"It's Just a Girl Thing"; The Feminization of Work Groups and the Effect of Numerical Composition On Group Hierarchy

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Abstract

Women have recently shown higher rates of attendance and graduation in college, a reversal of a long-standing educational status quo that could alter gender relations in society. Given recent trends of female achievement in higher education, how will this shift in gender composition shape processes of stratification in academic work settings? To answer this question, this study looked at 78 videos men and women working in three person groups, who had been videotaped for a previous laboratory study. Examination of these videos provided the qualitative data to investigate how group composition and gender shapes stratification within academic groups. Systematic observation of 50 videotapes produced several themes that were then explored further with a formal content analysis that including the coding of 28 more videotapes. Qualitative observations and results from the coding process suggests that individuals in the numerical gender majority often maintained the most influence and status in the group despite the type of task the group was working on at the time. Following a discussion of the results of the study, directions for future research are explored.

Recent research finds that women are outperforming men on a variety of educational measures, particularly in the realm of higher education. According to a study from the American Council of Education, 57% of students enrolled on college and university campuses are women (Aud, Hussar, Johnson, Kena, Roth, Manning, and Zhang 2012). This dramatic reversal of the representation of men and women in higher education invites important questions regarding how this change will ultimately affect inequality in larger society. Will this numerical dominance

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ultimately undo the historical legacy of gender inequality in educational and occupational arenas, or will we continue to see men guided towards higher status and higher paying careers and women tracked into lower paying, lower status occupational settings?

Research on the predominance of women on college campuses and hypotheses for these trends are available; however, the theoretical basis of this work has not been sufficient to understand the mechanisms at work motivating this trend. Furthermore, there have been no in-depth qualitative studies done on this trend on college campuses to see how real men and women are interacting and negotiating status and hierarchy in group settings. By exploring how the composition of men and women in a group shapes the processes of stratification, this study addresses a critical need in the fields of gender and education to better understand how the dominance of women in higher education may ultimately shape opportunities in the social world.

Due to this surprising reversal in the gender gap in higher education, it is imperative to begin by exploring how the gender composition of a group shapes the process of stratification in a group. This study uses a grounded theory approach to systematically observe and analyze 50 videotapes and code 28 videotapes from an experiment conducted with undergraduates from the University of Iowa. The central research question is this: Will numerical dominance or traditional male privilege be the motivating factor in the development of status hierarchies into task groups? In other words, if women numerically dominate in college settings, will they also dominate in interaction, or will men continue to maintain high status positions in interaction despite being in the numerical minority? Some research has suggested that differences in behavior are simply a result of an individual's assigned sex category of male or female. In order to move away from some of the theories that rely on such essentialist notions of gender difference, this research suggests that, rather than gender difference, it is social structure and, more specifically, group composition that motivates individuals' behavior in groups. To better understand how the

numerical dominance of a particular social group will shape the process of stratification within groups, existing research on majorities and minorities is explored in the next section. Following that are details about the study's data and methodology, a report of the results, a discussion of the results, and, finally, conclusions and suggestions for future research.

NUMERICAL MAJORITY AND MINORITY INFLUENCE

Research on majority and minority influence investigates how numerical majorities and minorities obtain influence in groups (Dovidio, Gaertner, John, Halabi, Saguy, Pearson, and Riek 2008). Previous research has identified different ways that influence within groups occurs.

One way to gain influence in a group is through the maintenance of social control and group norms. The majority in a group can often determine social control and group norms through the process of conformity, which is "the process through which an individual accepts or complies with the groups view" (Martin and Hewstone 2003:586). The research on numerical majority influence typically utilizes judgment tasks like the Asch line-judgment paradigm to demonstrate that participants faced with a decision by the majority will consistently agree with the majority even when the answer is obviously wrong (Bond & Smith, 1996). Research has proposed that this conformity to majority position is created through pressure for the group to reach agreement (Festinger 1954; see Martin and Hewstone 2003). More specifically, individuals in groups are dependent on other members for approval of social behavior and agreement with opinions. Individuals ensure they get this approval and peer justification through demonstrating their interest in belonging to the majority group and by accepting opinions and attitudes of the majority group. Higher evaluations and acceptance of opinions of the majority confer status to the individuals within the majority. Influence created by majority or minority positions is a key indicator of a member's status rank in a group.

