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Status problems and social structure in middle school classrooms

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**STATUS PROBLEMS AND SOCIAL STRUCTURE IN MIDDLE SCHOOL
CLASSROOMS**

A Thesis

Presented to

The Faculty of the Department of Sociology

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

Paulette Lloyd

August 1998

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ABSTRACT

STATUS PROBLEMS AND SOCIAL STRUCTURE IN MIDDLE SCHOOL CLASSROOMS

by Paulette Lloyd

The purpose of this study is twofold. The first is to apply a sociological theory -- Status Characteristics Theory -- to two types of middle school classroom structures to understand how status operates in middle schools and the consequences of this for middle school students. The second is to add to our knowledge of Status Characteristics Theory and to the body of research on applied Status Characteristics Theory.

Two sets of middle school classrooms located in Monterey County, California were observed over several months. The results of this study confirm the significant role a middle school student's perceived status has on his or her rates of interaction in group work activities. In addition, the findings from the present study indicate that certain classroom structures reduce some of the negative effects of status on interaction rates. Finally, the findings suggest that social groups can create their own solution for status problems, such as developing independent bases for definitions of status.

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Introduction

This thesis uses status characteristics theory to examine status generalization problems in the middle school classroom. Status generalization problems in this study refer to the domination of group work activity by one or two "high status" students. This results in the exclusion of lower status students. This is a problem for two reasons. First, prior studies have shown that higher interaction rates in group work activities result in higher scores on achievement tests. Second, when "high status" students are white and male, the result can be an implicit acceptance and perpetuation of current stratification problems in the general society.

Status characteristics are individual traits that carry certain stereotypes as well as generalized expectations for competence. There are generally two states to status characteristics, high and low, with the high state being the more desirable one. Status characteristics can be ascribed/diffuse, such as race, gender and age. In this society, women have been stereotyped as irrational, Blacks as lazy, young people as irresponsible. Status characteristics also can be achieved/specific, such as occupational prestige (doctor, lawyer), expertise in any area (scholar, consultant), or athletic ability. In groups working collectively on a task, such as juries or school committees, group members generally have higher expectations for competence among doctors and lawyers than for construction workers or clerical workers. In addition, schools contain what we refer to as "local" status characteristics. They are referred to as local because they do not necessarily reflect the norms of the general U.S. population. Academic status and peer status are local status characteristics in schools. Students are generally perceived by their peers as high in

academic status if they are seen as intelligent and capable with respect to teacher-assigned tasks. Students are perceived by their peers as high on peer status if they are popular (for a definition of terms, please see Appendix A, "Glossary of Terms"). The criteria for being high or low on these two local status characteristics differ by school and even by classroom.

Many studies have been done on the effects of status on students in elementary schools (see Cohen, 1984, 1990, 1994b). In elementary schools, the ability to read well gives a student high academic status. In elementary schools, peer and academic status tend to be strongly correlated, so good readers are also the most popular students (Cohen 1984, 1990, 1994b). A consequence of this is that a few select students tend to dominate group work activities. Students perceived as higher status by their peers interact more. A second consequence of this is that these students who interacted less scored lower on achievement tests. Cohen and Lotan's studies showed a strong correlation between rates of interaction in group work activities and scores on achievement tests (Cohen & Lotan, 1994, 1995).

Only recently have researchers begun to look at the effects of status in middle school classrooms. Cohen and Lotan's (1994, 1997a) initial studies in middle schools revealed that middle schools have more complex social structures than do elementary schools. Middle school teachers tend to be more evaluative than elementary schools. In elementary school classrooms, teachers focus more on effort than on achievement; the reverse of this occurs in middle school classrooms. Middle school students also use more criteria by which to evaluate their peers. Sexuality plays a stronger role, which activates

attractiveness as a status characteristic (see Webster & Driskell, 1983). Evidence suggests that peer status is a powerful determinant of generalized status in this environment.

The relationship peer and academic status have to each other also plays a strong role in developing a classroom social structure. Unlike the situation in elementary school classrooms, where peer and academic status tend to be strongly correlated, many middle school classrooms show no correlation between these status dimensions or even negative correlations. Thus some middle school classrooms are like elementary school classrooms where academic and peer status tend to go together. Cohen and Lotan referred to these as congruent classrooms. In other middle school classrooms, peer status appears quite independent of academic status. Cohen and Lotan referred to these as incongruent classrooms (Cohen & Lotan, 1997a, p. 25).

Cohen and Lotan (1997a) found that, when holding a number of variables constant, incongruence was associated with less severe status problems than congruence. They speculated that these results were due to a "natural treatment" found in incongruent classrooms in which students created a new peer status order that was independent of the academic status order. As a result, students high on one status dimension were working with students high on another status dimension. The result would theoretically be equal status behavior. However, Cohen and Lotan could not test this idea with their set of data. In the first place, they were studying classrooms where teachers were attempting special interventions designed to create equal status behavior. Thus they could not disentangle effects of the preexisting social structure from effects of the intervention. Secondly, they

had no data on the status composition of the groups in which they observed low and high status students.

In this study, I set out to test Cohen and Lotan's interpretation of their data on a new set of data constructed to yield much clearer evidence concerning issues that their study raised. My research questions focused on middle school classrooms which used small group instruction but no interventions designed to produce equal status behavior. If I collected data on the status composition of small groups in middle school classrooms and observed the participation of each member, would I find that there were more groups that were highly differentiated on status in the congruent in comparison to the incongruent classrooms?

In my study I also wanted to pursue the question of the effects of race and gender. Cohen and Lotan had found a puzzling interaction effect instead of a straightforward effect of the status characteristics of race and gender. Would race and gender act as diffuse status characteristics independent of the effects of academic and peer status? In other words, would girls and nonwhite students be less active within their groups than boys and white students? This was a second major research question in my study.

The present study takes up where Cohen and Lotan's (1997a) study left off. First, we corrected the design flaws by looking at classrooms that do not use the complex instruction approach. This approach incorporates special interventions designed to create equal status behavior. This allowed us to examine the effects of classroom structure independent of any methods to treat status problems. Second, after testing 16 classrooms in Monterey County (California), we selected two sets of classrooms, one congruent and

one incongruent. In this process, the peer and academic status of every student was assessed. After we selected the more extreme high and low status students as target students, we observed every student in any group in which a target student was found. This provided us with important information on the effects of relative status on rates of interaction. We then did a multivariate analysis on the data to test for any differences in status in the two types of classroom structures. In the process, we examined the relationship of race and gender and status, and compared our findings with that of Cohen and Lotan (1997a). Finally, we explored the role of peer status in the status generalization processes of middle school students. We hope this information will deepen the understanding of the status generalization process by adding to the body of knowledge on status characteristics theory.

Theoretical Background

Group Processes Tradition

We spend much of our lives in groups interacting with others. The "group processes tradition" is an area of sociology dedicated to the study of groups and how people interact in groups. This tradition is rooted "in the writings of Lewin and Mead . . . Heider, Schachter, Festinger, Bales, Thibault, Kelley, Homans and Emerson" (Foschi & Lawler, 1994, p. vii). The tradition of group processes is characterized by the following: "it has an analytical, theory-driven orientation" and proponents believe theories should be empirically tested, preferably through experiments. Although it has a close "methodological affinity with experimental social psychology," the unit of analysis is "the

person-in-a-context." This tradition focuses on social structures, "how they emerge and change, and how they affect and are affected by individuals" (Foschi & Lawler, 1994, p. vii).

Expectations States Theory

Expectations states theory has a central place in the group processes tradition. It was initiated by Joseph Berger in 1958 and furthered developed by Berger, Cohen and Zelditch in 1966. The theory explains how status differences in small, collectively-oriented task groups affect the group members' interaction. Berger et al. built upon research by Robert Bales in the early 1950s. Bales and his associates showed that group members, who were not initially differentiated with respect to status, nevertheless, developed a power and prestige order which affected subsequent interactions. Similar research can be traced back to Simmel and Park (Freese, 1974, p. 174). Berger and colleagues describe the operation of a power and prestige order as follows:

The higher the expectations associated with a given actor, (1) the more likely he is to receive and to accept chances to perform; (2) the more likely he is to receive agreement and other types of esteem from other members; (3) the more likely his performances are to be evaluated positively; (4) the more likely he is to be influential and the less likely he is to accept influence from others in case of disagreement; and (5) the more likely he is to receive votes as 'most helpful,' or as 'group leader' (in Webster & Driskell, 1978, p. 221).

Expectation states theory examines the power of status expectations to organize social interaction. According to expectations states theory, if we do not have direct knowledge of persons with whom we are dealing, we believe that we can gain knowledge about them from the status characteristics they possess (Freese, 1974, p.174).

Expectation states theories of status processes help explain how an individual's position

and influence in a group relate to the status characteristics the individual possesses.

Status characteristics, such as occupation, race, sex, age and education level, provide important information about a person. They evoke beliefs, and sometimes stereotypes, which can be used to explain the behavior of the individual possessing them (Webster & Driskell, 1978, pp. 220-221).

Status Characteristics Theory

Status characteristics theory (hereinafter SCT) is a branch of "the expectation states program," which includes power and prestige theory (also called behavior-expectation theory), expectations states theory, source theory, and distributive justice theory (for an illustration of the proliferation of the expectation states program, see Berger & Zelditch, 1993, pp. 52-53). The expectations states theory founded by Berger et al. continued to expand its scope through the introduction of complexities as the understanding of group processes grew (Wagner & Berger, 1993, p. 26). The key difference between power and prestige theory compared with expectations states theories and SCT is "that power and prestige theories consider how expectations emerge in the course of a group's interaction, whereas status characteristics theory focuses on how initial status differences become the basis of expectations in the immediate situation" (Wagner & Berger, 1993, p. 27).

Although situated in small group research, one goal of SCT is to give a theoretical explanation for the development of social stratification. In so doing, it tries to provide the link between social structures and individual behavior. Experimentalists studying status issues in small groups found evidence to suggest that external status characteristics are

imported into and affect relationships in groups. These external characteristics, such as occupation, and gender and race, are culturally evaluated and generally have two states, the desirable high state and the undesirable low state. In U.S. culture, being white and male are the high states for race and gender.

Webster and Foschi give an example of decision-making in juries to illustrate how culturally determined social evaluations of gender are "generalized into specific ideas and actions of individuals in the jury" resulting in differential (and less favorable) evaluations of female members (Webster & Foschi, 1988, p. 1). Webster and Foschi's evaluation of this status generalization process produced the following information: status generalization processes occur with or without "logical or evidential bases"; it is a process of inference which is practiced without depending on formal constraints. The outcomes are often undesirable (i.e., ignoring the ideas of women or nonwhites). These processes are as equally powerful for individuals who have the desirable state of a characteristic as they are for those who do not, and the processes generally occur outside the realm of conscious thought (Webster & Foschi, 1988, pp. 2-5).

This phenomenon is referred to as the "burden of proof" process and is defined as follows:

Status characteristics operate to define interaction situations through a generalization principle called 'burden of proof,' and determine group behavior through an expectation state process. The burden of proof principle states that, unless the relevance or applicability of an external status characteristic is challenged, actors will *infer* task-specific performance expectations on the basis of any discriminable status characteristics they possess. Such inferences occur *regardless of the actual relevance* of the status characteristics to the task at hand (Webster & Driskell, 1978, p. 222).

Certain conditions must exist for external status characteristics to affect face-to-face interaction. The individuals in the group must be collectively and task-oriented. To be task-oriented, the group must be working on a particular problem or goal. To be collectively oriented, the group must see its task as a group product. Examples of task and collectively oriented groups are juries, corporate decision making groups, and students who are required to complete a group project.

Status characteristics theory began with an examination of two-person groups, where the individuals were differentiated on one diffuse status characteristic. Diffuse status characteristics are ascribed characteristics such as race, age, gender, and occupation. They are not bounded by precise limitations (e.g., race versus dentist). Berger and his colleagues found that the individual's status outside of the group was imported into the group and maintained (Webster & Driskell, 1978, p. 220).

In 1969, Freese introduced specific (task-related) status characteristics. He found that the power and prestige order of the group emerged either by one diffuse status characteristic or by two or more specific performance-relevant characteristics. In 1973, Freese and Cohen experimented with how to eliminate status generalizations. Their results suggested that it was possible to block expectation formation from diffuse status characteristics if an individual had at least two specific status characteristics with a positive evaluation. They theorized that this happened because individuals find it cognitively easier to infer ability from a specific status characteristic than a diffuse status characteristic because the former directly represents ability information (Freese & Cohen, 1973; Webster & Driskell, 1978, p. 228).

Berger and Fisek (1974) revised the 1966 theory to include multicharacteristic situations, and introduced the concept of combining. Combining is a the process whereby an individual takes all of the perceived positive and negative characteristics to form an expectation. Several experiments were done to test combining theory (see Webster & Driskell, 1978, p. 228, for a list of these). The Freese and Cohen (1973) study, described above, presented a competing theory to account for the status generalization process. Recall that their theory argued that "it is possible to block expectation formation from a diffuse status characteristic if individuals possess at least two specific status characteristics whose evaluations differ from the evaluation of their diffuse characteristic" (Webster & Driskell, 1978, p. 228). They refer to their theory as "elimination," reasoning that a high state on two specific status characteristics overrides a low state on one diffuse status characteristic (Webster & Driskell, 1978, p. 228).

Zelditch and his colleagues attempted to replicate Freese and Cohen's (1973) results with experiments which should have allowed elimination to occur. Zelditch et al. (1975) felt that their experiments provided more support for combination than for elimination (Webster & Driskell, 1978, p. 228; see Greenstein & Knotterus, 1980; Lee & Ofshe, 1981; Ridgeway & Berger, 1986; Wagner & Berger, 1993 for additional studies on combination versus elimination).

Berger, Fisek, Norman and Zelditch (1977) expanded status characteristics theory to include the combining principle and added the concept of the referent actor, whereby individuals not in the immediate interaction can affect the expectations and behaviors of the others who are interacting. They also added a method to allow the assignment of

numerical values to different status characteristics. This latter development allowed for stronger tests of their theory (Webster & Driskell, 1978).

Sev'er (1989) conducted an experiment to further test the combining versus elimination arguments. She also tested her own model that examined the buffering effect of a task cue (confidence) on a diffuse status characteristic (race). Although she admitted her model was only marginally different from the combining model, she concluded that "with caution" task cues may be able "to buffer the negative generalization of external status" (Sev'er, 1989, p. 334). Her findings paralleled those of Cohen and Roper's (1972) study on the softening of the negative effects of race for students high on task competence.

Sell and Freese (1984) conducted experiments using situations of multiple status characteristics to further explore the combining process. They found that a diffuse status characteristic "appears to affect task decision-making in combination with a General Performance characteristic." Their research suggests that "some status generalization can be eliminated over time when actors are low in status and high in performance, but not necessarily when they are high in status and low in performance" (Sell & Freese, 1984, p. 550).

