, "interrupted" by student i/21 who asked the teacher a question.

Type 2 Events Coding System

Type 2 events are those events which are not themselves complete speaker turns but which give selected information about circumstances surrounding type 1 events.

1. non-verbal events:
   H = a student raises his or her hand to speak
   L = laughter
   X = silence

2. group verbal events:
   M = several students speaking out loud at once
   m = several students speaking in background without attempt to gain the floor

3. interruption events:
   \[\checkmark \ 3\] = the person identified (teacher or student) is trying to interrupt the current speaker
   B = the teacher "interrupts" a student with teasing remarks, indicating acknowledgment and encouragement to continue; i.e. the teacher is not taking the speaking turn away from the student
   / = the speaker following the slash mark has clearly interrupted the previous speaker's turn
4. initiative clarifiers:

\(\bigcirc\) = the speaker turns joined by this mark are part of the
same initiative; this is useful when a student has been
very briefly interrupted or helped along with some state-
ment by the teacher and the full expectation exists that
the student will continue and finish his or her point

\(/\) = two slash marks underneath the three-second coding indicate
that while the speaker turn has not changed, the current
speaker is taking a new initiative by going on to speak
about something new. This is useful when a student has
 answered a question by the teacher and, upon finishing
this answer, uses the opportunity of his or her turn to
address some other issue.

5. side speakers:

student identification number recorded above regular markings =

a student who speaks up in background and who is not really
trying to interrupt and seize a turn is recorded in this
fashion. This is useful to record those ambivalent attempts
to communicate which do not constitute talking turns but
are close to the threshold.

Mechanical Details of Recording

An observer sits in the class to be recorded in such a fashion as to be
both unobtrusive and yet able to see the faces of all potential speakers.
The observer begins by drawing up a seating chart and giving an identification
number to each student and making an attempt to memorize those numbers.
When coding begins, the observer writes markings horizontally across a page
of graph paper. This helps to distinguish large case from small case letters.
All markings for type 2 events, except \(X, /, \bigcirc\) and \(/\) are recorded above
the mid-line. Graph paper makes positioning of these markings and of the
superscripts mentioned in the addressee system easier.
Example of a 900-second recording session

Interpretation

Teacher comments to class (19 seconds); Teacher extends invitation to speak to class as a whole (9); Student #21 comments to teacher (9); Teacher poses question to student #21, then shifts attention to class (24); Teacher passes question to student #14; Student #14 answers and receives boost by teacher (15); Teacher asks student a question (9); Teacher answers #14 and also addresses #21 (15); Student #13 comments to student #14 (12); #14 disagrees with #8 (9); Teacher comments to #14 and #21 and then turns attention to class as a whole (24); Teacher lectures to class more than 30 seconds; #12 asks question of teacher (15); Teacher answers question (12); Teacher comments to class (12); Student #8 comments to teacher and is unsuccessfully interrupted by teacher (24); Teacher comments to #14 (9); #8 interrupts teacher and speaks while someone raises their hand (15); #14 comments to teacher while class laughs (15); Teacher comments to class while several students are speaking out loud simultaneously (16); Teacher directs question to class (12); Silence (5); Teacher invites #21 to speak (5); #21 comments to teacher and also to #8 (10); Teacher comments to #8 and #21, then turns attention to class (10); #8 comments to teacher and #21 (12); Teacher comments to #8 and then to #21 (10); #21 interrupts teacher with comment (9); #8 interrupts #21 and addresses comment to latter, then teacher and receives boosting remark from teacher (27); Teacher comments to #8 (3);
Analysis

Given such raw data, there are many different analyses possible, depending on the researcher's focus and hypotheses. Usually the analysis will be done as follows. First all student speaking turns, or speaking initiatives, will be identified. (It will be more useful in this analysis to speak of "initiatives" rather than speaker turns, because there are cases in which a student continues speaking beyond a point at which speaker change, mostly in the form of the teacher regaining the floor, is normally expected and in which the student has actually taken another initiative, or another turn, by continuing with a different and new tack). Upon identification of all student speaking initiatives, a listing is made, for each individual student and for each initiative, of the following data categories:

1. length of initiative in seconds
2. whether the initiative was addressed, all or in part, to one or more specific fellow students
3. degree of initiative

The degree of initiative is determined by the content and the addressee of the previous speaker turn and is described below in its fully operationalized form.

After tallying the above data, a table of summary data for each individual student is constructed as follows:

1. number of initiatives
2. total length of initiatives
3. mean length of initiatives
4. percentage of total initiatives addressed to students
5. mean degree of initiative

These individual student data make possible a ranking and/or comparison of individual students' participation rates and styles within a given class. To allow for comparison of individual students across different classes and to make possible the computation of a composite "participation score" for each individual student participant, the above five summary scores can be converted to z-scores or t-scores.
The raw data also make possible a description of the participation behavior of individuals or groups along other dimensions. Some of these additional participation measures are:

1. Number and percentage of students who participated at least once; number and percentage of students who remained silent
2. Total amount of time talked by students versus total amount of time talked by teacher
3. Mean amount of talk per student in group
4. Mean amount of talk per participating student in group
5. Total number of initiatives taken by group
6. Mean number of initiatives per student in group
7. Mean number of initiatives per participating student in group
8. Mean length of initiative
9. Mean degree of all initiatives
10. Number and percentage of initiatives that were questions, answers, or comments
11. Number and percentage of initiatives addressed to students
12. Number and percentage of initiatives taken at each level of initiative
13. Number and percentage of initiatives that were teacher-initiated
14. Number and percentage of initiatives that were "free", i.e. not specifically invited by the teacher or fellow students
15. Number and percentage of initiatives that do not fit into categories 13. and 14. but involved low avoidance possibilities

The possibilities of combining raw data information into additional descriptive categories are almost limitless. Only the specific purposes of the investigation in which the RIAS is used can dictate the appropriate combinations of data.