In Elizabeth Kanter's seminal work on group composition (1977), she suggested that the composition of men and women in a group has important implications for the group and the individuals within it. More specifically, she suggested that members in the numerical minority are subject to certain interactional pressures and high levels of scrutiny from their coworkers. "Such token members may adopt conservative behavior patterns, avoid conflict, and become a relatively passive audience for the boundary-heightening behavior of the numerical majority. Empirical studies have generally supported Kanter's ideas, showing that group dynamics and minority achievement differ in skewed groups as opposed to more representative groups" (e.g., Spangler, Gordon, and Pipkin 1978; Alexander and Thoits 1985; Smith-Lovin and Brody 1989:). In other words, the participation of particular members in a group is heavily dependent on the structure of the group. For example, if a group consists of all women, the interactions may differ greatly from a group where there is one woman interacting with several men. Therefore, the opportunity to be high status may not be only contingent on whether an individual is a man or a woman, but it may depend on how many men and women are present during interaction.

We know, therefore, that being positioned in the numerical minority of a group tends to decrease participation and decrease a member's overall status in the group. Alternatively, being in the numerical majority seems to increase an individual's opportunities to perform and gain status in the group. Some researchers have suggested that this maybe particularly true for women. For example, researchers have found that a woman's contribution to group participation increases as the number of women in the group increases (Johnson and Schulman 1989). It is possible that, as women's overall visibility increases, they can begin to support each other during group interactions. Linda Carli suggested that, "In essence, when females are in the majority, the male advantage is somewhat undercut by the opportunity for women to serve as allies to one another and by the greater communality of the interaction" (2001:728). Therefore, the

opportunity to be high status may not be only contingent on whether an individual is a man or a woman, but may depend on how many men and women are present during interaction.

The main proposition of this study is that being in the numerical gender majority of a group will matter more than being a man or a woman when it comes to who garners more influence in interaction. This research informs and complicates previous research on gender by asserting that, along with assigned gender, group composition also plays an important role in the development of social hierarchy. In the first portion of this study, qualitative analysis and grounded theory are used to observe videos of students working on three person-gendered tasks. During the second portion of the study a coding scheme is developed to quantitatively test the hypothesis developed in the first portion of the study. Once the results have been thoroughly described, the larger cultural importance of these findings are discussed.

DATA AND METHODS

Data was collected in an experiment called the Gendered Task Study, which was a controlled laboratory study completed in the spring of 2007. This initial study captured 91 videotaped interactions of 273 undergraduate students at the University of Iowa on video as they engaged in specific academic and nonacademic tasks with various group gender compositions. In this study, the student participants were randomly assigned to work together on collective tasks that were stereotyped either masculine or feminine and that were either academic or nonacademic. Four task conditions—nonacademic masculine (tower building), academic masculine (solving mathematical word problems), academic feminine (composing an essay on the feelings evoked by a famous poem), and nonacademic feminine (arranging particular pieces of clothing into fashion lines)—made up this study. The three-person groups varied in gender composition and were majority male, majority female, all male, and all female.

Analysis for the present study used the past data provided by the videotaped interactions with a coding and observation scheme designed specifically for this project. First, the videotapes were compiled and organized in order to begin observations for the qualitative portion of this study. Once several themes emerged from the qualitative observations of 50 videos, 28 were reviewed and coded for member contributions, gendered interactions, and leadership. Data from both the qualitative observations and quantitative coding process were used to construct a theoretical framework to understand and explore gendered interaction and formation of status hierarchy in task groups.

DESIGN OF QUALITATIVE OBSERVATION AND ANALYSIS

Video analysis was approached from a grounded theory perspective, allowing for hypotheses to emerge during the process of data analysis. Following the guidelines of grounded theory methodology (Glaser and Strauss 2009), the literature review was left until later in the data collection process so that existing research would not influence emerging themes. The videos were randomized to reduce the chance of bias in the selection process.

The first observation of tapes consisted of detailed note taking of each videotaped interaction. Each interaction, whether it consisted of verbal or non-verbal body language, was recorded in the observation booklet. In many cases direct quotes were transcribed into the notes in order to provide authentic representation of interactions. Once 25 videotapes had been observed, all the notes from each tape were reviewed for emergent themes and hypothesis to be noted and developed. Notes where methodically analyzed and after an example of a theme was observed in the notes it was marked with an A, B, C, or D. Each letter corresponded to a different theme that had emerged during this first round of theme development. After organizing findings from the first observations into selected themes, another 25 videos were watched to look for

confirming as well as disconfirming evidence. Finally, notes from the second round of observations were organized according to the initial themes outlined from the first round of observations. Themes were adjusted and re-formalized according to the new information obtained from the second round of observation.

