THE ROLE OF DIVERSITY IN GROUP PROCESSES AND OUTCOMES: VALUES AND SEX COMPOSITION

Dissertation

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by

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* * * * *

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For the Lord gives wisdom,
and from his mouth come knowledge and understanding.

Proverbs 2:6
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Abstract

In light of the increasing utilization of groups and teams in the workplace as well as the increasing diversity within organizations and hence teams, it is vital to address the impact of team composition on team effectiveness. Toward that end, this research investigated sex and values diversity in decision making groups. Undergraduate introductory psychology students participated in groups of four on a decision making task using Kogan and Wallach's (1964) Choice Dilemma Questionnaire. Group polarization was assessed as well as normative and informational influence processes leading to polarization.

Although it was hypothesized that more homogeneous groups would demonstrate greater polarization and internalization, results showed little difference in polarization or internalization across conditions. Males advocated more risky decisions on male-oriented scenarios but there were no differences between males and females on female-oriented or neutral scenarios or in polarization.

Content analysis of the group discussions revealed that informational and normative influence occurred in fairly equal proportions. Similar values groups made a greater number of informational influence statements than did dissimilar values groups. Consistent with previous social influence research, females in same-sex groups showed a higher proportion of agreeing with informational
influence and a lower proportion of giving informational influence than did males in same-sex groups. Individuals in mixed-sex groups made more statements classified as giving informational influence. Individuals in all-male groups with similar values were more likely to extend informational influence than were individuals in all-male groups with dissimilar values. Thus, this research both confirms and extends the literature on sex composition and social influence.

Results are discussed in terms of their implications for social influence and self-categorization theory, as well as practical implications for team effectiveness.
CHAPTER I

INTRODUCTION

Overview

It has become apparent that the utilization of groups of individuals (teams) in the workplace is increasing (Jackson, 1991; Sundstrom, DeMeuse, & Futrell, 1990), and that diversity of workplace, and hence, team membership is increasing as well (Johnston & Packer, 1987; Mai-Dalton, 1993). In light of this changing organizational context, it becomes incumbent on organizational researchers to determine what effects increased diversity may have on group and team processes. Toward this end, composition of work groups and teams and type of composition will be investigated in this study.

Because of the apparently inexorable trend toward increased diversity, many organizational researchers have taken an optimistic tone regarding the effects of diversity on work group and team processes and performance (e.g., Jackson, 1991). Other researchers, however, are more guarded in their optimism, noting that there is probably an optimal balance between heterogeneity and homogeneity in group and team composition (Hackman, 1992). In my opinion, taking either of this positions is premature. The fact is, researchers have not extensively investigated the effects of composition. Moreover,
they have rarely examined the impact of more than one type of composition concurrently (see Jackson, Brett, Sessa, Cooper, Julin, & Peyronnin, 1991 for a notable exception). It would seem that type of composition is an important piece of the puzzle since individuals are unlikely to differ only on one attribute.

The available research on group composition has tended to center on demographic attributes. However, this tradition too has weaknesses. Most problematic, demographic variables are often used as indicators of attitude variables. Evidence in support of this approach is not as defensible as some reviewers have assumed (e.g., Jackson, 1991). Furthermore, as indexed or measured, demographic variables themselves are not always consistent as determinants of the dependent variables being investigated.

Finally, organizational researchers investigating work group diversity have focused on outcome variables to the detriment of process variables, even though several group effectiveness models have promoted the importance of process variables (e.g., Hackman & Morris, 1975). Thus, organizational researchers have not taken full advantage of the social psychological literature, especially that which considers conformity and influence processes such as groupthink or group polarization.

I argue that research on composition effects on work group and team processes is vitally important. Process is thought to be an important predictor of performance (e.g., Hackman & Morris, 1975); therefore, both process and outcomes are important for team effective-
ness. With this in mind, the present research addresses the implications for diversity on group processes. Toward this end, I enlist group polarization dynamics as a vehicle for an investigation of work group and team (decision making) processes. Self-categorization theory and normative versus informational influence processes are implicated as an explanation of how diversity impacts decision outcomes.

The chapter is organized in the following manner. First, the importance of work groups and teams are discussed, as well as the implications for diversity. A brief discussion of team processes and outcomes follows, focusing on what constitutes evidence for team effectiveness and emphasizing the relevance of an input-process-output view. Next, I turn to a review of the group composition literature, centering on previous research on demographic variables, sex composition in particular. I address psychological variables as well, noting the relevance of work values, which have received little attention in work on group composition. Turning next to group decision making dynamics, namely group polarization, I address the relevance of group polarization for insight into the effects of team or group composition, and implicate self-categorization theory and normative and informational influence as pertinent phenomena. Finally, hypotheses are offered as to the impact of group composition in terms of sex and values on group polarization dynamics.

Purpose of Research

The purpose of this research is to investigate the role of diversity on group processes and outcomes. Diversity will be examined
both in terms of a demographic variable, sex, and a psychological variable, values. Groups of similar and dissimilar individuals will be created and will undertake a decision-making task using the group polarization paradigm. The outcome measure will be the amount of polarization that occurs and the degree of internalization reflected in member's final individual positions. The process variables will be embedded in measures of normative and informational influence.

This study extends the current literature by 1) investigating two diversity variables simultaneously, 2) considering psychological and demographic attributes separately and orthogonally, 3) introducing ethical values as an attribute of interest in terms of the effect of heterogeneity or homogeneity on group decision making, 4) investigating both group processes and outcomes, 5) emphasizing the distinction between perceived and actual similarity, and 6) examining the effects of subgroups on decision making processes in general and group polarization in particular.

The following review of the literature will show the limitations of previous research in the areas of diversity and its effects on work group and team processes and outcomes.

Work Groups and Teams

Many organizational theorists have cited work groups or teams as being fundamental structural units in organizations (Gersick, 1988; Reichers, 1985; Van Dyne, 1993). Executive teams, quality circles, semi-autonomous work groups, and research and development teams are all
examples of how teams are used within modern work organizations to accomplish certain objectives. Traditionally, teams have been formed as a result of the idea that groups are superior to individuals working individually, as a result of the humanistic movement in management, or simply to accomplish tasks that are unable to be done by a single individual (Cannon-Bowers, Oser, & Flanagan, 1992).

Emphasis on work groups and teams is increasing as well, largely due to the changing nature of work organizations (Jackson et al., 1991; Mai-Dalton, 1993). As a result of downsizing and re-engineering, production teams make many of the decisions once generated by management (Bennet, 1994; "I.B.M.," 1994). In the face of uncertain future economic conditions, strategic planning and management are becoming more important, and often these strategic decisions are made by upper management teams (Jackson, 1992). The proportion of jobs which require teamwork in these or other forms is increasing (Sundstrom et al., 1990). Researchers view this increase in teamwork as a result of new manufacturing techniques, management styles which emphasize collectivity, and job redesign which utilizes group interaction in an effort to implement certain competitive strategies (Jackson et al., 1991).

By way of definition, a team consists of two or more people who interact interdependently over time toward a common task-oriented goal (McGrath, 1984; Ilgen, Major, Hollenbeck, & Sego, 1993; Salas, Dickinson, Converse, & Tannenbaum, 1992; Steiner, 1986). Ilgen et al. (1993) have made the distinction that teams share a common goal and
exist for a task-oriented purpose while groups may exist only for social reasons. But most writers would agree that while all teams are groups, the reverse is not true. Thus, to be precise, the current research might be more precisely described as dealing with group diversity.

The greater emphasis on teams and groups in many facets of organizational life points to the need for greater understanding of their functioning (Gladstein, 1984; Jackson, 1991; Jackson, 1992; Swezey & Salas, 1992). In particular, organizational researchers and practitioners must come to understand the implications of diversity on team and group processes and outcomes.

Diversity

Along with the growing presence of teams and groups in organizational life, issues of diversity are becoming important to organizations (Jackson, May, & Whitney, 1995; Jackson et al., 1991; Johnson & Packer, 1987; Mai-Dalton, 1993; Morgan & Lassiter, 1992, Tsui, Egan, & O'Reilly, 1992). Traditionally, organizations have found it advantageous to control employee variability, at least to some extent, in order to promote coordination and harmony (Katz & Kahn, 1978). Current forces (demographic, social, political) are moving organizational decision makers in the opposite direction, however. As greater numbers of minorities enter the workforce, the impact of diversity on organizations in general and on teams in particular must be understood.
As diverse teams become more prevalent, "it becomes increasingly important to understand the factors that determine high performance and group-member satisfaction" (Gladstein, 1984, p. 499). However, in terms of diversity, Guzzo and Shea (1992) admit that "the 'right' combination of members has been very difficult to specify" (p. 301). This statement implies one of the complexities of research in the diversity area: the very "diversity" of types of diversity.

Although diversity research has typically focused on demographic variables, diversity can encompass a much wider range of personal attributes, including psychological variables such as values, attitudes, and personality. Earlier research focused on the impact of diversity (heterogeneity) of abilities (e.g., Goldman, 1965; Laughlin, Branch, & Johnson, 1969). A much smaller sample of research has investigated personality (e.g., Reddy & Byrnes, 1972) and attitudes (e.g., Terborg, Castore, & DeNinno, 1976; Triandis, Hall, & Ewen, 1965). Current research is stimulated by the increasing numbers of women and racial, ethnic, and cultural minorities entering the workforce.

Several difficulties have been cited with regard to research on diversity in the organizational literature. One is its atheoretical nature (Block, Roberson, & Neugen, 1993; Thompson & Tedesco, 1993). A second problem noted by several theorists (Tsui et al. 1992; Moreland & Levine, 1992) is that only very rarely has research investigated more than one type of diversity in the same study; most often research of this nature takes place in the organizational demography literature.
(e.g., Tsui et al., 1992), and not at the level of the work group or team. A notable exception is Jackson et al. (1991) which investigated several demographic variables in strategic management teams. Clearly, then, a valuable research endeavor would be to investigate the impact of more than one type of diversity simultaneously. Investigating more than one potentially critical attribute will allow more complete and appropriate inferences regarding the effects of different types of diversity, as well as their possible interactions.

Thirdly, the limited diversity literature implies that the effect of diversity on group processes and outcomes can be either positive or negative (e.g., creativity versus conflict; Mai-Dalton, 1993). But organizational research has focused mainly on the impact for minorities and not for the majority (Tsui et al., 1992) or for the group as a whole.

Finally, most diversity research has concentrated on either performance variables or process variables, and most often just performance variables even though process is an important antecedent to group and team effectiveness (Hackman & Morris, 1975; Sorensen, 1973).

Team Process and Outcomes

A fair amount of research and theory on the subject of teams has focused on team effectiveness. Team effectiveness involves more than "simply counting outputs" (Hackman & Walton, 1986, p. 79); thus, it encompasses both outcomes and the processes that lead to those outcomes (Cannon-Bowers et al., 1992). Specific indicators of good outcomes
include the quality, quantity, and timeliness of productive output; an enhanced capability to work together in the future; and observed personal growth of team members (Hackman & Walton, 1986). According to this broader view, high quality performance also includes group member satisfaction with the final outcome (Jackson, 1992) and satisfaction with the team itself (Gladstein, 1984; Guzzo, 1986). On the other hand, process indicators of team effectiveness are thought to include evidence of coordination, free-flowing communication, cohesion, and flexibility of team-member behavior (Cannon-Bowers et al., 1992). Evidence based on conformity and social influence processes such as group polarization have been considered but typically have been less explored (Streufert & Nogami, 1992).

Processes have been found to be particularly important in the context of decision making, a task in which teams commonly engage. Relevant decision making phenomena have been widely studied, including groupthink (Janis, 1972), the degree to which individuals share information (Stasser & Stewart, 1992), distribution of information (London, 1977), conflict resolution strategies (Zammuto, London, & Rowland, 1979), the role of conflict (Sessa, 1991), contingent decision behavior (Payne, 1982), problem recognition (Cowan, 1986), planning, monitoring, and communication (Weldon, Jehn, & Pradhan, 1991). Investigations of types of diversity and their effect on such processes are relatively recent.

Although several theorists have developed input-process-output models of group effectiveness (e.g., Hackman & Morris, 1975, Hackman,
1987; Gladstein, 1984; McGrath, 1964), the mediating role of group process has seldom been investigated empirically. Moreover, use of group composition as an input factor has been rarer still. When diversity is considered, typically it is with regard to distribution of member skills (e.g., Gladstein, 1984). Also typically, the goal of diversity or composition research is to investigate processes or outcomes only. This situation is unfortunate considering the strong theoretical basis for the effect of processes on outcomes, the practical implications for measuring outputs, as well as the current impetus for considering diversity as an input factor. Furthermore, Hirokawa and Johnston (1989) point out the importance for decision making in particular of articulating cognitive, communicative, individual- and system-level forces acting on a group.

Review of the Group Composition Literature

In an effort to assess the impact of diversity on teams, one can turn to an examination of the substantial body of research on group composition and its effect on group processes. Although a distinction has been made between teams and groups (Ilgen et al., 1993), it should be noted that much group composition research has made use of a task-oriented purpose or goal. Thus, group composition studies have relevance for a discussion of team performance. In attempting to ascertain the effects of group composition, researchers have assessed the impact of homogeneity versus heterogeneity and have investigated
ability, demographic, personality, and attitude variables (Guzzo & Shea, 1992; Jackson, 1991).

Although some evidence about the effects of abilities indicates that heterogeneity is preferable for performance, results have not been conclusive regarding the effects of demographic or attitudinal homogeneity versus heterogeneity on group processes and performance (Guzzo & Shea, 1992; Hackman 1992; Jackson, 1991). Reviews of the group composition literature (e.g., Lott & Lott, 1965; Shaw, 1981) depict a tension which is created between the desire for heterogeneous work groups which have been found to be beneficial for task requiring creativity and judgment (Jackson, 1991) and the desire for homogeneous work groups which promote cohesiveness, attachment, and member satisfaction, and also supply performance gains in certain situations (Tsui et al., 1992).

Heterogeneity of demographic and attitude variables within group membership has been found to result in a wider variety of decision alternatives and more creative solutions (Hoffman, 1959; Hoffman, Harburg, & Maier, 1962; Hoffman & Maier, 1961; Triandis, Hall, & Ewen, 1965). For example, Hoffman and Maier (1961) found that mixed-sex groups found more integrative solutions to problems. These results may be confounded, however, by personality heterogeneity, which was the primary variable of interest in the study.

Heterogeneous groups may also be beneficial in terms of conflict. Research also has found that moderate levels of conflict, and the experience of having to overcome that conflict is beneficial for group
effectiveness (Guzzo & Shea, 1992; Sessa, 1991). Over-emphasizing group cohesiveness can lend itself to group dysfunctions such as groupthink, conformity, and poor decision making (Janis, 1972; Ziller, 1965), or simply reduce performance because of the focus on interpersonal issues at the expense of the task (Jackson, 1992).

On the other hand, homogeneous groups imply the potential for more favorable interpersonal interaction (Filley, House, & Kerr, 1976; Lott & Lott, 1965). Data supporting Similarity-Attraction Theory (Byrne, 1971) has found that the greater the similarity between individuals, the greater the attraction for each other. It is likely that friction among group members due to interpersonal conflict or misunderstanding would mitigate against the positive features of group heterogeneity (Jackson et al., 1991). Individuals whose basic values do not coincide will have difficulty forming a strong group (Newcomb, 1961; Scott, 1965; Zander, 1982). People tend to prefer homogeneity and tend to classify themselves and others according to social categories (Tajfel & Turner, 1986). Incompatible groups become dissatisfied, which interferes with effective group functioning. For example, groups with diverse demography have been found to have higher turnover, (Jackson et al., 1991; O'Reilly, Caldwell, & Barnett, 1989) and decreased psychological attachment (Tsui et al., 1992). Individuals who are compatible are more effective in reaching group goals because they need to devote less effort to group maintenance (Sapolsky, 1960; Shaw, 1981). Additionally, both organizational and social psychological research have emphasized the importance of reducing
uncertainty in relationships (Gudykunst, Yang, & Nishida, 1985; Katz & Kahn, 1978); similarity should act to reduce uncertainty.

Still other research has found performance benefits from homogeneous groups (e.g., Clement & Schiereck, 1973; Fenelon & Megargee, 1971). For example, Clement and Schiereck (1973) found same-sex groups to be more efficient in a signal detection task.

Clearly, the results of investigating group composition have been varied. This complex pattern of findings has been viewed by reviewers as implying a decision as to whether it is more important for group members to "get along" or to produce (e.g., Lott & Lott, 1965). In fact, a more useful question may be what variables impact group processes (and hence performance) and how these variables affect processes. Gladstein (1984) has noted that group composition variables need to be investigated more fully in the context of team processes. Looking at composition research as a whole, it would seem that group composition effects on process and performance may be impacted by the type of task and, importantly, by the type of composition variable. Composition variables may have been shown to have mixed effects because only one variable usually has been investigated at one time.

Group Composition Variables

The above discussion has involved group composition effects in general. Next, I turn to a discussion of the effects of some specific composition variables. Demographic and psychological variables such as attitudes have received a significant portion of the research emphasis
in the group composition area; however, they have not demonstrated consistent results on group processes and performance. As will be discussed in further detail below, demographic variables, particularly sex, seem to have less effect than intuition would have us believe (see meta-analyses by Eagly, 1987; Wood, 1987). Sex effects may in fact depend on the particular task and whether sex differences have been made salient. Furthermore, although many theorists assume that sex is an indicator of underlying psychological variables (e.g., Pfeffer, 1983), sex is not tied to attitudes as strongly as has been thought. Psychological variables themselves may be important in the context of diversity and should be studied directly. Finally, the focus of research has been on performance outcomes rather than processes.

Demographic Variables: Sex Differences

Turning first to demographic variables, a primary focus has been on sex differences in group composition. This is certainly a valid emphasis considering the increasing number of mixed-sex groups in the workplace (Wood, 1987). Research evidence has not been conclusive, however, on the effects of sex heterogeneity within teams or groups. Most research has not considered mixed-sex groups (Wood, 1987). As Mabry (1985) has stated, "Neither the specific question of male and female participation in small groups or the more important issue of gender mix as a factor in small group composition has received adequate attention" (p. 76). Although researchers have found differences between males and females in their emphasis on task versus social emphases (although this result may be due at least in part to the
content of the task), there is no unequivocal support for a mixed-sex group being preferable (Kent & McGrath, 1969; Wood, 1987).

Research on sex differences has investigated both processes and outcomes, but seldom both simultaneously. In terms of outcomes, task type was more important than sex composition as a determinant of group product characteristics (Kent & McGrath, 1969). Interestingly, Kent and McGrath found that same-sex groups generated products which were more original than mixed-sex groups. This is inconsistent with the general premise that heterogeneous groups will be more creative. In a meta-analysis of group performance, Wood (1987) found that mixed-sex groups tended to perform better than single-sex groups, but this effect was not significant. Differences between all-female groups and mixed-sex groups and between all-male groups and mixed-sex groups were likewise mixed and were non-significant when aggregated (Wood, 1987). Even though this effect is non-significant, Wood (1987) views it as implying support for the idea that "heterogeneity in member attributes provides the group with diverse resources, prepares the group to address a wide variety of tasks, and facilitates task performance" (p. 67). More research must be done with mixed-sex groups before making any conclusive statement.