Competing Theories

Blau, Homans, Thibaut and Kelley created a different body of research to explain the formation of status hierarchies by focusing on the group process itself (Rosa & Mazur, 1979, p. 19). Rosa and Mazur (1979) conducted an experiment to test two assumptions presented by these competing theories. The first was that group members

make conscious and voluntary decisions about other group members. They defer to those whom they believe to have the most ability to help the group members reach their goals. The second assumption is that the formation of a group status structure occurs over time. The results from their experiment tended to support the theories of Berger et al. (1974): that status orders appear quickly and are not part of a conscious decision. This is not to imply that Mazur embraces the approaches used by Berger and others in the status characteristics theory tradition. In fact, in a later study Mazur (1985) subscribed to dominance theory (see also Lee & Ofshe, 1981; Ridgeway, 1987) over the status cues and legitimation theories. Several "variant" formulations of dominance theories and status cues and legitimation theories exist (see Berger & Zelditch, Jr., 1993, p. 54, for a discussion of these). At present, however, combining theory is the preferred method of explanation for how status generalizations are formed (Berger & Zelditch, 1993, p. 54). This paper uses combining theory and SCT to explain how status operates in middle school classrooms.

Derivation of Hypotheses

We derived the following two hypotheses from status characteristics theory and from combining theory:

(1) The more differentiated the group (i.e., the higher the status space between the highest and the lowest costatus score in a group), the lower the rate of participation of the low status members in that group.

(2) Race and gender will act as diffuse status characteristics and will therefore negatively affect participation rates of females and nonwhites working in task-oriented groups.

Literature Review

Status characteristics theory examines how status characteristics affect an individual's interaction in collectively and task-oriented groups. A status characteristic is a comparative evaluation between individuals, with one individual generally regarded as better or worse than another. The effects of stereotypes based on status characteristics are powerful, and have been associated with "differences in honor, life-chances, special privileges and immunities, rights before the law, styles of life, and the like" (Berger, et al., 1966, p. 31).

Two separate bodies of applied research using theorems from status characteristics theory have developed. The first body of applied research was initiated in 1968 by Elizabeth Cohen and her students. One of Cohen's principal concerns was to develop "techniques by which the effects of status characteristic differences can be modified or eliminated in on-going interpersonal situations." The second body was initiated in 1970 by Doris Entwistle and Murray Webster. A primary concern of their work was "to develop techniques by which the expectation states of individuals can be changed in natural social situations" (Berger, Conner & Fisek, 1974, p. 11). The focus of this paper is the body of research by Cohen.

Effects of Status on Classroom Interaction

The first issue Cohen addressed was race relations in education, specifically the issue of integration of schools. Social scientists initially thought that if members of different races had contact under equal status conditions, prejudice would be reduced. Cohen did not study prejudice, but she did find that contact on a collective task where no

one had an initial advantage, resulted in white dominance (Cohen 1972, 1975). She realized that the problem of unequal interaction was not so much an individual problem as it was a social product: white dominance is a social product that is reinforced in social interaction. Her theoretical basis for this understanding was expectation states theory. She applied the concepts from this theory to an experiment she conducted with a colleague in 1972. From this experiment, Cohen and Roper were able to document that "belief systems concerning race and other status characteristics are so powerful that they will infect the interaction setting and will likely reinforce rather than change stereotypical beliefs" (Cohen and Roper, 1972, p. 657).

The experiment involved white and Black junior high school boys working in groups. The researchers attempted to diminish the effects of the diffuse status characteristic, race, by manipulating a performance-based specific status characteristic. Their attempt to develop a practical application for the theory of status generalization was successful. They were able to "treat" a status generalization problem that permeated social behavior (i.e., racism). Based on this experiment, Cohen and Roper concluded that it is necessary to treat both white and Black expectations when intervening in social interactions. Unless this is done, resistance to equal interaction behavior from the advantaged group will continue. Finally, Cohen and Roper concluded that SCT could shed light on racial problems in groups. In order to overcome prejudice, it is important to create situations where equal status interaction can occur. This allows stereotypes to be overcome rather than reinforced. When empirically less academically and socio-economically advantaged Black youth are working in groups with more advantaged white

youth, a situation of unequal interaction is created, reinforcing stereotypes of Black inferiority (Cohen 1972, 1975).

These findings stimulated further research by Cohen and colleagues in their search for ways to foster equal interaction in biracial groups. In 1976, Cohen and her colleagues conducted an experiment applying two treatments in an attempt to produce equal-status behavior in interracial groups of early adolescents and pre-adolescents. Their goal was to create more equal rates of interaction among students working in groups to overcome white domination and the stereotypes of white superiority and Black inferiority (Cohen, Lockheed, & Lohman, 1976, pp. 47-58).

Several other researchers using expectations states theory experimented with interventions in interracial groups in education settings. The researchers took advantage of laboratory settings so that they could simulate the classroom situation, yet exert more controls. This enabled them to look more closely at the effects of race and ethnicity in classroom interaction. Many of the researchers found that in many classroom settings, being Black or Hispanic is correlated with lower academic status (performance), which makes it difficult to distinguish between these two status characteristics. The experiments provided evidence that lower status children, generally minority students, will be less active in and influential on a collective task than white students (Cohen, 1982, pp. 209-235; Cohen, et al., 1976). In a later study on the desegregation of schools, Cohen found that a key problem preventing successful integration was the wide range of academic skills and academic statuses when lower-social-class minority students were placed with middle-class majority students. The resulting academic status structure

avored the majority and contributed to status problems in the classroom, particularly in terms of the domination of white students in group work activities (Cohen, 1975).

The focus of many classroom-based studies, until 1983, was on problems with race and ethnicity. Lockheed, Harris and Nemcef (1983) initiated research on gender in the classroom. They designed a study to replicate Cohen and Roper's (1972) experiment in an attempt to encourage equal status interaction in mixed-gender children's groups. The findings from their study indicated that gender does not appear salient for elementary school children. In other words, gender does not appear to operate as a diffuse status characteristic in elementary school children. They found that it does not become salient until sometime between the ages of 10 and 14 (Lockheed, Harris, & Nemcef, 1983, pp. 877-888.) A study by Leal (1985) also failed to find evidence of the effects of gender in interactions at the elementary school level.

Interventions: Treatment of Status Problems

Cohen established that status does affect interaction levels in the classroom. Her findings indicated that peer and academic status predict rates of task-related talk in cooperative classroom groups. She then began testing the effects of interaction on learning. Results from systematic observations, conducted by Cohen in 1984, provided evidence that linked peer and academic status with learning. Her findings also indicated that students who talk and work together more frequently make greater gains in learning than those who participate less. Her analysis showed that status had an indirect effect on learning gains. Based on these results, Cohen provided evidence to teachers and other

researchers that classroom behavior and performance resulted partly from status (Cohen, 1984, pp. 171-187).

In 1985, Rosenholtz used an intervention to demonstrate how the traditional classroom structure produces status problems. She believed that: "Children who have established a low academic reputation will come to be seen, and will view themselves, as intellectually incompetent in a variety of task situations" (Rosenholtz, 1985, p. 446). Classroom structures have traditionally made classroom stratification visible to students through student grouping patterns and teacher grading practices (Rosenholtz, 1985, p.448). Rosenholtz's intervention successfully demonstrated significant improvement for lower-status group members when compared to control groups. Her intervention also bolstered the claim by SCT that combining, not elimination, is the process whereby multiple status characteristics are processed to arrive at a status generalization of an individual (Rosenholtz, 1985, pp. 464-468).

Cohen and her colleagues demonstrated that expectation states theory "has proved invaluable as a guide to the analysis of status problems in the classroom, the development of status treatments, and the evaluation of the effects of status on interaction and learning" (Cohen, Lotan & Catanzarite, 1988, p. 53). They applied their findings to the development of curriculum and instructional strategies designed to deal with status problems. This approach is referred to as "complex instruction." It has been successful in teaching children in academically and linguistically heterogeneous classrooms how to use each other as resources, eliminating the need for ability grouping and linguistic segregation (Cohen, Lotan & Catanzarite, 1988).

In 1989, Cohen and colleagues applied principles of organizational sociology to the classroom to evaluate organizational and social features of the classroom. They used these principles to test the relationship between "the type of differentiation in the technology, the nature of the teacher's supervision, and work arrangements among the students to gains in achievement at the classroom level" (Cohen, Lotan, & Leechor, 1989, p. 92). Specifically, they found that students working collectively in groups on an assignment requiring multiple abilities to produce a group task increased the possibility of all students contributing. The tasks were designed so that no one student was likely to have all of the abilities required to complete the project, which encouraged cooperation and mutual interdependence. This approach also required the teacher to delegate his or her authority to the students in the groups. The students were to depend less on the teacher and more on each other as resources. The combination of the multiple ability tasks, and the dependence of students on each other to produce a group product resulted in higher rates of interaction (Cohen, Lotan, & Leechor, 1989).

Students took standardized tests at the beginning of the year and at the end of the year after consistent group work of this nature. Significant increases in test scores for most of the students indicated the positive effect of this method. This approach also incorporated "status treatments," a method employed by the teacher to increase the status of low status students working in groups. These strategies resulted in a weakening of status problems associated with the domination of a group by one or more high status students, and the exclusion of one or more low status students. These results led Cohen

and her colleagues to conclude that their efforts to apply sociological knowledge to improve classroom situations were successful (Cohen, Lotan & Leechor, 1989, p. 92).

In a study published in 1995, Cohen and Lotan used two interventions derived from expectation states theory which were designed to counteract the process of stratification in classrooms using academically heterogeneous small groups. They found that focusing on tracking and ability grouping as major sources of inequality, and in need of reform, ignored processes of stratification in heterogeneous classrooms. Their elementary school data supported their hypotheses that using status treatments increased participation of low-status students without affecting participation of high-status students. This is accomplished through higher rates of interaction of all students and more interdependence of group members working on multiple ability tasks. Everyone gains when everyone participates as the knowledge resources of the group increases (Cohen & Lotan, 1995, pp. 99-120).

Status Complexity in Middle Schools

Until 1994, Cohen and her colleagues had conducted their studies in elementary school classrooms. Around this time, cooperative learning was being introduced to middle school classrooms as part of the move towards untracking. School administrators initially felt that cooperative learning would address status problems in the untracked schools. Cohen did not believe that cooperative learning alone was sufficient to deal with status problems because the very nature of a collective task would activate the process of status generalization.

Cohen and Lotan, in 1994, summed up their years of studying and collecting data on status problems in elementary school classrooms, and introduced their recent research conducted in middle school classrooms. Their research provided evidence that although the relationship between status and learning is as true for middle schools as it is for elementary schools, status problems are more complex in middle schools. Many factors contribute to this complexity. Students in middle schools tend to come from a wider range of social and ethnic backgrounds than do students in elementary schools. They place more emphasis on academic ability than on effort. In addition, issues of attractiveness and popularity cause students to emphasize peer evaluation and ranking more strongly at this level (Cohen & Lotan, 1984, p. 2).

Middle school students also tend to develop their own academic status order and criteria to rank peer status. General expectations for competence are attached to these statuses, but unlike diffuse status characteristics, the beliefs underlying the expectations do not lie in the general culture. Cohen and Lotan refer to academic and peer status rankings in schools as "local" status characteristics, because the general expectations attached to these rankings do not lie in the general (U.S.) culture.

In a recent study on middle school classrooms using complex instruction, Cohen and Lotan began testing their hypotheses that status and interaction rates are strongly correlated, and that interaction rates and learning are strongly correlated (Cohen & Lotan, 1997a). These hypotheses had been supported in the elementary school classrooms. They also tested for the positive effects of status treatments as all of these classrooms were using complex instruction, an approach which incorporated methods to treat status

problems. (For a discussion of the complex instruction approach and curriculum development, as well as a summary of their positive test results using the curriculum, see Cohen & Lotan, 1997b).

Cohen and Lotan's attempt to measure the effects of status treatments was inconclusive. They did find evidence to support their hypotheses that status is associated with interaction rates and that interaction rates are associated with achievement gains, as was true for elementary schools, so the generalizability of those findings was supported (Cohen & Lotan, 1997a, p. 7). They also found fewer status problems in incongruent than in congruent classrooms. Cohen and Lotan speculated that these incongruent classrooms may create a natural status treatment, by contributing to more equal interaction. This occurs because, in effect, the students are creating a situation in which they are not dependent on the school's or the teacher's criteria for high academic status as the only way to gain status with their peers (Cohen & Lotan, 1997a, p. 28). On the other hand, these incongruent classrooms may have the potential to create peer pressure to avoid being a good student, making it more difficult for the teacher to have control over the class.

Their results made it difficult to draw any final conclusions. Part of the problem was that the study was done in classes which used status treatments. The researchers did not do a pre-test for status problems prior to any intervention. They also found that teachers varied in their rate of using status treatments in the different classes that they taught, and teachers of congruent classrooms used more status treatments than teachers of incongruent classrooms. In addition, the design of this study only included "target

students," students who were deemed high or low status students based on a sociometric test given before the data were collected. Because Cohen and Lotan did not know if the low status students under observation were located in a group with all other low status students or located in a very heterogeneous group, they could not be certain that all observations were on status-differentiated groups. They found that congruent classrooms had a higher percentage of low status students. Moreover, the percentage of low status students had the effect of reducing classroom status problems. Cohen and Lotan speculated that higher proportions of low status students meant that many low status students could be in all low status groups, creating status-equal situations (Cohen & Lotan, 1997a, p. 27). Status problems occur in mixed status groups, in which high status students tend to dominate. Another study addressing these inconsistencies was needed.

Cohen and Lotan's study also revealed a puzzling interaction effect between academic and peer status and race and gender. They had predicted, based on prior studies, that Blacks and Mexican-Americans would be less active and influential in group work. They also had predicted that the relationship between status and gender would be complicated, as gender becomes activated as a diffuse status characteristic at this age (Cohen & Lotan, 1997a, p. 8). Cohen and Lotan's findings indicated that race and gender mattered only for students low in academic and peer status, but not for students high on these status characteristics. This finding would have to be explored in a future study. The present study is an attempt to address the issues raised by Cohen and Lotan's (1997a) study of status problems in the middle school.

Additional Hypothesis

In addition to the two hypotheses we derived from status characteristics theory and from combination theory, we tested the following hypothesis derived from the findings in the Cohen and Lotan study (1997a):

(3) All other things being equal (i.e., controlling for percentage of low status students), there will be more status problems in congruent than in incongruent classrooms.

The Present Study

General Hypotheses

This study tests the following general hypotheses: (1) The more differentiated the group (i.e., the higher the status space between the highest and the lowest costatus score in a group), the lower the rate of participation of the low status members in that group. (2) Race and gender will act as diffuse status characteristics and will therefore negatively affect participation rates of females and nonwhites working in task-oriented groups. (3) All other things being equal (i.e., controlling for percentage of low status students), there will be more status problems in congruent than in incongruent classrooms. In addition, the study tests specific predictions derived from these general hypotheses at three levels of analyses: individual, group and multilevel.

Predictions for Individual and Group Level Analyses

The predictions in the present study are similar to those made by Cohen and Lotan (1997a). This study tries to achieve a precision not achieved by this previous study, however, by the following improvements: (1) Our hypotheses were tested in classrooms where no status treatments had been attempted as they can interfere with our ability to see

the effects of pre-existing classroom social structure. (2) We measured the interaction of all students in a group noting their status with respect to academic and peer status characteristics. This allowed us to examine the effects of group status composition on interaction with a precision not achieved by previous studies. (3) We controlled for percentage of low status students by excluding undifferentiated groups (i.e., groups where all of the students are either high or low status).

Controlling for the percentage of low status students provided more precise information on the effects of classroom social structure because it distinguished two factors with an hypothesized effect on participation rates: percentage of low status students and congruency/incongruency of the classroom. In Cohen and Lotan's study (1997a), congruent classrooms had more low status students, while incongruent classrooms had fewer extreme high and low status students. Both of these factors have the potential to reduce status problems.