DESIGN OF CONTENT ANALYSIS

Once the qualitative observations were completed and the emergent themes were codified the next step was to do a formal content analysis of the data. The Content Analysis portion of this study included the development of a formal coding scheme used to further explore the themes that emerged from the observation of the first 50 videos. The videotapes were randomized before they were viewed to eliminate any potential for researcher bias in video choice. The first step in the process of randomizing the videos was to organize the videos by condition. A random number generator was then used to select which video under each condition would be viewed.

Once the videotapes were selected, they were then watched and coded. The first question on the coding sheet is to describe the gender composition of the group (whether it be majority male, majority female, all male, or all female). Next, several questions are asked to identify initial perception of contribution and leadership. For example, the next questions are about who talked first, who talked second, who picked up the task materials and directions first, who appeared to be in control of task contributions and leadership, who appeared to be the most passive in the group, and the research assistants perception of the ordering of the hierarchy in the social group (i.e., A lead the group, B was the second most influential in the group, or C was the least influential) Below the initial questions is a square grid. The grid indicates time passed on the horizontal plane and participants (A,B,C) on the vertical access. The grid is broken down into 5-

minute increments for each participant. When the interaction started, the time was marked at the vary left hand side of the participation grid. As time passed, each time a participant interacted with the group it was marked in their particular row, and the type of comment they made was noted. Types of verbal contributions by group members were categorized into different types. During the observation of the first 50 videos, it was clear that not all verbal contributions were alike or had the same effect on the group. Verbal comments were coded as: instrumental (which consisted of task initiative statements like "That dress should be in the high fashion line"), responses (often these where just one word responses to another participants statement like, "yeah" or "mmm hmmm") questions, interruptions, argumentative or negative comments about another person's idea, reading of directions, task maintenance or organizational comments, negative or self-deprecating comments, and laughter. For reference please see the coding sheet included as Appendix A. Once the coding of each video was completed analysis of the data could begin. Amount and type of contributions documented during the coding process were organized and reported in tables.

During the coding process members were divided into member A, member B, and member C according to the coders observation of the group interaction. A participant was placed in the A category if they appeared to be in control of organization and task success and if they appeared to be highest in the social hierarchy. A participant was placed in the B category if they deferred to others in the group but consistently participated in the forwarding of group goals. Participants were placed in the C category if they participated less than other members in contributions toward group goals and in general appeared to be lowest in the social hierarchy. The division of study participants into these categories was based on the types of contributions, both verbal and nonverbal that participants were making, as well as an overall perception of the structure of the group. After the contributions were coded and tallied, a chi square test was selected to test

whether there were significant differences in amount and type of contribution made by group members.

The chi-square test, is a good fit for this analysis because it is used to explore whether there is a statistical difference between observed and expected frequencies in categorical data. The main question is whether there is a real difference in amount of interaction across members or if all the members of the group interact equally. In other words are there differences in what is observed in the coding process compared to what we might expect? This is often referred to as a goodness-of-fit test. This test can help to further explore the question of whether the differences observed in the qualitative portion of the study were due to some variation in the sample, or if there is a real difference between the observed groups. If there is no differences in the amount of contributions from members in these groups than the frequencies in amount of contribution should be identical for all the members. A simple scan of the data collected show that the contributions were not identical, but it was important to know whether the contributions were different enough to be considered significant. If there is no relationship between contributions from group members than the chi square will equal zero. However, if there is a relationship the chi square will be bigger than zero, and the bigger it is the greater the relationship is. With the data collected the chi square statistic can be calculated with the formula below:

$$\text{Chi-Square} = \frac{\text{Sum of (Observed Frequency} - \text{Expected Frequency)}^2}{\text{(Expected Frequency)}}$$

The next section outlines the results from both the qualitative and quantitative analysis. First, the major findings from the qualitative portion of the study will be discussed, followed by a summary of the results of the formal coding process and how these findings informed the initial findings.