Group process has been largely investigated in terms of interaction style, usually with some form of Bales' (1970) Interaction Process Analysis. Mabry (1985) has observed that the sex effects observed in mixed-sex groups are generally weak, and can be eliminated or reversed by considering situational factors. Consistent with the potential
importance of situational factors, Wood (1985) has argued that a group's success depends on how well the interaction style of the members fits the requirements of the task—if it requires an agentic or task-oriented emphasis, an all-male group would be likely to perform better while if the task requires a social emphasis, females would be likely to perform better. Mixed-sex groups are particularly interesting because they tend to accentuate task versus social emphases (Levine & Moreland, 1990) by making sex roles more salient. This tends to lead individuals to adopt those roles through personal choice, behavioral confirmation, or as Eagly (1987) has posited, because sex differences are a product of the social roles that regulate behavior. Anderson and Blanchard (1982) have noted, however, that although there are significant sex differences in social interaction in task groups, these differences are typically less than ten percent and do not relate to the groups productivity. Furthermore, in most (laboratory) studies, both males and females engaged predominantly in task behavior.

Sex differences on group processes: Social influence. Findings with regard to levels of conformity in mixed versus same sex groups has been inconsistent. A recent review by Morgan & Lassiter (1992) reports that mixed groups conform more; however, Shaw's (1981) review reports that the evidence for this finding is mixed. No doubt the phenomena is more complex and context dependent than these reviews recognize.

In terms of differences between males and females in same-sex groups, the overall finding is that men are less easily influenced than women (Eagly, 1987) as evidenced by meta-analyses by Becker (1986),
Cooper (1979), and Eagly & Carli (1981). When individual studies and paradigms are taken into consideration, the picture becomes less clear, however. Becker's (1986) analysis found sex differences to be inconsistent across studies. Cooper (1979) found men to be more resistant to influence particularly in group pressure conformity studies (e.g. Asch, 1956); however, Eagly and Carli (1981) found sex differences in other types of conformity situations as well. It should also be noted that even in terms of the overall finding that females conform more, effect sizes are typically small (less than one percent of the variance). Additionally, "topics for which men were relatively more knowledgeable and interested than women tended to be associated with greater female influenceability"—people are more readily influenced to the extent they lack information about a topic (Eagly, 1987).

_Demographic variables as indicators of psychological variables._

In addition to research on demographic variables as direct predictors of behaviors such as performance or conformity, demographic variables have also tended to be used as indicators of underlying attitudes and values. This linkage, however, has received mixed support; demographic variability may or may not imply concomitant attitude variability, depending on the particular demographic variable (and attitude) in question.

Certain attitudes have been found to vary systematically with age (e.g., conservatism; Elder, 1974, 1975; Thernstrom, 1973) and education (e.g., innovation; Kimberly & Evansko, 1981; Rogers & Shoemaker, 1971).
Besides the robust findings for age and education, the appropriateness of using demographic variables as indicators of attitude variables can be called into question. For example, research has found little or no difference in values according to sex (Bengston and Lovejoy, 1973; Sanders, 1993), while other research (Galvin & Herzog, 1992; Kanaker & Vaz, 1992) on the existence of mean value differences between men and women has been mixed. Block et al. (1993) note the importance of individual variation in attitudes among those of the same race. Thus, demographic characteristics are consistent neither as indicators of attributes nor as predictors of group processes.

**Operationalization of sex composition.** It should be noted that researchers typically make a distinction between "sex" and "gender". Sex is a biological attribute while gender refers to attributes which are ascribed to males and females based on cultural or environmental influences (Eagly, 1987). Although some studies investigate gender differences (e.g., Johnson & Schulman, 1989), composition is usually based strictly on sex. Typically, groups which are all male are compared to all female groups to determine the impact of sex on the dependent variable of interest. Much less research has compared mixed-sex groups to same-sex male or female groups.

**Psychological Variables: Values**

Group member attitudes have been investigated less frequently and have largely been used to predict the performance component of team or group effectiveness. One problem with attitude research on group composition, however, has been that the attitudes measured often have
little to do with the task. A case in point is a study involving a land-surveying task and attitudes toward the state income tax, legal drinking age, etc. (Terborg et al., 1976). Attitudes were only shown to have an effect on cohesion after the fourth group project and had no effect on performance. A further example is a study which correlated attitudes toward social issues and performance on a creativity task (Triandis et al., 1965). Triandis et al. found that attitudes had an effect on performance only when they were directly relevant to the task.

The lack of relationship between attitudes and outcomes is hardly surprising. As will be discussed in further detail below, it is unlikely that such specific attitudes would be manifested during such a task; thus, similarity on them would have little impact on interpersonal attraction or self-categorization. Since the attitudes measured were not obvious to group members or did not become salient while undertaking the task, it is doubtful they would have an impact on cohesion or performance. In contrast, in the circumstance where attitudes were relevant to the task, performance was affected (Triandis et al., 1965). It is also likely that if group members were aware of their similarity or differences, their behavior would be influenced.

In contrast to attitudes, individual's values constitute a psychological variable likely to have relevance for group composition effects on team decision making processes, but one which has received little attention. "Values may well be more parsimonious predictors of organizational phenomena than are such variables as attitudes,
perceptions, and personality traits—all of which are currently used frequently and with little thought of their relationships to underlying value systems" (Connor & Becker, 1975, p. 558). Decisions are often based on values (Svenson, 1990). Compared to attitudes, values are general (Rokeach, 1968, 1973), stable (England, 1967; Kluckhohn, 1951; Levy, 1990; Meglino, Ravlin, & Adkins, 1989; Rokeach, 1968, 1973), and central to the individual's identity (Kluckhohn, 1951; Rokeach, 1973). Thus, they tend to be important to the individual, held over a variety of situations, and are comparatively difficult to change. Furthermore, the number of values any individual holds is small (Rokeach, 1968, 1973).

The research emphasis in the values domain has been concerned primarily with defining values and values content (e.g., Kluckhohn, 1951; Rokeach, 1973), investigating individual differences in values (e.g., England, 1967; Hulin & Blood, 1984), and predicting attitudes from values (e.g., Rokeach, 1973; Tetlock, 1986). In organizational research, values have been used to predict job satisfaction, job choice (e.g., Judge & Bretz, 1992), organizational commitment (Kidron, 1984), and vocational interest (e.g., Pryor, 1979). Although previous research has focused on the individual, values and values congruity would be relevant with regard to the investigation of team processes and team composition.

Since, as previously stated, values are general, stable, and central, they would likely be perceived by other group members in the context of interaction and observation of behavior and decisions.
Interaction with group members would lead to perceptions of similarity or dissimilarity on the basis of values. In fact, value similarity has been found to be an even stronger predictor of interpersonal attraction than attitudes (Newcomb, 1961). Conversely, a perception of dissimilarity would, in turn, mitigate against perceptions of an ingroup. Whether a group is similar or diverse in terms of the values members hold will have important implications for how they interact. Although some conflict in groups is considered adaptive (Fisher, 1974), it is likely that groups of differing values will have more difficulty reaching consensus (Connor & Becker, 1975). Moreover, since similarity is a strong predictor of disclosure and trust (Byrne, 1971; Jackson et al., 1991; Kanter, 1977; Useem & Karabel, 1986), individuals with similar values will be more likely to share (give) opinions.

Individuals with similar values appear to have similar cognitive processing tendencies (Ravlin & Moglino, 1987) and cognitively similar individuals are able to communicate more effectively (Shaw, 1981; Triandis, 1969; Zenger & Lawrence, 1989). Brown (1976) has posited that basic philosophic or value differences are detrimental to high quality communication; "respect and confidence are reduced or disappear" (p. 18). Connor and Becker (1975) also have proposed that decision utility is related to the degree of value consensus among group members.

Although values are relevant for groups, they have received little attention in the literature on work groups. Exceptions are Van Dyne's (1993) work on values and extra-role behavior, Enz's (1991) work
on value consensus in management teams and its effect on competitive methods and performance, and Jehn and Van Dyne’s study of the influence of value diversity on product originality. Clearly, these researchers have only scratched the surface of potential implications of the effect of values on work group or team performance. Furthermore, none of these studies investigated process variables.

**Ethical values.** Ethical values, that is, normative values concerning what one ought to do (Cavanagh, Moberg, & Velasquez, 1981; Saul, 1981), have traditionally been downplayed in organizational research (Kahn, 1990). Nevertheless, they would seem to be relevant for a group decision making situation. Organizational decision making, particularly strategic decision making, often involves choices between expediency and "appropriate conduct", however defined. Since values are stable, they will be held by group members throughout the course of group interaction. Being general, values are held across a variety of situations; thus, values will be relevant within any particular decision making context. Finally, since values are central to an individual’s identity, differences in values among group members will have implications for interactions within the group.

Traditionally, ethical values have been described in terms of the rule for behavior (deontology) or for consequences (teleology). Teleology is further divided into the distinction between ethical egoism and utilitarianism (Holmes, 1984). The main difference between these two philosophies of ethics is whether the ethical decision maker is concerned with only the consequences for oneself (ethical egoism) or
is also concerned with the consequences for people in general (utilitarianism). Ethical egoists attempt to maximize the benefits for themselves while utilitarians endeavor to maximize benefits (or reduce costs) for the maximum number of people.

In addition to the consequences, ethical philosophy can also be described in terms of focusing on following certain moral rules rather than the consequences of behavior. Ethics based on rules can be further subdivided as well. Absolutists believe that the best possible outcome can always be achieved by following universal moral rules. In contrast, situationists embrace situational ethics—the idea that there may be a different set of rules depending on the situation.

When it comes to conceptualizing the values area, Schlenker & Forsyth (1977) propose that two basic factors can most parsimoniously describe individual variations in moral judgment. The first factor is the extent to which individuals focus on idealism versus realism in moral judgments, while the second factor is the "extent to which the individual rejects universal moral rules in favor of relativism" (Forsyth, 1980, p. 175). These two factors can be crossed in order to form a four-cell taxonomy that roughly corresponds to the traditional categories of moral philosophy. Individuals high on idealism and high on relativism embrace situational ethics, while those high on idealism but low on relativism embrace absolutism. The low idealism-high relativism category corresponds to ethical egoism or pragmatism, and the low idealism-low relativism category corresponds to utilitarianism or teleology.
The advantage of this framework (and its accompanying measure, the Ethics Position Questionnaire; EPQ; Forsyth, 1980) is that 1) it measures approaches to ethical judgment without being contaminated by moral development, 2) it has a basis in a long tradition of philosophical theory, yet provides a psychological measure, and 3) can be used to predict particular attitudes on the basis of the general value system. Unlike other values measures (e.g., Rokeach's [1968] Values Survey) this is not a ranking; thus, it has more useful psychometric properties. There is high internal consistency, orthogonality between the two subscales, reliability over time, and no correlation with social desirability (Forsyth, 1980). Unlike other measures which consider moral values (e.g., England's [1967] Personal Values Survey) it is generalizable beyond managers and has a sound theoretical basis. Research using this taxonomy of ethical values has investigated moral choices (Forsyth, 1981; Forsyth & Nye, 1990; Forsyth, Nye, & Kelley, 1988), moral behavior (Forsyth & Berger, 1982), leadership appraisals (Nye & Forsyth, 1991), perceptions of ethics in research (Forsyth & Pope, 1984), and correlations with other individual difference variables such as Machiavellianism (Leary, Knight, & Barnes, 1986), information integration (Forsyth, 1985), and self-monitoring (Rim, 1982).

**Actual versus Perceived Similarity**

Before leaving the topic of group composition variables, the difference between actual and perceived similarity should also be noted. Several research streams have investigated the effects of
perceived versus actual similarity on relationships (e.g., Byrne, 1971; Pulakos & Wexley, 1983; Turban & Jones, 1988; Van Dyne, 1993; Wexley, Alexander, Greenwalt, & Couch, 1980) in a variety of social and organizational settings. Although similarity has been shown to influence such things as attraction, satisfaction, and performance, it is frequently acknowledged that there is a distinction between actual and perceived similarity when it comes to effects. Actual similarity references the objective aspects of the interpersonal situation including nominal demographic characteristics (sex, age, race) and measured ability, experience, value or personality attributes. In contrast, perceived similarity is an internal psychological state—the individual’s sense of feeling similar to or different from other group members (Pulakos & Wexley, 1983; Turban & Jones, 1988; Van Dyne, 1993). Although actual similarity can be indexed across situations, perceived similarity is context dependent. For example, if group members truly differ on the value of fairness (actual similarity), but this value is not implicated in the issue to be decided, nor otherwise made salient, nor do individuals know other’s values from previous encounters, it is unlikely that this value will be taken into consideration in individuals’ sense of perceived similarity to team members. Since the effects of values are both more context dependent and context relevant than are demographic variables, actual and perceived value similarity are likely to have direct and interactive consequences.


**Shortcomings in the Team Composition Literature**

The above review points to some serious gaps in team research especially as it relates to diversity. First, the assumed linkage between demographic variables and psychological variables has been over-emphasized. Although certain demographic variables such as age and tenure do demonstrate significant relationships with other personal attributes such as creativity and innovation, this should not be taken as an overall indicator that demographic variables will show parallel attitude differences. Writers have overstated this assertion by failing to cite supporting empirical studies (e.g., Jackson, 1991) or citing research which does not support their argument (e.g., Jackson, 1992). In order to determine the actual impact of demographic and psychological variables on group processes, these variables should be measured independently. A related point concerns the nature of the psychological variables commonly investigated. Compared to attitudes (the psychological attribute more often examined), values are strong, stable, and general. Thus values should have a stronger influence on group processes. Additionally, more than one composition variable should be investigated at the same time to determine if the variables in question are actually correlated as well as to determine if they have similar, different, or interactive effects on group processes. Finally, the distinction between actual and perceived similarity must be explicitly made and investigated.

A further problem with team composition research concerns the fact that reviewers who advocate heterogeneity for teams exaggerate the
positive effects of heterogeneous groups on task effectiveness (Jackson, 1991; Wood, 1987). Wood's (1987) meta-analysis found no significant differences between mixed and same-sex groups, and the individual studies cited showed mixed results. Furthermore, very few studies compared same- and mixed-sex groups. Although heterogeneous groups may, in fact be most desirable, it must be determined which attributes are important in improving effectiveness and under what conditions they have an impact. The position taken here is that work values, particularly ethical values, constitute an important basis for composition research.

A final problem is that the focus has predominantly been on the outcome variables in team effectiveness. Even though various models (e.g., Gladstein, 1984; Hackman & Morris, 1975) acknowledge the importance of process variables, these variables have not been widely investigated in organizational research. This is indicative of the "schism" between social and applied psychology (Guzzo & Shea, 1992, p. 307). Most investigation of internal group processes has been limited to cohesiveness and conflict (Jackson, 1992).

A more fully developed investigation should include more than one diversity variable and consider both group processes and outcomes. Research on psychological variables, especially work values, and their effect on group members should prove beneficial in understanding the processes leading to team effectiveness (Guzzo & Shea, 1992; Hackman, 1992; Moreland & Levine, 1992).
Self-categorization Theory

In discussing potential processes which may impact the effect of sex- and values-based group diversity on processes and outcomes, a relevant theory is self-categorization theory (Turner, 1987, 1991). Self-categorization theory derives from social identity theory (Tajfel & Turner, 1979; Turner, 1987) and posits that group membership and categorizing oneself as a member of that group is integral in explaining social influence. Self-categorization in reference to others is the first step in the social identity process: in this step, both self and others are perceived, defined or recognized as members of distinct social groups (Mackie, 1986). It is worth emphasizing that differences from others rather than just similarity seem to trigger self-categorization (Turner, 1987). Research by Oakes, Turner, & Haslam (1991), for example, shows that perceived differences must be made salient for self-categorization to come into effect. Subjects watched one of four tape-slide presentations of a six-person group discussion which manipulated gender composition (either three male-three female or one male-five female) and pattern of agreement (same sex group members all agreed or agreement crossed gender lines). Greater sex categorization in terms of attributes of the target person (the same male member in the group discussion regardless of condition) occurred when agreement between group members was consonant with sex.

In fact, findings from self-categorization research are consistent with the distinction between perceived and actual similarity. Both dynamics emphasize that individuals must perceive or
categorize themselves as being "like" relevant others for the predicted effects to occur. Research has typically operationalized these dynamics differently, however. Perceived similarity is typically measured (e.g., Pulakos & Wexley, 1983; Turban and Jones, 1988), whereas categorization is usually manipulated, e.g., by having color-coded name tags (e.g., Gaertner, Mann, Murrell, & Dovidio, 1989) or by telling a group they are similar in some way (even if not in actuality, e.g., Turner, Wetherell, & Hogg, 1989).

A final point regarding the relevance of self-categorization is that several studies have shown that individuals are more likely to be influenced by those they perceive as being in their own category (Hogg, Turner, & Davidson, 1990; Mackie, 1986; Mackie & Cooper, 1984). Hence, self-categorization has implications for conformity processes in groups.

Although the potential implications of self-categorization for organizations have been recognized, the impact of self-categorization remains largely untested. Jackson's (1991) review suggests that self-categorization issues are relevant for work teams. In their research on organizational demography, Tsui et al. (1992) promote self-categorization as an explanation for why individuals prefer similar others. Tsui et al.'s focus, however, is on non-interactive groups. In terms of group interaction, self-categorization may provide an answer to the question of how and when diversity will impact group processes and outcomes.
Group Polarization

Investigation of composition effects on team processes can be enhanced by tying them to phenomena such as group-member conformity and social influence. One example of a group conformity dynamic is group polarization. Group polarization has been and continues to be a robust and widely investigated phenomenon in social psychology. Research efforts in this area initially centered around the idea of an apparently "risky shift" in decisions: group members advocated riskier choices after a consensus discussion regarding life situations than would be predicted by the central tendency of their initial individual responses (Stoner, 1961; Kogan & Wallach, 1964). The interesting aspect of this finding is that rather than merely conforming to the group average as a result of the consensus discussion, the group response became more extreme. The riskier level is also found when subjects are asked for their current individual positions subsequent to the group consensus—the riskier level is internalized. Although this finding has particular implications for group decisions concerning risk, it has been subsequently generalized to include a propensity to become more conservative if initial attitudes were conservative, extremization of other attitudes, gambling behavior, and confidence in knowledge of obscure facts (Lamm & Myers, 1978; Myers, 1982; Turner, 1991). Thus, the risky shift has come to be referred to by a more general term: group polarization (Moscovici & Zavalloni, 1969).
Relevance for Teams

Several theorists have noted that task characteristics (e.g., problem solving vs. production tasks) are salient factors influencing group processes and outcomes (Hackman, 1969; Hackman & Morris, 1975; McGrath & Altman, 1966; Shaw, 1981). It is common for teams to make decisions in which it is impossible to know the correct answer. Polarization effects are indicative of processes which occur when groups make decisions under conditions of uncertainty, thus involving risk. Finally, the group polarization paradigm offers insight into conformity and influence processes which occur in team settings. A great deal of data supports the prediction that any team which engages in a discussion in order to reach consensus about an opinion or perception would be likely to advocate a more extreme position than would result from the average of individual assessments. Such a reliable phenomenon would seem to be a benchmark process with which to study composition effects.

Why Group Polarization Occurs

Although polarization is a robust finding, researchers have not had an easy task in determining the reason for this effect. Why do groups become more extreme rather than simply conforming to the average of individual members' initial responses? Over time, the majority of research evidence has come to favor two main explanations: social comparison (e.g., Sanders & Baron, 1977; Wallach & Wing, 1968) and persuasive arguments (e.g., Burnstein & Vinokur, 1973, 1977; Vinokur & Burnstein, 1978). Although advocates of these respective explanations
seem disinclined to admit it, there seems little doubt that both processes are usually if not always present in a group polarization context and are difficult to separate. No one theory has been able to explain all the data or to entirely refute the other theory (Mackie & Cooper, 1984). While evidence appears strongest for the influence of persuasive arguments, researchers have not ruled out the impact of social comparison (Lamm & Myers, 1978). Both explanations as well as some supporting and disconfirming research will be briefly discussed in turn.