Hypotheses 1 and 3 above were tested primarily at the group level of analysis. The key measure of status generalization problems in this study is the relationship between a student's costatus score (their combined peer status score and academic status score), and his or her percentage of participation. We analyzed this relationship at both the individual and the group level to test for the effects of costatus and of classroom structure. We predicted that incongruent classrooms would have fewer status generalization problems based on our knowledge of the combining principle, that is to say that all of the status information -- race, gender, academic status and peer status -- about a student will be combined to produce a generalized status expectation of that student. We

predicted that incongruent classrooms would have more groups containing students who were high on either academic or peer status, and that congruent classrooms would have fewer groups with this mixed composition, and more groups with uniformly low status students. For incongruent classrooms, the combining principle suggests that when all of the status information is combined, the net result should be equal status interaction.

Hypothesis 2 is tested primarily at the individual level of analysis. Cohen and Lotan (1997a) found that race and gender acted as more powerful status characteristics for low status students than for high status students. This was a puzzling finding and is contrary to what would be expected from combining theory. We predicted that race and gender would act as diffuse status characteristics and would therefore be combined with the information about a student's peer and academic status. We also suspected the subject matter might have had an independent effect on low status females and nonwhites, as we used all science classes. Prior studies by Cohen and colleagues have used primarily social science and reading classes. Traditionally, there has been a stereotype that people of color and women do less well in science. For this reason, we predicted that race and gender would act as diffuse status characteristics independent of the effects of academic and peer status.

To summarize, we made the following specific predictions for the individual and the group levels of analysis: At the individual level of analysis, we predicted that:

1. Small group participation will be affected by status characteristics, e.g., there will be a positive relationship between a student's standing on peer and academic status and his or her participation in small groups.

2. Status will be a more powerful predictor of individual participation in congruent than in incongruent classrooms.

3. Race and gender will act as diffuse status characteristics independent of the effects of academic and peer status. Thus girls and non-white students will tend to have lower participation within the small groups than boys and white students.

At the group level of analysis, we predicted that:

1. There will be more groups with a large group status space in congruent than in incongruent classrooms.

2. Incongruence in the classroom social structure will positively affect the average percentage of task-related interaction of low status students.

3. The greater the group status space, the lower the percentage talk of low status students.

Methodology

Research Design

We contrasted two sets of middle school classrooms, one clearly congruent and one clearly incongruent, using the same measures that Cohen and Lotan (1997a) used in their study. We obtained measures of perceived status for each student and then selected a sample of target students who were high and low status. We then conducted systematic observations of these students while they were engaged in group tasks that met the scope conditions of the theory. We attempted to do five observations of each student. When observing them, we took care to score for interaction of all other members of the group and their student identification code, so we would know their measure of costatus. No status treatments were used in any of the classrooms. Our major tool of analysis was

regressions, where we regressed participation rates of low status students on a number of predictor variables.

Administration of the Sociometric Test

Our study first required us to measure perceived status in a pool of middle school classrooms using group work. The measure of status would indicate congruence and incongruence, and would serve to select a target sample of students of high and low status. We measured status in the same way as did Cohen and Lotan in their study, and used an indicator called "the costatus score," which was comprised of the combined academic and peer status scores in order to determine who the high, medium and low status students were (Cohen & Lotan, 1997a).

In December 1996 and January 1997, student permission slips (see Appendices B-E) were sent to the parents of all students in 21 selected classrooms of two Monterey County Middle Schools: Los Arboles Middle School in Marina, California and Martin Luther King, Jr. Middle School, in Seaside, California. In February and March 1997, a sociometric test (or "Student Questionnaire") was administered to all students in these 21 middle school classrooms (see Appendices F-H). The test consisted of three questions; two of the questions were intended to determine how students rate their peers on two measures: academic achievement and popularity, and the third question was intended to determine how athletic ability relates to popularity. The questions were as follows: 1. In your opinion, which students are best at the subject in this class? 2. If your class had a popularity contest, which students do you think would get the most votes? 3. In your

opinion, who are the most outstanding male and female athletes in the class? (The third question will be examined in a later study.)

Results of the Sociometric Tests: Costatus Scores and Classroom Congruence

Scoring of the sociometric tests was accomplished by placing a hash mark by the name of a student each time their name was circled by their peers. The totals for all students were then divided into quintiles and a score from one to five was given to each student for each of the two questions. Each student then received a score (ranging from 1 to 5) on academic status and on peer status (popularity). The two scores were then added to give each student a costatus score (ranging from 2 to 10, with 10 being the highest).

The academic and peer status scores also were used to obtain a correlation coefficient for each classroom to determine classroom congruence. Scores ranged from -.4 to +.8. Negative or near zero scores indicated that academic and peer status were either unrelated or inversely related. Classrooms with these coefficients were determined to be incongruent classrooms. Positive scores with a significance level of at least .05 indicated that academic and peer status were positively related. Classrooms with these coefficients were determined to be congruent. Based on these scores, two congruent and two incongruent classrooms were selected for observation. Four classrooms at Los Arboles Middle School met all of the criteria required by the study, including having a very ethnically and racially diverse student body. Several of the classrooms at Martin Luther King, Jr. Middle School met our criteria for incongruent classrooms, but only one classroom met the criteria for congruent classrooms. In addition, we had a prompt and complete return of student permission slips for the Los Arboles Middle School

classrooms. In the interest of time and for convenience of observations, the four classrooms at Los Arboles Middle School were selected for observation. All four classrooms were science classes, and three of the four classrooms had the same teacher.

After selecting the classrooms for data collection, eight to ten students from each class were selected to observe based on their costatus score. These students were referred to as the "target students." Each student receiving a costatus score of two or three was designated as a low status student, and each student receiving a costatus score of seven to nine was designated as a high status student. Students receiving a score of four to six were designated as middle status students. In general, an equal number of low and high status students were selected as target students. Because we observed every student in the group with the target student, our sample of middle status students was solely due to chance. Essentially they were "chosen" when they ended up in a group where a target student was located. How often groups were changed varied with the individual teacher. In three of the classrooms, groups changed per group work assignment, and for the fourth classroom, groups changed every few assignments. The method for "choosing" middle status students meant we recorded five or more observations on some middle status students, and only three or four observations for others. The consequences of this are discussed in the section on results.

Table 1 shows the contrast in percentage of high and low status students in the congruent and incongruent classrooms. Most of the students in the incongruent classrooms were middle status students: 59%, compared with 44% in the congruent classrooms. Congruent classrooms also had more low status students (36% compared to

26% for incongruent classrooms), and more high status students (16% compared to 13% for incongruent classrooms). In addition, there were no students with a costatus score above 8 for the incongruent classrooms. We had predicted there would be more extreme costatus scores in the congruent classrooms, and this was confirmed. Our highest costatus score in congruent classrooms was 10, but the two individuals with this score were transferred before the observations began. The next highest costatus score was a nine.

In addition, according to the theory, a student's status is relative to the other members of their group. For example, a middle status student in a group with two or three low status students, will be the high status student of that group. Similarly, a middle status student in a group with two or three high status students, will be the low status student of that group. This phenomenon was evidenced by large changes in the percent participation of low status students, depending on the group they were in. This phenomenon also created a data analysis problem, discussed below.

Observation Procedures

Observations were made from March to June, 1997. Class periods were 45 minutes long. Each group was observed for five minutes. This allowed the teacher to give a five minute introduction to the group work task and a five minute wrap-up, and left time for five or six groups to be observed. When we began the study, we decided to make five observations on each target student. In prior studies on individual participation rates (Cohen & Lotan, 1994b, p. 12; Cohen & Lotan, 1997a, p. 7), researchers determined multiple observations were necessary to give the best "snapshot" of a student's actual rate

of participation. Averaging across the five observations makes allowances for atypical rates due to a student's lack of interest in a particular project and for days the student was not feeling well.

Once we began averaging observations, however, we noted very inconsistent results for target students (see Appendix I). We realized that this variation also supported our hypotheses about the effect of the group's characteristics on an individual's participation rate, and this supported our decision to collect information on all of the students in a group. Therefore, although we had five observations on each target student, we may have had fewer observations on the other students in the study. If the other students were not in a group with a target student, they were not observed. Time constraints prevented us from making five observations on every student in every classroom. This was taken into account when we analyzed the data, and is discussed below.

The indicator of interaction was the student's task-related talk ("speech acts") (E. Cohen, personal communication, October 4, 1996) . (A copy of the Observation Instrument can be found in Appendix J.) Each time the student spoke on task, a hash mark was made. There was no specified length to the speech act; one speech act continued until the student stopped talking or was interrupted. The content of the talk was not recorded. In addition, if the student spoke on any topic other than the group task, no hash marks were made. Each student in the target student's group was observed and the frequency of his or her talk was recorded. This enabled the researcher to calculate the percentage of total interaction observed in a group that was scored for the target

student(s). In order to obtain a reliable rate of interaction, the students were observed doing a variety of tasks with different members of the class. Observations were only made of groups meeting the necessary scope conditions of status characteristics theory.

Scope Conditions

The scope conditions were as follows: the students needed to be working in heterogeneous small groups (composed of three to five students) engaged in collective tasks (commonly called cooperative learning), and members needed to perceive that they could be more or less successful on the task. Our study also required the teacher to delegate authority to the group; group members were required to use each other as resources. The teacher could not be present during the observation of a group. If the teacher was present, the observations were halted until the teacher left (Cohen 1994a, pp. 1-3).

Standardization of Dependent Variable: Percentage of Task-Related Talk

At the end of each day, the hash marks were totaled for each student and for the group the student was in, and then divided to determine the percentage of task-related talk for each student in the group. Because groups were composed of three to five students, we standardized this measure for our data base. First we entered the observed percentage of task-related talk for each student. Then we calculated the expected percentage of task-related talk as follows: for groups of three, each student was expected to talk 33.33% of the time; for groups of four, each student was expected to talk 25% of the time; and for groups of five, each student was expected to talk 20% of the time. Finally, we subtracted the observed from the expected percentage of task-related talk to arrive at a standardized

measure of each student's percentage of task-related talk in the group. One of the predictions of this paper is that low status students would talk less than high status students. If the student talked less than expected, we would expect to find a negative percentage for that student. For example, in a group of four students, with an expected percentage of task-related talk of 25%, a low status student talked 10% of the time. This student's score for that observation was -15%.

Observer Reliability

The observations were largely conducted by the principal investigator. Several measures were taken to ensure observer reliability. First, the principal investigator was trained by viewing videotapes of students working in groups. Cohen and the principal investigator viewed the videotapes, and separately scored the number of times each student spoke on task. Then they compared their results and determined little variance in their observations. Second, the principal investigator observed and scored four classes with an experienced teacher and trainer (of other teachers) in the complex instruction approach at an elementary school in San Jose. They compared their results and determined little variance in their observations. Third, a second observer from Stanford University's Complex Instruction staff spent a day observing and scoring the classrooms involved in the research. An observer reliability test was done, with 93% agreement between them. (The standard for inter-observer reliability is 90% or better. A copy of the Observer Reliability Form with results from the second observer can be found in Appendix K.)

Results

Our study included predictions about the effects of status on individual behavior and about the effects of status on classroom structure. Therefore, we analyzed our data at three different levels of analysis, individual, group and multilevel. At the individual level, we examined the relationship between a student's costatus score, race and gender, and his or her percentage of participation in a group, and compared the differences between congruent and incongruent classrooms. Our prediction was that there would be a greater correlation between an individual's generalized status (his or her costatus score) and his or her percentage of participation in congruent classrooms than in incongruent classrooms, indicating greater status problems in congruent classrooms. We also predicted there would be a straightforward effect of the status characteristics of race and gender on a student's percentage of participation in a group.

At the group level, we used group status space to determine the difference in participation in very differentiated groups compared to less differentiated groups. Groups with a high degree of differentiation were typically composed of individuals with very high and very low costatus scores, creating a large "status space." We predicted that there would be more groups with a higher degree of differentiation in congruent classrooms than in incongruent classrooms, reflecting greater status problems in congruent classrooms.

The multilevel analysis allowed us to look at individuals in groups over time because it was able to account for the correlated errors that the individual level analysis could not. This also enabled us to increase our sample size and to retest the predictions

made for the individual level of analysis. The dependent and independent variables used at each level of analysis as well as the results of the tested predictions are discussed separately below.

Individual Level of Analysis

Dependent Variable. At the individual level of analysis, our dependent variable was the standardized percentage of task-related talk, referred to as "observed - expected percentage of task-related talk" in Tables 2, 3 and 4. As discussed in the section on methodology, we needed to standardize the percentage of task-related talk to account for differences in group size and to give a more precise meaning to this measure. Percentage of task-related talk of a student in a group of three could not be compared directly with the percentage of task-related talk of a student in a group of four or five. Because of this measurement technique, a student could have a negative score for percentage of task-related talk. For example, if a student participated less than the expected percent, they would receive a negative score. If they participated exactly as would be expected, they received a score of zero, and if they participated more than would be expected, they received a positive score.

It is important to repeat that our measure included only "on task" talk. That means if a student was talking about what they were going to do after school, or what movie they saw recently, nothing was recorded. We also did not record interruptions, dominance behaviors, nonverbal behaviors, tone of voice, aggressive behavior or the like. Although these are valuable indicators of student interactions, they were beyond the scope of this study. It would not be possible for one observer to record all of these details on every

student in a group in a five minute observation. Other studies have recorded off task talk and behavior (Cohen & Lotan, 1994, 1995) and studies on conversational analysis (see Ritzer, 1992, pp. 257-259 for some examples) have gleaned valuable information on interaction processes. The purpose of our study was to explore specific findings on the effect of classroom social structure on status and student interactions. The measure we developed was more appropriate to our goals and methods.

Independent Variables. Our independent variables were the students' costatus score, their gender and their race, and we compared these across the two types of classrooms, congruent and incongruent. Studies differ in how they combine racial groups. In some studies, the groupings consist of non-Hispanic whites and nonwhites. In other studies, whites and Asians are grouped together as one group, and Hispanics and Blacks are grouped together as a second group. The reasons often relate to particular groups having similar socioeconomic backgrounds. Because we did not know the socioeconomic backgrounds of the students used in this study, we used four racial/ethnic categories: whites, Blacks, Hispanics and Asians. We obtained the information on race and ethnicity from the school roster given to us by the principal; no student was designated as "Other," even though there were several multiracial students.

As discussed above, we attempted to observe each of the target students five times. Students rotated groups, ending up in groups of different sizes and in groups with varying degrees of differentiation. Because status is relative to the group in which one is situated, participation rates varied accordingly.

This data collection procedure resulted in two complications. First, we were not able to average across scores for each student. When we tried this, we found that we did not have a meaningful measure of a student's average percentage of participation. As we mentioned, if a student was in a group comprised of all low status students, their predicted percentage of participation would be very different than if they were in a mixed status group. The difference between the observed and expected percentage of task-related talk for low status students in mixed status groups tended to be negative. The observed - expected percentage of task-related talk for low status students in groups composed of all low status students was sometimes a high positive number. The same situation occurred with high status students; their percentage of task-related talk was relative to the costatus scores of the other members of their group. (See Appendix I for each target student's percentage of participation averaged across five observations.)

The second complication relates to the first. Once we determined we could not meaningfully average across observations, we were left with five sets of observations for most students (some middle status students had fewer). The result was non-independence of observations. To resolve this problem, we first determined that there was not a significant difference between the observations. We then chose the first set of observations for each student, because it had the highest number of students in it. The total number of students in the first set of observations was 96.