RESULTS

Qualitative Analysis

Several interesting themes and propositions emerged from observing individuals interacting in same and mixed gender task groups. While the analysis for this paper only focuses on one of the major emergent themes, a few of the other most interesting themes are briefly outlined. One interesting theme that emerged from the analysis was that task condition mattered for minority participation. For example, when the stereotypical gender of the task condition was consistent with the minorities gender identity than they were more likely to have and take chances to contribute to the task. Another interesting theme was that individuals in the numerical minority were more likely to report that they found the task boring, disengage, and even sabotage the group's progress. The next prominent theme was that male and female groups tended to develop and maintain the stratification of their groups differently. For example, in the all-male groups men tended to bicker early on and establish stable hierarchies with in groups, whereas women seem to stratify less quickly and spend more time establishing and reestablishing hierarchy and leadership throughout the interaction. The last prominent theme that emerged was that specific aspects of interaction were commonly used to establish and maintain dominance and status in a group. For example, central seating position, reading of directions, control over task materials, and use of interruptions during verbal interaction were all common tactics used by individuals to gain leadership in a group.

This research focuses on one of the major emergent themes from the qualitative observations. This theme was that, when a group was in the numerical majority, they dominated the verbal contributions and overall completion of task group goals. This was true for both females and males in both the masculine and feminine gendered tasks. Numerical majority and

minority dynamics can be further explored through a description of observations of tasks with different gender compositions. This section will provide two typical examples of how and when the group in the numerical majority dominated interaction. Observations revealed that, if men were in the numerical majority of the group, they would dominate the interaction regardless of whether the task was a masculine or feminine task. In other words, men in the numerical majority dominate in tower building tasks as much as they do in fashion tasks. Similarly, when women were in the numerical majority, they would dominate in both the masculine and feminine tasks. In a group interaction between two women and a man working on a fashion task, for example, women dominate the interaction in a variety of different ways.

Video 6, which included the nonacademic female task of putting clothes into fashion lines, was an example of this type of interaction. The group consisted of two females and a male. Throughout the interaction, the women consulted each other about what fashion line they thought a particular piece of clothing should be in. Every time the male would try to integrate his opinion, he would be ignored either by a lack of verbal contact or eye contact or sometimes through more overt verbal comments like, "You don't know. You're a boy." In one exemplary interaction, the women were working on a jeans and t-shirt combination when the male interjected, "Ok, how much time do we have? We probably only have like five minutes so we better get moving. Find a formal dress and just pick it, like this one." The women looked up at him but ignored his suggestion by continuing to work on the outfit combination that they were working on. Male C and Female A started to talk at the same time. Male A started to say, in a loud tone, "That's not a discount." However, Female A cut him off and said, "I don't think you have ever shopped at Target in the women's section. If we were looking at guy's clothes, it might be different." The tone of this comment was harsh and had an underlying current of annoyance. "We could have sat at a table, you know," said the male, to which Female A said, "I like sitting on the floor." This

interaction was wrought with interpersonal tension. The female students expressed annoyance and disregard for the male's attempts to control the group. Male C tried many different strategies to gain influence. He consistently tried to interrupt, he attempted to change the location of the activity, and he tried to give himself the job of writing information down. However, each attempt that the male made to get a sense of control or ownership over the activity was inevitably shut down by the females in the group.

Perhaps the females were dominating in the example above because it was a fashion task, and the cultural expectation is that women are more competent in fashion than men. Surprisingly, the group that was in the numerical gender majority tended to dominate even in tasks where the type of task didn't match normative expectations of the gender in the numerical majority. For example, in a feminine task where men were in the numerical majority, the men dominated the interaction. In a female academic, male majority task, there were two males and a female who were asked to write an essay. Despite the expectation that men might be uncomfortable with writing an essay on an Emily Dickinson poem, when men were in the numerical majority, they often took on leadership roles, talked the most, and made the most decisions about task development.