**Social comparison explanations.** Social comparison theory states that individuals initially view themselves as being above average in the strength of their support for a particular attitude or societal value (e.g., risk-taking). Since it is unrealistic for every individual to assume that he or she is above the mean on a particular attribute, when confronted with the views of other group members during the consensus discussion, individuals realize that they are not as extreme as they believed. This realization, combined with the motive to perceive and present themselves favorably, prompts a readjustment of their initial response (Pruitt, 1971; Jellison & Arkin, 1977). Additionally, people want to be distinctive, not merely similar (Fromkin, 1972; Lemaire, 1974; Schlenker, 1975); thus, group responses become more polarized as each individual seeks to embody the ideal (Myers, 1982).

Support for social comparison explanations comes in the form of studies which ask subjects to go back over the questionnaire items they
have answered and guess how their average peer would respond (Myers, 1982). Individuals typically estimate that the norm is more neutral than their own initial responses. When asked to determine which response they would admire most, individuals indicate that their ideal is more extreme than their own (previously stated) response. Research has also used "fake norms" in which subjects are lead to believe that the group norm is the opposite of what it actually would be; subjects still polarize to this false norm (Baron, Dion, Baron, & Miller, 1971; Blascovich & Ginsburg, 1974; St. Jean & Percival, 1974).

Research has found that subjects who are merely informed of each other's positions (Myers, 1978) or are given normative data (Myers, Bach & Schreiber, 1974; Myers, Bruggink, Kersting, & Schlosser, 1980) but are not given an opportunity to engage in discussion still polarize, although the effect is not always as strong. Polarization also occurs in situations where rational arguments do not exist, such as judging the attractiveness of faces (Myers, 1982) or judging movement of light using Sherif's (1935) autokinetic effect paradigm (Abrams, Wetherell, Cochrane, Hogg, & Turner, 1990; Baron & Roper, 1976; Hogg et al., 1990). It can be argued, however, that knowledge of group members' positions still provides information about what response is "correct" much as do persuasive arguments. Hearing another's judgement may cause individuals to think of arguments themselves (Myers, 1982). Additionally, several studies have failed to find a polarization effect or have found a greatly reduced one when subjects could compare positions but not arguments (Burnstein & Vinokur, 1973,
All this implicates an attentive, persuasive arguments perspective.

**Persuasive arguments explanation.** The competing explanation for group polarization is built around the notion of persuasive arguments (Burnstein & Vinokur, 1977). Proponents of this view have found that group members are influenced by the novel, valid arguments presented by other members (Bishop & Myers, 1974). Initial responses predict the trend of the arguments (Myers & Bishop, 1971) and direction of subsequent polarization (Myers & Bach, 1974; Vinokur and Burnstein, 1974, 1978). Since these arguments are likely to be all in favor of one direction (e.g., all advocating either risk or caution), members are motivated to adjust their responses further in that direction in response to the arguments. Thus, the group consensus is more extreme than the mean of the individuals' responses before group discussion.

In an attempt to disqualify social comparison explanations, researchers have found that polarization still occurs when subjects discuss scenarios but are prohibited from stating their initial responses (Burnstein & Vinokur, 1973; Myers, Wong, & Murdoch, 1971) or discuss the substance of the items without knowing the response scale on which they were to eventually record their choices (Myers, Schreiber, & Viel, 1974) presumably eliminating normative influence. It can be argued (Sanders & Baron, 1977), however, that individuals could infer positions based on the arguments. Sanders and Baron (1977) also argue that the reason the most compelling arguments favor a particular, relatively extreme position is due to a social value for
that position which is brought about through social comparison. Finally, the arguments proposed may be selected based on social comparison. Studies have shown that group members censor the arguments they propose in order to conform to the emerging group consensus (Ebbesen & Bowers, 1974).

**Normative versus Informational Influence Processes in General**

Group polarization is a relevant example of group decision making outcome because it is so closely related to the wider issue of normative and informational influence processes. Social comparison and persuasive arguments can be compared to normative and informational social influence, respectively. Festinger (1950, 1954) and Deutsch and Gerard (1955) were the first theorists to make the distinction between normative and informational influence, which has since been applied to a variety of social psychological research topics (Jones & Gerard, 1967). Deutsch and Gerard have defined normative influence as "influence to conform with the positive expectations of another" while informational influence is "influence to accept information obtained from another as evidence about reality" (p. 629). The important distinction is whether the motivation is to be accepted by others or to be correct in one's assessment of reality (Myers, 1993).

The distinction between normative and informational influence and the amount of such influence which occurs in group decision making are potentially important factors. Hereck, Janis, & Huth (1987) point out that the use of information in decision making groups is important to both the decision making process and the final decision itself.
Research by Stasser and colleagues (e.g., Stasser & Stewart, 1992) clearly demonstrates the impact of sharing information on decision quality. Persuasion research (e.g., Hovland, Janis, & Kelley, 1953) investigates when such information will affect others' opinions.

In the group polarization context, the social comparison perspective invokes a normative process. Individuals are motivated to perceive and present themselves favorably (Isenberg, 1986). Thus, they must adopt a position on each issue at least equal to other group members, or even a more socially desirable position. On the other hand, the persuasive arguments view illustrates an informational influence process. In an ambiguous situation where individuals do not know the "true" degree of risk or the "correct" attitude, they seek information about reality from other group members. This information comes in the form of arguments supporting the dominant position. Just as it is difficult to separate whether polarization effects are due to social comparison or persuasive arguments, it seems difficult to separate normative and informational influence. Both are likely to be present in social influence situations, and any explanation of the factors impacting the circumstances under which influence is effective should take both normative and informational influence into account.

**Self-categorization theory.** Recently, self-categorization theory has been applied to explaining the group polarization phenomenon (Mackie, 1986; Mackie & Cooper, 1984; Turner, 1991; Turner, 1987). Self-categorization theory posits that categorizing oneself as a member of a group on the basis of salient characteristics, in fact, underlies
the polarization effect. This line of research seeks to supersede both normative and informational bases for polarization. Studies have found that individuals will polarize their attitudes when they believe the influence to be coming from an ingroup (Mackie & Cooper, 1984). Information also is perceived as being more valid when it comes from people in one's own group or category.

Turner (1991) has proposed that individuals in a group will polarize because they see the group as an ingroup and the most extreme attitude score as a prototype. The prototype corresponds to the position which best defines the ingroup's commonalities compared to relevant outgroups. The prototype position differs most from outgroup members but least from ingroup members. It is defined by the highest meta-contrast ratio (the individual's average difference from outgroup members divided by the average difference from ingroup members). Thus, the group norm to which members of the group conform is not the pre-discussion mean, but rather the prototype, usually a more extreme (polarized) score.

To date, however, research investigating the effect of self-categorization on group polarization has been limited. Often, studies have included no real group interaction (Hogg et al., 1991; Mackie, 1984; Mackie & Cooper, 1986); instead, subjects hear or watch a taped group discussion and the extent to which their attitudes become closer to the group norm is measured. Other research has simply tested the meta-contrast ratio using a computer simulation (McGarty, Turner, Hogg, David, & Wetherell, 1992). Abrams et al. (1990) purported to investi-
gate polarization, but did not require a group consensus decision; thus, this study did not examine conformity (polarization) processes.

Although research on self-categorization and group polarization has been tentative, Turner's research program does raise questions about the conditions under which individuals perceive an ingroup. Self-categorization researchers have implied that the mere presence of a group leads to a perception of an ingroup (Abrams et al., 1990); simply assigning experimental subjects to groups with no obvious differences will induce self-categorization. To the extent that this view is valid, it supports the argument that group polarization dynamics found in previous research is the result of self-categorization processes. (It should be noted, however, that polarization does not occur in every group situation (e.g., Burnstein & Vinokur, 1973; Coet & McDermott, 1979). Nor is it true that influence toward a more extreme view must occur in the context of a group (e.g., Mackie & Cooper, 1984).

How group diversity will affect group influence processes such as polarization may be explained in terms of self-categorization theory. For example, will group members view the entire group as an ingroup, or will they categorize the group into smaller subgroups based on one or more composition variables? Will the categorization affect conformity processes? The lack of research on subgroups is a shortcoming in the groups literature (Isenberg, 1986; see Ward & Reingen, 1990 for an exception), yet focusing on subgroups and the dynamics they create is central to understanding the implications of diversity in teams.
Turner's line of research has not, however, investigated the extent to which perceived differences within the group will mitigate against perception of the whole group as the ingroup; self-categorization research typically examines between group differences. An exception to this is Abrams et al. (1990), however, this study did not investigate group consensus.

I would argue that when within group differences among members (e.g., sex or values) are salient, group members do not perceive a sense of group unity. Instead, group members may see themselves as belonging to one of two or more subgroup of individuals with whom they have attributes in common and by which they are distinguished from other subgroup(s). If they perceive no other individuals in the group as similar to themselves, categorization will be at the level of the individual rather than at the subgroup level or group as a whole. Since individuals are more likely to accept influence from those with whom they perceive similarity, group members will be less likely to conform to the extent they consider themselves to be diverse. Thus, they would be less susceptible to conformity forces, resulting in less polarization. On the other hand, when within-group differences are minimized and when greater homogeneity is perceived, such conformity forces would be exacerbated. Therefore, degree of polarization in group decisions may be used to calibrate the nature and impact of team composition.

*Salience.* It is not clear, however, what constitutes a "salient difference" within a group, or even what makes group differences
salient. Research has found that people typically assume similarity (the "similar to me" bias; e.g., Rand & Wexley, 1975). Thus, it is likely that without some cue which makes group differences salient, individuals will assume themselves to be similar. This is likely the reasoning behind the Abrams et al. (1990) assertion that individuals perceive an ingroup simply by being assigned to a group in an experiment. The need for salience of group differences also highlights the importance of the distinction between perceived and actual similarity discussed earlier.

Self-categorization researchers have not speculated extensively, however, on the conditions under which differences become salient and thus encourage or prevent an ingroup from forming. Yet, the salience factor may provide one clue as to why sex differences, for example, have not shown consistent effects on group processes. Self-categorization researchers have not compared types of variables upon which the ingroup may be based. Thus, a relevant question is what characteristics of group members, and under what conditions, lead to perceptions of similarity and therefore a strong impression of an ingroup. Likewise, what leads to perceptions of dissimilarity. Turner (1991) himself has noted that little attention has been paid to group belongingness variables such as similarity and cohesiveness.

In my study, unlike the majority of previous self-categorization research, I have chosen not to falsely manipulate categorization, but rather to use categories, i.e., sex and values, which occur naturally within a group. Although steps will be taken to make within group
differences apparent, participants will not be told explicitly that they belong to a subgroup which shares one or more characteristics. Recognizing also the distinction between actual and perceived similarity, subjects will be asked to assess the perceived similarity of the group at the conclusion of the study.

**Group Composition and Group Polarization**

I have argued that group polarization is a useful vehicle for understanding the effects of diversity on group decision making processes. Indeed, it is surprising that there has not been more investigation into the effects of group composition on group polarization. One reason for this oversight, at least in terms of sex differences, is that this variable has been neglected by social psychologists as "an annoying source or error" (Dion, 1985, p. 294). Another reason is likely to be the aforementioned lack of crossover between organizational and social psychology. Self-categorization theory, however, has, in part, rekindled interest in group member attributes and dynamics that promote the use of social categories.

According to the logic put forth above, composition of the group would be important to polarization to the extent that composition affects the degree of perceived similarity. If the team members do, in fact, see themselves as similar to one another and thus categorize themselves as a unit (e.g., all are perceived as belonging to an ingroup), as proposed by self-categorization theory, then they should polarize to a greater extent. The effects of diversity, then, would depend on the extent to which a heterogeneous group will find within
group differences to be salient, resulting in a perception of membership in one of a set of subgroups. Generally, members of a heterogeneous group will not consider themselves as belonging to a unified ingroup to the same extent as will a homogenous one. In the context of heterogeneity (diversity), I will investigate sex and values as composition variables.

Hypotheses

Polarization

Group composition: Sex. Studies which measure the effect sex on polarization of group consensus decisions most often have either failed to find an effect at all (Coet & McDermott (1979) or failed to find a difference between males and females (DiBernardinis, Ramage, & Leavitt, 1984; Dunham, 1980). In the single study which considered mixed-sex groups, Seeborg, LaPollette, & Belohlav (1980) found that mixed-sex groups demonstrated less shift than same sex groups of either type.

According to self-categorization theory, if group membership is salient, groups should, in fact, polarize. Although Coet & McDermott's (1979) results are inconsistent, the results found by Seeborg et al. (1980) are consistent with self-categorization theory. Thus far, there has been no evidence that there are sex differences in polarization. Other research on conformity has found that individuals conform more in mixed-sex groups (Morgan & Lassiter, 1992). However, self-categorization theory and Seeborg et al. (1980) imply that mixed-sex groups should demonstrate less polarization. Heterogeneity of sex makes group
differences salient, thus reducing the propensity to perceive an ingroup. The first hypothesis tests a replication of the Seiberg et al. finding.

**Hypothesis la**: Groups which are homogeneous with regard to sex (either all male or all female) will polarize more than will groups which are heterogeneous with regard to sex.

**Group composition: Values**. With the exception of a "cultural value for risk", values have been implicated only indirectly in group polarization research. Stoner (1968) developed a list of "widely held values" which corresponded to each alternative in a series of choice dilemmas. When he asked subjects to rank these values, he found widespread differences in values expressed by the population. Nevertheless, the order of ranking corresponded to the alternative favored in each choice scenario. In another study, Billig & Cochrane (1971) used Rokeach's Values Survey to determine if the value for "an exciting life" and "a comfortable life" corresponded to choice of a risky or conservative alternative in a choice dilemma. There was no relationship.

Nonetheless, group polarization dynamics should be useful to further the understanding of value diversity in teams. Whether a team is similar or diverse in terms of the values they hold may have important implications for how they interact. Although some conflict in groups is considered adaptive (Fisher, 1974), it is likely that groups of differing values will have more difficulty reaching consen-
sus. Factions would create perceptions of two subgroups—an ingroup and an outgroup according to self-categorization theory.

Thus, the more strongly team members perceive their team as holding similar values, the more it will be perceived as an ingroup, and consequently, the more likely the group will be influenced by group norms of risk. A judgement task such as group polarization where a preferred rather than a correct answer is sought is especially relevant in terms of values. Attaining consensus requires communication of values regarding the relative merits of alternatives (Straus & McGrath, 1994). Even if the judgment task itself is not related to specific values, the cohesiveness achieved by perceived values similarity will enhance adherence to group norms. Perceived value congruence will lead group members to expect to agree with each other; people who expect to agree with others are also more open to influence (Turner, 1987).

Hypothesis 1b: Groups which are more homogenous with regard to values will polarize more than groups which are more heterogeneous with regard to values.

Group composition: Sex versus values. The more group members perceive themselves as diverse, the more likely they are to categorize themselves into subgroups. As stated previously, they will then be less likely to be influenced by others' opinions either in terms of compliance or internalization. Thus, heterogeneity on more than one attribute or characteristic should inhibit polarization to a greater extent than differences on just one. If a group is perceived as
diverse and there is no salient outgroup, the diversity may prevent a "group" perception from forming; thus, self-categorization theory would predict convergence to the mean rather than polarization.

**Hypothesis lc:** Groups which are more homogeneous on both sex and values will polarize more than groups which are more homogeneous on sex or values only.

**Internalization**

The portion of the Choice Dilemma paradigm which arguably has been discussed least is a third stage in which subjects respond individually once again to the scenarios but this time after the group discussion. Given that this is a private statement of the subject's position, it is felt that this step would reveal whether or not the subject has internalized the group consensus decision. It is likely that more heterogeneous groups, who thus would be less likely to see themselves as a unified ingroup, would be less likely to internalize the norms established during the group discussion. They would therefore respond more similarly to their initial positions in their post-discussion response. In contrast, more homogeneous groups would view themselves as an ingroup and would internalize group norms. These group members would respond more similarly to the group consensus decisions in their post-discussion responses. Individuals with similar values or the same sex would be more likely to see others as sources of influence with whom they would agree.
Hypothesis 2a: Groups which are homogeneous with regard to sex will demonstrate more internalization of the group consensus as revealed in the post-test than groups which are heterogeneous with regard to sex.

Hypothesis 2b: Groups which are more homogeneous with regard to values will demonstrate more internalization of the group consensus as revealed in the post-test than groups which are more heterogeneous with regard to values.

Hypothesis 2c: Groups which are more homogeneous with regard to both values and sex will demonstrate more internalization of the group consensus as revealed in the post-test than groups which are more homogeneous on sex or values only.

Endurance of Opinion Change

In addition to appropriate comparisons between heterogeneous groups and homogeneous groups, it is also relevant to discuss differences between group consensus and post-test scores within groups. At what point(s) are conformity processes affected by diversity? Since groups and teams are often responsible for implementing the decisions they make, it would seem prudent to investigate the extent to which group members are merely conforming in the presence of the group and the extent to which their opinions are truly changed--internalized--by
the group discussion. Because polarization has been found to be a robust effect, it is likely to occur to some extent in both heterogeneous and homogeneous groups. Although both types of groups may polarize during the group discussion to consensus, internalization may not follow, however. This leads to the following hypotheses:

**Hypothesis 3a:** In more heterogeneous groups, polarization (pretest-group consensus differences) will be greater than internalization (pretest-posttest differences).

**Hypothesis 3b:** In more homogeneous groups, polarization (pretest-group consensus differences) and internalization (pretest-posttest differences) will not be significantly different.

**Effects of Task Content**

As was discussed earlier, the findings on the effect of sex composition of a group on group processes have not been consistent. This is the case not only for the group decision making and conformity literatures in general, but also for group polarization studies. In terms of a tendency to choose riskier initial choices, some studies have found males to be riskier than females (Coet & McDermott, 1979; DiBernardinis, et al., 1984; Dunham, 1980) and mixed-sex groups (Coet & McDermott, 1979). Another study found that males were riskier only for masculine choice dilemma items.
Consistent with the notion of salience discussed earlier, the content of the decision making task may make diversity variables more salient. In a Choice Dilemma Questionnaire scenario with male oriented content (e.g., a football game), males would be more likely to show propensity for risk. Additionally, the greater the initial risk level, the greater the amount of polarization (Cartwright, 1971); thus, males would also polarize more on a male-oriented scenario. The same would be true for females on female-oriented scenarios.

**Hypothesis 4a**: With regard to task content, 1) males will show more propensity to advocate risk on male-oriented scenarios, and 2) females will show more propensity to advocate risk on female-oriented scenarios.

**Hypothesis 4b**: With regard to task content, 1) males will show more propensity to polarize on male-oriented scenarios, and 2) females will show more propensity to polarize on female oriented scenarios.

**Conditions for Normative versus Informational Influence**

Earlier it was mentioned that investigating the process leading to team outcomes will lead to a better understanding of team effectiveness. Therefore, a relevant question, in the context of team diversity, is to what extent polarization is promoted by normative and/or informational influence.
Whether a team is similar or diverse in terms of values and sex may have important implications for how members interact. It may be that although both homogeneous and heterogeneous groups would polarize, they do so as a result of different processes. These processes in turn impact the amount of information brought to bear on the problem and the individual member's ownership of the group decision (internalization). In terms of informational influence, it is likely that the composition of the group has ramifications for how likely group members are to contribute persuasive arguments to the group discussion. Normative influence is also likely to be affected by group composition.

Homogeneous groups may be more likely to conform (polarize and internalize) due to normative influence. Individuals who perceive themselves to be similar and as an ingroup would be more likely to accept normative influence from members of that group because they are more motivated to present themselves favorably to their own ingroup. This idea is captured by the concept of impression-relevant involvement (Johnson & Eagly, 1989). Under conditions of impression-relevant involvement, when individuals are motivated to present themselves favorably, more normative influence occurs. This appears to be a more heuristically driven process, as described by peripheral route processing in Petty and Cacioppo's (1986) Elaboration Likelihood Model. Rather than evaluating reasons for choosing a particular position, individuals may simply assess the most normative or acceptable position in comparison to other members responses. Johnson and Eagly (1989) contrast impression-relevant involvement with value-relevant involve-
ment. Here, individuals may be less inclined to be influenced by informational arguments because they have already been exposed to them due to the relevance of the issue to central values. In the choice dilemma scenarios, it is likely that impression-relevant involvement will occur as group members are motivated to present themselves favorably, as will be the case for more homogeneous groups.