We ran regressions on all four classrooms combined ($N = 96$ students), and then separately for congruent classrooms ($N = 50$ students), and for incongruent classrooms (N

= 46 students). We tested predictions 1 - 3 for the individual level of analysis in three separate regression analyses, represented in Tables 2 - 5. The results are discussed below.

Interpretation of Tables 2 - 5

Table 2 shows the effect of costatus, gender, and ethnicity on observed - expected percent participation for all four classes at the individual level of analysis. The results in Table 2 show costatus is a significant predictor for task-related talk ($Beta = .37; p = .000$); students with a higher costatus score will talk more in groups. Table 2 also shows a significant negative relationship between being Asian and percent talk ($Beta = -.30; p = .000$). None of the other relationships between variables are significant, although all of their slopes are negative. Table 3 shows the results of the same regression for congruent classes only. Congruent classes show a strong relationship between costatus and task-related talk ($Beta = .41; p = .001$). There is also a significant negative effect of being Asian and Black on task-related talk. Table 4 shows the results for incongruent classrooms. This model itself is not significant, however.

Appendices L and M represent three different matrices of intercorrelations of the variables used in the analysis. Appendix L gives the correlation matrix for the variables in Table 2. This correlation matrix shows there is a significant effect of status (the costatus variable) on observed - expected percentage of task-related talk ($r = .3253; p = .001$). There is a significant negative effect of being nonwhite on observed - expected percentage of task-related talk ($r = -.2007; p = .05$). Appendix M gives the correlation matrices for Table 3 (congruent classes) and Table 4 (incongruent classes). These matrices show that costatus has a significant effect on observed - expected percentage of

task-related talk for both congruent ($r = .3509$; $p = .05$) and incongruent ($r = .2945$; $p = .05$) classes. Therefore, although the model for incongruent classes (Table 4) was not significant, there is a statistically significant correlation coefficient between costatus and participation for incongruent classes. The correlation coefficients for costatus and task-related talk were not significantly different between the two classroom types. (The ratio for the standardized coefficients was $.296$, $p > .05$.)

In summary, our prediction that small group participation would be affected by status characteristics, that is to say that there would be a positive relationship between a student's standing on peer and academic status and his or her participation in small groups (prediction #1), was supported. Our prediction that status would be a more powerful predictor of individual participation in congruent than in incongruent classrooms (prediction #2) also was supported. The fact that the total model was insignificant for the incongruent classrooms means that status as well as the other characteristics do not account for enough variance in the incongruent classrooms to make a significant model. Our prediction that race and gender would act as diffuse status characteristics, and therefore would have a negative effect on the participation rates of females and nonwhites working in task-oriented groups, particularly for low status students in congruent classrooms, was partially supported (prediction #3). For the classes as a whole, only being Asian was a significant negative predictor of percentage of task-related talk. There was evidence of a negative effect of gender in congruent classrooms, but not at a level of significance. There was a positive and significant effect of gender on the percentage of task-related talk in incongruent classrooms.

Table 5 shows the index of status problems for each classroom. This measure is the correlation coefficient for task-related talk (the standardized observed - expected percent participation) and costatus score, per classroom. Only one congruent classroom shows a significant relationship between these two variables. According to our predictions, both of the congruent classrooms should have shown a significant relationship between these two variables. We explore this issue further below.

Group Level of Analysis

Analyzing at the group level allowed us to overcome the problem of independence that we encountered at the individual level of analysis. At the group level, we examined how group composition and degree of group differentiation affected the percentage of task-related talk of low status students. This approach allowed us to include most of our observations. There were 113 unique groups observed; however, 21 of these did not have any students with a costatus score less than 4. Because we were using the average percentage of task-related talk for all low status students in a group, we excluded these 21 groups, resulting in a total of 92 groups to analyze at the group level.

Dependent Variable. The dependent variable for the group level of analysis was the percentage of participation of low status students. Because we needed to account for differences in group sizes, as we did for the individual level of analysis, we had to measure the participation rates of low status students in two ways. This resulted in two dependent variables for the group level of analysis. The first dependent variable was standardized for group size. We used the observed minus expected percentage of task-related talk averaged for all low status students in a group. The second dependent

variable did not take group size into account, so we controlled for the number of group members when we did our regression. Our second dependent variable was the nonstandardized percentage of task-related talk averaged for all low status students in a group.

Independent Variables. Our independent variables were classroom congruence and group status space. Group status space was the variable that tested for degree of group differentiation. Group status space is calculated by subtracting the lowest costatus score in the group from the highest costatus score. Table 6 provides a frequency tabulation for groups with a large group status space, calculated separately for groups in congruent and in incongruent classrooms. Congruent classrooms had a much higher percentage of groups with a large group status space, confirming prediction #1 of the group level of analysis.

Interpretation of Tables 7-10

Tables 7 - 10 represent the results of group level predictions 1 - 3. As we discussed above, there were some major advantages in attempting to test these hypotheses at the group level. Status characteristics theory makes its predictions based on interaction and influence relative to participation of other group members. When we tried to average across individual observations, we found that the percentage of task-related talk for our target students varied greatly, and was relative to the group that the student was in (see Appendix I). This theoretically-based finding required us to do a group level analysis of the data and it solved the problem of non-independence of observations found at the individual level of analysis. Now, instead of examining separate observations for each

individual, we could look at observations of each unique group to determine if there was a difference between percentage of task-related talk of low status students in congruent and incongruent classrooms.

There were two important findings at the group level of analysis. Tables 7 and 8 provide a correlation matrix for the group level variables, using a separate analysis for each of the dependent variables. These tables show that groups in congruent classrooms were more differentiated on costatus than groups in incongruent classrooms. Note the significant negative relationship ($r = -.22$; $p < .05$) between congruence and group status space. Tables 7 and 8 also reveal that there is no relationship between congruence and the average percentage of talk for low status students. We had expected a higher percentage of talk for low status students in incongruent classrooms.

Table 9 shows the results for the regression using the standardized average of observed - expected percentage of task-related talk of low status students as the dependent variable. Again, only group status space was a significant predictor of task-related talk for low status students. The results of the regression for this variable were exactly what we had predicted: the greater the group status space, the lower the percentage talk of low status students (prediction #3, for group level of analysis). Based on these findings, we concluded that the effects of congruence disappear at the group level once we controlled for status space. Thus it appears that the hypothesis on status space explains the findings on congruence more than the fact of congruence itself.

Table 10 shows the results for the same regression, using the non-standardized (for group size) average of percentage of task-related talk of low status students. To

account for group size, we added the number of group members as an additional variable in the regression. The results of the two regressions, using different dependent variables, were quite similar. Group status space was again a significant predictor and in the same direction as for the standardized dependent variable. Moreover, there was not a significant effect of classroom congruence. In addition, the variable accounting for the number of group members appears to be a significant negative predictor of percentage of task-related talk for low status students. The negative slope indicates that larger groups have a dampening effect on task-related talk of low status students. We believe this illustrates a possible dampening effect of larger groups because of less "air time" for each group member.

In summary, our predictions that there would be more groups with a large group status space in congruent classrooms, and that this would lower the percentage of talk of low status students (predictions #1 and #3, group level analysis), were supported. Our prediction that incongruence would positively affect the percentage of talk of low status students (prediction #2, group level analysis) was not supported. We believe that two factors account for this. First, although there are more groups with a large status space in congruent classrooms, there are also more low status students. This may result in many groups that are less differentiated on status. In incongruent classrooms, there were more middle status students resulting in groups with less extreme status differences. The overall effect of this was a reduced difference between the two types of classroom structure.

Multilevel Analysis

The results from both the individual and group levels of analysis provided support for our hypotheses that costatus is a strong predictor of group participation, and that there are more extreme status differences in congruent classrooms than in incongruent classrooms. The results were less conclusive on the effects of the diffuse status characteristics, race and gender. Cohen and Lotan's study (1997a) found that race and gender interacted negatively with a low status on the two measures of task competence, academic and peer status. One goal of this paper was to explore this apparent interaction effect. The problem of independence of the observations (discussed above) complicated efforts to resolve this issue in two ways. First, it reduced the sample size in the individual level analysis, which potentially affected significance levels for the variables of interest. Second, the individual level variables of race and gender were lost when the data were analyzed at the group level. Both of these problems were overcome by using a random effects or multilevel model.

Multilevel models often are used in educational research because this research usually involves nested or hierarchical data (DiPrete & Forristal, 1994; de Leeuw & Kreft, 1986). In this study, the variables are nested in three levels. The first level involves the individual observations over time (several observations per student over three months). The second level involves students working in task groups. The third level involves students working in task groups in two types of classrooms, congruent and incongruent. The multilevel model we used allowed the use of all of the observations taken over a period of several months. It did not account for the second and third levels.

The mathematical equation the model used is:

$$y_{it} = \alpha + x_{it}\beta + v_i + e_{it} ,$$

where y_{it} is the value of the dependent variable for person i at time t ; v_i is the correlated error for each individual across observations; and e_{it} is the observation specific error term, which is not constant across observations. Using this model allowed the use of all of the previous individual observations because it accounted for the correlated errors that were at the root of the independence problem we encountered. This resulted in a substantial increase in the number of observations used in the study.

We also added several independent variables. The first addition was actually a replacement of the costatus variable used in the individual level OLS regression model. Because status is relative to the group the student is in, we created a variable that would vary accordingly, and we standardized it for differences in the size of the groups. This variable was created as follows: First, we summed the costatus of each individual in the group and obtained an average for the group. Next, we divided each individual's costatus score by the average costatus score of the group. This new variable differs somewhat from the costatus variable. When we divided the individual's costatus score by the group's average costatus score, we incorporated the concept of group status space used in the group level analysis. This required us to combine prediction #2 at the individual level analysis and prediction #3 at the group level analysis. The new prediction tests the effect of a student's costatus score in groups of varying levels of status space. We also added several interaction terms to test for an interaction effect between race and gender and a low costatus score (low status).

Results of the Multilevel Analysis

Table 12 provides a comparison of the results for the OLS and multilevel regressions. There are 12 models in this table. Models 1 - 3 correlate with Tables 2 - 4 of the individual level analysis. Model 4 correlates with Table 9 of the group level analysis, using the standardized dependent variable. Models 5 - 7 correlate with Tables 13 - 15 of the multilevel analysis. Models 8 - 10 correlate with Tables 16 - 18 and are the same as Models 5 - 7, but add first-order interaction terms to test for a combining effect for low status with race or gender. Models 11 - 12 correlate with Tables 19 - 20 and add the second-order interaction terms to test for a combining effect for low status with race and gender. There is no model for congruent classrooms with the second-order interaction terms because there are either no male or no female nonwhite low status students.

Models 1 - 3 (summarizing results from the OLS regression) and 5 - 7 (summarizing the results from the multilevel regression) show that both relative status and costatus are strong positive predictors of percent talk. These results are consistent with SCT, which holds that status is relevant to the group the individual is in. Model 1 also indicates that being Asian has a significant and negative effect on percent talk (Beta = -6.94; $p = .001$). This same coefficient is not significant in Model 5 (Beta = -2.64; $p > .05$), although the slope is also negative.

Models 2 and 6 provide results for congruent classrooms only. Model 2, from the OLS regression, indicates there is a significant and positive effect of costatus on percent talk (Beta = 2.10; $p = .01$), but a significant and negative effect for being Asian

($B = -9.60$; $p = .01$) and Black ($B = -6.38$; $p = .05$). Model 6, from the multilevel regression, shows a significant and positive effect of relative status on percent talk ($B = 7.88$; $p = .01$) and a significant and negative effect for being Asian ($B = -4.24$; $p = .05$). The variable Black is no longer significant.

Models 3 and 7 provide results for incongruent classrooms only. As we discussed in our earlier section on the individual level results, Model 3 is not significant. Model 7 is significant, however. In this model, the variable relative status is a significant predictor of percentage of task-related talk ($B = 11.3$; $p = .001$). The increased significance for this model may be the result of an increase in sample size. Model 4 (OLS group level regression) does not have the individual level variables (race, gender, costatus). The variable group status space is similar to the individual level variables costatus and relative status, however, in that it measures the degree of differentiation between students' costatus scores. The coefficient for this variable is significant and negative (Beta = -1.70 ; $p = .01$) indicating that the greater the differentiation, the less the low status students participate.

The results of these regressions remained inconclusive on the effects of race and gender on percent talk. Gender only had a significant (and positive) affect on percent talk in the incongruent classroom at the individual level of analysis (Model 3). This effect did not hold for the multilevel analysis. The slopes of the race and gender variables continued to be negative for congruent classrooms and largely positive for incongruent classrooms, however, indicating the potential for status problems in congruent classrooms.

We explored the possibility of an interaction effect for low status and race and gender by adding several interaction terms to Models 5 - 7. Models 8 - 10 in Table 12 add first-order interaction terms and Models 11 - 12 add second-order interaction terms. The results provide some support for an interaction effect between low status and race and gender. Model 8 indicates there is a significant and negative effect on percent talk for low status Black students (Beta = -8.01; $p = .05$) when all 4 classrooms are combined. There is also a significant and positive effect on percent talk for Black females (Beta = 11.3; $p = .01$). Model 9 indicates a loss of significance for the variable Asian; only relative status is significant in this model. Model 10 indicates there is a significant and negative effect on percent talk for low status females (Beta = -9.07; $p = .05$), and a significant and positive effect for Black females (Beta = 21.7; $p = .01$). Models 11 - 12 include the second-order interaction terms. When these terms are added we lose significance for all of the variables except relative status and Black females. Both of these variables indicate a positive effect on percent talk.

Table 21 provides a summary of the percentage of low status and high status students in the entire population and by race. The results indicate that Asians as a whole represent almost half (49%) of all high status students in the population and about a third of all low status students in the population. More than half of the high status Asians are female and the majority (84%) of the low status Asians are female. These results indicate a split in the Asian population between very low and very high status students. Table 22 provides the same data for the two types of classroom. This table indicates that the majority of low status Asians were in the incongruent classrooms, which explains the

significant negative effect on percent talk for Asians in Models 2, 6 and 9. Table 21 also indicates that the proportion of low status students for Blacks (41%) and Hispanics (40%) is high, while the proportion of high status students for Blacks (6%) and Hispanics (13%) is low.

Tables 23 - 25 provide information on the breakdown of race, gender and low status students for all classrooms combined and separately by type of classroom. These tables indicate there is a significant difference in the percentages of members of different racial groups, of males and females, and of low status students between the two types of classrooms. Table 23 indicates nonwhites represent 57% of the students in congruent classrooms compared to 64% in incongruent classrooms. Table 24 indicates females represent 63% of the students in congruent classrooms compared to 41% in incongruent classrooms. Table 25 indicates low status students represent 40% of the students in congruent classrooms compared to 30% in incongruent classrooms.

In summary, the results from the multilevel regression provided strong support for the effect of relative status in a student's participation level in small groups. The results did not support our prediction that status would be a more powerful predictor of individual participation in congruent than in incongruent classrooms. The negative effect of being Asian (Models 2, 6, and 9) and of being Black (Model 2) in the regression for congruent classrooms provided some support for our prediction that race and gender would act as diffuse status characteristics, independent of the effects of academic and peer status. The negative effect of being Black with a low costatus score (Model 8) and of being female with a low costatus score (Model 10) provides some support for Cohen

and Lotan's (1997a) findings on an interaction effect between diffuse status characteristics and task-related characteristics. We attribute this finding to the combining principle. According to this principle, diffuse status characteristics will be overcome if a student is high on task-related competencies (academic and peer status). Conversely, if a student is low on task-related competencies, diffuse status characteristics will negatively affect participation. In this case, being low on task-related competencies negatively affected the participation of Black students in congruent classrooms and of female students in incongruent classrooms. There were also positive effects of being a Black female (Models 8, 10, 11, and 12) that are not explained by the combining principle. Second-order interaction terms combining being female, nonwhite and high status were not significant (results not included in the Tables), nor were they for being female, nonwhite and low status (Models 11 - 12).