In addition to the kinds of summary measures just described, it is also possible to take a matrix approach to the data. This would reveal sequential patterns of interaction and provide more complete contextual information for each isolated speaking turn. Such a sequential analysis is at the base of the determination of degree, or level of initiative of each speaking turn. A description of the operationalization of these levels of initiative follows.
Operationalisation of Levels of Initiative

Upon analysis of the process whereby speaker turns are distributed in the context of a classroom, it becomes clear that not every member of the group has an equal chance at seizing a turn at every turn-taking juncture. The teacher has the power and authority to dispense or withhold turn-taking rights and he or she exercises this power by different means, offering various opportunities or lack of them for students to speak up. Students who wish to say something are thus faced with situations requiring various degrees of self-assertion or levels of initiative. For example, when the teacher is lecturing to the class as a whole, opportunities for student interruption are comparatively low as compared to the situation in which the teacher has specifically invited a comment or a question from students. On the other hand, when the focus of attention has moved away from the teacher and to student comments, the psychological barrier to taking a speaking turn away from the teacher has been softened and less initiative is required, on the part of a student, to enter into the student to teacher or student to student exchange. The level of initiative required to seize a speaking turn in the classroom setting can thus be seen as depending on the antecedent speaking situation. This antecedent situation has three relevant components: who has been the previous speaker (the teacher or another student), who has been addressed (the speaker about to seize the initiative or some other person), and what was the conversational intent of the previous turn (lecture, question, invitation to speak, or comment). The various combinations of these features can be interpreted as creating different expectations or sanctioning different behaviors for students contemplating the decision to speak up.

As a result of careful observation of about 20 classes and analysis of the expectancy dynamics at work over such a large sample of classroom interactions, the following system for assigning levels of initiative has been developed. An attempt was made to identify all relevant antecedents to a student's taking a turn to speak and those antecedents were determined to require five different levels of initiative. These are presented in descending order, i.e. level five requires the highest degree of initiative.
**Level Five Initiative**

speaker: teacher  
content: lecture or comment  
addresses: the class as a whole

**Level Four Initiative**

speaker: teacher  
content: question, comment, answer, or invitation to speak  
addresses: a specific student or students other than the individual student who seizes the turn to speak

**Level Three Initiative**

speaker: teacher  
content: question or invitation to speak  
addresses: all students in the class  
Or:  
speaker: another student  
content: question, answer, or comment  
addresses: teacher  
Or:  
simultaneous attempts by students to speak; confusion; laughter

**Level Two Initiative**

speaker: teacher  
content: comment  
addresses: student who then seizes the turn to speak  
Or:  
speaker: student  
content: question, comment, or answer  
addresses: student or students other than the individual who seizes the turn to speak

**Level One Initiative**

speaker: teacher  
content: question or invitation to speak  
addresses: student who then seizes the turn to speak  
Or:  
speaker: student  
content: question, answer, or comment  
addresses: student who then seizes the turn to speak

These assignment of levels of initiatives are made on an intuitive basis after extensive observation and analysis of the dynamics of a variety of classroom situations.
APPENDIX B

CODED SEATING CHART
To all students:

Thank you for agreeing to participate in this study and for allowing me to observe this class and to pass out a questionnaire. However, in order for me to be able to relate observation and questionnaire data, I need to be able to identify you in some way. In order to protect your anonymity, I am using a code for each student, rather than names.

In the seating chart below, please carefully find your space and write into it your code, which you determine in the following way:

1. your first name initial
2. the month of your birth
3. the year of your birth (last two digits)

For example: Ann L. Smith, born July, 1957 has the code A757. Jim Jones, born December, 1961 has the code J1261.

To aid you in finding your space, I have drawn circles for males and squares for females. I have also indicated the color of tops worn by some individuals, to help you locate yourself.

Please pass this along quickly — to all students!

Thank you!

[Diagram showing codes and seating arrangements]
APPENDIX C

STUDENT OBSERVATION QUESTIONNAIRE NO. 1
Dear Student,

Thank you for cooperating with this research project by allowing me to observe this class and by answering the following questions. Please be assured that this questionnaire is completely confidential and that neither your instructor nor anyone other than my research assistants will see your answers.

Thank You!