Yet, homogenous groups may conform due to informational influence as well. Research on similarity and self-disclosure has shown that individuals will gather more information from liked others (Byrne, 1971). Since similarity is a strong predictor of self-disclosure and trust (Byrne, 1971; Jackson et al., 1991; Kanter, 1977; Useem & Karabel, 1986), individuals who are more homogeneous with regard to gender or values will be more likely to share opinions. Thus, more arguments may be presented. Additionally, there is empirical support for the idea that individuals are more persuaded by the same information when it comes from ingroup than from outgroup sources, and from similar others more so than from dissimilar others (Turner, Wetherell, & Hogg, 1988, Experiment 1, cited in Hogg et al., 1990).

On the other hand, if values or sex heterogeneity create differences in opinion (as they should), more arguments may be generated in attempts to influence others to conform to their position. If group members do contribute arguments, it may also be likely that these arguments would be more novel, thus more persuasive (Burnstein & Vinokur, 1977). This is analogous to central route processing as described in the Elaboration Likelihood Model (Petty & Cacioppo, 1986)
in which individuals critically analyze and evaluate arguments. Nevertheless, groups with differing values have more difficulty reaching consensus. It terms of gender heterogeneity, it may be that mixed-sex groups are more likely to conform due to normative influence; research has shown inconsistent results on conformity in mixed-sex groups (Shaw, 1981).

Clearly, the conditions under which normative or informational influence processes are more or less important are not well understood (Eagly & Chaiken, 1993). Researchers have primarily focused on either social comparison and persuasive arguments, related to normative and informational influence respectively, but have not investigated what situations may be most likely to implicate which process. This study proposes to explore the impact of diversity on these processes. Since it is unclear what effect group composition will have on normative and informational influence, however, no hypothesis will be presented.

**Summary**

As a means of bringing together the various constructs which have been discussed, the reader's attention is drawn to Figure 1 which depicts group-level relationships which will be explored in the present research. Group-level hypotheses are labeled; other relationships depicted have no hypothesized direction (positive or negative). Although the figure is drawn at the group level, it is recognized that the "group's values" are made up of four individual member's values. The group's particular configuration of values and sex composition acts on the group's initial position (both mean and variance) and on
perceived similarity. The initial position is one factor which predicts amount of polarization and internalization; however, this relationships is also mediated by normative and informational influence processes.

A summary listing of the research hypotheses follows.

**Hypothesis 1a:** Groups which are homogeneous with regard to sex (either all male or all female) will polarize more than will groups which are heterogeneous with regard to sex.

**Hypothesis 1b:** Groups which are more homogenous with regard to values will polarize more than groups which are more heterogeneous with regard to values.

**Hypothesis 1c:** Groups which are more homogeneous on both sex and values will polarize more than groups which are more homogeneous on sex or values only.

**Hypothesis 2a:** Groups which are homogeneous with regard to sex will demonstrate more internalization of the group consensus as revealed in the post-test than groups which are heterogeneous with regard to sex.

**Hypothesis 2b:** Groups which are more homogeneous with regard to values will demonstrate more internalization of the group consensus as revealed in the post-test than groups which are more heterogeneous with regard to values.

**Hypothesis 2c:** Groups which are more homogeneous with regard to both values and sex will demonstrate more internalization of the
Figure 1. Framework for the effect of group composition on group processes and outcomes in group polarization and internalization.
group consensus as revealed in the post-test than groups which are more homogeneous on sex or values only.

**Hypothesis 3a:** In more heterogeneous groups, polarization (pretest-group consensus differences) will be greater than internalization (pretest-posttest differences).

**Hypothesis 3b:** In more homogeneous groups, polarization (pretest-group consensus differences) and internalization (pretest-posttest differences) will not be significantly different.

**Hypothesis 4a:** With regard to task content, 1) males will show more propensity to advocate risk on male-oriented scenarios, and 2) females will show more propensity to advocate risk on female-oriented scenarios.

**Hypothesis 4b:** With regard to task content, 1) males will show more propensity to polarize on male-oriented scenarios, and 2) females will show more propensity to polarize on female-oriented scenarios.
CHAPTER II

METHOD

Subjects

Subjects were Psychology 100 students who participated for course credit. There were six conditions with ten groups in each condition and four individuals in each group, for a total of 240 subjects. Sessions were conducted in random order. At the time they were scheduled for sessions, students were randomly assigned to experimental conditions for which they were eligible on the basis of their sex and values attributes.

Group Composition

This study examined the effects of diversity on two variables (sex similarity and values similarity) on group decision processes, namely group polarization. Four person teams were composed of individuals known to be either similar or dissimilar in ethical values (two pairs of similar subjects with the pairs being different vs. all four similar) and either similar or different in sex (two male and two female vs. four male vs. four female). This resulted in a 2 (homogeneous vs. heterogeneous values) X 3 (male vs. female vs. mixed) design. Individuals were not informed directly of other group members' values. The experimenter was blind to this experimental condition.
Measures

Similarity in ethical values were based on responses to the Ethics Position Questionnaire (EPQ; Forsyth, 1985). The EPQ is a 20-item instrument which is divided into two scales: Idealism and Relativism. Items are answered on a 9-point Likert scale with "completely agree" and "completely disagree" as the endpoints. The Idealism scale was used to compose groups relative to values. (See Appendix A.)

Polarization and internalization was assessed using six scenarios from the Choice Dilemma Questionnaire (CDQ; Wallach & Kogan, 1964) and from Myers (1967). Choice dilemma items depict a variety of hypothetical situations in which a fictitious person must choose between a desirable but risky option and a safer but less desirable option. Respondents were asked to indicate the lowest odds for success (1, 2, 3, 4, 5, 6, 7, 8, or 9 out of ten, or that the odds must be ten out of ten) that they would consider acceptable before advising the fictitious individual to take the risky alternative. The six scenarios are ones which have been shown to produce a shift toward risk (Cartwright, 1971; Coet & McDermott, 1979; Vinokur & Burnstein, 1978). Two risk scenarios are about masculine topics (e.g., choice of football plays), two are feminine in content (e.g., girl deciding whether to make a dress for the prom) and two are neutral. As in DiBernardinis et al. (1984), the Wallach & Kogan version of the CDQ was adapted to be gender neutral, expect for the scenarios which are purposely male-oriented or female-oriented in content. (See Appendix B for the actual scenarios.)
Final questionnaire. A questionnaire distributed at the end of the study allowed participants to rate perceived similarity of the group, of individual members, and the extent to which they perceive group members are characterized by certain attributes corresponding to the EPQ. These items were assessed by 7-point Likert scales. In addition, participants were asked about their levels of satisfaction with the group decision, influence felt, agreement with group decisions, liking for other group members, willingness to work with the same group in the future, characterization of the group interaction, and assessment of whether decisions were due more to normative or informational influence. (See Appendix C for Final Questionnaire.)

Masculinity-Femininity. Along with the final questionnaire, subjects were given scales which assessed their perceptions of their own masculinity and femininity. The measure used was the Masculinity, Femininity, and Masculinity-Femininity scales of the Personal Attributes Questionnaire (PAQ; Spence and Helmreich, 1978). The PAQ assesses masculinity and femininity both as orthogonal and bipolar constructs. This measure was used to assess the extent to which group members are more likely to categorize themselves as masculine or feminine in the face of differing group composition. That is, did sex composition make gender salient (Hogg & Turner, 1987). (See Appendix D for the scales.)

Pre-screening. Subjects were administered the values instrument (EPQ) during the first week of class. On the basis of their scores, the upper and lower quartiles were used to compose groups for the second session.
Cover Story

Subjects were told that this study concerned an investigation of both individual and group decision making. They were informed that the experimenter does research in industrial/organizational psychology, and that decision making is an important topic for research in this area. Additionally, subjects were told that work teams are becoming increasingly relevant in organizations; thus, this study is investigating decision making among individuals who have not previously worked together, as might be the case in an ad hoc task force.

Procedure

The script used by the experimenter is presented in Appendix E. Subjects were brought into the laboratory and seated around a square table. In the heterogeneous sex conditions, males were asked to sit on one side of the table and females on the other. In homogeneous sex conditions, the experimenter commented on the fact that the group happens to be all male (female). Subjects first completed a "record-keeping" form (see Appendix F) which collected information regarding date and time of the study, assessed whether subjects have had any previous contact with each other, and made gender salient by asking subjects to record the first name and gender of each group member.

Next, subjects were told they would now be completing some individual work. Subjects were given the set of six scenarios from the Choice Dilemma Questionnaire and the scenario which implicates the values of interest in the study. The values scenario and one of the CDQ items which implicates gender were counterbalanced as to which
appeared first in the set of scenarios. The purpose in giving subjects a value-laden scenario to discuss first (or second) was to provide implicit information as to the values of the other group members, and hence subjects' similarity to other group members on this variable.

Once given the CDQ, subjects first answered the Choice Dilemma questions individually. Their booklets were then collected and they were given fresh CDQ questionnaires. They were told that now that they have familiarized themselves with the items, they would now gather as a group to come to a consensus decision. Following the discussion, they were again given fresh questionnaires and asked to answer the same questions individually once again. They were told that they could feel free to respond the same as the group or differently and that only the experimenter would see their answers.

Additionally, in the individual and final administration, for four of the seven scenarios, subjects were asked to record their reasons for choosing that level of risk. This allowed comparison of what types of arguments were brought up in the group discussion compared to the total pool of arguments that subjects listed. Subjects were only asked to record arguments for four of the seven scenarios in the interests of time and to allow comparison with polarization and internalization effects when they do not record arguments. The typical session lasted about fifty minutes.

It should be noted that this procedure conforms to the procedure established by Kogan and Wallach (Wallach, Kogan, & Bem, 1962), with the exception that subjects were given a fresh questionnaire for the
post-test rather than marking their personal decision on the same sheet that the group consensus has been recorded. This procedural change is found in other studies (e.g., Dion, Miller, & Magnan, 1971) where both the group consensus and individual post-test answers are recorded. It is thought to better assess the subjects actual internalization of the group responses. The response format is also slightly different from the original Kogan and Wallach version. D. G. Myers (personal communication, April 13, 1994) recommends this format as being easier for subjects to understand.

Finally, subjects received the questionnaire requesting assessments of satisfaction with the group decision, liking for other group members, perceived similarity of the group, and perception of whether they were influenced more by group members positions or arguments.

Content Coding

A successful content analytic device must yield reliable data which is categorized systematically and meaningfully (Holsti, 1968). It is a technique for making inferences about data (Bonomo & Rosenberg, 1978). The most commonly used coding scheme for group discussions is Bales' (1970) Interaction Process Analysis. However, as Bales would no doubt agree, this scheme is more useful for analyzing communication modes than message content. Analysis of message content is more situation or task specific.

An extensive literature search revealed only one previous content coding scheme for normative versus informational influence. This coding scheme was used by Kaplan and Miller (1987) in their investiga-
tion of jury decisions and was closely tied to the task. Only one previous study involving group polarization utilized content coding (Vinokur, Trope, Burnstein, 1975). This study was concerned with utility versus action outcome; thus, the categories were not relevant. Although relevant ideas were drawn from these sources, the content coding scheme was developed for this research was largely new. However, the overall approach is consistent with informational and normative influence theory as developed by Deutsch and Gerard (1955).

The scoring categories are shown in Appendix G.

Each utterance in the group discussion was coded as to whether it was normative or informational influence and whether it was giving, requesting, or agreeing with information. The major difference between normative and informational influence includes whether the statement is based on logic or some externally verifiable fact (informational influence) or based on the opinion that "most people" or the speaker would do something or that "people should" take a certain action (normative influence; Kaplan & Miller, 1987). Other miscellaneous utterances which did not fall under the categories of normative or informational influence were included as well so that each utterance would receive a code. Following Vinokur et al. (1975), one "sentence" may receive more than one code if it included more than one phrase, e.g., a sentence which agrees with a previous statement, plus adds a new reason for advocating the risky alternative. Each participant's utterances were coded separately, as was each decision scenario.
Development of the coding procedure proceeded as follows. Two coders were trained by the experimenter on the concepts of normative and informational influence as well as how to use the content coding sheet. Next, coders practiced assigning codes using tapes of pilot data. On the basis of this pilot coding, the coders and the experimenter discussed areas of disagreement, either resolving the differences or including an additional code for that category of utterance. The revised coding scheme was used in further practice sessions until understanding of the procedure and agreement between coders was achieved.

When coding data from the study, both coders listened to each tape and coded it independently. Disagreement between coders was resolved by a third party (the experimenter). Both coders and the experimenter were blind to experimental conditions. The voices on the actual tapes were coded rather than transcriptions to facilitate assignment of the appropriate code based on vocal tone and to facilitate recognizing order of responses, since, for example, coding agreement with a reason versus agreement with a statement of odds is dependent on the previous utterance. This emphasis on context is also characteristic of other content coding schemes (e.g., Vinokur et al., 1975). When more than one participant speaks at the same time, it is easier to determine the appropriate relationship between utterances directly from the tape itself. Group discussions were recorded on four-track audio recording equipment to facilitated determination of which subject made which utterance.
Subjects listed reasons they chose their particular odds for Scenarios 1 through 4. Thus, in addition to coding the group discussion themselves, reasons brought up in the group discussion were compared to the reasons participants listed individually both before and after the group discussion. When comparing reasons listed before the group discussion, reasons could be classified as not stated at all in the subsequent discussion, stated in the discussion by that person, or stated in the discussion by another group member. Reasons listed after the group discussion were classified as not stated in the discussion, stated by that person and on their previous list, stated by that person but not on their previous list, stated by another group member but on the individual's own list, or stated by another individual and not on their own previous list.
CHAPTER III

RESULTS

Pre-screening

The actual study was conducted during the spring and fall of 1994. Prior to conducting the study, students enrolled in Psychology 100 were pre-screened on the values measure. During the spring quarter, pre-screening questionnaires were distributed to students who signed up to participate in experiments for course credit. 306 questionnaires were returned. During the fall quarter, 1065 questionnaires were distributed; approximately half of these were administered within Psychology classes and the rest were to be completed outside of class and returned. Completed questionnaires numbered 802 (some questionnaires to be completed outside of class were not returned or not all students were present during the class session) for a total of 1108 for both quarters. Only questionnaires completed by Caucasian students were used as a subject pool for the actual study, bringing usable questionnaires to 902 (412 males, 490 females). The scores on the Ethics Position Questionnaire (EPQ) falling in the upper and lower quartiles were used for the subject pool, bringing the total pool to 476. Table 1 shows means and standard deviations for idealism and relativism on the EPQ (Forsyth, 1985) for the total number of students
answering the questionnaire, students participating in the study, and norms according to Forsythe (1985).

Table 1

<table>
<thead>
<tr>
<th></th>
<th>Norms</th>
<th>Subject Pool</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Idealism</td>
<td>6.35</td>
<td>1.17</td>
<td>6.39</td>
</tr>
<tr>
<td>Relativism</td>
<td>6.18</td>
<td>1.13</td>
<td>5.91</td>
</tr>
</tbody>
</table>

There was no difference between students participating in the study during spring or fall quarters on idealism ($F(1,238)=.01$, $p=.921$) or relativism ($F(1,238)=.099$, $p=.754$). Most subjects who responded to the pre-screening questionnaire in the spring were used for purposes of piloting. Of the 60 experimental sessions run, seven took place in the spring and 53 in the autumn quarter.

A factor analysis was performed to investigate the dimensionality of the EPQ. Principle axis factoring with squared multiple correlations as communality estimates was used to fit the common factor model to the data. A scree plot of factors by eigenvalues indicated that two factors could be retained. This solution was rotated to an oblique solution via the Harris-Kaiser method. The resulting factor loadings confirmed the presence of two factors corresponding to Idealism and Relativism. Items 1 to 10 loaded on the first factor and items 11-20 loaded on the second factor.
Reliability of the idealism scale as measured by Cronbach's alpha was .90.

**Demographic Characteristics**

Fifty percent of subjects were male and fifty percent were female, as dictated by the conditions of the study. All were Caucasian (to control for other perceptions of diversity besides the independent variables of interest). Mean age was 19 (SD=2.08) and ages ranged from 17 to 43. Ninety-nine percent of students were under the age of 24 and ninety percent were under the age of 20.

**Achievement of Experimental Conditions**

*Diversity.* To assess the effects of diversity on group polarization it is important to determine if groups were in fact composed to be diverse. In terms of sex, groups were either all male, all female, or two males and two females. In terms of values, subjects were either all from the upper quartile on idealism, all from the lower quartile on idealism (i.e., realism), or two from the upper quartile and two from the lower quartile. The Tsui et al. (1992) relational demography index was used to as a measure of the heterogeneity within groups. A relational demography score was computed for each individual. The equation for this score is as follows:

\[
\frac{1}{n} \sum_{j=1}^{n} (S_j - \bar{S}_j)^2 \right)^{1/2}
\]  

(1)
This equation is "the square root of the summed squared differences between an individual S1's value on a specific demographic variable and the value on the same variable for every other individual S2 in the work unit, divided by the total number of respondents in the unit (n)" (Tsui, et al., 1992, p. 562). Since sex is a nominal variable and groups were composed to be either all of one sex or two males and two females, individuals in same-sex groups had a relational demography score of zero (no difference) and individuals in mixed-sex groups had a score of .77. Since values were not a nominal variable, further analyses of heterogeneity were performed to determine if these group assignment effort actually resulted in more diverse groups in the heterogenous value conditions. Analysis of variance were performed to determine if diversity was greater in heterogeneous value groups. Comparisons were made using both the relational demography index and the standard deviation within the group on the values measure. Heterogeneous value groups were indeed found to be more heterogeneous \( F(1,58)=159.632, \ p < .0001 \) according to ANOVA of the relational demography index. The mean relational demography score for values was .72 for homogeneous value groups and 2.26 for heterogeneous value groups. Analysis of variance of the mean standard deviation of similar versus dissimilar value groups also showed significant differences \( f(1,58)=5.457, \ p < .05 \). Mean SD for homogeneous value groups was .20 while mean SD for heterogeneous value groups was .32.

Know each other before. Subjects were asked if they had seen or knew or were friends with other group members prior to the study.
Ninety-three percent of individuals had never met before. The remaining seven percent had only seen each other before or had a class together. None reported being acquaintances or friends. Thus, the condition sought whereby subjects would be unfamiliar with each other was achieved.

**Initial scenario.** The CDQ scenario which implicated values and the first CDQ male-oriented risk scenario were counterbalanced as to which was given to groups first. This was done in order that control for the potential effects of values or gender being implicated in the first scenario read or discussed. Analyses of variance revealed no differences for any of the dependent variables according to which scenario was presented first. Both conditions were combined on further analyses.

**Values scenario.** The purpose of the values scenario was to make subjects aware, without telling them explicitly, of the values of other group members. Since the scenario and the decision choice implicated idealism versus realism, the group consensus discussion should make subjects aware of the values held by group members.

Analysis of variance results showed that more idealistic group members did indeed respond more ideistically in their initial individual responses (F(1,238) = 6.184, p = .013). Mean response for idealistic individuals was 5.72 versus 4.82 for realistic members.

Furthermore, members of heterogeneous value groups were able to perceive differences between group members in level of idealism/realism (t(119) = 2.37, p < .01). One a seven-point Likert scale with one being
idealistic and seven being realistic, mean rating of more idealistic
group members was 4.74 (SD=1.30) and mean rating of less idealistic
(more realistic) group members was 5.07 (SD=1.23).