The elimination principle could explain the positive effects on percent talk for Black females (Models 8, 10, 11, and 12) if they were high status. The elimination principle predicts that if a female or nonwhite is high on task-related competencies they will have a higher rate of interaction regardless of his or her race or gender. Table 21 indicates that there are no high status Black females, however. The results in Model 3 also indicate possible support for the elimination argument. The elimination argument implies that males and females of high status will talk equally (no sex effect), but among low status males and females, males will talk more than females (a sex effect). Therefore high status females should talk more than what you would expect on the basis of their

sex. Model 3 indicates a positive effect on percent talk for female students, but this result did not hold for the multilevel regressions (Models 5 - 12).

Interpretation and Implications

This was a field study without controls, requiring the use of a multivariate analysis. On the one hand, we were not able to control for different group sizes and compositions. On the other hand, school and teacher variability were reduced because of the classrooms selected. All of the classrooms observed were at one school, and three of the four classrooms had the same teacher. It also turned out that all four classrooms were science classes, reducing subject variability.

The theory from which we derived our hypothesis required the analysis of our data at the group level. In addition, our desire to test our predictions about the different effects of classroom structure on the status of individual students required us to analyze our data at the individual level as well. Finally, the hierarchical nature of our variables required us to analyze our data using a multilevel or random effects regression model. The findings from our three levels of analyses provided some support for our initial three general hypotheses: (1) The more differentiated the group (i.e., the higher the status space between the highest and the lowest costatus score in a group), the lower the rate of participation of the low status members in that group. (2) Race and gender would act as diffuse status characteristics and would therefore negatively affect participation rates of females and nonwhites working in task-oriented groups. (3) All other things being equal

(i.e., controlling for the percentage of low status students), there would be more status problems in congruent than in incongruent classrooms.

In addition to finding support for our general hypotheses, three key interpretive issues have resulted from this study. First, although the congruent classrooms in our study (and in Cohen and Lotan's study, 1997a) had a higher percentage of low status students (see Table 1), and a higher percentage of groups with more than 50% low status students in them (see Table 11), the status space in the mixed status groups was larger in congruent classrooms than in incongruent classrooms. The regressions suggest that it is this greater status space in congruent classrooms that is producing the contrast between congruent and incongruent classrooms. When status space is controlled in the regression, the effect of the congruence-incongruence variable disappears. Groups with a higher level of differentiation resulted in greater status problems. It is important to note that incongruency did not eliminate status problems, it just reduced the severity of status problems. At the individual level, there was a significant correlation between costatus and participation for both congruent and incongruent classrooms and no significant differences in the correlation coefficients between the two types of classrooms.

Second, Cohen and Lotan's (1997a) speculations about the effects of classroom structure on status problems seem to be confirmed by this study in many ways. These results suggest that it is useful and important to know the status structure of a classroom, and the costatus of all of the members in the target student's group, before status treatments are initiated. Fewer status treatments are needed in incongruent classrooms where there are less extreme status differences in the task groups.

Finally, we found strong negative effects of race in the congruent classrooms, but not in the incongruent classrooms at the individual level of analysis. The effects of gender and race in the multilevel analysis were less conclusive. These inconsistent findings could reflect an independent effect of subject matter; all of the classrooms in our study were science classrooms. U.S. culture includes the stereotype that females and nonwhites are less capable in math and science. Since race and gender have been shown to act as an instance of diffuse status characteristics elsewhere, one would expect status effects of these characteristics in the classroom. It is puzzling that this effect would be reduced in incongruent classrooms. We believe, however, that the principle of combining best explains this finding. In incongruent classrooms, more students receive high status on one of the two measures of academic and peer status, increasing equal status interaction between students. Peer status seems to have a powerful effect on the status generalization process in these classrooms. Students possess their own criteria for determining peer status that is different from the criteria used by students in congruent classrooms. It is possible that race and gender are evaluated differently. For example, attractiveness would contribute to popularity, thereby raising the status of a female student's peer status.

Cohen and Lotan (1997a) speculated that the classroom structure of incongruent classrooms has a dampening effect on status generalization processes because of the different criteria used to determine peer status. That this finding is based on a study using all science classes is especially encouraging for teachers interested in more equal interaction in the classroom. Good students in science classes are more likely to be male

and white. If peer and academic status are strongly correlated, females and nonwhites are likely to be shut out. Incongruent classrooms seem to contain a mechanism to prevent this. It would be valuable to further explore this phenomenon as it suggests that social groups can create their own solutions to status problems by developing independent bases for status. This is also a very interesting finding from a sociological point of view, particularly for SCT, because few attempts have been made to correlate the degree of differentiation with the degree of status problems.

When we controlled for group status space at the group level, we found that congruence worked in the opposite direction. This finding supported our hypothesis that more differentiated groups have greater status problems. This finding is also interesting for SCT, as little research has been done correlating the degree of differentiation with the degree of status problems.

Conclusion

In conclusion, at the individual level of analysis, there was a statistically significant correlation between costatus and participation. The multilevel analysis indicated a statistically significant correlation between relative status and participation. There was not a straightforward support for race and gender as a diffuse status characteristic, but evidence that supports the combining principle. Students who are low on all measures of status have a lower status overall and this results in reduced rates of participation in small groups. There was some support for an interaction effect for the

status characteristics of race and gender. There were some odd inconsistencies also.

Overall, we feel that the combining principle explains the interaction effects we found.

At the group level of analysis, the effects of congruence disappeared once we controlled for status space. Thus it appears that our hypothesis on status space does more to explain the findings on congruence than the fact of congruence itself. In addition, this study found that there was a higher percentage of low status students in congruent classrooms and that this factor alleviated status problems. This study tends to support the interpretation that the number of undifferentiated low status groups in congruent classrooms, and the number of groups with a smaller group status space in incongruent classrooms do indeed lessen status problems (Cohen & Lotan, 1997a). This finding is an interesting one for status characteristics theory, because it reveals that the more the group is differentiated, the more severe the status problems will be. These findings suggest degree of differentiation is a significant predictor of status problems.

Cohen and Lotan's (1997a) study speculated that incongruent classrooms could act as a "natural" status treatment. They also suspected that there were more undifferentiated low status groups in congruent classrooms. Our study found that there were more undifferentiated low status groups in congruent classrooms, but also more groups composed of students who were high on one status and low on another in incongruent classrooms, creating more status-equal interaction. The key determinant of status-equal interaction appears to be the degree of status space in a group and not the classroom structure of congruence/incongruence.

The findings from this study can be useful to middle school classroom teachers and to researchers in education and in the sociology of education. They can use these findings to understand how status affects interaction rates of students studying in collectively oriented task groups, and even experiment to reduce status problems. For middle school teachers using the complex instruction approach, this study underlines the importance of assessing students' status before they apply status treatments. Finally, sociologists interested in SCT may want to explore the findings in this study that suggest social groups can create their own solution for status problems by developing independent bases for status. Sociologists also may want to examine possible correlations between degree of differentiation and degree of status problems in collectively and task-oriented groups.

Table 1

*Percentages of Low Status (LS), Middle Status (MS) &
High Status (HS) Students for Congruent and Incongruent Classes*
(Individual Level Analysis)*

N = 96 Individuals (All Four Classes)

Congruent Classes
(*N* = 50)

36% LS students
16% HS students
44% MS students
4% unknown**

Incongruent Classes
(*N* = 46)

26% LS students
13% HS students
59% MS students
2% unknown**

* Low status students have a costatus score of 2-3; middle status students have a costatus score of 4-6; and high status students have a costatus score of 7-9.

** Unknown applies to a total of 3 students who came in the class late in the year, after the sociometric test had been given.

Table 2 (Model 1)

*Regression of Task-Related Talk on Status Characteristics:
All Four Classes
(Individual Level Analysis)*

$N = 96$

Dependent Variable: Observed - Expected Percentage of Task-Related Talk

Predictor	<i>B</i>	Beta	<i>t</i>	<i>p</i> (1 tail)
Constant	-6.00 (3.10)	0.00	-1.94	0.028
Costatus	2.05 (0.54)	0.37	3.76	.0000
Female	-0.28 (2.17)	-0.01	-0.13	0.448
Asian	-6.94 (2.48)	-0.30	-2.80	0.000
Black	-2.59 (3.01)	-0.09	-0.86	0.195
Hispanic	-1.62 (3.46)	-0.05	-0.47	0.319

*Standard Error in Parenthesis

$$R^2 = .18 \text{ (} F = 4.05; p\text{-value} = .002 \text{)}$$

Legend for Variables:

1. Costatus: Low status = 2-3; Middle Status = 4-6; High status = 7-9
2. Gender: Male = 0; Female = 1
3. Race: White = 0; Black = 1; Hispanic = 1; Asian = 1

Table 3 (Model 2)

*Regression of Task-Related Talk on Status Characteristics:
Congruent Classes
(Individual Level Analysis)*

$N = 50$

Dependent Variable: Observed - Expected Percentage of Task-Related Talk

Predictor	<i>B</i>	Beta	<i>t</i>	<i>p</i> (1 tail)
Constant	-1.58 (3.78)	0.00	-0.42	0.339
Costatus	2.10 (0.64)	0.41	3.30	0.001
Female	-4.47 (3.17)	-0.19	-1.41	0.082
Asian	-9.60 (3.29)	-0.42	-2.91	0.002
Black	-6.38 (3.73)	-0.22	-1.71	0.047
Hispanic	-2.77 (5.81)	-0.06	-0.48	0.317

*Standard Error in Parenthesis

$$R^2 = .39 (F = 5.56; p\text{-value} = .000)$$

Legend for Variables:

1. Costatus: Low status = 2-3; Middle Status = 4-6; High status = 7-9
2. Gender: Male = 0; Female = 1
3. Race: White = 0; Black = 1; Hispanic = 1; Asian = 1

Table 4 (Model 3)

Regression of Task-Related Talk on Status Characteristics:
Incongruent Classes
(Individual Level of Analysis)

$N = 46$

Dependent Variable: Observed - Expected Percentage of Task-Related Talk

Predictor	<i>B</i>	Beta	<i>t</i>	<i>p</i> (1 tail)
Constant	-12.9 (5.28)	0.00	-2.44	0.009
Costatus	2.18 (0.95)	0.34	2.29	0.013
Female	5.57 (3.18)	0.26	1.75	0.043
Asian	-0.84 (3.80)	-0.04	-0.22	0.412
Black	4.16 (4.71)	0.14	0.88	0.191
Hispanic	1.89 (4.51)	0.07	0.42	0.338

*Standard Error in Parenthesis

$$R^2 = .16 (F = 1.56; p\text{-value} = .192)$$

Legend for Variables:

1. Costatus: Low status = 2-3; Middle Status = 4-6; High status = 7-9
2. Gender: Male = 0; Female = 1
3. Race: White = 0; Black = 1; Hispanic = 1; Asian = 1

Table 5

*Index of Status Problems
For Congruent and Incongruent Classes*

Congruent Classes

Class ID 13: .3913*

Class ID 22: .3243

Incongruent Classes

Class ID 12: .2834

Class ID 15: .3759

* $p < .05$ (2-tailed significance)

Note. This index is equal to the correlation coefficient for the observed - expected percentage of task-related talk and the costatus score calculated for each class.

Table 6

*Frequency Table of Groups With a Large Group Status Space
(Group Level Analysis)*

N = 113 Groups (All Four Classes)

<i>Congruent Classes</i> (<i>N</i> = 62)		<i>Incongruent Classes</i> (<i>N</i> = 51)	
<u>Group Status Space</u>	<u>Frequency</u>	<u>Group Status Space</u>	<u>Frequency</u>
5	21	5	13
6	3	6	0
7	1	7	0
Totals	25	Totals	13

Table 7

*Correlation Matrix of Group Level Variables;
Dependent Variable: Average of Observed - Ex-
pected Percentage of Task-Related Talk for LS
Students.
N = 92*

	LS Obs. Exp.	In- Congr.	Grp. Stat. Spc.
LS Obs. Exp.	1.0		
In- Congr.	-.0711	1.0	
Grp. Stat. Spc.	-.2417*	-.2232*	1.0

* $p < .05$
 ** $p < .01$
 *** $p < .001$
 (2-tailed Significance)

Table 8

*Correlation Matrix of Group Level
Variables; Dependent Variable: Average
of Percentage of Task-Related Talk of LS
students.
N = 92*

	LS Pct.	In- Congr.	Grp. Stat. Spc.	No. Mem.
LS. Pct.	1.0			
In- Congr.	-.0435	1.0		
Grp. Stat. Spc.	-.3677***	-.2232*	1.0	
No. Mem.	-.4032***	-.0970	.2900**	1.0

* $p < .05$
 ** $p < .01$
 *** $p < .001$
 (2-tailed Significance)

Legend for Variables:

1. **Obs.Exp.** (Observed - Expected), Expected values: Groups of 3 = 33 1/3%; Groups of 4 = 25%; Groups of 5 = 20%; Less than expected = negative values; Expected = 0; More than expected = positive values.
2. **LS.Pct.** Values of percentage of task-related talk; nonstandardized for number of group members; Range is below 0 to above 0; high values are positive numbers.
3. **Incongr.** (Congruence): Congruent = 0; Incongruent = 1
4. **Grp.Stat.Spc.** (group status space): Difference between costatus score of the highest status student and the lowest status student in the group. Range is 0 - 7; 7 is the high value.
5. **No.Mem.** (number of members): Range is from 3 to 5; 5 is high value.

Table 9 (Model 4)

*Regression of Task-Related Talk on Status Characteristics
(Group Level Analysis)*

N = 92 Groups (All Four Classes)

Dependent Variable: Average of Observed - Expected Percentage of
Task-Related Talk of Low Status Students ***

Predictor	<i>B</i>	Beta	<i>t</i>	<i>p</i> (1 tail)
Constant	1.56 (2.91)	0.00	0.54	0.296
Incongruence	-2.32 (1.84)	-0.13	-1.26	0.105
Group Status Space	-1.70 (0.66)	-0.27	-2.57	0.005

*Standard Error in Parenthesis

**Observations were made on 113 groups; 21 of the groups did not have any students with a costatus score of 2 or 3, and so were excluded from the regressions. The dependent variable is the average of observed - expected percentage of task-related talk of LS students. LS students are defined as students with a costatus score of 2 or 3.

***This variable has been standardized to account for group size.

$$R^2 = .07 (F = 3.60; p\text{-value} = .03)$$

Legend for Variables:

1. Incongruence: Congruent = 0; Incongruent = 1
2. Group Status Space: The difference in the costatus score of the highest status student and the lowest status student. In this study, the highest costatus score is 9; the lowest costatus score is 2. A group status space of 7 represents the most status differentiated group; a group status space of 0 represents an undifferentiated or status equal group.