Further illustrating this in Video 23, a female academic essay-writing task with two males and a female, an interesting interaction between expected gender competence and numerical majority influence was observed. In this group, both men contributed a majority of the ideas regarding how to write the essay and how to structure the group's time. In one instance, Male A decided how the labor would be divided and what each paragraph would be about. To accomplish this, Male A said, "You write that one and we'll sit over here and figure out what we're going to talk about in the next paragraphs," or "The first paragraph should be about emotions and the second about the symbolism conveyed by the poem." The female continually made self-

deprecating comments like, "You should change the first sentence of that paragraph that I wrote. It's terrible," and "I'm not very good at interpreting poems." Perhaps the discomfort felt by the female resulted from being a member of numerical minority in the group. Had there been another female or an all-female group it is possible that the women would engage in fewer self-deprecating comments and participate with more confidence. The observation that the gender in the numerical majority would continue to dominate despite the task type was pervasive throughout the first round of video observations. In order to rule out the possibility that this finding was somehow specific to the groups that were analyzed, further coding analysis was needed to verify the assumption that group composition played an important role in development of group hierarchy.

Formal Content Analysis

In order to see whether the findings in the qualitative research study were accurate, a second group of videos were coded to see if a content analysis of the videos would provide similar findings and evidence about group dynamics as those revealed in the qualitative section of the paper. Twenty-eight videos were coded overall. During the coding process, members were divided into Member A, Member B, and Member C according to the coder's observations of the group interaction. A participant was placed in the A category if they appeared to be in control of organization and task success and if they appeared to be highest in the social hierarchy. A participant was placed in the B category if they deferred to others in the group but consistently participated in the forwarding of group goals. Participants were placed in the C category if they participated less than other members in contributions toward group goals and in general appeared to be lowest in the social hierarchy. A frequency table describing a general summary of findings is provided in Table 1. In the frequency table, total contributions and types of contributions are

provided for each group member. Overall, the evidence supports the finding in the qualitative analysis that majority members dominate interactions. For example, simply looking at the differences in overall verbal contributions, the majority A members contributed 44.6% of all

Table 1. Frequency Distribution of Contributions Made by Majority Member A, Majority Member B, and Minority Member C in the Gender Task Study, (N=28).

Participant	Type of Contribution	Frequency (f)	% within	% across
Majority Member A	Total participant contributions	2,167 (77.4 per group)	100%	44.6%
	Instrumental contributions	1,051 (37.5 per group)	48.5%	50.8% (all instrumental contributions)
	Questions	261	12%	35% (all questions)
	Interruptions	109	5%	52% (all interruptions)
	Laughter	110	5%	36% (all laughter)
Majority Member B	Total participant contributions	1654 (59 per group)	100%	34%
	Instrumental contributions	686 (24.5 per group)	41%	33% (all instrumental contributions)
	Questions	271	16%	36% (all questions)
	Interruptions	64	4%	31% (all interruptions)
	Laughter	109	5%	36% (all laughter)
Minority Member C	Total participant contributions	1,036 (37 per group)	100%	21%
	Instrumental contributions	339 (12.1 per group)	32.7	16% (all instrumental contributions)
	Questions	214	21%	29% (all questions)
	Interruptions	35	3%	16.8% (all interruptions)
	Laughter	84	8%	27.7% (all laughter)
	Total group contributions	4857		

NOTE: Frequency categories are simply a count of all contributions made by Members A, B, and C in all 28 coded videos. Percentages were calculated by dividing this overall count by the number of groups.

contributions in all coded groups, majority B members contributed 34% of all contributions in all coded groups, and minority C members contributed only 21% of all the contributions in all coded groups. The evidence also suggests that individuals that are higher up in the social hierarchy make different types of contributions than individuals lower in the hierarchy. For example, in Table 1, participants in the A category made more instrumental contributions then minority C members.

Table 2. Contributions Made by Majority Member A, Majority Member B, and Minority Member C in the Gender Task Study, 2012.

Type of Contribution	Majority Member A	Majority Member B	Minority Member C	A X2 (1, N=28)
Average Overall Contributions Per Group	77.40	59.00	37.00	4.71*
Instrumental Contributions Per Group	37.50	24.52	12.12	10.52**
Questions Per Group	9.30	9.67	7.64	.07
Interruptions	3.90	2.32	1.25	.48
Laughter	3.90	3.91	3.31	.05

*p<.05. ** p<.01.

In order to test whether the amount of contributions that majority A members made compared to minority C members was significantly different, a chi-square analysis was conducted. In Table 2, the amount of participation and the types of participation are split up across group members. The average number of contributions was 77.4 for the top member, 59 for the middle member, and 37 for the minority member. With one degree of freedom, the chi-square of 4.71

was significant at the .05 level. Therefore, the null hypothesis that there are no differences in the number of contributions made by the top, middle, and lowest members of the group was rejected.