Group polarization and internalization. Before the effect of
diversity on polarization can be assessed, it must be determined that
the groups in this study do in fact polarize. T-tests were performed
which compared the average initial individual odds chosen to the group
consensus response. Across conditions, groups polarized on all
scenarios with the exception of Scenario 6 (t(1,59)=.25, p=.400).
Contrary to pilot study and previous research, groups did not polarize
nor have an initial trend toward risk (M=6.06) on this scenario.
Therefore, this scenario was dropped from further analyses.

T-tests comparing average individual scores and group consensus
scores on the scale showed that groups did polarize (t(59)=11.11, p <
.0001). Likewise, t-tests comparing initial individual scores and
final individual scores on the scale showed that overall groups
internalize (t(59)=10.95, p > .0001).

Tests of Hypotheses

Means and standard deviations for all dependent variables and
final questionnaire items are shown in Table 2. Correlations between
dependent variables are presented in Table 28 of Appendix H. Figure 2
depicts relationships between the variables of interest.
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*Indicates initial individual position for Scenario 1; Gcpl=Group consensus position for Scenario 1; Fnl=Final individual position for scenario 1; Polart=Polartization on Scenario 1; Intern=Internalization on Scenario 1; Reasons=Reasons perceived of group positions being based on reasons versus rankings; Agree=Agree with group position (7-point Likert scale).
Figure 2. Revised framework for the effect of group composition on group processes and outcomes in group polarization based on study results.
Hypothesis 1

Hypothesis one predicted that subjects in more homogeneous groups will polarize more than groups in more heterogeneous (diverse) groups. Hypothesis 1a predicted specifically with regard to sex that groups which are homogeneous will polarize (the difference between initial individual odds and group consensus odds) more than groups which are heterogeneous with regard to sex (either all male or all female). As reported above, polarization occurred across all conditions, ANOVA showed no difference between same-sex and mixed-sex groups for any of the scenarios in the amount of polarization that occurred.

Hypothesis 1b predicted the effects of similarity with regard to values, specifically that groups which are more homogeneous with regard to values will polarize more than groups which are more heterogeneous with regard to values. Of individual CDQ scenarios, only Scenario 4 (the engineer contemplating a new job) demonstrated an effect for values similarity. An ANOVA was conducted which revealed a significant effect for values similarity in the hypothesized direction as shown in Table 3. Groups with similar values polarized more on the scenario than groups with dissimilar values (M=1.32 vs. M=.25). Analyses were also conducted separately for males and females, but also found no significant effects for value similarity.
Table 3

ANOVA Summary Table for Polarization on CDQ Scenario 4

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<td>.048</td>
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<td>6.093*</td>
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*p<.05

Hypothesis 1c examined the combined effects of sex and values similarity. It was predicted that groups which are more homogeneous on both sex and values will polarize more than groups which are more homogeneous on sex or values only. Analyses investigating individual CDQ scenarios showed an interaction of values similarity and sex similarity on polarization for Scenario 3 (making a dress for the prom). Table 4 presents the ANOVA summary. The interaction was not of the form hypothesized, however. Figure 3 depicts the form of the interaction between values and sex similarity.
Table 4

ANOVA Summary Table for Polarization on CDQ Scenario 3

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*p<.01
Figure 3. Interaction of Sex Similarity and Value Similarity on Polarization for Scenario 3
Since the individual scenarios were theoretically related and correlated, but not so strongly as to permit aggregation into a single scale, a multivariate analysis of variance was performed. Scenario 1 was not included since its purpose was to communicate values and Scenario 6 was not included since there was no polarization. The MANOVA summary table for the interaction between sex and values similarity on polarization is shown in Table 5. Overall $F(1,52)=2.99$, $p < .05$.

### Table 5

**MANOVA Summary Table for Polarization Scenarios**

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</tr>
</tbody>
</table>

Examination of the individual scenarios yields findings which corroborate the findings of the univariate ANOVAs which showed an interaction for polarization on Scenario 3. The multivariate ANOVA showed no main effects for values or sex composition.
In summary, then, results for Hypothesis 1 demonstrate only marginal support for the prediction that more homogeneous groups will polarize more than groups that are more heterogeneous. This hypothesis was supported for values only on Scenario 4.

Hypothesis 2

Hypothesis 2 dealt with the effects of group similarity on internalization and is similar in its prediction to Hypothesis 1 regarding polarization. Hypothesis 2a predicted that groups which are homogeneous with regard to sex will internalize more than groups which are heterogeneous. Analyses of variance of individual CDQ scenarios revealed no significant main effects for sex similarity.

Hypothesis 2b predicted that groups which are more homogeneous with regard to values would demonstrate less internalization than groups which were more heterogeneous. Analyses of variance of individual CDQ scenarios revealed a significant effect for values on CDQ Scenario 4 (engineer contemplating changing jobs) as shown in Table 6. As hypothesized, groups with similar values demonstrated more internalization than groups with dissimilar values (M=1.02 vs. M=.17).
Table 6
ANOVA Summary Table for Internalization on CDQ Scenario 4

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex Similarity</td>
<td>1</td>
<td>1.102</td>
<td>.464</td>
</tr>
<tr>
<td>Value Similarity</td>
<td>1</td>
<td>11.051</td>
<td>4.655*</td>
</tr>
<tr>
<td>Sex X Value Similarity</td>
<td>1</td>
<td>2.552</td>
<td>1.075</td>
</tr>
<tr>
<td>Error</td>
<td>56</td>
<td>2.374</td>
<td></td>
</tr>
</tbody>
</table>

*p<.05

Hypothesis 2c considers the combined effects of sex similarity and values similarity on internalization. Hypothesis 2c predicted that groups which are more homogeneous with regard to both values and sex will demonstrate more polarization than groups which are more heterogeneous with regard to sex and values. Analyses of variance of individual CDQ scenarios revealed a significant interaction on internalization (F(1,58)=12.107, p=.001) for CDQ Scenario 3 (making a dress for the prom). ANOVA results are shown in Table 7. The form of the interaction is shown in Figure 4. Again, the form of the interaction was not as hypothesized.
Table 7

ANOVA Summary Table for Internalization on CDQ Scenario 3

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex Similarity</td>
<td>1</td>
<td>.033</td>
<td>.030</td>
</tr>
<tr>
<td>Value Similarity</td>
<td>1</td>
<td>1.134</td>
<td>1.005</td>
</tr>
<tr>
<td>Sex X Value Similarity</td>
<td>1</td>
<td>13.669</td>
<td>12.107*</td>
</tr>
<tr>
<td>Error</td>
<td>56</td>
<td>1.129</td>
<td></td>
</tr>
</tbody>
</table>

*p<.001
Figure 4. Interaction of Sex Similarity and Value Similarity on Internalization for Scenario 3
A multivariate ANOVA was also conducted to aggregate the results across scenarios for internalization. Table 8 presents the MANOVA summary for the interaction of sex and values similarity on internalization. Overall $F(1,52)=2.459$, $p < .05$.

Table 8

MANOVA Summary Table for Internalization Scenarios

<table>
<thead>
<tr>
<th>Test Name</th>
<th>Value</th>
<th>Exact F</th>
<th>df</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pillais</td>
<td>.19125</td>
<td>2.45939</td>
<td>52</td>
<td>.045</td>
</tr>
<tr>
<td>Hotellings</td>
<td>.23648</td>
<td>2.45939</td>
<td>52</td>
<td>.045</td>
</tr>
<tr>
<td>Wilks</td>
<td>.80875</td>
<td>2.45939</td>
<td>52</td>
<td>.045</td>
</tr>
<tr>
<td>Roys</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As with polarization, only the interaction between sex and values similarity was significant. Consistent with the univariate ANOVAs of the individual scenarios, Scenario 3 appears to be the source of the interaction.

In summary, for Hypothesis 2, there was marginal support for the prediction that more homogeneous groups would internalize more than more heterogeneous groups. The hypothesis was supported only for values composition for Scenario 4.
Alternative computation of internalization. Although most research has computed internalization as the difference between average individual pretest and posttest responses (e.g., Hogg, Turner, & Davidson, 1990) some researchers (e.g., Zuber, Crott, & Werner, 1992) define internalization as the difference between the group consensus response and subsequent individual responses. Analysis of variance using this latter definition revealed no main effects for sex similarity or value similarity on individual scenarios. Analysis of variance of Scenario 3 (prom dress) showed a significant interaction between sex similarity and value similarity ($F(1,58)=4.010$, $p < .05$). The form of this interaction is similar to the interaction shown for the original computation of internalization for Scenario 3, and is depicted in Figure 5. Multivariate ANOVA revealed no significant effects.
Figure 5. Interaction of Sex Similarity and Value Similarity on Mean Internalization using the Alternative Computation for Scenario 3.
Investigation of differences between conditions in amount of variance within groups. In addition to mean differences in polarization, exploratory analyses examined whether there were differences between groups on the variance within members initial and final individual responses. Investigation of individual scenarios showed an interaction between sex similarity and values similarity for Scenario 3 on the initial individual responses ($F(1,58)=6.204$, $p=.016$). The form of the interaction is shown in Figure 6. Multivariate ANOVA of the initial individual responses showed no significant interactions or main effects for sex or values similarity.

![Graph](image)

**Figure 6.** Interaction of Sex Similarity and Value Similarity on Mean Standard Deviation on Initial Individual Responses to Scenario 3.
Investigation of the mean standard deviation of final individual responses showed a significant interaction between sex similarity and values similarity for Scenario 6 (F(1,58)=4.566, p=.037). The form of the interaction is shown in Figure 7. Multivariate ANOVA of the final individual responses showed no significant interactions or main effects for sex or values similarity.

Figure 7. Interaction of Sex Similarity and Value Similarity on Mean Standard Deviation on Final Individual Responses to Scenario 6.
To summarize, exploratory analyses investigated the extent to which individuals within groups of different conditions varied on their initial individual responses and final individual responses. There was interaction for initial individual responses in Scenario 3 such that groups that were more heterogeneous on both sex and values, and groups that were more homogeneous on both sex and values had the highest standard deviation within the group. A different form of interaction was found for the final individual responses on Scenario 6. Here, groups that were homogeneous on sex and more heterogeneous on values had the widest standard deviation followed by groups that were heterogeneous on sex composition and more homogeneous on values composition.

**Hypothesis 3**

Hypothesis 3 compared opinion change due to polarization with opinion change due to internalization. Hypothesis 3a predicted that in more heterogeneous groups, polarization (pretest-group consensus differences) will be greater than internalization (pretest-posttest differences). Hypothesis 3b predicted that in more homogeneous groups, polarization and internalization will be equal. Analyses were conducted for each using a repeated measures ANOVA with polarization and internalization as the within subjects factor. Although across conditions means for polarization were larger than for internalization (see Table 2) this effect achieved significant only for Scenario 3. The ANOVA summary is given in Table 9. Although means (polarization
vs. internalization) were in the hypothesized direction for the values similarity condition, neither this effect nor the effect for sex similarity were significant for any of the scenarios.

Table 9

ANOVA Summary Table for Polarization versus Internalization on Scenario 3

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trial</td>
<td>1</td>
<td>1.39</td>
<td>4.86*</td>
</tr>
<tr>
<td>Sex Similarity X Trial</td>
<td>1</td>
<td>.16</td>
<td>.57</td>
</tr>
<tr>
<td>Value Similarity X Trial</td>
<td>1</td>
<td>.25</td>
<td>.88</td>
</tr>
<tr>
<td>Sex Sim. X Value Sim. X Trial</td>
<td>1</td>
<td>.08</td>
<td>.26</td>
</tr>
</tbody>
</table>

*p<.05

In summary, although means were in the predicted direction for values similarity, the difference between polarization and internalization was not significant for values or sex composition.

Hypothesis 4

Hypothesis 4 considered the effects of task content on initial propensity for risk and polarization. Hypothesis 4a1 predicted that males would show more propensity to risk on male-oriented scenarios. Analysis of variance results supported this hypothesis for both Scenario 2 (football; F(1,238)=9.949, p=.002) and Scenario 5 (prisoner-
of war; F(1,237)=11.820, p=.001). For Scenario 2, males advocated mean
odds of 4.5 (out of 10) and females advocated odds of 5.6. For
Scenario 5, males advocated odds of 3.3 while females advocated odds of
4.57.

Hypothesis 4a2 predicted that females would show more propensity
to risk on female-oriented scenarios. Analysis of variance did not
support this hypothesis. There was no difference in risk level between
males and females for Scenario 3 (making a dress for the prom;
F(1,238)=.237, p=.627, male M=3.32, female M=3.17) although means were
in the hypothesized direction, or Scenario 6 (decision to become a
concert pianist; F(1,238)=.103, p=.749, male M=6.04, female M=6.16).

Hypothesis 4b1 predicted that males would polarize more than
females on a male-oriented scenario. Analysis of variance for this
hypothesis showed a marginally significant effect for Scenario 2. For
Scenario 2 (football; F(1,238)=2.860, p=.092), mean polarization was
1.80 for males and 1.39 for females. Analysis of variance results
showed no significant effect for Scenario 5 (POW; F(1,238)=.804,
p=.371).

Hypothesis 4b2 predicted that females would polarize more than
males on female-oriented scenarios. Analysis of variance did not
support this hypothesis. There was no difference in risk level between
males and females for Scenario 3 (prom dress; F(1,238)=1.247, p=.265,
m=1.33) and a marginal effect for Scenario 6 (pianist; F(1,238)=3.211,
p=.074, M=.07).
In summary, Hypothesis 4a1 was supported; males advocated riskier positions on the male-oriented scenarios. Hypothesis 4a2 was not supported; there was no difference between males and females on risk advocacy for female-oriented scenarios. Contrary to the predictions of Hypotheses 4b1 and 4b2 there was no difference between males and females on polarization for either male-oriented or female-oriented scenarios.

Perceptions of Group Members

In addition to the specific hypotheses in the study, it is important to assess individuals' perceptions of the group and group members, including such things as whether individuals perceived the group as similar. These results were obtained from analyses of items from the final questionnaire. It should also be recalled from the discussion above that members of heterogeneous groups did perceive idealistic group members to be more idealistic than realistic group members.

Satisfaction with the group. Several questions on the final questionnaire related to whether group members perceived the group as likeable, cohesive, desirable to work with again, etc. These items were highly correlated, and so were combined into an single score. The specific items, means, standard deviations, and intercorrelations are shown in Table 10. Reliability of the scale using Cronbach's alpha for the scale was .859. According to the scale, general perceptions of the group are favorable (M=5.620, SD=.92).
Table 10

Items Included in the Scale of Satisfaction with the Group

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Satisfaction w/group decision (FQ1)</td>
<td>5.82</td>
<td>.95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Satis. w/way group made decision (FQ2)</td>
<td>5.94</td>
<td>1.04</td>
<td>.66*</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Like other group members (FQ5)</td>
<td>5.64</td>
<td>1.57</td>
<td>.36*</td>
<td>.34*</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Like to work with same group again (FQ6)</td>
<td>5.63</td>
<td>1.43</td>
<td>.57*</td>
<td>.46*</td>
<td>.63*</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>5. Comparison to other groups (FQ7)</td>
<td>5.57</td>
<td>1.14</td>
<td>.51*</td>
<td>.50*</td>
<td>.53*</td>
<td>.68*</td>
<td>--</td>
</tr>
<tr>
<td>6. Aggregate of perceptions of wanting to work w/individual group members again (AVJ)</td>
<td>5.10</td>
<td>.95</td>
<td>.47*</td>
<td>.38*</td>
<td>.50*</td>
<td>.72*</td>
<td>.56*</td>
</tr>
</tbody>
</table>

*p < .01

Perceptions of the group as similar. Participants were asked the extent to which they perceived their group as similar or dissimilar. Subjects responded on a seven-point Likert scale with endpoints from very dissimilar (1) to very similar (7). Individuals in same-sex groups (M=4.46) did perceive their groups as being more similar than individuals in mixed-sex groups (M=4.15, F(1, 237)=5.071, p=.025). There was no difference in perceived similarity between members of heterogeneous and homogeneous values groups (M=4.38, F(1, 237)=.180, p=.671).

Subjects were also asked what this attribution of similarity was based upon. Subjects could check off as many as applied from a list
comprised of Personality, Knowledge, Values, Age, Race, and Gender. As would be expected, there were no differences between conditions on the percentage of subjects attributing level of group similarity to Personality, Age, or Race. Also, as would be expected, individuals in same-sex groups were more likely to check Gender ($F(1,237)=46.473$, $p<.0001$). There was no difference in homogeneous or heterogeneous values groups in those most likely to check off values as a reason for perceiving similarity ($F(1,237)=.699$, $p=.404$). However, mixed-sex groups (72%) were more likely than same-sex groups (46%) to check off values ($F(1,237)=16.085$, $p<.0001$). Analysis of the conditions where subjects checked off "Knowledge" revealed a main effect for sex similarity ($F(1,237)=6.921$, $p=.009$) such that mixed-sex groups (63%) were more likely than same-sex groups (45%) to check off knowledge. There was also a marginally significant effect for values ($F(237)=3.539$, $p=.061$) such that individuals in homogeneous values groups were more likely to check off knowledge (57% vs. 45%).

A similar set of questions were asked of subjects regarding each other individual in their group. Besides a difference in perception of group members as idealistic vs. realistic, t-tests revealed no differences in perceptions of other group members according to whether they were in a heterogeneous or homogeneous group.

Combining perceptions of each group member gives another assessment of individuals perceptions of the group as a whole. Once again, same-sex groups were more likely to describe the group of individuals as similar ($F(1,237)=3.979$, $p=.049$, $M=4.48$ vs. 4.24).
Subjects in same-sex groups were more likely to attribute similarity to gender \((F(1,235)=26.700, p < .0001, M=.62\ vs\ .33)\). Subjects in mixed-sex groups were more likely to attribute similarity to values \((F(1,237)=13.705, p < .0001, M=.63\ vs\ .42)\). Subjects in homogeneous value groups were more likely than subjects in heterogeneous value groups to attribute similarity to knowledge \((F(1,237)=3.969, p < .05), M=.50\ vs\ .39)\).

Variation in perceptions of similarity. Same-sex groups were more varied in their perceptions of similarity (Mean SD=.80) than were mixed-sex groups (Mean SD=.58; \(F(1,57)=5.503, p=.022\)). There was an interaction between sex similarity and values similarity on variation in attribution of similarity being due to values \((F(1,58)=6.325, p=.015)\). The form of this interaction is shown in Figure 8. (Note: This heterogeneity of variance does not violate assumption of ANOVA because it refers to variation within groups and not across conditions.)
Figure 8. Interaction of Sex Similarity and Value Similarity on Mean Standard Deviation on Attribution of Similarity
Perception of Being Idealistic or Realistic

In addition to the finding discussed earlier that idealistic group members are indeed perceived as being more idealistic than realistic group members, other relationships were found as well. Analysis of variance showed that females are more likely to perceive other group members as being idealistic (M=4.76 vs. M=5.13, F(1,237)=8.46, p=.004).

Idealistic group members were more likely to be seen as idealistic by idealistic individuals than by realistic individuals (M=4.58 vs. M=4.98, F(1,175)=5.387, p=.021) according to analysis of variance results. Idealistic group members were more likely than realistic subjects to desire to work with idealistic group members again (M=5.24 vs. M=4.80, F(1,175)=7.061, p=.009) according to an ANOVA.

Subjects with similar values were more likely than subjects with dissimilar values to other group members to see themselves as similar to idealistic group members (M=5.33 vs. M=4.97, F(1,173)=4.49 p=.035).