Table 10

*Regression of Task-Related Talk on Status Characteristics
(Group Level Analysis)*

N = 92 Groups (All Four Classes)

Dependent Variable: Average of Percentage of Task-Related Talk of Low Status Students

Predictor	<i>B</i>	Beta	<i>t</i>	<i>p</i> (1 tail)
Constant	47.1 (5.34)	0.00	8.82	0.000
Incongruence	-2.83 (1.87)	-0.14	-1.51	0.066
Group Status Space	-2.14 (.69)	-0.30	-3.10	0.001
Number of Group Members	-4.42 (1.30)	-0.33	-3.40	0.000

*Standard Error in Parenthesis $R^2 = .25$ ($F = 9.81$; p -value = .000)

**Observations were made on 113 groups; 21 of the groups did not have any students with a costatus score of 2 or 3, and so were excluded from the regressions. The dependent variable is the average of percentage of task-related talk of LS students. LS students are defined as students with a costatus score of 2 or 3.

Legend for Variables:

1. Incongruence: Congruent = 0; Incongruent = 1
2. Group Status Space: The difference in the costatus score of the highest status student and the lowest status student. In this study, the highest costatus score is 9; the lowest costatus score is 2. A group status space of 7 represents the most status differentiated group; a group status space of 0 represents an undifferentiated or status equal group.
3. Number of Group Members: groups are composed of 3, 4 and 5 students.

Table 11

*Composition of Groups by Type
(Group Level Analysis)*

N = 113 Groups (All Four Classes)

	<u>Congruent</u>	<u>Incongruent</u>
>50% low status students	35%	12%
>50% low status students, if any low status students	41%	16%
No low status students	13%	25%

Table 12. *Regression coefficients for Models 1-12. Dependent variable = % talk*

Model/coefficient	Model 1 N=96 Table 2 All classes	Model 2 N=50 Table 3 Congr.	Model 3 N=46 Table 4 Incongr.	Model 4 N=92 Table 9 All classes	Model 5 N=444 Table 13 All classes
Costatus	2.05***	2.10**	2.18**		
Relative status					9.45***
Female	-0.28	-4.47	5.57*		0.19
Asian	-6.94***	-9.60**	-0.84		-2.64
Black	-2.59	-6.38*	4.16		0.52
Hispanic	-1.62	-2.77	1.89		0.19
Low status					-2.25
Congruence				-2.32	-0.25
Grp status Sp				-1.70**	
Constant	-6.00*	-1.58	-12.9**	1.56	-7.89*
R^2 overall	0.18	0.39	0.16	0.07	0.16
R^2 within					0.045
R^2 between					0.235
F	4.05**	5.56***	1.56	3.6*	
X^2					43.43*
* = .05, 1-tailed ** = .01, 1-tailed *** = .001, 1-tailed					

Table 12. (cont.) *Regression coefficients for Models 1-12. Dependent variable = % talk*

Model/coefficient	Model 6 N=246 Table 14 Congr.	Model 7 N=198 Table 15 Incongr.	Model 8 N=444 Table 16 All classes	Model 9 N=246 Table 17 Congr.	Model 10 N=198 Table 18 Incongr.
Relative status	7.89***	11.30***	9.75***	8.33***	10.3***
Female	-1.03	2.12	-1.48	0.73	-1.20
Asian	-4.24*	-0.10	-3.44	2.13	-1.03
Black	-2.91	5.46	-1.47	-6.04	2.23
Hispanic	-2.26	2.32	-3.27	-7.44	-0.83
Low status	-2.49	-2.56	0.86	-0.45	2.79
Congruence			0.43		
Asian*LS			-1.40	6.29	-7.22
Black*LS			-8.01*	-8.72	-8.63
Hisp*LS			2.88	6.04	2.99
Female*LS			-3.43	-5.15	-9.07*
Asian*Fem			2.64	-9.35	7.34
Black*Fem			11.3**	10.3	21.7**
Hisp*Fem			7.13	N/A	8.48
Constant	-3.20	-14.7**	-8.53*	-5.08	-10.5*
R^2 overall	0.18	0.20	0.19	0.24	0.32
R^2 within	0.03	0.07	0.04	0.03	0.07
R^2 between	0.33	0.21	0.33	0.43	0.47
X^2	27.65***	22.33**	54.81***	36.61***	39.93***

* = .05, 1-tailed

** = .01, 1-tailed

*** = .001, 1-tailed

Table 12. (cont.) *Regression coefficients for Models 1-12. Dependent variable = % talk*

Model/coefficient	Model 11 N=444 Table 19 All classes	Model 12 N=198 Table 21 Incongr. ¹
Relative status	9.91***	10.5***
Female	-1.27	-0.96
Asian	-2.18	-1.04
Black	-2.63	1.85
Hispanic	-2.90	-0.11
Low status	1.26	3.34
Congruence	0.26	
Asian*LS	-6.33	-7.14
Black*LS	-3.70	-7.79
Hisp*LS	1.84	-0.99
Female*LS	-4.08	-10.2
Asian*Fem	0.77	7.41
Black*Fem	14.9**	23.9**
Hisp*Fem	5.29	4.42
Asian*LS*F	6.56	-0.00
Black*LS*F	-8.51	-4.03
Hisp*LS*F	4.24	11.1
Constant	-8.60*	-10.9*

Table 12. (cont.) *Regression coefficients for Models 1-13. Dependent variable = % talk*

Model/coefficient	Model 11 N=444 Table 19 All classes	Model 12 N=198 Table 21 Incongr. ¹
R^2 overall	0.20	0.33
R^2 within	0.04	0.07
R^2 between	0.34	0.49
χ^2	56.47***	38.55***

* = .05, 1-tailed ** = .01, 1-tailed *** = .001, 1-tailed

¹ There is no regression including second-order interaction terms for the congruent classrooms because there is a category of person missing for each of these terms. Specifically, for Asian*LS*F, there are no females fitting this description; for Black*LS*F, there are no males fitting this description; and for Hisp*LS*F, there are no males fitting this description.

Table 13 (Model 5)

Multilevel Model Regressing Task-Related Talk on Status Characteristics

N = 444 Individuals; 96 Groups (All Four Classes)

Dependent Variable: Observed - Expected Percentage of Task-Related Talk

Predictor	Coeff.	Std.Error	<i>z</i>	<i>p</i> *
Constant	-7.89	4.66	-1.69	0.045
Female	0.19	1.66	0.11	0.454
Asian	-2.64	1.83	-1.45	0.074
Black	0.52	2.31	0.22	0.411
Hispanic	0.19	2.63	0.07	0.471
Congruence	-0.25	1.59	-0.15	0.438
Relative Status	9.45	2.05	4.61	0.000
Low Status	-2.25	1.95	-1.15	0.124

*One-tailed

R^2 within = .045

X^2 (7 df) = 43.43; p = .000

R^2 between = .235

R^2 overall = .16

Legend for Variables:

1. Gender: Male = 0; Female = 1
2. Race: White = 0; Black = 1; Hispanic = 1; Asian = 1
3. Congruence: Congruent = 0; Incongruent = 1
4. Relative Status: Range is from .0833 (low) - .6 (high)
5. Low Status: low status = 1 (costatus scores ≤ 3); all others = 0

Table 14 (Model 6)

Multilevel Model Regressing Task-Related Talk on Status Characteristics

N = 246 Individuals; 50 Groups (Congruent Classes Only)

Dependent Variable: Observed - Expected Percentage of Task-Related Talk

Predictor	Coeff.	Std.Error	<i>z</i>	<i>p</i>
Constant	-3.20	5.06	-0.63	0.263
Female	-1.03	2.53	-0.41	0.342
Asian	-4.24	2.51	-1.69	0.045
Black	-2.91	3.00	-0.97	0.166
Hispanic	-2.26	4.43	-0.51	0.305
Relative Status	7.88	2.64	2.98	0.001
Low Status	-2.49	2.72	-0.91	0.180

*One-tailed

R^2 within = .03

X^2 (6 df) = 27.65; p = .000

R^2 between = .33

R^2 overall = .18

Legend for Variables:

1. Gender: Male = 0; Female = 1
2. Race: White = 0; Black = 1; Hispanic = 1; Asian = 1
3. Congruence: Congruent = 0; Incongruent = 1
4. Relative Status: Range is from .0833 (low) - .6 (high)
5. Low Status: low status = 1 (costatus scores <=3); all others = 0

Table 15 (Model 7)

Multilevel Model Regressing Task-Related Talk on Status Characteristics

N = 198 Individuals; 46 Groups (Incongruent Classes Only)

Dependent Variable: Observed - Expected Percentage of Task-Related Talk

Predictor	Coeff.	Std.Error	<i>z</i>	<i>p</i>
Constant	-14.7	5.53	-2.77	0.003
Female	2.12	2.50	0.85	0.198
Asian	-0.10	2.97	-0.03	0.486
Black	5.46	3.74	1.46	0.072
Hispanic	2.32	3.58	0.65	0.258
Relative Status	11.30	3.24	3.48	0.000
Low Status	-2.56	2.96	-0.86	0.193

*One-tailed

R^2 within = .07

X^2 (6 df) = 22.33; p = .001

R^2 between = .21

R^2 overall = .20

Legend for Variables:

1. Gender: Male = 0; Female = 1
2. Race: White = 0; Black = 1; Hispanic = 1; Asian = 1
3. Congruence: Congruent = 0; Incongruent = 1
4. Relative Status: Range is from .0833 (low) - .6 (high)
5. Low Status: low status = 1 (costatus scores <=3); all others = 0

Table 16 (Model 8)

*Multilevel Model Regressing Task-Related Talk on Status Characteristics**N* = 444 Individuals; 96 Groups (All Four Classes)

Dependent Variable: Observed - Expected Percentage of Task-Related Talk

Predictor	Coeff.	Std.Error	<i>z</i>	<i>p</i> *
Constant	-8.53	4.01	-2.13	0.016
Female	-1.48	2.60	-0.57	0.285
Asian	-3.44	3.28	-1.05	0.147
Black	-1.47	3.39	-0.43	0.332
Hispanic	-3.27	3.47	-0.94	0.173
Congruence	0.43	1.69	0.25	0.400
Rel. Stat	9.75	2.05	4.74	0.000
Low Status	0.86	3.30	0.26	0.397
Asian*LS	-1.40	3.87	-0.36	0.359
Black*LS	-8.01	4.84	-1.65	0.049
Hisp*LS	2.88	5.34	0.54	0.295
Female*LS	-3.43	3.49	-0.98	0.163
Asian*Fem	2.64	3.94	0.67	0.251
Black*Fem	11.3	4.75	2.39	0.008
Hisp*Fem	7.13	6.43	1.11	0.134

*One-tailed

Table 16 (Model 8) (cont.)

R^2 within = .04 X^2 (14 df) = 54.81; p = .000
 R^2 between = .33
 R^2 overall = .19

Legend for Variables:

1. Gender: Male = 0; Female = 1
2. Race: White = 0; Black = 1; Hispanic = 1; Asian = 1
3. Congruence: Congruent = 0; Incongruent = 1
4. Relative Status: Range is from .0833 (low) - .6 (high)
5. Low Status: low status = 1 (costatus scores ≤ 3); all others = 0
6. Asian*LS = Interaction term for low status Asian students
7. Black*LS = Interaction term for low status Black students
8. Hisp*LS = Interaction term for low status Hispanic students
9. Asian*Fem = Interaction term for Asian female students
10. Black*Fem = Interaction term for Black female students
11. Hisp*Fem = Interaction term for Hispanic female students

Table 17 (Model 9)

Multilevel Model Regressing Task-Related Talk on Status Characteristics

N = 246 Individuals; 50 Groups (Congruent Classes Only)

Dependent Variable: Observed - Expected Percentage of Task-Related Talk

Predictor	Coeff.	Std.Error	<i>z</i>	<i>p</i>
Constant	-5.08	3.95	-1.28	0.099
Female	0.73	4.02	-0.18	0.427
Asian	2.13	7.12	0.30	0.382
Black	-6.04	4.93	-1.23	0.110
Hispanic	-7.44	7.36	-1.01	0.156
Rel. Stat.	8.33	2.82	2.95	0.001
Low Status	-0.45	4.70	-0.10	0.462
Asian*LS	6.29	5.45	1.15	0.124
Black*LS	-8.72	7.72	-1.13	0.129
Hisp*LS	6.04	9.40	0.64	0.260
Female*LS	-5.15	6.20	-0.83	0.203
Asian*Fem	-9.35	8.16	-1.14	0.126
Black*Fem	10.3	7.75	1.32	0.092
Hisp*Fem	N/A			

*One-tailed

R^2 within = .03
 R^2 between = .43
 R^2 overall = .24

X^2 (12 df) = 36.61; p = .000

Table 17 (Model 9) (cont.)

Legend for Variables:

1. Gender: Male = 0; Female = 1
2. Race: White = 0; Black = 1; Hispanic = 1; Asian = 1
3. Congruence: Congruent = 0; Incongruent = 1
4. Relative Status: Range is from .0833 (low) - .6 (high)
5. Low Status: low status = 1 (costatus scores ≤ 3); all others = 0
6. Asian*LS = Interaction term for low status Asian students
7. Black*LS = Interaction term for low status Black students
8. Hisp*LS = Interaction term for low status Hispanic students
9. Asian*Fem = Interaction term for Asian female students
10. Black*Fem = Interaction term for Black female students
11. Hisp*Fem = Interaction term for Hispanic female students

Table 18 (Model 10)

Multilevel Model Regressing Task-Related Talk on Status Characteristics

N = 198 Individuals; 46 Groups (Incongruent Classes Only)

Dependent Variable: Observed - Expected Percentage of Task-Related Talk

Predictor	Coeff.	Std.Error	<i>z</i>	<i>p</i>
Constant	-10.5	4.89	-2.15	0.015
Female	-1.20	3.81	-0.31	0.377
Asian	-1.03	4.21	-0.25	0.403
Black	2.23	4.97	0.45	0.327
Hispanic	-0.83	4.32	-0.19	0.423
Rel. Stat.	10.3	3.29	3.13	0.001
Low Status	2.79	5.13	0.54	0.293
Asian*LS	-7.22	6.14	-1.18	0.120
Black*LS	-8.63	7.08	-1.22	0.111
Hisp*LS	2.99	7.76	0.39	0.350
Female*LS	-9.07	5.16	-1.76	0.039
Asian*Fem	7.34	5.45	1.35	0.089
Black*Fem	21.7	7.53	2.88	0.002
Hisp*Fem	8.48	7.38	1.15	0.125

*One-tailed

R^2 within = .07

R^2 between = .47

R^2 overall = .32

X^2 (13 df) = 39.93; p = .000

Table 18 (Model 10) (cont)

Legend for Variables:

1. Gender: Male = 0; Female = 1
2. Race: White = 0; Black = 1; Hispanic = 1; Asian = 1
3. Congruence: Congruent = 0; Incongruent = 1
4. Relative Status: Range is from .0833 (low) - .6 (high)
5. Low Status: low status = 1 (costatus scores ≤ 3); all others = 0
6. Asian*LS = Interaction term for low status Asian students
7. Black*LS = Interaction term for low status Black students
8. Hisp*LS = Interaction term for low status Hispanic students
9. Asian*Fem = Interaction term for Asian female students
10. Black*Fem = Interaction term for Black female students
11. Hisp*Fem = Interaction term for Hispanic female students

Table 19 (Model 11)

Multilevel Model Regressing Task-Related Talk on Status Characteristics

N = 444 Individuals; 96 Groups (All Four Classes)