1. Please indicate your code:  
   (first name initial, month and year of birth; e.g., Ann Smith, born July 1957 = A757)

2. How frequently did you speak up in class today?  
   1 - Very often  
   2 - Fairly often  
   3 - Occasionally  
   4 - Rarely  
   5 - Never

3. How frequently do you usually speak up in this class?  
   1 - More than I did today  
   2 - About the same as today  
   3 - Less than I did today  
   4 - It varies too much to say

4. Think about how active or quiet you tend to be in your classes in general. Please place a checkmark somewhere on this line to indicate how active or quiet you generally tend to be:  
   active __ __ __ __ __ quiet

5. If you compare your general participation tendency, as indicated above, to your usual participation in this class, which alternative is most descriptive of you?  
   In this class I am generally  
   1 - Much more active than in other classes of this type  
   2 - Somewhat more active than in other classes of this type  
   3 - About as active or quiet as in other classes of this type  
   4 - Somewhat less active than in other classes of this type  
   5 - Much less active than in other classes of this type

6. How up-to-date are you in assigned readings for this class?  
   1 - I've read everything that's been assigned  
   2 - I've read most of the assignments  
   3 - I've read about half the assignments  
   4 - I've read about a third of the assignments  
   5 - I've read almost none of the assignments

7. How would you evaluate today's class in terms of its value for you?  
   good __ __ __ __ __ bad

8. Were there times today when you felt stirred to say something but, for whatever reasons, you did not say it?  
   1 - YES  
   2 - NO

If you answered Yes, why did you not speak up?
APPENDIX D

STUDENT OBSERVATION QUESTIONNAIRE NO. 2
Dear Student,

Thank you for co-operating with this research project. If time allows, I will inform all participating students of the hypotheses and preliminary findings of this study before the end of the semester.

Please be assured once more of the complete confidentiality of this questionnaire.

Thank You!

1. Please indicate your code
   (first name initial, month and year of birth;
   e.g.: Ann L. Smith, born Dec. '56 = A1256)

2. Your class:
   1 - freshman  3 - junior  5 - other
   2 - sophomore 4 - senior

3. Your home campus this semester:
   1 - Smith  4 - Amherst
   2 - Mt. Holyoke  5 - UMass
   3 - Hampshire  6 - other

4. How frequently did you speak up in class today?
   1 - very often
   2 - fairly often
   3 - occasionally
   4 - rarely
   5 - never

5. How frequently do you usually speak up in this class?
   1 - More than I did today
   2 - About the same as I did today
   3 - Less than I did today
   4 - It varies too much to say

6. Think about how much you tend to participate in your classes in general. If you were to compare your participation level to that of your classmates in general, how would you rate yourself?
   I tend to participate
   1 - much more than most students
   2 - somewhat more than most students
   3 - about the same as most students
   4 - somewhat less than most students
   5 - much less than most students

7. Once again, think about how active or quiet you tend to be in your classes in general. Please indicate your general participation level by placing a checkmark somewhere on this line:
   active __ __ __ __ quiet
8. How satisfied are you with your current general participation level?
   1 - I would like to participate more than I do now
   2 - I am just about satisfied with my present level
   3 - I feel I participate too much

9. If you compare your general participation tendency, as indicated in
    Question 7, to your usual participation level in this class, which
    alternative describes you best?

   In this class, I am generally
   1 - much more active than in other classes of this type
   2 - somewhat more active than in other classes of this type
   3 - about as active or quiet as in other classes of this type
   4 - somewhat less active than in other classes of this type
   5 - much less active than in other classes of this type

10. How up-to-date are you in assigned readings for this class?
    1 - I've read all the assignments for today
    2 - I've read only part of the assignments for today
    3 - I've read none of the assignments for today

11. How would you evaluate today's class in terms of its value for you?
    good __ __ __ bad

12. How many students present in this class today participated in the
    discussion more than you?
    number of students __________

13. How do you feel towards the most active students in this class?
    favorably __ __ __ unfavorably

   Do you wish to elaborate on this question?

14. If you spoke up rarely or never in class today, could you give some
    reasons for your lack of participation? (use back of page for more
    space)

THANK YOU!
APPENDIX E

REQUESTS TO STUDENTS TO PARTICIPATE IN THE ATTITUDINAL DATA GATHERING STAGE OF THE PROJECT
Text of Verbal Request to Students to Participate in Attitude Data Gathering Stage of the Project

As you have probably guessed, my study is concerned with classroom verbal participation by college students. I have chosen this topic because a great number of students and professors feel that there is often a real problem in setting up conditions conducive to student discussion.

In my study I am looking at both a number of situational variables that might affect the degree of participation by students (i.e. class size, student composition by sex, subject, etc.) and at the attitudes and experiences that students bring to bear on the situation. My hope is, of course, to come to identify factors which might help both teachers and students to promote classroom dialog.

You have graciously allowed me to observe your class and thus gather data on situational variables. Now I would like to ask you to participate once more, by allowing me to find out, in greater detail, your own attitudes and experiences in regard to classroom discussions. This involves giving an hour of your time, at a time which I will try to make convenient to you, and filling out an interesting, wide-ranging attitude-type questionnaire.

I hope very much that you will consider helping me out in this. If you yourself have no problem with class participation, you have a great deal of important information to share. If you do have a problem with it, it would be of great value to find out more about your attitudes and experiences.

Though I can offer no monetary reward, I can offer you, beyond the good feeling of having served a good cause, all the feedback you would like on both general results and your own particular, individual case.

I have here some coded sign-up sheets. Please come and identify yours by your code and indicate on it whether you are willing to help me out. On the sheet you can also indicate to me convenient times for you to take the questionnaire. Please give the filled-out sheet back to me before you leave and please fill it out whether you are willing or not to participate further.