Self-perception of Masculinity-Femininity

In addition to perceiving similarity or diversity as a function of group composition, it is possible that individual group members would characterize themselves as more strongly masculine (if a male) or feminine (if a female) as a result of categorization (e.g., Hogg & Turner, 1987). To assess this perception, subjects were given the Personal Attributes Questionnaire (PAQ, Spence & Helmreich, 1978), a measure of masculinity and femininity, at the end of the study.
Masculinity and femininity are assessed by the PAQ both as a single bipolar scale and as orthogonal constructs. Table 11 shows the means and standard deviations for scale norms (college students) and for the study sample.

Table 11

Means and Standard Deviations for Masculinity and Femininity

<table>
<thead>
<tr>
<th></th>
<th>PAQ Norms</th>
<th>Study Total</th>
<th>Same Sex</th>
<th>Mixed-Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean SD</td>
<td>Mean SD</td>
<td>Mean SD</td>
<td>Mean SD</td>
</tr>
<tr>
<td>Masc.-Fem. Scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>16.61 4.01</td>
<td>19.25 4.31</td>
<td>18.81 3.96</td>
<td>20.12 4.87</td>
</tr>
<tr>
<td>Females</td>
<td>12.63 4.13</td>
<td>15.05 5.04</td>
<td>15.87 5.12</td>
<td>13.40 4.51</td>
</tr>
<tr>
<td>Masculinity Scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>22.46 4.24</td>
<td>24.65 4.54</td>
<td>24.20 4.72</td>
<td>25.52 4.09</td>
</tr>
<tr>
<td>Females</td>
<td>19.88 4.48</td>
<td>22.16 3.99</td>
<td>22.61 3.84</td>
<td>21.23 4.19</td>
</tr>
<tr>
<td>Femininity Scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>24.13 3.66</td>
<td>25.08 3.92</td>
<td>25.41 3.66</td>
<td>24.41 4.40</td>
</tr>
</tbody>
</table>

Reliability of the Masculinity-Femininity scale using Cronbach's alpha was .689. Cronbach's alpha for the Masculinity scale was .740. Reliability for the Femininity scale was .774.

Analyses of variance were conducted to verify that males and females were significantly different overall on the scales. As would be predicted males scored significantly higher than females on the Masculinity-Femininity scale (F(1,237)=47.936, p < .0001), and on the masculinity scale (F(1,236)=20.143, p < .0001). Females scored significantly higher than males on the Femininity scale (F(1,237)=14.556, p < .0001). Means are shown in Table 11 above.
The table above also shows that mean scores for individuals in the mixed-sex conditions were stronger in the predicted direction than for individuals in same-sex conditions. That is, males scored higher on the Masculinity-Femininity Scale and the Masculinity Scale and females scored lower on the Masculinity-Femininity in mixed-sex groups than in same-sex groups. The only exception was for females on the Femininity scale. Analysis of variance of the planned comparison found no statistically significant differences between males in same-sex and mixed-sex conditions, however. Females in mixed-sex groups scored lower on Masculinity-Femininity than females in same-sex groups (F(1,118)=6.734, p=.001). The difference between females in mixed- and same-sex groups on Masculinity was marginally significant (F(1,117)=3.200, p=.076). There was no difference between females in same- and mixed-sex groups on Femininity. These results are similar to those found by Hogg and Turner (1987).

In addition, there was a significant main effect for values on the Femininity scale showing that more idealistic individuals scored more highly (M=24.87) than realistic individuals (M=23.28, F(1,237)=8.744, p=.003). Looking at males and females separately, idealistic males were significantly higher on Femininity than realistic males (F(1,118)=6.734, p=.011); however, there was no difference in Femininity score between idealistic and realistic females (F(91,117)=1.487), p=.225).
Agreement with group decision

One item on the final questionnaire asked on a seven-point Likert scale: "To what extent would you be likely to agree with a decision the rest of the group made if you were not there to participate and shape the outcome?" Analysis of variance showed that members of homogeneous value groups responded significantly more positively to this question (M=4.69 vs. M=4.29) compared to heterogeneous value groups (F(1,233)=5.304, p < .05).

Exploratory Analyses of Normative versus Informational Influence

One of the goals of this research effort was to assess the influence processes by which groups polarize in their group discussion. Although polarization has been viewed as being due to normative influence (social consensus) and informational influence (persuasive arguments), theorists have argued for one over the other rather than assessing the role of both together. Furthermore, since previous research has also implicated sex of group members in predicting influence style, it is plausible that polarization may come about through different processes depending upon the composition of the group. No formal hypotheses were advocated, however.

A series of items on the final questionnaire assessed individual's perceptions of how much they, individually, were influenced by the specific odds or the reasons group members advocated for those odds. Since these items were highly intercorrelated and related theoretically, they were combined into a scale. Cronbach's alpha
reliability estimate for the scale was .79. Analyses of variance of this scale indicated that members of homogeneous value groups were more likely (M=6.01 vs. M=5.79) to be influenced by reasons than by rankings (F(1,235)=4.01, p < .05).

**Group Discussion**

In the following section, results having to do with time and total statements will be discussed first, followed by content analysis results which compare normative and informational influence.

**Time.** Analysis of variance was used to explore differences in time spent on the group discussion. Mixed-sex groups spent more time discussing the scenarios in order to achieve a consensus than did same-sex male or female groups. Mean time in seconds for individuals in all-male, all female, and mixed-sex groups are shown in Table 12.

**Table 12**

<table>
<thead>
<tr>
<th>Time</th>
<th>Female</th>
<th>Male</th>
<th>Mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>98</td>
<td>94</td>
<td>162</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>72</td>
<td>71</td>
<td>103</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>36</td>
<td>38</td>
<td>65</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>68</td>
<td>80</td>
<td>103</td>
</tr>
<tr>
<td>Scenario 5</td>
<td>38</td>
<td>41</td>
<td>61</td>
</tr>
<tr>
<td>Scenario 6</td>
<td>59</td>
<td>78</td>
<td>116</td>
</tr>
<tr>
<td>Scenario 7</td>
<td>47</td>
<td>61</td>
<td>80</td>
</tr>
<tr>
<td>All Scenarios</td>
<td>417</td>
<td>463</td>
<td>681</td>
</tr>
</tbody>
</table>

*Means for individuals in mixed-sex groups differ from female and male groups at p < .01, Tukey*
In addition to the strong difference in time spent according to sex composition of the group, Scenarios 2 and 7 showed differences according to the values composition of the group. Individuals in homogeneous values groups spent more time in discussion (M=93) then did individuals in heterogeneous values groups (M=70) in Scenario 2 (F(1,238)=9.354, p=.002). The same relationship was found for Scenario 7 (homogenous values M=72, heterogeneous values M=53, F(1,234)=4.275, p=.04).

Interactions between sex composition and values composition for several scenarios (2, 3, 5, 7). The interactions took several forms; however, they shared the finding that for individuals in all male groups, individuals in similar values groups spent more time in discussion than individuals in dissimilar values groups. The following table (Table 13), compares these means.

Table 13

<table>
<thead>
<tr>
<th>Time</th>
<th>Similar Values</th>
<th>Dissimilar Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>99</td>
<td>90</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>96&lt;sup&gt;a&lt;/sup&gt;</td>
<td>45&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>43&lt;sup&gt;a&lt;/sup&gt;</td>
<td>32&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>93&lt;sup&gt;a&lt;/sup&gt;</td>
<td>68&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Scenario 5</td>
<td>50&lt;sup&gt;a&lt;/sup&gt;</td>
<td>32&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Scenario 6</td>
<td>71</td>
<td>55</td>
</tr>
<tr>
<td>Scenario 7</td>
<td>94&lt;sup&gt;a&lt;/sup&gt;</td>
<td>28&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>All Scenarios</td>
<td>546&lt;sup&gt;a&lt;/sup&gt;</td>
<td>381&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>*Means with different superscripts are significantly different, p<.05.*</sup>
Total Statements. The total number of statements made by group members was also analyzed via ANOVA. This analysis showed the same relationship between mixed- and same-sex groups as was demonstrated with time: mixed-sex groups contributed more statements (M=33.80) than did either all-male (M=29.57) or all-female (28.11) groups (F(2,237)=5.231, p=.006). Table 14 shows a comparison of total statements for each decision scenario and the sum of all scenarios.

Table 14
Means of Total Statements by Sex Composition

<table>
<thead>
<tr>
<th>Total Statements</th>
<th>Female</th>
<th>Male</th>
<th>Mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>4.51a</td>
<td>4.67a</td>
<td>6.21a</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>4.40</td>
<td>4.46</td>
<td>5.11</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>3.63a</td>
<td>3.54a</td>
<td>4.35a</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>4.70</td>
<td>4.97</td>
<td>5.55</td>
</tr>
<tr>
<td>Scenario 5</td>
<td>3.46a</td>
<td>3.04a</td>
<td>4.04a</td>
</tr>
<tr>
<td>Scenario 6</td>
<td>3.95</td>
<td>4.86</td>
<td>4.79</td>
</tr>
<tr>
<td>Scenario 7</td>
<td>3.46</td>
<td>4.02</td>
<td>3.75</td>
</tr>
<tr>
<td>All Scenarios</td>
<td>28.11a</td>
<td>29.57a</td>
<td>33.80b</td>
</tr>
</tbody>
</table>

*Means with different superscripts are significantly different, p<.05.

In summary, analyses of the group discussion revealed that individuals in mixed-sex groups spent more time and made more statements than individuals in same-sex groups. There was also some evidence that individuals in homogeneous values groups spent more time in discussion, particularly males in groups that were homogenous both in sex and values.
Content Analysis

Accuracy and reliability of the two raters was assessed in two ways. First, interrater reliability was assessed in terms of whether the raters both assigned the same code to an utterance. Agreement was achieved 92% of the time, indicating favorable rater reliability. All cases of disagreement were resolved by a third party (the experimenter). Furthermore, areas of disagreement were primarily regarding categories within the overall category of normative influence. Since these categories were subsequently combined, this adds greater credence to the reliability score. (That is, had interrater reliability been assessed after collapsing categories, reliability would have approached 100%).

Since coders did the content analysis directly from the audio-tapes of the group discussion rather than transcription, the number of statements coders reported was also analyzed. This percentage is somewhat lower, 80%, meaning that both coders reported a code for an utterance only 80% of the time. This is likely due to the fact that coding was done directly from the tape and because study participants spoke at the same time or made short responses such as "Yeah." These were the types of utterances which most frequently failed to be counted. Although agreement was lower than one might prefer, use of two coders as well as checking by the experimenter provides assurance that all utterances were indeed recorded in the final tally. Moreover, this level of is well above Hirokawa's (1980) criterion for acceptable reliability.
Because some categories did not contain many utterances, some categories were collapsed. Categories 4, 5, 6, 9, 12, and 20 were included in "Giving Normative Influence." "Asking for Normative Influence" includes categories 7, 11, and 21. "Other" included categories 14, 17, and 18. All types of informational influence (codes 1-3, 19) were aggregated, as were all types of normative influence (codes 4-13, 15). This is similar to Innami's (1995) coding categories. Other analyses investigated giving (any type of) influence (codes 1, 4, 5, 6, 9, 12, 20) versus requesting influence (codes 2, 8, 10, 16) versus agreeing with influence attempts (codes 3, 7, 11, 21). Even after collapsing, there were too few instances of "Requesting Informational Influence" or "Requesting Normative Influence" to allow meaningful analysis. Correlations between coding categories and with the independent variables are given in Table 29 of Appendix H. (Relationships are depicted in Figure 2 on page 72). The following discussion is organized by proportion of influence, normative versus informational influence, and giving versus receiving influence. The effect of group composition and individual characteristics are discussed within each category.

Proportions of normative and informational influence. The following table (Table 15) shows "Informational Influence," "Normative Influence," and "Other" as a percentage of total statements by individuals within the group discussion. "Giving Influence," "Requesting Influence" and "Agreeing with Influence" are given as percentages within the larger category of informational or normative influence.
Table 15

Categories of Utterances as a Percentage of Total Statements

<table>
<thead>
<tr>
<th>Influence Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Informational Influence</strong></td>
<td>45%</td>
</tr>
<tr>
<td>Giving Info. Influence</td>
<td>63%</td>
</tr>
<tr>
<td>Requesting Info. Influence</td>
<td>1%</td>
</tr>
<tr>
<td>Agreeing with Info. Influence</td>
<td>36%</td>
</tr>
<tr>
<td><strong>Normative Influence</strong></td>
<td>48%</td>
</tr>
<tr>
<td>Giving Norm. Influence</td>
<td>60%</td>
</tr>
<tr>
<td>Requesting Norm. Influence</td>
<td>1%</td>
</tr>
<tr>
<td>Agreeing with Norm. Influence</td>
<td>37%</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>4%</td>
</tr>
</tbody>
</table>

* Percentages do not equal 100% due to rounding

These proportions were also investigated with respect to the effects of group composition conditions by means of analysis of variance. ANOVA results showed that individuals in all-female groups (M=41%) had a higher proportion than individuals in all-male (M=32%) or mixed-sex groups (M=35%) of statements classified as "Agreeing with Informational Influence" (F(2,237)=4.70, p=.01). Additionally, regardless of group composition, females (M=59%) had a smaller proportion than males (68%) of "Giving Informational Influence" (F(1,238)=15.032, p=.001).

Values composition had a significant effect on the overall category of "Informational Influence" such that individuals in similar values groups made a greater percentage of these utterances (M=47%) than did individuals in dissimilar values groups (M=43%, F(1,238)=7.281, p=.007). Individuals' values, regardless of group composition, showed that low idealism individuals had a higher
percentage of "Giving Informational Influence" utterances (M=66%) than high idealism individuals (M=61%, F(1,238)=4.277, p=.04). This relationship was also true for "Giving Normative Influence" (low idealism M=62%, high idealism M=57%, F(1,238)=4.431, p=.036). In contrast, low idealism subjects demonstrated a marginally lower percentage (M=34%) than high idealism subjects (38%) of "Agreeing with Informational Influence" (F(1,238)=3.122, p=.079) and a marginally significant difference in percentage of "Agreeing with Normative Influence" (low idealism M=34%, high idealism M=39%, F(1,238)=3.799, p=.052).

**Amount of Informational versus Normative Influence.** Analyses of variance were performed on each decision scenario for each content code category. Significant differences between sex composition conditions were found for the informational influence category and, more specifically, for giving informational influence for several of the decision scenarios as well as all scenarios summed together. Table 16 shows a comparison of means for individuals in all-female, all-male, and mixed-sex groups. As can be seen from the table, the most common relationship shows individuals in mixed-sex groups to generate more of the particular type of utterance than either all-male or all-female groups.
Table 16

Mean Levels of Informational Influence and Giving Informational Influence by Sex Composition*

<table>
<thead>
<tr>
<th>Informational Infl.</th>
<th>Female</th>
<th>Male</th>
<th>Mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>2.02</td>
<td>1.99</td>
<td>3.02b</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>1.77</td>
<td>1.82b</td>
<td>2.36b</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>1.80</td>
<td>1.69</td>
<td>2.08</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>2.42</td>
<td>2.64</td>
<td>2.80</td>
</tr>
<tr>
<td>Scenario 5</td>
<td>1.38</td>
<td>1.42</td>
<td>1.68</td>
</tr>
<tr>
<td>Scenario 6</td>
<td>1.64</td>
<td>2.24</td>
<td>2.50</td>
</tr>
<tr>
<td>Scenario 7</td>
<td>1.21</td>
<td>1.81b</td>
<td>1.86</td>
</tr>
<tr>
<td>All Scenarios</td>
<td>12.25b</td>
<td>13.61</td>
<td>16.20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Giving Info. Infl.</th>
<th>Female</th>
<th>Male</th>
<th>Mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>1.27</td>
<td>1.38</td>
<td>1.88</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>1.06</td>
<td>1.16</td>
<td>1.65</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>.96</td>
<td>1.12</td>
<td>1.30</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>1.45</td>
<td>1.71</td>
<td>1.75</td>
</tr>
<tr>
<td>Scenario 5</td>
<td>.99</td>
<td>.96</td>
<td>1.19</td>
</tr>
<tr>
<td>Scenario 6</td>
<td>.99</td>
<td>1.40</td>
<td>1.71</td>
</tr>
<tr>
<td>Scenario 7</td>
<td>.75</td>
<td>1.30</td>
<td>1.13</td>
</tr>
<tr>
<td>All Scenarios</td>
<td>7.47</td>
<td>9.04</td>
<td>10.60</td>
</tr>
</tbody>
</table>

*Means with different superscripts are significantly different, p<.05.

No significant differences were found for "Agreeing with Informational Influence," "Normative Influence," "Giving Normative Influence," or "Agreeing with Normative Influence" for sex composition.

Post-hoc comparisons using the Tukey correction for family-wise error showed a significant difference between males versus females in mixed-sex groups on "Giving Informational Influence" such that males (M=9.91) made more of this type of statement than females (M=8.17, F(1,239)=6.006, p<.05). No differences were found between males and females in mixed-sex groups for "Total Informational Influence," "Total Giving Influence," or "Total Statements."
Analyses of variance showed interaction effects due to values composition on "Agreeing with Informational Influence" for the sum of all scenarios, Scenario 2, Scenario 5, and Scenario 7. The same form of interaction was found on "Total Informational Influence" for Scenarios 2 and 7 and on "Giving Informational Influence" on Scenarios 4 and 7. The general form of this interaction is shown in Figure 9. It shows that when in all-male groups, males among those with similar values are more likely to give and/or receive informational influence than males among those with dissimilar values. The reverse is true, or else there is no difference, for females in similar and dissimilar value groups and for individuals in mixed-sex groups with similar or dissimilar values.
Figure 9. Interaction of Sex and Values Composition on Informational Influence
In addition to investigating differences according to group composition, differences in informational and normative influence were investigated with respect to sex and value content as well. The number of statements defined as "Giving Influence" was higher for males than females for Scenarios 4, 6, 7, and the sum of all scenarios. Analysis of variance results also showed that low idealism subjects gave more informational influence than high idealism subjects for Scenarios 2, 3, 5, 6, and the sum of all scenarios. Means are shown in Table 17.

Table 17

Means of Giving Informational Influence by Sex and by Values

<table>
<thead>
<tr>
<th>Giving Info. Infl.</th>
<th>Female</th>
<th>Male</th>
<th>Low Ideal.</th>
<th>High Ideal.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>1.43</td>
<td>1.38</td>
<td>1.52</td>
<td>1.50</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>1.46</td>
<td>1.32</td>
<td>1.51^n</td>
<td>1.07^n</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>1.09</td>
<td>1.07</td>
<td>1.31^n</td>
<td>.95^n</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>1.42^n</td>
<td>1.85^n</td>
<td>1.60</td>
<td>1.67</td>
</tr>
<tr>
<td>Scenario 5</td>
<td>1.03</td>
<td>1.06</td>
<td>1.23^n</td>
<td>.86^n</td>
</tr>
<tr>
<td>Scenario 6</td>
<td>1.17^n</td>
<td>1.56^n</td>
<td>1.56^n</td>
<td>1.17^n</td>
</tr>
<tr>
<td>Scenario 7</td>
<td>.75^n</td>
<td>1.37^n</td>
<td></td>
<td>1.11</td>
</tr>
<tr>
<td>All Scenarios</td>
<td>8.27^n</td>
<td>9.91^n</td>
<td>9.80^n</td>
<td>8.27^n</td>
</tr>
</tbody>
</table>

"Means with different superscripts are significantly different, p<.05. Comparisons are between Females and Males and between Low and High Idealism only.

"Giving Normative Influence" was also impacted by sex of individuals in some scenarios. In Scenario 4, males (M=1.53) gave more normative influence than females (M=1.22, F(1,238)=5.110, p=.025), while in Scenario 5, females (M=1.24) gave more normative influence than males (M=.97, F(1,238)=4.215, p=.041). Values affected amount of "Giving Normative Influence" in Scenario 6. Low idealism subjects
(M=1.44) said more of these utterances than did high idealism subjects (M=1.13, F(1,238)=3.905, p=.049).