Not only is there clear stratification across groups, this research suggests that the numerical majority is extremely dominant. For example, when looking at Table 2, if we add Member A's and Member B's contributions, the majority contributed 136 times on average compared to the numerical minority, who only contributed 37 times on average. This means that that the numerical majority dominated 78% of the verbal interaction and the numerical minority only contributed 22% of the interaction. This is a major difference in the number of interactions between minority and majority members. Even when disregarding the different conditions and types of participation this finding is striking. Independent of the types of contributions these members are making, it is clear that if they are dominating almost 80% of the interaction, they have enormous sway over the group dynamic and structure.

Once it was clear that, on average, the numerical majority was dominating these interactions, the question that emerged was whether this dynamic would shift or become more pronounced when the analysis was broken down by task condition. Was the numerical majority more dominant in some conditions than in others? Were there any conditions where the numerical minority dominated the numerical majority? In general, the numerical majority dominated across the various conditions. Four of the groups had significant differences, and the other four supported the hypothesis, but they were not significant. Out of the eight different types of groups there were two groups in which there were significantly different numbers of contributions between majority and minority members. These two are described below.

In a female nonacademic, female numerical majority group assigned to create fashion lines, women verbally participating much more than the men. In this condition, the group members were asked to work as a team to create two high-end, two mid-range, and two low-

end fashion lines. During the coding of this group it became clear that when the group was a female numerical majority the women would dominate the interaction. In most cases, if the male numerical minority did have something to contribute, it would be a short one-word response like, "Ok" or "Sounds good." When the average of contributions in all groups was assessed, on average, in the female nonacademic, female majority condition, Participant A contributed 114.25 times, Participant B contributed 89.25 times and Participant C contributed 41 times. In order to test whether this difference between top, middle, and lowest members was significant, a chi-square analysis was run. The null hypothesis was that there was no difference in contributions between members. However, with one degree of freedom, the chi-square of 11.34 exceeds the largest listed chi-square value of 10.82 (p=. 001). Therefore, because the probability of observing the observed chi-square of 11.34 is less than the alpha of .05, the null hypothesis—that there are no differences in contributions between group members—was rejected. A similar dynamic occurred in the male academic, male numerical majority groups. The difference in contributions between members in that group was also significant. The same dynamic, where the numerical majority far exceeded the numerical minority in terms of participation, occurred in the male majority male tasks.

For example, this dynamic is quite clear in the male academic male numerical majority groups. The male academic group is asked to complete a variety of math problems similar to those found on an ACT or SAT test. During the coding of this group, it became clear that when the group was a majority male the men would always dominate the interaction. In general, the female numerical minority members talked and participated less and, in some instances, female members almost did not participate at all. When the average of all contributions was assessed, findings suggested that, on average, in the female nonacademic, female numerical majority condition, Participant A made 75.8 contributions on average, Participant B made 71.5

Table 3. Overall Average Contributions Made by Majority Member A, Majority Member B, and Minority Member C in the Eight Different Task Conditions of the Gender Task Study, 2012.

Task Type	Average Total Contributions			
	Majority A	Majority B	Minority C	X2
Female Nonacademic Female Majority Average Per Group (where A=female, B=female, C=male)	114.25	89.25	41	11.34**
Female Nonacademic, Male Majority Average Per Group (where A=male, B=male, C=female)	83	75	82.66	1.14
Female Academic Female Majority Average Per Group (where A=female, B=female, C=male)	74.66	69.5	36	5.15*
Female Academic Male Majority Average Per Group (where A=male, B=male, C=female)	62	40.25	55	2.68
Male Nonacademic Male Majority Average Per Group (where A=male, B=male, C=female)	43.66	40.60	40.66	.30
Male Nonacademic Female Majority Average Per Group (where A=female, B=female, C=male)	57.33	44	54.33	.80
Male Academic Male Majority Average Per Group (where A=male, B=male, C=female)	75.8	71.5	20.4	10.41**
Male Academic Female Majority Average Per Group (where A=female, B=female, C=male)	83	57.5	36.5	6.25*

*p<.05. ** p<.01

contributions on average, and Participant C made 20.4 contributions on average. In order to test whether this difference between top, middle, and lowest members was significant, a chi-square analysis was run. The null hypothesis was that there is no difference in contributions between members. With one degree of freedom, the chi-square of 10.41 exceeds the largest listed chi-square value of 6.635 (p=. 001). Therefore, it was determined that the probability of observing the observed chi-square of 6.9 is less than the alpha of .05, allowing the null hypothesis to be rejected.