Thank you very much!
Class Participation Project

Director: Angelika Robertson
c/o C.L. Robertson, Wright Hall, Smith C.

April 15, 1977

Dear [Name],

You were absent on the day on which I came to your class to explain the nature of my study and to request further participation by some students, including you. I am therefore writing you this note to give you the information you missed.

As you have probably guessed, my study is concerned with classroom verbal participation by college students. I have chosen this topic because a great number of students and professors feel that there is often a real problem in setting up conditions conducive to student discussion.

In my study I am looking at both a number of situational variables that might affect the degree of participation by students (i.e. class size, student composition by sex, subject, etc.) and at the attitudes and experiences that students bring to bear on the situation. My hope is, of course, to come to identify factors which might help both teachers and students to promote classroom dialog.

You have graciously allowed me to observe your class and thus gather data on situational variables. Now I would like to ask you to participate once more, by allowing me to find out, in greater detail, your own attitudes and experiences in regard to classroom discussions. This involves your giving an hour of your time, at a time which I will try to make convenient to you, and filling out an interesting, wide-ranging attitude-type questionnaire.

I hope very much that you will consider helping me out in this. If you yourself have no problem with class participation, you have a great deal of important information to share. If you do have a problem with it, it would be of great value to find out more about your attitudes and experiences.

Though I can offer no monetary reward, I can offer you, beyond the good feeling of having served a good cause, all the feedback you would like on both general results and your own particular, individual case.

Please fill out the accompanying sheet and indicate your willingness to participate. Please fill it out right now and either give it to your teacher, who will forward it to me, or mail it by Campus Mail, at the address given above.

If you have any more questions, please feel free to call me at 584-9002.

Sincerely,

Angelika Robertson

P.S. I will get in touch with you to let you know about the times and places at which you could do the follow-up questionnaire.
Classroom Verbal Participation Project
Director: Angelika Robertson

April, 1977

Dear [Blank],

I hope very much that you found my brief presentation about this study informative and interesting. I especially hope that you were persuaded of the importance of your participation in the follow-up phase of the study, which consists of responding to a questionnaire, which takes about an hour of your time. It is very important to the validity and ultimate usefulness of this project to find out what you think and what your experiences have been in regard to speaking up in classroom situations. After the data have been analyzed, I will be happy to provide you with feedback, not only about the general results, but also about how your individual case fits in with general trends.

Please indicate below your willingness to participate:

0 I am willing to participate
0 I am unwilling to participate, for the following reasons:

0 Before I decide, I wish to know more about the study. I will call 584-5003 (please note the phone no.) today or tomorrow for more information.

In order for me to find a suitable time for group administration of the follow-up questionnaire, I need to know what times you might be available. Please indicate below the suitability of the suggested times:

Possible	Impossible	Possible, but not desirable

Thursday, April 14, 2-3 P.M.
Thursday, April 14, 3-4 P.M.
Wednesday, April 13, 4-5 P.M.
Wednesday, April 13, 5-6 P.M.

If none of the above times are possible for you, I will get in touch with you to try to arrange a suitable time.

IMPORTANT: At this time, I need to ask you your name, phone number, and address, so that I may communicate further with you about this. Please, however, be assured that I will continue to treat all data with absolute confidentiality.

Name: ___________________________ Phone: ___________________________
Mailing Address: ___________________________
Dear

I missed you! I am sorry our questionnaire appointment didn’t work out for you but I’m now mailing you a copy of the questionnaire, in the hope that you will find about 45 minutes, in the next day or so, to fill it out for me.

When you have finished, please mail it back to me promptly in the envelope in which it arrived; simply place the enclosed address label on top of your address. Put in a CAMPUS MAIL box, not a U.S. mailbox (unless you add a stamp).

I really appreciate your help! Call me if there are any questions or problems, at 584-5002.

Thank you,

Angelika Robertson

---

Dear

I appreciate very much your indication that you were willing to fill out my questionnaire for me. Unfortunately I could not reach you in the last few days to agree on a convenient time. I am therefore mailing you the questionnaire to do at your convenience. It takes about 45 minutes to fill out. Don’t you please do it in the next two days?

When you have finished, please mail it back to me promptly in the envelope in which it arrived; simply place the enclosed address label on top of your address. Put in a CAMPUS MAIL box, not a U.S. mailbox (unless you add a stamp).

Thank you so much for your help. Call me if there are any questions or problems, at 584-5002.

Thank you,

Angelika Robertson

---

Dear

On the request sheet about filling out a questionnaire for me you indicated that the suggested times were not convenient to you. I have therefore decided to mail you the questionnaire, to do at a time convenient to you. The questionnaire takes about 45 minutes to do. Don’t you please try to find time to do it in the next 5 days? I would really appreciate it!

When you have finished, please mail it back to me promptly in the envelope in which it arrived; simply place the enclosed address label on top of your address. Put in a CAMPUS MAIL box, not a U.S. mailbox (unless you add a stamp).

Thank you for your help. Call me if there are any questions or problems; my number is 584-5002.