Dependent Variable: Observed - Expected Percentage of Task-Related Talk

Predictor	Coeff.	Std.Error	<i>z</i>	<i>p</i> *
Constant	-8.60	4.06	-2.11	0.017
Female	-1.27	2.89	-0.44	0.330
Asian	-2.18	3.65	-0.59	0.275
Black	-2.63	3.70	-0.71	0.239
Hispanic	-2.90	3.68	-0.79	0.215
Congruence	0.26	1.72	0.15	0.439
Rel. Stat	9.91	2.07	4.79	0.000
Low Status	1.26	3.77	0.33	0.369
Asian*LS	-6.33	6.97	-0.91	0.182
Black*LS	-3.70	6.86	-0.54	0.294
Hisp*LS	1.84	6.25	0.29	0.384
Female*LS	-4.08	5.09	-0.80	0.211
Asian*Fem	0.77	4.69	0.16	0.434
Black*Fem	14.9	6.11	2.43	0.007
Hisp*Fem	5.29	8.72	0.60	0.272
Asian*LS*F	6.56	8.43	0.77	0.218
Black*LS*F	-8.51	9.64	-0.88	0.189

Table 19 (Model 11) (cont)

Hisp*LS*F	4.24	13.1	0.32	0.373
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*One-tailed

R^2 within = .04	X^2 (17 df) = 56.47; p = .000
R^2 between = .34	
R^2 overall = .20	

Legend for Variables:

1. Gender: Male = 0; Female = 1
2. Race: White = 0; Black = 1; Hispanic = 1; Asian = 1
3. Congruence: Congruent = 0; Incongruent = 1
4. Relative Status: Range is from .0833 (low) - .6 (high)
5. Low Status: low status = 1 (costatus scores ≤ 3); all others = 0
6. Asian*LS = Interaction term for low status Asian students
7. Black*LS = Interaction term for low status Black students
8. Hisp*LS = Interaction term for low status Hispanic students
9. Asian*Fem = Interaction term for Asian female students
10. Black*Fem = Interaction term for Black female students
11. Hisp*Fem = Interaction term for Hispanic female students
12. Asian*LS*F = Interaction term for low status Asian female students
13. Black*LS*F = Interaction term for low status Black female students
14. Hisp*LS*F = Interaction term for low status Hispanic female students

Table 20 (Model 12)

Multilevel Model Regressing Task-Related Talk on Status Characteristics

N = 198 Individuals; 46 Groups (Incongruent Classes Only)

Dependent Variable: Observed - Expected Percentage of Task-Related Talk

Predictor	Coeff.	Std.Error	z	p
Constant	-10.9	5.08	-2.15	0.016
Female	-0.96	4.25	-0.22	0.410
Asian	-1.04	4.69	-0.22	0.412
Black	1.85	5.48	0.34	0.368
Hispanic	-0.11	4.69	-0.02	0.490
Rel. Stat.	10.5	3.33	3.16	0.001
Low Status	3.34	5.91	0.56	0.286
Asian*LS	-7.14	8.34	-0.86	0.196
Black*LS	-7.79	8.68	-0.89	0.185
Hisp*LS	-0.99	9.88	-0.11	0.459
Female*LS	-10.2	9.50	-1.70	0.142
Asian*Fem	7.41	6.52	1.13	0.128
Black*Fem	23.9	10.2	2.34	0.009
Hisp*Fem	4.42	9.40	0.47	0.319
Asian*LS*F	-0.00	12.9	0.00	0.500
Black*LS*F	-4.03	16.2	-0.25	0.402
Hisp*LS*F	11.1	16.5	0.50	0.251

Table 20 (Model 12) (cont.)

*One-tailed

R^2 within = .07

X^2 (16 df) = 38.55; p = .000

R^2 between = .49

R^2 overall = .33

Legend for Variables:

1. Gender: Male = 0; Female = 1
2. Race: White = 0; Black = 1; Hispanic = 1; Asian = 1
3. Congruence: Congruent = 0; Incongruent = 1
4. Relative Status: Range is from .0833 (low) - .6 (high)
5. Low Status: low status = 1 (costatus scores ≤ 3); all others = 0
6. Asian*LS = Interaction term for low status Asian students
7. Black*LS = Interaction term for low status Black students
8. Hisp*LS = Interaction term for low status Hispanic students
9. Asian*Fem = Interaction term for Asian female students
10. Black*Fem = Interaction term for Black female students
11. Hisp*Fem = Interaction term for Hispanic female students
12. Asian*LS*F = Interaction term for low status Asian female students
13. Black*LS*F = Interaction term for low status Black female students
14. Hisp*LS*F = Interaction term for low status Hispanic female students

Table 21
*Summary of Percentages of High and
 Low Status Students by Gender and Race*

All Groups
N=444

	Male	Female	Total
High Status	41 (53.00)*	36 (47.00)	77 (100.00)
Low Status	68 (44.00)	88 (56.00)	156 (100.00)

ASIAN
N=155

	Male	Female	Total
High Status	16 (42.00)	22 (58.00)	38 (49.00)
Low Status	8 (16.00)	43 (84.00)	51 (33.00)

BLACK
N=63

	Male	Female	Total
High Status	5 (100.00)	0 (0.00)	5 (7.00)
Low Status	2 (44.00)	14 (56.00)	26 (17.00)

HISPANIC
N=50

	Male	Female	Total
High Status	10 (100.00)	0 (0.00)	10 (13.00)
Low Status	7 (85.00)	3 (15.00)	20 (13.00)

WHITE
N=176

	Male	Female	Total
High Status	10 (42.00)	14 (58.00)	24 (31.00)
Low Status	31 (52.5)	28 (47.50)	59 (38.00)

*Percentages are in parentheses.

Table 22
Summary of Percentages of High and
Low Status Students by Gender, Race and Congruence

Congruent
N=246

	Male	Female	Total
High Status	11 (12.09)*	36 (23.23)	47 (19.11)
Low Status	31 (34.07)	67 (43.23)	98 (39.84)

All Groups
N=444

Incongruent
N=198

	Male	Female	Total
High Status	30 (25.64)	0 (0.00)	30 (15.15)
Low Status	37 (31.62)	21 (25.93)	58 (29.29)

Congruent
N=91

	Male	Female	Total
High Status	6 (100.00)	22 (25.88)	28 (30.77)
Low Status	0 (0.00)	33 (38.82)	33 (36.26)

Asian
N=155

Incongruent
N=64

	Male	Female	Total
High Status	10 (31.25)	0 (0.00)	10 (15.62)
Low Status	8 (25.00)	10 (31.25)	18 (28.12)

Congruent
N=34

	Male	Female	Total
High Status	5 (38.46)	0 (0.00)	5 (14.71)
Low Status	0 (00.00)	11 (52.38)	11 (32.35)

Black
N=63

Incongruent
N=29

	Male	Female	Total
High Status	24 (100.00)	5 (100.00)	29 (100.00)
Low Status	12 (50.00)	3 (60.00)	15 (51.72)

*Percentages are in parentheses.

Table 22 (cont.)
*Summary of Percentages of High and
 Low Status Students by Gender, Race and Congruence*

Hispanic
 N=50

Congruent
 N=16

	Male	Female	Total
High Status	0 (0.00)*	0 (0.00)	0 (0.00)
Low Status	12 (75.00)	0 (0.00)	12 (75.00)

Incongruent
 N=34

	Male	Female	Total
High Status	10 (35.71)	0 (0.00)	10 (29.41)
Low Status	5 (17.86)	3 (50.00)	8 (23.53)

White
 N=176

Congruent
 N=105

	Male	Female	Total
High Status	0 (0.00)	14 (28.57)	14 (13.33)
Low Status	19 (33.93)	23 (46.94)	42 (40.00)

Incongruent
 N=71

	Male	Female	Total
High Status	10 (30.30)	0 (0.00)	10 (14.08)
Low Status	12 (36.36)	5 (13.16)	17 (23.94)

*Percentages are in parentheses.

Table 23
Chi-Square for
Race and Congruence

<i>Race</i>	<i>Congruence</i>		<i>Total</i>
	<i>Congr</i>	<i>Incong</i>	
White	105 42.68	71 35.86	176 39.64
Black	34 13.82	29 14.65	63 14.19
Hispanic	16 6.50	34 17.17	50 11.26
Asian	91 36.99	64 32.32	155 34.91
Total	246 100.00	198 100.00	444 100.00

Pearson X^2 (3) = 13.11 $p = 0.004$

Table 24
Chi-Square
for Gender and
Congruence

<i>Gender</i>	<i>Congruence</i>		<i>Total</i>
	<i>Congru</i>	<i>Incong</i>	
Male	91 36.99	117 59.09	208 46.85
Female	155 63.01	81 40.91	236 53.15
Total	246 100.00	198 100.00	444 100.00

Pearson X^2 (1) = 21.52 $p = 0.000$

Table 25
Chi-Square for
Low Status
and Congruence

<i>Low Status</i>	<i>Congruence</i>		<i>Total</i>
	<i>Congru</i>	<i>Incong</i>	
Other	148 60.16	140 70.71	288 64.86
Low status	98 39.84	58 29.29	156 35.14
Total	246 100.00	198 100.00	444 100.00

Pearson X^2 (1) = 5.35 $p = 0.021$

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Appendix A GLOSSARY OF TERMS

Academic Status: A score assigned to each student based on the results of a sociometric test (questionnaire) given to all of the students in each class participating in the study. This indicator is a measure of a student's academic ability as perceived by his or her peers. It is one of two measures used to attain a costatus score for each student. The values range from 1 to 5, with 5 being the highest.

Combination Theory: This theory holds that a single generalized expectation of an individual is formed by combining all of the individual's perceived positive and negative characteristics. In this study, we hold that a student's race, gender, academic status and peer status combine to form a single generalized expectation for competence.

Complex Instruction: An approach based on expectation states theory consisting of curriculum and instructional strategies designed to deal with status problems. Essential components include students working in highly interactive groups on tasks requiring multiple skills and abilities, and status treatments designed to reduce status problems in the group.

Congruent Classroom: Academic and peer statuses of each student in a classroom were correlated to obtain a correlation coefficient for each classroom. If academic and peer status were positively related with a .05 or better significance, the classroom was referred to as congruent.

Costatus: A score assigned to each student based on the results of a sociometric test (questionnaire) given to all of the students in each class participating in the study. This score is a result of adding a student's academic and peer status. The values range from 2 to 10, with 10 being the highest. High, middle and low status designations are given to each student based on their costatus score. **High status students** have a costatus score of 7-10; **Middle status students** have a costatus score of 4-6; and **Low status students** have a costatus score of 2-3.

Differentiated Groups: This concept relates to group status space. A high group status space indicates a highly differentiated group. If the group status space was 0, all of the group members would have the same costatus score. This would be a non-differentiated group. The range of group status space is 0 to 7, resulting in 7 "degrees" of differentiation. Our focus in this study was whether the group was very differentiated or not at all differentiated.

Differentiation: The degree of status space between students in a group. (See group status space and differentiated groups.)

Diffuse Status Characteristics: Also known as ascribed status characteristics. Examples are race, gender, and age.

Elimination Theory: This theory holds that expectations based on a diffuse status characteristic of an individual can be prevented from forming if the individual has at least two specific status characteristics that are evaluated differently from the diffuse status characteristic. For example, a woman doctor with a specialty or expertise related to the task at hand, may be a

higher status person than a male construction worker with no expertise related to the task at hand. In this study, if a person is low on race but high on academic and peer status, their generalized expectation for competence may be higher than someone high on race but low on academic and peer status.

Expectations States Theory: This theory examines the power of status expectations to organize social interaction. The theory helps to explain how an individual's position and influence in a group relate to the status characteristics the individual possesses.

Group Status Space: the difference between the costatus score of the highest status student and the lowest status student in the group. For example, in a four person group, if the costatus scores were 8, 6, 4, and 2, the group status space would be $8 - 2 = 6$. A score of 6 is considered to be a very high group status space. The range in our study was 0 to 7. Group status space is a predictor variable for our dependent variable: percentage of task-related talk. In particular, the higher the group status space, the lower the percentage talk for low status students in a group.

Group Work: Students working in groups on a task that requires both an individual and a group product. The students must interact together in order to complete the project; the tasks generally require multiple skills and abilities and no one student is likely to have all of them. This encourages mutual interdependence.

Incongruent Classroom: Academic and Peer Statuses of each student in a classroom were correlated to obtain a correlation coefficient for each classroom. If academic and peer status were unrelated or negatively related, with a .05 or better significance, the classroom was referred to as incongruent.

Peer Status: A score assigned to each student, based on the results of a sociometric test (questionnaire) given to all of the students in each class participating in the study. This indicator is a measure of a student's popularity as perceived by his or her peers. It is one of two measures used to attain a costatus score for each student. The values range from 1 to 5, with 5 being the highest.

Local Status Characteristics: Not recognized in general by the members of a given population. In this study, peer and academic status are considered local characteristics because the criteria used to determine high and low states of these status characteristics vary by classroom and by school. The criteria are "local" to a specific subgroup of the population.

Scope Conditions: These are the requirements that must be met in order for Status Characteristics Theory (SCT) to be applicable. The scope conditions for SCT are that individuals must be working in task- and collectively-oriented groups.

Specific Status Characteristics: Also known as achieved status characteristics. Examples are occupations, especially if they indicate abilities relevant to the group task or expertise relevant to the group task.

Status Characteristics: traits of a person, often associated with stereotypes. They carry a generalized expectation for competence. There is usually a high state and a low state. They are recognized in general by the members of a given population. For example, in the United

States, being white has historically been considered the high state of the diffuse status characteristic, race. Likewise, being Black has historically been considered the low state. On the diffuse status characteristic gender, being male has historically been considered the high state and being female, the low state.

Status Characteristics Theory: The theory focuses on how initial differences in a collectively and task-oriented group become the basis of expectations in the immediate situation. For example, if little is known about group members, white males in professional or managerial occupations will have higher status than nonwhite females in a non-professional occupation, regardless of the task at hand.

Status Problems: Unequal interaction in small groups that is due to the status differences of its members. In this study, low status students in a group of high status students have lower rates of participation. This not only disadvantages the low status student academically and personally (the negative effects of being ignored), but it disrupts the group process.

Status Treatments: A method used by teachers to increase the status of a low status person in the eyes of their peers. For example, if a low status student has a skill or an ability that the group needs but may otherwise ignore, the teacher will publicly point out that the student "was the only one who got all of the math problems right yesterday and the group that gets him or her as a member will be lucky." This is usually tied in to a group task that requires the skill or ability being praised; for example, quantitative skills. The findings of past studies indicate very positive results for the low status students; their status is raised, they are asked to participate more and their interaction rates increase. Past studies also have shown an indirect effect of higher scores on achievement tests resulting from higher interaction rates.

Target Students: After all of the students received a costatus score, 8 to 10 high and low status students were selected to observe. These target students determined which groups were observed. For example, if a group did not have any target students, they were not observed. If a group had one or more target students in them, all of the students in the group were observed.

Variables Used in Individual and Group Levels of Analysis: Each of the variables are described in a Legend corresponding to the Table or Appendix containing the variables.

Appendix B
AGREEMENT TO PARTICIPATE IN RESEARCH

This study seeks to gather information via observations on what happens when students are asked to work with a mixed group of classmates whom they have not selected. The purpose is to better understand how groups of students learn and talk with each other.

There are no personal risks associated with your participation in this study. Possible benefits to you include a greater understanding of how groups of students learn and talk with each other.

This study is confidential. The information I provide will not, in any way, be made available to any agency, or individual, public or private. The results from this study may be published, but any information from this study that can be identified with you will remain confidential and will be disclosed only with your permission.