In two groups the numerical minority slightly dominated in terms of verbal participation. This is the most interesting and troubling part of the present theory. This occurred in the male nonacademic, male majority group and the male nonacademic, female majority group. The amount of dominance observed from the minority is very small and not numerically significant but interesting nonetheless. There are a few possible explanations for this. One is that there were simply not enough male nonacademic tasks observed and the ones that were observed had very dominant minorities. The other, and perhaps more plausible, explanation is that the male nonacademic task relied less on verbal participation than on physical participation. The coding sheets themselves reflected much less overall verbal participation in the male non-academic tasks in general. Therefore, relying on verbal participation as an indicator of dominance might be inaccurate in this case. A follow-up study would benefit from recoding these particular cases for physical behaviors that signaled dominance. The next section will discuss the overall importance this study's findings and how they might be useful for understanding how this new trend of increased female achievement in higher education will shape interaction in educational settings.

DISCUSSION

The major theme that emerged from this research is that the majority/minority dynamic is the most important factor in the development of group hierarchy. Through a formal content analysis, the themes could be further explored and verified. The proposition emerging from the qualitative observations—that the numerical majority was the most important factor in shaping group hierarchy—was supported. On average across all groups, the numerical majority dominated interaction. When the analysis was split by task condition, in most cases the numerical majority dominated. However, there were two groups that were inconsistent with the theory. Both groups were the male nonacademic conditions. In these groups, the majority only slightly dominated the amount of verbal participation, but there was no significant difference. A few theoretical explanations for this anomaly are explored in the discussion section below.

Power in Numbers: Does Being in the Numerical Majority Matter in Social Interaction?

During the qualitative portion of the study, it was observed that the gender in the numerical majority of a task group tends to dominate, for both male and female numerical majorities. The reason that women are able to maintain control of the group interaction over a male minority is twofold. First, the literature suggests that the numerical majority position is an important indicator of amount of an individual's participation, type of participation, and overall dominance in a group. Secondly, given recent trends of female achievement in higher education, women are expectedly more competent in academic task group settings. The combination of numerical majority position and expectations of academic competence override the male status characteristic of the numerical minority member, providing women in the group with an advantage.

This "majority rules" dynamic occurs despite the high status masculine characteristic of the male in the numerical minority. One reason given for why majority influence may occur in task groups is that during interaction minority members tend to be avoided because of a fear of being associated with out group members (Moscovice 1976, 1980; Mugny,1982; Wood, Lundgren, Ouellette, Busceme, and Blackstone 1994; Tormala, Petty, and Desensi 2010). Despite expectations that men will dominate in interactions—based on feminist assumptions of male privilege and high status—the present study found that group composition actually outweighs male privilege in many of these groups. Once this theme emerged, it became imperative to go back and test it with a more formalized content analysis.

One interesting caveat was that the task condition tempered how dominant the gender majority became in the interaction. For example, when the task was a stereotypically feminine task and the numerical majority was female the women dominated more. Similarly, when the task was stereotypically masculine and the numerical majority was male, the men dominated more intensely. However, in the groups where the gender in the numerical majority did not match the gender stereotype of the task, the overall participation was more equal from all task members. This suggests that group composition matters but is influenced by task condition.

There were two groups in which there was an extreme dominance of the numerical majority over the numerical minority: the female nonacademic, female majority task and the male academic, male majority task. In both of these types of groups, the numerical majority gender dominated so much of the task interaction that in several cases the minority member had almost no influence on the progression or direction of the task itself. For example, on average the numerical minority members made 11.75% of the verbal contributions in the male academic, male majority task. In the female nonacademic, female majority task group, on average the female majority contributed 86% of the overall verbal contributions and the male minority

contributed 14% of the interactions. In some situations, the numerical minority member was so passive that they hardly interacted in the task at all, only participating to verbally support the other members with a basic interjection. When a female was in the numerical minority in a group like this, she would often laugh, touch her hair, or talk about how she wasn't very good at that task. When a male was in the numerical minority, he would often disengage physically from the task or make comments that were unrelated to the task.