Thank you,

Angelika Robertson
APPENDIX F

LONG QUESTIONNAIRE

Cover page with demographic information p. 1
Rathus General Assertiveness Schedule p. 2
Spence-Helmreich Attitudes Towards Women Scale p. 3
Robertson Intellectual Verbal Conflict Approach/Avoidance Measure p. 4
Section I: General Information about Target Class p. 6
Section A: Miscellaneous Attitudes about Target Class p. 7
Section B: Consequence Likelihood Items p. 7
Section C: Consequence Desirability Items p. 8
Section D: Normative Expectancy Items p. 9
Section E: Motivation to Comply Items p. 10
Section F: Evaluative Attitude Items p. 10
Section G: General Attitudinal Questions p. 12
Dear Student,

Thank you for participating in this project. On the following pages you will find a variety of questions, to be answered in a variety of formats. Please read directions carefully as you go along and please answer all items, even though some may be hard to decide. The final section invites you to say, in your own words, what you think about this issue of student participation in class discussions. The various sections with their "ready-made" answers will take you only about 30-40 minutes. On these sections, please feel free to "talk back" to the questionnaire by writing in comments wherever you find space; just be sure you do mark one of the alternative answers given.

My address and phone number are noted above, so that you can consult with me further about this, if you wish. I am also asking you to provide your summer mailing address so that I can send you, as promised, a report about the results of this study.

When you have finished with this questionnaire, please return it to me or my research assistant in the place in which you picked up this questionnaire.

THANK YOU AGAIN!

1. Your name ____________________________ (assurances of confidentiality still apply, of course)

2. The code you used ___________________
   (first name initial, month and year of birth)

3. Your sex ___ female ___ male

4. Your major field of study __________________

5. Your home campus this semester _______________

6. Your religious background ___ Protestant ___ Catholic ___ Jewish ___ Other

7. Your summer mailing address:
-2-

RATHUS GENERAL ASSERTIVENESS SCHEDULE

Directions: Indicate how characteristic or descriptive each of the following statements is of you by circling the number which applies to you, given the following code:

+3 very characteristic of me, extremely descriptive
+2 rather characteristic of me, quite descriptive
+1 somewhat characteristic of me, slightly descriptive
-1 somewhat uncharacteristic of me, slightly nondescriptive
-2 rather uncharacteristic of me, quite nondescriptive
-3 very uncharacteristic of me, extremely nondescriptive

1. I have hesitated to make or accept dates because of "shyness."
2. When the food served at a restaurant is not done to my satisfaction, I complain about it to the waiter or waitress.
3. I am careful to avoid hurting other people's feelings, even when I feel that I have been injured.
4. When I am asked to do something, I insist upon knowing why.
5. To be honest, people often take advantage of me.
6. I often don't know what to say to attractive persons of the opposite sex.
7. I will hesitate to make phone calls to business establishments and institutions.
8. I would rather apply for a job or for admission to a college by writing letters than by going through personal interviews.
9. I find it embarrassing to return merchandise.
10. I have avoided asking questions for fear of sounding stupid.
11. During an argument I am sometimes afraid that I will get so upset that I will shake all over.
12. I avoid arguing over prices with clerks and salesmen.
13. If someone has been spreading false and bad stories about me, I see him/her as soon as possible to "have a talk" about it.
14. I often have a hard time saying "no."
15. I tend to bottle up my emotions rather than make a scene.
16. I complain about poor service in a restaurant and elsewhere.
17. Anyone attempting to push ahead of me in a line is in for a good battle.
18. I am quick to express an opinion.
19. There are times when I just can't say anything.
The statements below describe attitudes toward the role of women in society that different people have. There are no right or wrong answers, only opinions. You are asked to express your feeling about each statement by indicating whether you (1) agree strongly, (2) agree mildly, (3) disagree mildly, or (4) disagree strongly. Please circle the response of your choice.

<table>
<thead>
<tr>
<th></th>
<th>Agree Strongly</th>
<th>Agree Mildly</th>
<th>Disagree Mildly</th>
<th>Disagree Strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Swearing and obscenity are more repulsive in the speech of a woman than of a man.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>Women should take increasing responsibility for leadership in solving the intellectual and social problems of the day.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>Both husband and wife should be allowed the same grounds for divorce.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>Telling dirty jokes should be mostly a masculine prerogative.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>Intoxication among women is worse than intoxication among men.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>Under modern economic conditions with women being active outside the home, men should share in household tasks, such as washing the dishes or doing the laundry.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7.</td>
<td>It is insulting to women to have the &quot;obey clause&quot; remain in the marriage service.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8.</td>
<td>There should be a strict merit system in job appointment and promotion, without regard to sex.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9.</td>
<td>A woman should be as free as a man to propose marriage.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10.</td>
<td>Women should worry less about their rights and more about becoming good wives and mothers.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11.</td>
<td>Women earning as much as their dates should bear equally the expense when they go out together.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12.</td>
<td>Women should assume their rightful place in business and all the professions along with men.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13.</td>
<td>A woman should not expect to go to exactly the same places, or to have quite the same freedom of action as a man.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14.</td>
<td>Sons in a family should be given more encouragement to go to college than daughters.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>15.</td>
<td>It is ridiculous for a woman to run a locomotive and for a man to clean socks.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>16.</td>
<td>In general, the father should have greater authority than the mother in the bringing up of children.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>17.</td>
<td>Women should be encouraged not to become sexually intimate with anyone before marriage, even their fiancés.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>18.</td>
<td>The husband should not be favored by law over the wife in the disposal of family property or income.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>19.</td>
<td>Women should be concerned with their duties of child-bearing and house-tending rather than with desires for professional and business careers.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>20.</td>
<td>The intellectual leadership of a community should be largely in the hands of men.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>21.</td>
<td>Economic and social freedom is worth far more to women than acceptance of the ideal of femininity as set up by men.</td>
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<td>22.</td>
<td>On the average, women should be regarded as less capable of contributing to economic production than are men.</td>
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<td>23.</td>
<td>There are many jobs in which men should be given preference over women in being hired and promoted.</td>
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<td>24.</td>
<td>Women should be given equal opportunity with men for apprenticeship in the various trades.</td>
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<td>25.</td>
<td>The modern girl is entitled to the same freedom from regulation and control that is given to the modern boy.</td>
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ROBERTSON VERBAL CONFLICT MEASURE