**Giving and Agreeing With Influence.** In addition to investigating differences in types of influence according to condition, Giving and Agreeing with influence were investigated without regard for the type of influence which was being given or agreed with. Analyses of variance showed an effect of sex composition on "Giving Influence" such that individuals in mixed-sex groups gave more of this type of utterance than did individuals in either all-female or all males groups. This effect was found for Scenarios 1, 2, 3, and the sum of all scenarios. Means are shown in Table 18.

**Table 18**

*Means for Giving Influence by Sex Composition*

<table>
<thead>
<tr>
<th>Giving Influence</th>
<th>Female</th>
<th>Male</th>
<th>Mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>2.51&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.77&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.49&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>2.26&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.51&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.05&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>1.95&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.05&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.59&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>2.70</td>
<td>3.18</td>
<td>3.15</td>
</tr>
<tr>
<td>Scenario 5</td>
<td>2.12</td>
<td>1.84</td>
<td>2.50</td>
</tr>
<tr>
<td>Scenario 6</td>
<td>2.19</td>
<td>2.71</td>
<td>3.05</td>
</tr>
<tr>
<td>Scenario 7</td>
<td>1.91</td>
<td>2.39</td>
<td>2.42</td>
</tr>
<tr>
<td>All Scenarios</td>
<td>15.65&lt;sup&gt;a&lt;/sup&gt;</td>
<td>17.45&lt;sup&gt;a&lt;/sup&gt;</td>
<td>20.14&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

*Means with different superscripts are significantly different, p<.05.

For Scenarios 4 and 7, sex of the subjects without regard to the composition of the group affected "Giving Influence." In Scenario 4, males (M=3.38) gave more influence than females (M=2.64, F(1,238)=7.686, p=.006). Likewise, in Scenario 7 males (M=2.56) also
gave more influence than females (M=1.84, F=(1,234)=7.925, p=.005). These scenarios were the two "neutral" scenarios, as opposed to being male-oriented or female-oriented.

Values composition affected "Giving Influence" in Scenario 2. Analysis of variance showed that individuals in dissimilar values groups (M=3.36) made marginally more "Giving Influence" utterances than did individuals in similar values groups (M=2.86, F(1,238)=3.835, p=.051). Values themselves irrespective of the values composition of the group impacted "Giving Influence" as well. In Scenarios 5 and 6, and the sum of all scenarios, individuals scoring low on idealism (i.e., realistic) gave more influence than high idealism individuals. Means for low and high idealism subjects are shown in Table 19.

**Table 19**

**Means for Giving Influence by Individual Values**

<table>
<thead>
<tr>
<th>Giving Influence</th>
<th>Low Idealism</th>
<th>High Idealism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>2.96</td>
<td>2.89</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>2.96</td>
<td>2.26</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>2.44</td>
<td>1.95</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>3.02</td>
<td>3.01</td>
</tr>
<tr>
<td>Scenario 5</td>
<td>2.43</td>
<td>1.88</td>
</tr>
<tr>
<td>Scenario 6</td>
<td>3.00</td>
<td>2.30</td>
</tr>
<tr>
<td>Scenario 7</td>
<td>2.17</td>
<td>2.23</td>
</tr>
<tr>
<td>All Scenarios</td>
<td>18.97</td>
<td>16.52</td>
</tr>
</tbody>
</table>

*Means with different superscripts are significantly different, p<.05.*

In addition to "Giving Influence," analyses were also performed on "Agreeing with Influence." Except for the first scenario, there were no differences between conditions on "Agreeing with Influence." For Scenario 1, individuals in mixed-sex groups made more Agreeing
utterances (M=1.81) than did individuals in all female (M=1.39) or all male groups (M=1.27, F(2,237)=3.74, p=.025). There was no difference between individuals in groups of differing values composition, individuals.

To summarize the content analyses, informational and normative influence occurred in fairly equal proportions. Similar values groups made a greater number of informational influence statements than did dissimilar values groups. Consistent with previous social influence research, females in same-sex groups showed a higher proportion of agreeing with informational influence and a lower proportion of giving informational influence than did males in same-sex groups. Individuals in mixed-sex groups made more statements classified as giving informational influence. Individuals in all-male groups with similar values were more likely to extend informational influence than were individuals in all-male groups with dissimilar values. Values content itself also played a role, with low idealism subjects giving greater influence, particularly giving greater informational influence.

Regression Analyses

Stepwise multiple regression analyses were performed to determine what might influence subjects to perceive their group as similar and to report satisfaction with their group. Table 20 shows the multiple regression on perceiving the group as similar.
Table 20

Regression Analysis: Perceiving the Group as Similar

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>p&lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satis. w/ Group</td>
<td>.408</td>
<td>.064</td>
<td>.373</td>
<td>6.428</td>
<td>.000</td>
</tr>
<tr>
<td>Polarization on Scen. 5</td>
<td>-.144</td>
<td>.042</td>
<td>-.199</td>
<td>-3.433</td>
<td>.001</td>
</tr>
<tr>
<td>SD of Indiv. Scores on Scen 1</td>
<td>-.139</td>
<td>.059</td>
<td>-.145</td>
<td>-2.493</td>
<td>.013</td>
</tr>
<tr>
<td>(constant)</td>
<td>2.627</td>
<td>.403</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The greater the agreement on the first scenario and the less polarization on Scenario 5, the greater the perception of group similarity. Satisfaction with the group is positively associated with similarity perceptions. Interestingly, sex and values similarity were not significant and dropped out of the model. Multiple $R^2$=.217.

Table 21 shows the multiple regression analysis for satisfaction with the group.
Table 21

Regression Analysis: Satisfaction with the Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>p&lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pcvd. Informative</td>
<td>.171</td>
<td>.041</td>
<td>.226</td>
<td>4.123</td>
<td>.000</td>
</tr>
<tr>
<td>Pcvd. Similarity</td>
<td>.249</td>
<td>.046</td>
<td>.270</td>
<td>5.366</td>
<td>.000</td>
</tr>
<tr>
<td>Pcvd. Relaxed</td>
<td>.152</td>
<td>.042</td>
<td>.199</td>
<td>3.585</td>
<td>.000</td>
</tr>
<tr>
<td>Idealism</td>
<td>.092</td>
<td>.027</td>
<td>.171</td>
<td>3.384</td>
<td>.000</td>
</tr>
<tr>
<td>Pcvd. Risky</td>
<td>.125</td>
<td>.039</td>
<td>.159</td>
<td>3.180</td>
<td>.000</td>
</tr>
<tr>
<td>Femininity</td>
<td>.030</td>
<td>.011</td>
<td>.138</td>
<td>2.695</td>
<td>.007</td>
</tr>
<tr>
<td>Pcvd. Friendly</td>
<td>.090</td>
<td>.038</td>
<td>.135</td>
<td>2.345</td>
<td>.020</td>
</tr>
<tr>
<td>(constant)</td>
<td>.461</td>
<td>.388</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All of the above variables were positively associated with satisfaction with the group. Multiple $R^2$ was .47.

Because a significant main effect was shown for values composition on Scenario 4, a stepwise multiple regression was performed on polarization for this scenario. The analysis is shown in Table 22.

Table 22

Regression Analysis: Polarization on Scenario 4

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>p&lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Values Similarity</td>
<td>1.110</td>
<td>.201</td>
<td>.330</td>
<td>5.523</td>
<td>.000</td>
</tr>
<tr>
<td>SD of Scenario 1</td>
<td>.395</td>
<td>.097</td>
<td>.242</td>
<td>4.063</td>
<td>.000</td>
</tr>
<tr>
<td>Pcvd. Risky</td>
<td>.296</td>
<td>.087</td>
<td>.211</td>
<td>3.407</td>
<td>.001</td>
</tr>
<tr>
<td>Satis. w/ Group</td>
<td>-.438</td>
<td>.122</td>
<td>-.236</td>
<td>-3.610</td>
<td>.000</td>
</tr>
<tr>
<td>Pcvd. Friendly</td>
<td>.190</td>
<td>.091</td>
<td>.135</td>
<td>2.090</td>
<td>.038</td>
</tr>
<tr>
<td>(constant)</td>
<td>1.572</td>
<td>.839</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Values similarity is positively related to amount of polarization, as is the standard deviation within the group on Scenario 1, perceived riskiness of the group, and perceived friendliness of the group. Satisfaction with the group was negatively related to amount of polarization. Multiple $R^2=.242$.

Looking at internalization also for Scenario 4, there is a similar regression pattern; however, sex has entered the model and satisfaction with the group and perception of friendliness have dropped out. The stepwise regression is shown in Table 23.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>p&lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Values Similarity</td>
<td>.804</td>
<td>.191</td>
<td>.260</td>
<td>4.208</td>
<td>.000</td>
</tr>
<tr>
<td>Sex</td>
<td>-.688</td>
<td>.190</td>
<td>-.222</td>
<td>-3.625</td>
<td>.000</td>
</tr>
<tr>
<td>SD of Scenario 4</td>
<td>.268</td>
<td>.093</td>
<td>.177</td>
<td>2.874</td>
<td>.004</td>
</tr>
<tr>
<td>Fcvd. Risky</td>
<td>.226</td>
<td>.079</td>
<td>.175</td>
<td>2.857</td>
<td>.004</td>
</tr>
<tr>
<td>(constant)</td>
<td>1.177</td>
<td>.599</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Values similarity, standard deviation on initial individual responses to Scenario 4, and perception of riskiness of the group are all positively related to internalization on Scenario 4. Being a male is negatively related to internalization. Multiple $R^2=.192$.

Since there was an interaction for Scenario 3, although it was not of the form hypothesized, a stepwise multiple regression analysis
was performed on polarization for this scenario as well, as shown in Table 24.

Table 24

Regression Analysis: Polarization on Scenario 3

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>p&lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD of Scenario 3</td>
<td>.487</td>
<td>.083</td>
<td>.368</td>
<td>5.846</td>
<td>0.000</td>
</tr>
<tr>
<td>Normative Infl. on Scenario 3</td>
<td>-.087</td>
<td>.027</td>
<td>-.202</td>
<td>-3.202</td>
<td>.002</td>
</tr>
<tr>
<td>Initial Response on Scenario 3</td>
<td>.059</td>
<td>.029</td>
<td>.125</td>
<td>2.018</td>
<td>.045</td>
</tr>
<tr>
<td>(constant)</td>
<td>-.691</td>
<td>.277</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As polarization research would predict, the standard deviation of the initial individual responses within the group and the initial responses themselves are both positively related to polarization on Scenario 3. The amount of normative influence is negatively related to polarization. Multiple $R^2 = .163$.

Internalization on Scenario 3 was submitted to a stepwise multiple regression analysis as well. Compared to the equation for polarization for Scenario 3, several other variables, including sex of subjects, have been added to the model. The regression analysis is shown in Table 25.
Table 25

Regression Analysis: Internalization on Scenario 3

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>p&lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD of Scenario 3</td>
<td>.448</td>
<td>.063</td>
<td>.392</td>
<td>7.145</td>
<td>.000</td>
</tr>
<tr>
<td>SD of Scenario 4</td>
<td>-.389</td>
<td>.063</td>
<td>-.337</td>
<td>-6.147</td>
<td>.000</td>
</tr>
<tr>
<td>Sex</td>
<td>.448</td>
<td>.133</td>
<td>.193</td>
<td>3.356</td>
<td>.001</td>
</tr>
<tr>
<td>SD of Scenario 5</td>
<td>.237</td>
<td>.058</td>
<td>.232</td>
<td>4.078</td>
<td>.000</td>
</tr>
<tr>
<td>SD of Scenario 7</td>
<td>-.148</td>
<td>.058</td>
<td>-.146</td>
<td>-2.576</td>
<td>.011</td>
</tr>
<tr>
<td>SD of Scenario 2</td>
<td>-.169</td>
<td>.068</td>
<td>-.142</td>
<td>-2.496</td>
<td>.013</td>
</tr>
<tr>
<td>Pcvd. Relaxed</td>
<td>.136</td>
<td>.051</td>
<td>.143</td>
<td>2.653</td>
<td>.008</td>
</tr>
<tr>
<td>Initial Indiv.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resp. Scen. 5 (const)</td>
<td>.049</td>
<td>.023</td>
<td>.120</td>
<td>2.109</td>
<td>.036</td>
</tr>
</tbody>
</table>

The standard deviation of initial individual responses on Scenarios 3 and 5, being female, perceiving the group as relaxed, and initial individual responses on Scenario 5 are all positively related to internalization on Scenario 3, while the initial individual responses on Scenarios 4 and 7 show a negative relationship. Multiple R²=.402.

Regression analyses were also used to further investigate the variables which affect normative and informational influence. Table 26 presents the regression analysis for amount of informational influence,
Table 26

Regression Analysis: Total Normative Influence

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>p&lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD of Scenario 4</td>
<td>2.624</td>
<td>.870</td>
<td>.192</td>
<td>3.014</td>
<td>.003</td>
</tr>
<tr>
<td>Idealism (constant)</td>
<td>-1.370</td>
<td>.523</td>
<td>-.167</td>
<td>-2.620</td>
<td>.009</td>
</tr>
<tr>
<td></td>
<td>59.675</td>
<td>3.955</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The standard deviation for Scenario 4 was positively related to normative influence and idealism was negatively related. These were the only two variables to contribute to the stepwise regression and the multiple $R^2$ was only .065. The amount of informational influence was somewhat better predicted as shown in Table 27.

Table 27

Regression Analysis: Total informational Influence

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>p&lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex Similarity</td>
<td>-11.041</td>
<td>2.695</td>
<td>-.250</td>
<td>-4.097</td>
<td>.000</td>
</tr>
<tr>
<td>SD of Scenario 7</td>
<td>2.197</td>
<td>1.166</td>
<td>.120</td>
<td>1.884</td>
<td>.061</td>
</tr>
<tr>
<td>SD of Scenario 1</td>
<td>4.545</td>
<td>1.291</td>
<td>.229</td>
<td>3.520</td>
<td>.000</td>
</tr>
<tr>
<td>SD of Scenario 3</td>
<td>-3.342</td>
<td>1.340</td>
<td>-.162</td>
<td>-2.493</td>
<td>.013</td>
</tr>
<tr>
<td>SD of Scenario 2</td>
<td>3.017</td>
<td>1.382</td>
<td>.139</td>
<td>2.183</td>
<td>.030</td>
</tr>
<tr>
<td>(constant)</td>
<td>24.482</td>
<td>6.525</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Same-sex groups produced less informational influence. The standard deviation of some scenarios led to more informational
influence statements, but in one case (Scenario 3) informational influence decreased. Multiple $R^2 = .183$.

In summary, regression analyses showed satisfaction to be based on a variety of group attributes including similarity. Perceptions of similarity were based on satisfaction with the group and on small initial differences in response to the first scenario, but not, as might be expected, based on group composition variables. On the scenario which conformed to the hypothesized relationship for values similarity and polarization, values similarity did lead to polarization, as did the standard deviation on the initial scenario. Perceived friendliness of the group led to polarization while satisfaction showed a negative relationship. In contrast to polarization, sex of subjects did have an effect on internalization as did variation in initial responses. Normative and informational influence were predicted by different variables, but neither were related to group composition variables. Discussion of conclusions to be drawn from these relationships will be addressed in the next section.
CHAPTER IV
DISCUSSION

The purpose of this study was to examine the dynamics of diversity relative to group decision processes, group polarization in particular. Toward that end, group composition was manipulated such that individuals were either similar or dissimilar to one another regarding their sex and values. Two hundred forty subjects participated in groups of four to make individual and group decisions on the appropriate risk level to advocate in a series of scenarios. Individual and group consensus decisions were compared to determine degree of polarization. Individuals also assessed their own satisfaction with the group as well as their perceptions of similarity of the group as a whole and their own similarity to other group members. Differences in normative and informational influence processes within the group discussion were also explored.

This study extends the line of inquiry of diversity in team/group processes by investigating the effects of the existence of more than one diversity variable simultaneously, exploring the relevance of values as a diversity variable while questioning the assumption that demographic diversity variables are necessarily indicators of underlying psychological diversity variables. It also emphasized the
distinction between perceived and actual similarity and examined the role of normative and informational influence processes in group decision making.

The desired study conditions were created. Groups were comprised of all males, all females, or two males and two females; groups were also composed of individuals adequately similar or dissimilar on the values measure. Differences in values were made apparent to individuals in the first decision scenario and were realized and reported by group members.

Four hypotheses were tested. The first, second, and third hypotheses did not receive support, and the fourth hypothesis was partially supported. Additional exploratory work was also conducted. Discussion of the results will be directed first toward the hypotheses, followed by perceptions of group members, and concluding with the exploratory findings on normative and informational influence.

Results for Hypotheses

Hypotheses 1 and 2

Hypothesis one was concerned with whether more homogeneous groups would demonstrate more polarization than more heterogeneous groups. Although polarization occurred across all conditions, contrary to the hypothesized prediction, in most cases, more homogeneous groups did not polarize more than heterogeneous groups. Hypothesis 1a predicted that groups which are homogeneous with regard to sex would polarize more than those which are heterogeneous on sex. None of the scenarios
followed this pattern. Hypothesis 1b predicted that more homogenous values groups would polarize more than more heterogeneous values groups. This prediction was supported only for Scenario 4 which concerned an engineer deciding whether to pursue a new job with a new company where he could make more money, or to remain with the stability of his present job. It is curious why this scenario showed the predicted effect while the others did not. There was no correlation between position or polarization and the values measure.

Hypothesis 1c predicted an interaction between sex and values composition within the groups such that groups that were more homogeneous on both variables would polarize more than groups which were homogeneous on only one variable. The data did not support this hypothesis; however, Scenario 3 showed a significant interaction whereby groups which were similar on one attribute but not the other polarized most. It may be that there is some optimal level of similarity in groups. Perhaps there needs to be enough similarity for group members to feel comfortable, but enough diversity for them to be influenced.

Hypothesis 2 was similar in phrasing to Hypothesis 1; however, this prediction concerned internalization. Hypothesis 2 predicted that more homogeneous groups would polarize more than more heterogeneous groups. Again, much as for Hypothesis 1, although groups did internalize, there was no difference between conditions in internalization, in most cases. More specifically, Hypothesis 1a predicted that groups which were homogeneous with regard to sex would internalize more than
groups which were heterogeneous. None of the scenarios supported this hypothesis. Hypothesis 1b predicted that groups which were more homogeneous in values would internalize more than groups which were more heterogeneous. This prediction was supported only in Scenario 4 (the same scenario that supported Hypothesis 1).

Hypothesis 2c predicted an interaction between sex composition and values composition such that groups that were more homogeneous on both attributes would internalize more. None of the scenarios demonstrated the hypothesized interaction. There were significant differences between conditions only for Scenario 3. The interaction between conditions in Scenario 3 was of the same form as for Hypothesis 1c; groups that were homogenous on one attribute only were the ones that internalized most.

Since Hypotheses 1 and 2 were based on similar logic and received similar results, they will be discussed together. There are several plausible reasons for the findings obtained for the first hypothesis. First, subjects may have identified themselves most strongly as "College students enrolled in Psychology 100" rather than either by sex or values. This is unlikely, however, because ratings of perceived similarity were not high enough to support the idea of "Psychology 100 Students" as the overwhelming categorization factor. Moreover, previous research has shown that individuals do readily categorize on other attributes even when they share the same organizational identity (e.g., Tsui et al. 1992).
It may be the case, however, that although subjects perceived only average similarity, they did not feel strongly dissimilar either. Although not identifying themselves strongly as college students, they nevertheless felt that other group members belonged in that setting and were not, then, vastly different from themselves. This may not be the case, however, in a business setting where it is relatively new or perceived as undesirable to have women in a previously all-male decision group for example.