Looking at these two groups, certain theoretical explanations of why the numerical majority was so dominant stand out. Because the number in the majority was the same in all the groups, two men or two women, these findings suggest that in this case, it was the condition—not the number—that influenced the level of domination by the majority. For example, the male academic group is a math task, which is still strongly associated with male ability. While women are going to college and graduating more than men, there is still a good deal of segregation across majors. Men still dominate in math and science and women still dominate in the humanities. This is reflected in research done by the National Science Foundation. They found that men disproportionately outnumber women in the amount of science, technology, engineering, and mathematic (STEM) degrees received (Diekman et al. 2010). So, while women have been making major forays into the world of education, it seems that there are still some subjects that are strongly associated with masculine competence and therefore will support masculine dominance in interactions as long as men are in the numerical majority. Similarly, the female nonacademic task (building fashion lines) is still strongly gendered. For example, fashion itself is a field and occupation that has been strongly associated with women and gay men (Hart 2007). The literature on masculinity suggests that policing the boundaries around masculinity, particularly assumptions around heterosexuality, is very important in terms of maintaining and proving a masculine identity to the outside world (Pascoe 2005). If it is the case that engaging

in this task might threaten these young men's masculine identities and sense of self, it makes sense that they would be hesitant to engage in the task, especially if it was a group dominated by women.

CONCLUSION

This research reveals that there are aspects of groups beyond individual characteristics that affect status hierarchies. This revelation points to the need for further exploration of the various aspects of group interaction that influence group structure. One of the main questions driving this research was whether being in the numerical majority trumps masculine status in-group interactions. The major hypothesis that emerged from the qualitative research was that being in a numerical majority position provides more influence in a group than the status characteristics of the individuals of that group. This hypothesis suggests that the numerical majority group will have the most influence in the group despite the status characteristics of those individuals. For example, in cases where women are in the numerical majority, even on a masculine gendered task, they will have more influence than the male minority despite the expected advantage of masculinity.

In the content analysis, we did find evidence that being in the numerical majority leads to leadership and dominance for that group in most conditions. This was true in six out of eight conditions. The two conditions where the numerical minority was less dominant were the female nonacademic, male majority and the male nonacademic, male majority. In both of these cases, the difference between contributions was minimal and not significant. It is possible that the small sample influenced the data and predictions in this case. It is also possible that there was something different about these two particular groups in terms of the task condition, or in terms of the interaction between the condition and gender composition of the group. This would

be an area where future research would be helpful in further exploring why these groups were different from the others.

In conclusion, the results from this study provide evidence that the numerical composition in a group strongly affects the allocation of status in that group. This research also indicates that specific behavioral strategies are used by numerical minority and majority members to produce and maintain their social position. For numerical minority members, this behavior works to justify their status position and confront the cognitive dissonance created by personal expectations of self and minority status. For numerical majority members, it works to justify—as well as maintain—their social position. This is the first study to focus on numerical majority and numerical minority influence as a way to explain interactional dynamics and social hierarchy in academic task groups. Understanding the development of hierarchy in groups, particularly in relation to gendered processes, could lead to strategies and interventions that would encourage minority members to contribute and engage in the world around them. This research supports equality in academia by understanding the differences and intersections created in the construction of identity and its relationship to stratification.

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Gender Task Study Tape Code

Date_____ Tape ID_____ Condition_____ #Males_____ # Females _____ Sex A___ Sex B___ Sex C___ First to Speak (circle one) A B C Second to Speak (Circle one) A B C Who first picked up the Keyboard/cards/calculator/blocks/directions/pencil Who read the directions (circle all that apply) A B C Who appeared to be in control of organization and task maintenance (Circle all that apply) A B C Who appeared to be in control of conceptual or intellectual contributions (Circle all that apply) A B C Who seemed to be least influential or most withdrawn from task contributions (Circle all that apply) A B C

Each time talked mark: Question=Q/Laughter=L/Reading Directions=R/Argumentative Negative=A/Interruption=I/Task organization (time, delegation, organization) =T/ Withdraw (negative self talk, non task related)/initiative = I/ Response=R/ When Hierarchy has developed = X

Time	0-3 minutes	3-5 minutes	5-10 Minutes	10-15 Minutes	15-20 Minutes
A					
B					
C					