The statements below describe attitudes that different people have toward situations in which verbal conflict about intellectual issues can take place. There are no wrong or right answers, only opinions. You are asked to express your feeling about each statement by circling the number corresponding to your choice:

1 = AGREE STRONGLY, or very characteristic of me
2 = agree mildly, or somewhat characteristic of me
3 = disagree mildly, or somewhat uncharacteristic of me
4 = DISAGREE STRONGLY, or very uncharacteristic of me

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<th>1. I like classes in which there is a lot of student discussion.</th>
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<td>2. I enjoy speaking up in class.</td>
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<td>3. When I speak up in class, I rarely have a sense of having contributed anything worthwhile.</td>
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<td>4. I prefer writing a paper to making an oral presentation.</td>
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<td>5. I usually get a lot out of class discussions.</td>
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<td>6. I get more satisfaction from participating in the discussions during a course than I get from writing a paper at the end of a course.</td>
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<td>7. I often think that students in my classes might as well have kept their opinions to themselves without any loss to anyone.</td>
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<td>8. I am rarely afraid to express an opinion in class which differs from the opinions voiced by the professor.</td>
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<td>9. Students that dominate class discussions really turn me off.</td>
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<td>10. I feel that students should not put each other on the spot in a class discussion.</td>
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<td>11. I tend to like the most vocal students in my classes.</td>
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<td>12. If I disagree with what another student says in a discussion, I tend to say so.</td>
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<td>13. I would rather listen to what the professor has to say than to the opinions of other students.</td>
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<td>14. I prefer making my comments to the professor after class to expressing them in class.</td>
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<td>15. I would not mind if a student argued against something I have said in the course of a class discussion.</td>
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Note: The following statements refer to situations of discussion about intellectual, rather than emotional or personal issues, irrespective of the classroom or the academic setting.

|   |   |   |   | 16. When I disagree with people, I tend to have a hard time expressing what I want to say. |
| 1 | 2 | 3 | 4 |
|   |   |   |   | 17. In an intellectual dispute I worry a lot about sounding stupid. |
| 1 | 2 | 3 | 4 |
|   |   |   |   | 18. Discussing controversial issues can easily raise a lot of temperatures and rarely results in anything positive. |
| 1 | 2 | 3 | 4 |
|   |   |   |   | 19. I often keep my opinions to myself because I don't want to risk alienating people. |
| 1 | 2 | 3 | 4 |
|   |   |   |   | 20. When someone criticizes my opinions, I tend to feel that I am being personally attacked. |
| 1 | 2 | 3 | 4 |
|   |   |   |   | 21. I like to test out my ideas on certain issues by discussing them with people who are likely to disagree with me. |
| 1 | 2 | 3 | 4 |
22. When I'm in the pressured situation of an intellectual argument, I find I can't articulate my thoughts well at all.

23. I enjoy matching wits and trying to be clever with friends.

24. I prefer submitting my ideas to open criticism rather than sharing them with people who will be mostly accepting and supportive.

25. If the situation demands it, I'm good at pretending to know more than I do.

26. When I'm in a heated discussion with someone, I tend to feel exhilarated and intellectually alive.

27. I would come across as less knowledgeable on an oral exam than on a written exam.

28. I would rather apply for a job or a fellowship by writing letters than by going to personal interviews.

29. My close friends and I often have heated discussions about various issues.

30. I'm suspicious of people with strong opinions.

31. In my family we frequently discuss(ed) controversial issues.

32. Dinner in my home is (was) often an occasion for lively exchange of ideas.

33. In jobs that I have held, I was usually very reluctant to make suggestions or offer criticism.

34. I would enjoy participating in a debate on a controversial issue.

35. While I don't go looking for verbal fights, I sure can enjoy one once I'm in it.
SPECIFIC CLASS EXPERIENCE QUESTIONNAIRE

The purpose of the following sets of questions is to gain an understanding of your attitudes and experiences in specific classes that you are now taking or have recently taken.

We shall call those specific classes:
1) "class A"
2) "class B"
3) "class C"

"class A" is the class in which you and your classmates were observed for this study.
"class B" and "class C" are classes that you choose from your recent experience, according to directions found on a subsequent page.

SECTION A
This section asks questions about CLASS A only.

I-1. The subject area of CLASS A is ________________________________.

I-2. CLASS A has about ____ students present, on average. (number)

I-3. The teacher's sex in CLASS A is ___ male ___ female.