Any questions about your participation in this study may be addressed to the principal investigator, Paulette Lloyd at (408) 375-1208. Complaints about the research may be presented to Dr. Robert Gliner, Sociology Department Chair at (408) 924-5337. Questions or complaints about research, subject's rights, or research related injury, may be presented to Serena Stanford, Ph.D., Associate Academic Vice President for Graduate Studies & Research, at (408) 924-2480.

Your decision to participate in this study is entirely voluntary and you may refuse to participate in this study or withdraw at any time, without affecting your relationship with San Jose State University or any department or agency involved with this study.

I release the district and its employees from liability resulting from the district's participation in this program and I agree that in the event of any claim or cause of action from any matter regarding the questionnaire, that the district will be held harmless.

I HAVE READ THE ABOVE INFORMATION AND HAVE MADE A DECISION WHETHER OR NOT TO PARTICIPATE. MY SIGNATURE INDICATES THAT I HAVE DECIDED TO PARTICIPATE AND I HAVE RECEIVED A COPY OF THIS FORM FOR MY FILES.

Date

Participant's Signature

The signature of a parent or guardian on this document indicates approval for the child or ward to participate in the study and a statement that the child or ward is freely willing to participate.

Name of Child or Ward

Parent or Guardian Signature

Date

Relation to Child or Ward

Phone

Full Mailing Address

Investigator's Signature

Date

Appendix C
PARENT NON-CONSENT FORM

**RETURN THIS FORM IF YOU OBJECT TO YOUR CHILD'S PARTICIPATION
IN THE FOLLOWING ACTIVITY**

I object to my child (PLACE A CHECK MARK IF THIS APPLIES):

[] Completing a sociometric questionnaire*

Name (printed): _____ Child's Name: _____
Signature: _____ Date: _____

Keep the extra copy for your records.

*A copy of the questionnaire is available upon request.

Appendix D

Researcher: Paulette Lloyd
Address: Sociology Department
San Jose State University
One Washington Square
San Jose, CA 95192-0009
(408) 375-1208

STUDENT PERMISSION SLIP

You and your classmates are part of a study on status in groups conducted by researchers at San Jose State University and Stanford University. The purpose of this study is to better understand how groups of students learn and interact with each other and the role status plays.

You have the right to decide how you will participate in this study. You can refuse to fill out the sociometric questionnaire without penalty. You also have the right to refuse to answer particular questions. Your privacy will be maintained in all published and written work resulting from this study.

CHECK THE BOX THAT APPLIES:

☐ **YES.** You can ask me to fill out the questionnaire.

OR

☐ **NO.** You cannot ask me to fill out the questionnaire.

STUDENT SIGNATURE _____ DATE _____

If you have any questions about your rights as a participant in this study, or are dissatisfied at any time with any aspect of this study, you may write to -- anonymously, if you wish -- the Human Subjects Review Committee, San Jose State University, One Washington Square, San Jose, CA 95192-0009 (USA). Or, you may call at (408) 924-2479.

The extra copy of this form is yours to keep.

Appendix E
SAMPLE COVER LETTER FOR STUDENT PERMISSION SLIP

Date:

Dear Parent:

Our school is working in collaboration with Stanford University's Program for Complex Instruction and San Jose State University's Sociology Department. Complex Instruction is a model of cooperative learning. Its goal is to provide all students access to learning through the use of intellectually challenging group tasks.

The study is expected to take one month. Its purpose is to better understand the role status plays in learning and interaction in groups.

Data collection for this study will occur during regular classroom events and activities, and is not expected to interfere with students' learning. For example, Paulette Lloyd and her colleagues at Complex Instruction will observe students during class time, noting what they do and say.

In addition, students in my class will be asked to fill out a questionnaire. The questionnaire is called a sociometric form. It asks students three questions: (1) In your opinion, which students are best at the subject in this class?; (2) If your class had a popularity contest, which students do you think would get the most votes? and (3) In your opinion, who are the most outstanding male and female athletes in the class? This questionnaire will only be administered once.

Information collected in this study may be reported in professional papers or presented at conferences. However, in no case will the identities of the school, teacher or children involved be made available to anyone outside the project. Complete anonymity will be maintained.

If you have any questions or concerns about this study, please feel free to contact me, the school office, or Paulette Lloyd at San Jose State University, Sociology Department, One Washington Square, San Jose, CA 95192-0009, (408) 375-1208. If you are concerned or of this project, you may write to -- anonymously, if you wish -- the Human Subjects Review Committee, San Jose State University, One Washington Square, San Jose, CA 95192-0009 (USA). Or, you may call at (408) 924-2479.

Your child has already received information about this research project. He or she has been given the option of participating in the completion of the questionnaire. You also get a say in your child's participation.

If you OBJECT to your child filling out the questionnaire, please sign and return one copy of the non-consent form to me. If you AGREE to your child filling out the questionnaire, you do not need to complete or return the form.

Sincerely yours,

Teacher

Appendix F

STUDENT QUESTIONNAIRE

YOUR NAME: _____

TEACHER NAME: _____ SUBJECT: _____ PERIOD(S) _____

CIRCLE the name or names you choose to answer each question.

1. In your opinion, which students are best at the subject in this class?

(Researcher will list names of all classmates here)

2. If your class had a popularity contest, which students do you think would get the most votes?

(Researcher will list names of all classmates here)

3. In your opinion, who are the most outstanding male and female athletes in the class?

(Researcher will list names of all classmates here)

Appendix G
DIRECTIONS FOR ADMINISTRATION OF
STUDENT QUESTIONNAIRE

Directions: Circle the name or names you choose to answer each question. Your answers are very private. They are not to be discussed with anyone. Use the manila folder we will give you as a shield to keep your work private.

Explanation to the students: I am studying how status works in groups because groups now are used a lot in schools. First, I need to find out who you are as a group. This questionnaire is a simple way to help me do that.

Instructions for teachers: Please help me monitor the completion of the questionnaire by walking up and down isles to make sure no one is peeking. If a student is looking around, we can point to the poster I have placed in the front of the room which reminds students of the directions and cautions them with this message: "REMEMBER: THIS IS PRIVATE."

Appendix H

INSTRUCTIONS TO TEACHERS ON ADMINISTRATION OF STUDENT QUESTIONNAIRE

I will need a class list to prepare the student questionnaire. It will take about two days to type it up and xerox it. Administration of the questionnaire will take approximately 15 minutes of class time: this includes roughly 10 minutes for the students to complete the form and about 5 minutes for me to explain the process.

Once I have administered the questionnaires from each of the classes and coded the responses, I will select four classes to observe. I will need to make five observations of each class. In order to do the observations, the following conditions must be met:

(1) The students must be working collectively in small groups (3, 4 or 5 students only) on a task requiring cooperation to produce a group product. The task cannot be "collaborative seat work" where students are working on problems with right answers and only asking for help when they need it. For example, math problems with clear right and wrong answers that a single individual can do alone are not acceptable tasks for group projects. The task must be complex enough to require student interdependence to complete the task. I have purchased a copy of "Designing Groupwork" for each teacher and prepared a packet of materials providing examples of the kinds of tasks that require group work and cooperation among students of different abilities. I will give these to you before I begin observations.

(2) The observations must be made when the teacher is not a part of the group. When the teacher is there, the students will be focused on him or her. They must be focused on each other and working collectively to problem solve. When a student raises his or her hand for your help, I will stop observing until the student has resumed the task on his or her own.

(3) The students must be working continuously and uninterrupted on a task, to allow me to observe several groups for 5 minutes each.

I will arrange observations with you, so that my research will not take up any class time. I will only observe when you have a regularly scheduled group work project. My role will be a silent observer. I will stand near the group being observed with a clipboard and will record the number of times a student talks on task in their group. Please note that I do not observe teachers in any way, which is why I cannot observe groups when the teacher is there. I am only looking at students interacting in groups. My research objective is to document how status affects interaction in groups. This research is related to work done on cooperative learning, where a unique approach, complex instruction, was developed to encourage maximum interaction of students working in groups. Prior research findings have shown a positive correlation with this approach and higher standardized test scores. I will share my research findings with the teachers and the students. If you find the materials I have given you on complex instruction interesting, I can help arrange for training in this for either individual teachers or a group of teachers .

Appendix I

AVERAGED OBSERVED - EXPECTED PERCENTAGE OF TASK-RELATED TALK OF TARGET STUDENTS

A. INCONGRUENT CLASSES

CLASS ID: 12

Low Status Students

Student ID 1201: -19.44
Student ID 1202: -1.42
Student ID 1208: 2.35
Student ID 1215: -6.51
Student ID 1226: -6.54

High Status Students

Student ID 1212: 0.60
Student ID 1216: 13.25
Student ID 1217: 13.05
Student ID 1225: 7.30

CLASS ID: 15

Low Status Students

Student ID 1502: -8.16
Student ID 1504: -7.37
Student ID 1515: -0.97
Student ID 1522: -13.78

High Status Students

Student ID 1505: 8.15
Student ID 1514: -1.03
Student ID 1517: 2.05
Student ID 1518: -1.37

B. CONGRUENT CLASSES

CLASS ID: 13

Low Status Students

Student ID 1308: 2.24
Student ID 1309: -3.98
Student ID 1315: -6.39
Student ID 1316: -10.66
Student ID 1317: 8.91
Student ID 1323: -4.71

High Status Students

Student ID 1301: 8.02
Student ID 1305: -3.39
Student ID 1322: 3.90
Student ID 1331: 4.09

CLASS ID: 22

Low Status Students

Student ID 2202: -5.90
Student ID 2204: -0.65
Student ID 2211: -10.20
Student ID 2214: -18.28
Student ID 2223: 5.10
Student ID 2224: -1.94
Student ID 2225: 0.11

High Status Students

Student ID 2201: 11.44
Student ID 2219: -3.24
Student ID 2220: 5.91
Student ID 2221: 1.84

Appendix J OBSERVATION INSTRUMENT

Explanation:

The cover sheet provides date, school ID, the class ID (code), description of the task, time of the observation, the number of the observation (for that class) and the observer. There is room for notes about anything unusual about the task or grouping.

The form itself is arranged by group. Column 1 provides 6 spaces to record the numerical code for each child. Column 2 provides an area to make hash marks, recording each individual's task-related speech act. Column 3 is used to sum up the total speech acts for the individual. Column 4 is used to sum up the total speech acts for the group. Column 5 is used to record the percent interaction of each student. The time the 5-minute observation for each group began and ended is recorded to the left of column 1. Any unusual events occurring in the group is recorded to the right of column 5.

The information from the observation forms was entered into an SPSS data base for analysis. The variables entered and their descriptions can be found in Appendices I (data for individual level analysis) and J (for group level analysis).

Appendix J TARGET STUDENT OBSERVATION FORM

Class Code Name: _____
Observer: _____
Date: _____

5 minute observation
time began: _____
time ended: _____

Group Number/ Participant number	Task-Related Talk	Non-Task Related Talk	Can't Tell	In transition
<u>Group 1</u>				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
<u>Group 2</u>				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
<u>Group 3</u>				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
<u>Group 4</u>				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				

Appendix K OBSERVER RELIABILITY FORM

The following person attained reliability as an observer for the "Observation Instrument":

<u>Code #</u>	<u>Name</u>	<u>Date</u>	<u>% Agreement</u>
01	Pat Visser	5/30/97	93%

Procedures:

1. Researcher Paulette Lloyd was designated "reliability person," embodying the standards of quality for the use of the "Observation Instrument."
2. Additional observer(s) worked with the "reliability person" and used the "Observation Instrument" between three and five times.
3. Reliability was defined as "percentage agreement." The following formula was used to calculate "percentage agreement":

$$1 - [\text{total \# of disagreements} / \text{total \# of possible disagreements}] = \text{percentage agreement}$$

Documentation of the observations and the calculated percentage agreement is listed below.

Group 1:

Observer 1:	16	12	18	= 46	
Observer 2:	19	12	22	= 53	
Difference	3	0	4	= 7	7/99 = .07; 100 - .07 = 93%

Group 2:

Observer 1:	16	13	12	14 = 55	
Observer 2:	14	14	11	21 = 60	
Difference	2	1	1	7 = 11	11/115 = .09; 100 - .09 = 91%

Group 3:

Observer 1:	18	15	8	13 = 54	
Observer 2:	18	13	12	12 = 55	
Difference	0	2	4	1 = 7	7/109 = .06; 100 - .06 = 94%

Group 4:

Observer 1:	14	14	6	15 = 49	
Observer 2:	17	16	5	17 = 55	
Difference	3	2	1	2 = 8	8/104 = .08; 100 - .08 = 92%

Group 5:

Observer 1:	19	21	13	18 = 71	
Observer 2:	19	25	9	21 = 74	
Difference	0	4	4	3 = 11	11/145 = .07; 100 - .07 = 93%

Totals: 93 + 91 + 94 + 92 + 93 = 463/5 = 92.6 or 93%

Appendix L

Correlation Matrix for Table 2 Variables; All Four Classrooms
N = 96

	Obs. Exp.	Co- Status	In- Congr.	Gender	Race
Obs. Exp.	1.0				
Co- Status	.3253***	1.0			
In- Congr.	.0103	.0911	1.0		
Gender	-.1062	-.0893	-.2058*	1.0	
Race	-.2007*	.1582	.0184	.1325	1.0

* $p < .05$
 ** $p < .01$
 *** $p < .001$
 (2-tailed Significance)

Legend for Variables:

1. **Obs.Exp.** (Observed - Expected), Expected values: Groups of 3 = 33 1/3%; Groups of 4 = 25%; Groups of 5 = 20%; Less than expected = negative values; Expected = 0; More than expected = positive values.
2. **Costatus:** Low status = 2-3; Middle status = 4-6; High status = 7-9
3. **Incongr.** (Congruence): Congruent = 0; Incongruent = 1
4. **Gender:** Male = 0; Female = 1
5. **Race:** White = 0; Black = 1; Hispanic = 1; Asian = 1

Appendix M

*Correlation Matrix for Table 3 Variables;
Congruent classrooms.
N = 50*

	Obs. Exp.	Co- Status	Gender	Race
Obs. Exp.	1.0			
Co- Status	.3509*	1.0		
Gender	-.3890**	-.0536	1.0	
Race	-.3895**	.1400	.3570*	1.0

* $p < .05$
 ** $p < .01$
 *** $p < .001$
 (2-tailed Significance)

*Correlation Matrix for Table 4 Variables;
Incongruent classrooms.
N = 46*

	Obs. Exp.	Co- Status	Gender	Race
Obs. Exp.	1.0			
Co- Status	.2945*	1.0		
Gender	.1976	-.0986	1.0	
Race	.0058	.1835	-.1033	1.0

* $p < .05$
 ** $p < .01$
 *** $p < .001$
 (2-tailed Significance)

Legend for Variables:

1. **Obs.Exp.** (Observed - Expected), Expected values: Groups of 3 = 33 1/3%; Groups of 4 = 25%; Groups of 5 = 20%; Less than expected = negative values; Expected = 0; More than expected = positive values.
2. **Costatus:** Low status = 2-3; Middle status = 4-6; High status = 7-9
3. **Incongr.** (Congruence): Congruent = 0; Incongruent = 1
4. **Gender:** Male = 0; Female = 1
5. **Race:** White = 0; Black = 1; Hispanic = 1; Asian = 1

IMAGE EVALUATION TEST TARGET (QA-3)

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