I-4. The approximate age of the teacher in CLASS A is

under 34 ___ 34-45 ___ 46 or older

I-5. The approximate sex composition of students in CLASS A is:

___ percent female ___ percent male

I-6. The number of students who were generally more active in verbal participation than you is

___(number of students)

I-7. If you had to describe the class as a whole in terms of the amount of verbal participation by students in class discussion, what percentage of students would you place in each of the following categories?

1. ___% very active participants
2. ___% moderately active participants
3. ___% rarely active participants
4. ___% students who never participate

I-8. In which of the groups described in question 7 would you place yourself?

group number ___

Please answer the following sets of questions by placing a checkmark somewhere along the line to indicate how strongly (or how neutral) you feel about the appropriateness of the descriptive words or phrases.

Please place your mark on the line like this: ✓: , not like this: _:_:

Please answer all items. Please place only one checkmark per item, never more.
Note: These questions still refer to CLASS A!

(9-11) How would you describe the atmosphere of CLASS A?
A-1 9. formal:__________ informal
A-2 10. competitive:__________ co-operative
A-3 11. teacher-centered:__________ student-centered
A-4 12. How much at ease do you feel with the other students in the class?
I feel at ease:________: I feel ill at ease
A-5 13. How much of an effect do you think that your class participation has on the grade you will get in this course?
no effect:__________ strong effect
A-6 14. How likely are you in this class to save a comment or a question to the teacher for after class?
likely:________: unlikely
A-7 15. How likely are you to discuss the subject matter of this course with your friends outside of class?
likely:________: unlikely
A-8 16. Ideally speaking, how teacher-centered or student-centered would you like this class to be?
teacher-centered:__________ student-centered
A-9 17. In CLASS A, how likely are you, or were you, to raise a question, or to express an idea or an opinion during class?
likely:________: unlikely

(18-32) Listed below are a number of consequences which various students think might follow upon raising a question or expressing an idea or an opinion in class. Please indicate how likely you think these consequences are when you raise a question, or express an idea or an opinion in CLASS A:

B-1 18. The class might laugh at me
likely:________: unlikely
B-2 19. I might make a good impression on the teacher
likely:________: unlikely
B-3 20. It might result in an argument
likely:________: unlikely
B-4 21. The teacher might respond in a negative manner
likely:________: unlikely
22. I might be wrong
likely: __________: unlikely

23. What I have to say will be ignored.
likely: __________: unlikely

24. It might stimulate discussion
likely: __________: unlikely

25. It might help clarify a concept
likely: __________: unlikely

26. The teacher might ask me to follow up on what I said and I won't be able to
likely: __________: unlikely

27. The class might think I'm trying to earn "brownie points" with the teacher
likely: __________: unlikely

28. I might not make myself understood
likely: __________: unlikely

29. The class might think I'm talking only to be noticed
likely: __________: unlikely

30. I might show that I haven't done or understood all the reading
likely: __________: unlikely

31. My comment or question might be seen as repetitive, trivial or irrelevant
likely: __________: unlikely

32. My classmates might think that I made a good point
likely: __________: unlikely

(33-47) Just how good or bad do you consider the above consequences to be?

C-1 33. For the class to laugh at me is
    good: __________: bad

C-2 34. For me to make a good impression on the teacher is
    good: __________: bad

C-3 35. For my remark or question to result in an argument is
    good: __________: bad

C-4 36. For the teacher to respond to me in a negative manner is
    good: __________: bad
C-5 37. For me to be wrong is

  good :_________; _______; _______; _______; _______; bad

C-6 38. For my comment or question to be ignored is

  good :_________; _______; _______; _______; _______; bad

C-7 39. For me to stimulate discussion is

  good :_________; _______; _______; _______; _______; bad

C-8 40. For me to help clarify a concept is

  good :_________; _______; _______; _______; _______; bad

C-9 41. For the teacher to ask me to follow up on what I said and for me then not to be able to is

  good :_________; _______; _______; _______; _______; bad

C-10 42. For the class to think that I'm trying to earn "brownie points" with the teacher is

  good :_________; _______; _______; _______; _______; bad

C-11 43. For me not to make myself understood is

  good :_________; _______; _______; _______; _______; bad

C-12 44. For the class to think that I'm talking only to be noticed is

  good :_________; _______; _______; _______; _______; bad

C-13 45. For me to show that I haven't done or understood all the reading is

  good :_________; _______; _______; _______; _______; bad

C-14 46. For my comment or question to be seen as repetitive, trivial, or irrelevant is

  good :_________; _______; _______; _______; _______; bad

C-15 47. For my classmates to think that I made a good point is

  good :_________; _______; _______; _______; _______; bad

(48-52) Often we feel that certain people in our lives have expectations for us to do, or not do, certain things:

D-1 48. My female friends would probably think that

  I should :_________; _______; _______; _______; _______; I should not raise questions or express ideas or opinions in CLASS A.

D-2 49. My male friends would probably think that

  I should :_________; _______; _______; _______; _______; I should not raise questions or express ideas or opinions in CLASS A.
D-3 50. My female classmates in CLASS A probably think that
   I should :____:____:____:____:____: I should not
   raise questions or express ideas or opinions in CLASS A.

D-4 51. (answer if applicable): My male classmates in CLASS A probably think that
   I should :____:____:____:____:____: I should not
   raise questions or express ideas or opinions in CLASS A.

D-5 52. My teacher in CLASS A probably thinks that
   I should :____:____:____:____:____: I should not
   raise questions or express ideas or opinions in CLASS A.

D-6 53. Most people who are important to me probably would think that
   I should :____:____:____:____:____: I should not
   raise questions or express ideas or opinions in CLASS A.

(54-55) While various people in our lives have expectations for us to do or not
do certain things, we are not equally motivated to comply with these
expectations:

E-1 54. In general, how much do you want to do what your female friends think
   you should do?
      very much :____:____:____:____:____: not at all

E-2 55. In general, how much do you want to do what your male friends think
   you should do?
      very much :____:____:____:____:____: not at all

E-3 56. In general, how much do you want to do what your female classmates
       think you should do?
      very much :____:____:____:____:____: not at all

E-4 57. In general, how much do you want to do what your male classmates think
       you should do?
      very much :____:____:____:____:____: not at all

E-5 58. In general, how much do you want to do what your teacher in CLASS A
       thinks you should do?
      very much :____:____:____:____:____: not at all

(59-65) How would you evaluate or describe raising a question, or expressing an
idea or an opinion in CLASS A?

F-1 59. good :____:____:____:____:____: bad

F-2 60. harmful :____:____:____:____:____: beneficial
F-3 61. pleasant :_________: unpleasant
F-4 62. punishing :_________: rewarding
F-5 63. competitive :_________: co-operative
F-6 64. feminine :_________: masculine
F-7 65. productive :_________: unproductive
Thank you for plowing through all the preceding pages. Just three more items and then you can have your say in your own words:

G-1 1. Just how large a problem do you think that lack of student participation in class discussions is, in general, at your college?

- a large problem:__:__:__:__:__:__:__

no problem

G-2 2. You have already indicated, on a previous questionnaire, how much you tend to participate in class discussions in general. Now I would like to know how talkative or reticent you tend to be in other situations:

- when you are with your friends:
  talkative:__:__:__:__:__:__:
  reticent

- when you are with your family:
  talkative:__:__:__:__:__:__:
  reticent

- when you are with your professors on a one-to-one basis:
  talkative:__:__:__:__:__:__:
  reticent

- when you are in a task-oriented group with your peers, such as on a committee, or in a student organisation, etc.
  talkative:__:__:__:__:__:__:
  reticent

G-3 3. In order for me to test an hypothesis about the relationship between a student's grades in a course and his/her participation in class discussions, I would like to find out the grade(s) you received in the course in which you and your classmates were observed for this study. Would you give me permission to inquire of the professor in CLASS A, at the end of the semester, about the grade(s) you received in that course?

"I hereby authorize Professor ____________________ to give information concerning the grade(s) I received in the course ________________

to Ms. Angelika Robertson.

Signed ____________________________________________

(student's signature)

Do you have any thoughts, beyond what is already implied in this questionnaire, about what helps you or others from avoiding or in class -- or, on the other hand, what facilitates or facilitates your or others doing so?

(for more space please use backs of pages)
APPENDIX G

TEACHER QUESTIONNAIRE I
TEACHER QUESTIONNAIRE 1

Please provide the following information on the student named below. (His/her permission to you to give this information is enclosed.)

Name of Student:

1. When you reflect on this student's participation in class discussion this semester, in which of the following categories would you place her/him?

   1 - very active participant
   2 - moderately active participant
   3 - rarely active participant
   4 - never participated

2. When you compare the extent of this student's participation to that of the other students in the class, how would you rank this student?

   Out of about ____ students who attended this class
   (no. of students)
   fairly regularly, about ____ students participated
   (no. of students)
   more frequently than this student.

3. In general, how would you rate the quality of this student's contributions to class discussions?

   1 - A or excellent
   2 - B or good
   3 - C or adequate
   4 - D or barely adequate

4. What grades or informal evaluations did you (or would you) give this student in the following areas? (Please circle appropriate grade or leave blank if item doesn't apply)

   1 - Oral report(s): A B C D
   2 - Written reports or papers: A B C D
   3 - Written exams: A B C D
   4 - Final grade in course: A B C D
APPENDIX H

TEACHER QUESTIONNAIRE II
TEACHER QUESTIONNAIRE 2

Please answer the questions below. If you have any further thoughts related to the issue of verbal class participation, please write them down. (Use back of page, if necessary.)

1. Please give your name: _______________________________________________

   (On the following questions, please place a checkmark at a point on the line that reflects how closely one or neither of the polar expressions applies.)

2. How well did the students in this class in general meet your expectations for participation in class discussions, both as to quantity and quality?
   
   a. as to quantity:
   
   I am very satisfied :__:__:__:__:__:__:__:__: I am not at all satisfied

   b. as to quality:
   
   I am very satisfied :__:__:__:__:__:__:__: I am not at all satisfied

3. How much do you take into account students' class participation in your calculation of final grades in this course?
   
   very much :__:__:__:__:__:__:__: not at all

4. How much of a problem, if at all, do you think it is to elicit participation from students in classes in general at your college?
   
   a large problem :__:__:__:__:__:__:__: not a problem

5. How typical was the class I observed of the kind of response you tend to elicit in your classes in general? What was special about this course? What other information about this class would help to understand the context in which participation did or did not take place? (Please use back of page for more space, if desired)

6. Have you taught at other colleges or in different settings where the class participation picture differed notably? Please elaborate.