Finally, another possible reason for the above findings is that group polarization is such a robust phenomenon that this effect is stronger than any effect diversity might have. This is where the importance of using an input-process-output model is demonstrated. Some component of the group processes may mediate the relationship of composition to amount of polarization. As will be discussed further in the section on exploratory analysis of normative and informational influence, group interaction is likely to play an important role.

Hypothesis 3

Hypothesis 3 made two predictions, one for heterogeneous groups and one for homogeneous groups. Hypothesis 3a predicted that in more heterogeneous groups, polarization (pretest-group consensus differences) would be greater than internalization (pretest-posttest differences). In contrast, hypothesis 3b predicted that in more homogeneous groups, polarization and internalization would not be significantly different. Overall comparisons of mean polarization and mean internalization showed that polarization was greater than internalization,
although this difference was significant only for Scenario 3. This finding implies that groups tended to revert back somewhat to their initial responses when they were away from the direct influence of the group and responses were private. No support was found for the hypothesized composition by trial (i.e., polarization versus internalization) interaction. Means were in the direction hypothesized for values composition but differences were not significant. Means for sex composition were in the opposite direction from that hypothesized, but again did not reach significance.

Although the relationship did not reach significance, the fact that values composition supported the hypothesis but sex composition did not provides support for the idea that different types of diversity variables have different effects on group processes and outcomes. This is exactly the reasoning behind investigating more than one type of diversity variable, and in particular, investigating demographic and psychological variables separately but concurrently. The reasons and implications for the different effects of sex and values composition will be discussed below.

Hypothesis 4

Hypothesis 4 made specific predictions for the effect of sex on risk level and polarization. Hypothesis 4a predicted that males would give responses with greater risk levels than females on a male-oriented item, while females would advocate greater risk levels on a female-oriented scenarios. This hypothesis was supported for male-oriented scenarios but not female-oriented ones.
Hypothesis 4b predicted that males would polarize more on a male-oriented task and females would polarize more on a female-oriented task. Results showed marginal support for males polarizing more on a male-oriented task but no support for females polarizing more on a female-oriented task. Since Hypothesis 4b builds on the outcome of Hypothesis 4a, these results are not entirely surprising. Polarization is in part a function of the initial position; thus, if there is no initial difference in risk advocacy, it is less likely for there to be a difference in polarization.

Thus, males were more risky only for male-oriented topics, not just any topic, and there were no differences for polarization. Previous group polarization research has not examined the role of male- or female-oriented content. Other research on gender and sex differences (besides group polarization research) has investigated sex-related knowledge domains (e.g. Brown, Dovidio, & Ellyson, 1990; Dovidio, Brown, Heltman, & Ellyson, 1988). Results of these studies showed that the gender content of the task predicted greater amounts of speech and other dominance behaviors for the individuals whose sex matched the discussion topic. Similarly, persuasion research has found that individuals are more easily influenced if they lack information about a topic, i.e., it is oriented to the opposite sex (e.g., McGuire & Papageorgis, 1961). The present findings and the hypothesized result are inconsistent with this finding on persuasibility. If, for a same-sex scenario, higher initial risk leads to greater polarization and
less influenceability, these two effects may cancel each other out, resulting in no difference in polarization.

Perceptions of Similarity

Individuals in same sex groups did perceive their groups as being more similar than individuals in mixed-sex groups. Moreover, individuals recognized differences between idealistic and realistic group members. There was no difference, however, in perceptions of similarity between more homogeneous and more heterogeneous group members on values; the recognition of values differences did not influence their overall perceptions of the similarity of the group.

This lack of impact for similar and dissimilar values members is likely to have occurred for several reasons. It may be because "idealism" is but one value among many upon which group members could differ. Although idealism was made salient by discussion of the first scenario, no doubt other values were implicated as well in that and other scenarios and in group members' interaction behavior (i.e., interrupting when others are speaking, being open-minded toward other views, etc.).

Alternatively, subjects may have based their perceptions of values similarity on sex diversity because individuals are more concerned with surface differences or with those differences which are more readily apparent. In this regard, Fiske and Neuberg (1990) review literature which suggests that the most likely feature for categorization is one which is physically manifested (e.g., McArthur & Baron, 1983; Stangor, Lynch, Duan, & Glass, 1992). A physical feature is more
salient and easier to detect. Furthermore, individuals often act as "cognitive misers" (Tetlock, 1983); thus, if sex is used as a basis for inferring underlying psychological attributes (as often occurs; e.g., Hamilton & Rose, 1980), individuals will look no further than demographic differences to assess similarity. In fact, previous research has found that even though men and women do not differ on work values, individuals predicted that there would be sex differences in values (Sanders, 1993). A physical feature is also more likely to be a nominal variable rather than a ordinal attribute or continuum (Fiske & Neuberg, 1990), thus making it easier to define "differentness."

Furthermore, although categorizing individuals according to more than one category provides more meaningful information (e.g., Brewer, Dull & Lui, 1981; Deaux, Winton, Crowley, & Lewis, 1985), individuals must be motivated to obtain this richer information (Stangor et al., 1992).

These findings would explain why subjects more readily perceived similarity/dissimilarity due to sex and not values. Sex is both a salient physical feature and one in which there are two explicit categories. In situations of repeated interaction over a longer period of time, however, there is some evidence that individuals will begin to use greater amounts of information to assess individual attributes (Fiske & Neuberg, 1990). They would have more access to information and in the face of anticipated future interaction they would be motivated to gather information in lower level categories or sub-categories.
Further clues as to subjects' thought processes are provided by their responses when asked to check off which attributes contributed to their assessment of similarity. Although same-sex groups were more likely to check off "Gender," more homogeneous values groups were not more likely (than more heterogeneous values groups) to check off "Values." Taken together, this is consistent with the finding that differences in perceived levels of similarity varied according to sex composition but not values composition. What is interesting, however, is that mixed-sex groups were more likely to check off values as a reason for their lower level perceived similarity, whether or not values were, in fact, similar. This suggests that individuals do, in fact, see sex as an indicator of values (whether this assumption is accurate or not).

Mixed-sex groups were also more likely than same-sex groups to check off "Knowledge" as a reason for their lower level perceived similarity. This finding also provides support for the idea that once differences of one sort are highlighted, individuals look for other differences as well. On the other hand, since this study used scenarios which were male- and female-oriented, mixed-sex groups legitimately did offer more diverse knowledge in terms of reasons for advocating a certain position.

Masculinity-Femininity. Subjects were given Spence and Helmreich's (1978) PAQ to assess whether group composition affected perception of their own masculinity or femininity. Although not statistically significant in each case, males in mixed-sex groups did
respond in a more "masculine" fashion and females responded in a more "feminine" fashion. This finding implies that sex composition was salient and affected individual's thought processes at least at some level.

**Exploratory Findings**

The main goal of the exploratory analysis was to determine whether more similar versus more diverse groups used different influence processes in their discussions to come to a group consensus on their position with regard to the decision making scenarios. The specific influence processes to be investigated were normative versus informational influence, that is, influence based on group/societal norms versus influence based on logic or facts (Kaplan & Miller, 1987). Since reasoning could be established to predict more or less normative or informational influence for both similar and diverse groups, no hypothesis were proposed.

Across all conditions, the proportion of statements that were classified as normative influence and those that were classified as informational influence was roughly equal. This is in part due to the nature of the task (coming to consensus on a position according to odds one would accept) and the fact that proposing odds is classified as normative influence. It is clear that both normative and informational influence must play a role in the group discussion processes to arrive at a consensus.

The number and proportion of types of statements were also compared across conditions. Individuals in similar values groups made
a greater percentage of "Informational Influence" statements. This finding is consistent with subject's own perceptions of the group influence process as assessed by the post-discussion questionnaire. Subjects in homogeneous values groups stated that the group relied on the odds group members advocated or the reasons for those odds in order to form their group consensus. (Odds correspond to normative influence and reasons to informational influence). Together, these findings support the idea that groups which are similar are more likely than dissimilar groups (at least in terms of values) to use informational influence.

It seems clear from the data that the notion of sex composition must be viewed not simply in terms of the degree of homogeneity or heterogeneity but also in terms of the actual sex of the homogeneous group. Females in same-sex groups had a higher proportion of "Agreeing with Informational Influence" and (consequently) a lower proportion of "Giving Informational Influence." On the other hand, at least in the case of the neutral scenarios, males gave more influence (normative or informational) than females. These findings are consistent with other research on interaction processes (e.g., Mabry, 1985) which has found females to use more communal and less dominant types of interaction. Agreeing with others may be a means of achieving communal outcomes (Eagly, 1987). The present study also found that in several instances, females were less likely to state reasons (even if they had previously written them down). Perhaps they were reluctant to give reasons if this would result in conflict within the group.
As previously stated, there has been comparatively little research on the effects of mixed-sex groups. The present study found that in terms of numbers of statements, individuals in mixed-sex groups made more "Informational Influence" statements, and more specifically, "Giving Informational Influence" statements, as well as "Giving Influence" of any kind (normative plus informational). If giving more informational influence implies that more facts and logic are at the group's disposal, then a mixed-sex group has positive implications for organizations in terms of effective decision making. However, it should be kept in mind that giving more information did not necessarily lead to more actual influence in terms of polarization. Even though information is being disseminated, it had no greater effect in convincing others to adjust their views. It may be that members of the opposite sex are not seen as credible or persuasive communicators. Often similar people are seen as more credible (Jordan, 1953).

Additionally, individuals may have been reacting against what they perceived as overly strong influence attempts (Brehm, 1972). The pressure to change one's position in the face of a mandate to come to a group consensus may have actually produced less change than the amount of information at the group's disposal would predict.

Sex composition and values composition demonstrated some interactive effects as well. On several scenarios, including the male-oriented scenarios, the greatest difference in number of "Informational Influence" statements occurred between individuals in all-male groups who had similar values and those with dissimilar values. Those with
similar values made more "Informational Influence" statements. This interaction follows the same form as observed for time spent in group discussion. It appears that males among others with similar values feel more comfortable giving reasons for their views than do males among dissimilar others.

Finally, in terms of types of values (regardless of composition), realistic (low idealism) individuals had a greater percentage of statements classified as "Informational Influence," and more specifically, "Giving Informational Influence," as well as "Giving Normative Influence." Also, these subjects had a lower percentage of "Agreeing with Informational Influence." In some cases, individuals in dissimilar values groups and realistic (low idealism) subjects gave more influence (normative and/or informational). Interpersonal influence is thus due to characteristics of the individual as well as the group.

Time and total statements. In addition to particular types of influence, conditions were compared in terms of the time spent on the group discussion and the total number of statements. Looking at the discussion as a whole, mixed-sex groups spent more time in discussion than did same-sex groups. This finding is consistent with Jackson's (1992) prediction that heterogeneous groups will spend more time in resolving issues that require consensus-building. This finding has at least two possible reasons. First, college undergraduates may simply have been more motivated to spend time interacting in a mixed-sex group. On the other hand, individuals of different sexes may have had
greater resources to provide information for assessing the issue at hand.

Homogenous values groups also spent more time in group discussion than did heterogeneous values groups on many scenarios. Since giving more reasons would also take more time, this finding supports the questionnaire results showing that more homogeneous values groups give more reasons. Finally, discussions of several scenarios showed an interaction whereby all-male, similar value groups spent more time than all-male dissimilar value groups. Having similar values appears to play an important role for males; the results for time and informational influence imply that similar values males felt more comfortable to discuss all relevant reasons regarding the issue to be decided rather than simply spending more time expressing their agreement with one another.

Results for the total statements made by the group closely follow results for time. This is logical since more statements require more time in order to be made. Specifically, discussions in mixed-sex groups included more statements than in same-sex groups.

Conclusions from Exploratory Analyses

The results of the exploratory findings can be distilled into three important points. First, it is apparent that processes within similar and dissimilar groups differ according to the diversity variable in question. A second point concerns the role played across conditions by informational influence. Finally, examination of the results for discussion content in conjunction with polarization and
internalization reveals a curious relationship between amount of influence and resultant change in position. These three points will be discussed in further detail.

As is made clear from the results of the present research, effects of diversity are diverse. Values composition and sex composition promoted different levels of normative and informational influence process. Values similarity led to increased informational influence, while diversity of sex composition led to increased informational influence. It should also be noted that individual-level variables (e.g., idealism vs. realism) as well as composition variables contribute to levels of influence. Both levels must therefore be considered.

Examining the results as a whole according to the classification of the group discussion, it appears that Informational Influence, Giving Influence, and the intersection of these two categories, Giving Informational Influence provide the key differences between conditions. This finding is consistent with the Burnstein and Vinokur view that persuasive arguments are of the most importance in group polarization. Nevertheless, it should also be recognized that approximately half of the statements are classified as normative influence; thus, normative influence plays a role in polarization as well.

Additionally, these results show that amount of time as well as content of that time differs for groups with different composition. Mixed-sex groups take longer to come to a consensus, make more statements, and give more influence, particularly informational influence. Similar values groups were more likely to use informational
influence than normative influence. Additionally, males among other males with similar values were more likely to give informational influence.

It is curious, however, that greater amount of influence does not increase polarization. One would expect based on previous research and theory that the more influence occurring in the group discussion, the greater the difference between the initial individual responses and the group consensus. In fact, the number of normative influence statements can actually reduce polarization. A possible explanation for this, as well as for why composition had no effect on polarization, is that more homogeneous groups came to a consensus more readily and thus polarized without a great deal of discussion and influence attempts. In contrast, more heterogeneous groups tried to influence each other and polarization occurred despite influence attempts. The dissemination of knowledge/reasons was helpful, but group members may have felt resistant as well. In fact, heterogeneous groups may have polarized more than homogeneous groups were it not for reactance to the influence. Turner and Oakes (1986) assert that shared identification with a group is a precondition for mutual influence; shared identification may be what mitigates against resistance to change.

Conclusions

Group polarization has often been viewed as exhibiting a conformity dynamic (e.g., Turner, 1987). The key role that normative and informational influence have been shown to play in the present study argues for viewing polarization as being a result of persuasion
processes as well. In her review of sex differences in influenceability, Eagly (1978) defines a persuasion situation as one where "an influencing agent gives his or her position on an issue and presents arguments supporting the position" (p. 89). This definition describes the typical group polarization paradigm. In contrast, in conformity studies, "participants are informed that the source holds a particular belief or attitude, but arguments are not provided to support this position (Eagly, 1978, p. 91). Although this description applies to group polarization studies in which the goal is to determine the role of social comparison or normative influence, it pertains only to a particular subset of group polarization research. I argue that by examining group polarization in the light of the large body of persuasion research, this phenomena and its role in decision making can be better understood.

One example of how persuasion theory is relevant for group decision making, particularly polarization, is found in Petty and Cacioppo's (1986) Elaboration Likelihood Model. The finding in the present study that both informational and normative influence were present implies that both central and peripheral route processes were in effect. Composition can cue which persuasion route will be taken, as evidenced by the effect of composition on amount of informational influence attempts. Additionally, as discussed above, reactance is another potentially relevant persuasion phenomena.

Self-categorization. Although this study was not designed as a test of self-categorization theory, it does offer some insight into the
validity of a self-categorization explanation for group polarization. Self-categorization theorists (e.g., Turner & Oakes, 1989) view self-categorization theory as competing with the "dual process" theory of normative and informational influence. Although SCT certainly adds some insight and makes some valuable points, it is not valid to view it as a replacement for the dual process model. On the positive side, self-categorization theorists emphasize influence in general as a group process, not just influence between individuals. Additionally, they provide an explanation of why groups polarize to a more extreme position rather than merely the average, recognizing that influence has its effect in part by virtue the contrast with those outside the group.

Neither of these insights, however, detract from the idea of normative and informational influence occurring within a group or the role of normative and informational influence in group polarization. The present study, by investigating the group discussion itself, highlights the importance of these influence processes. Both normative and informational influence were present and normative influence predicted amount of polarization. Additionally, perceived similarity (i.e., salience of within group differences) did not lead to differences in amount of polarization.

One reason Turner and his colleagues are blind to the merits of normative and informational influence is that they do not consider the importance of the group decision rule—or any decision at all. Abrams et al. (1990, Experiment 3) purport to compare categorization with normative and informational effects. They cite their study as an
improvement of Vinokur and Burnstein's (1978) test of the effect of subgroups on polarization because their subgroups were not required to reach a consensus, a condition they feel occasions a higher group identity even in the presence of subgroups. In contrast, I would argue that the mandate to make a decision, as well as the decision rule is a vital aspect of the group interaction—as shown in this study as well as being generalizable to conditions for group interaction and decision making in organizations. If groups tend to converge and polarize even in the presence of subgroups (as found by Vinokur and Burnstein, 1978), this works against a self-categorization theory explanation.

Furthermore, Ashforth and Mael (1989) in their review of the organizational implications of social identity theory recognize an important distinction between social identification (or categorization) and internalization (incorporation of the groups values, etc.): "acceptance of the category as a definition of the self does not necessarily mean acceptance of those values and attitudes" (p. 22). The results of the present study imply that the group processes, namely normative and informational influence, occurring subsequent to self-categorization (if any occurs) have strong implications for polarization and internalization.

Sex differences. It has been suggested (Wood, 1987) that in terms of sex and sex composition, input-process-output models (e.g., McGrath, 1964) has received only little investigation of the process-output linkage and even less support. This study has examined all
three stages and found results which have implications for gender
diverse work teams in organizations.

Although no differences were found in polarization due to sex
composition, investigation of the group interaction processes found
that sex composition did play a role in group influence attempts.
These influence attempts did not, however, affect polarization. Since
influence is at least in part a function of the credibility of the
influencer (Hovland et al., 1953), it may be that individuals view
others of the same sex as more credible. Balance theory (Heider, 1958)
would suggest that individuals would find similar others more persua-
sive. Several other studies also have found that individuals are more
greatly influenced by others of the same sex (Crano, 1970; Morelock,

Role of Values. The content of the values themselves had little
effect on the group processes and outcomes. This is consistent with
previous research by Van Dyne (1993) and others in which subjects
interacted for a relatively short time. Realistic individuals did give
more influence, both normative and informational. There was no impact
on polarization or internalization, however. Although the idealism-
realism distinction was relevant to the task, it may be that it had no
impact on an ad hoc group interacting in the limited time frame of the
current study. Repeated interaction may highlight the ramifications
for the group of group members advocating certain values.
Implications

The preceding discussion leads to several implications for practice which center around training for teamwork as well as encouraging more accurate perceptions of group members.

Fostering credibility. Since, as previously discussed, one reason why influence attempts did not lead to polarization may have been a lack of credibility on the part of the influencer, managers should foster knowledge of credibility or expertise among group members. Pettigrew and Martin (1987) note in their discussion of diversity management strategies that employers should provide information on employee's competencies prior to their start date. This approach would apply to newly formed teams as well. If group members are seen as credible, appropriate influence should occur.

Avoiding stereotypes. Results in this study also suggest that individuals have stereotyped views of other individuals based on gender, and that perceived similarity is a function of these stereotypes. Training group members to avoid stereotypes would also facilitate group interaction. Fiske and Neuberg (1990) cite three factors which lead people to ignore stereotypes. First, if personal information is available, stereotypes lose impact. This factor confirms Pettigrew and Martin's (1987) recommendation discussed above. Second, reducing time pressure can improve people's cognitive ability to focus on unique aspects of other individuals. In the present study, although there was sufficient time to complete the study requirements, subjects were aware that only one hour was available. In a real world
setting, time pressure is likely to be even more salient. Finally, individuals must be sufficiently motivated to form a unique rather than stereotyped impression. If group members work interdependently and anticipate future interaction, this may enhance motivation to view others multidimensionally.

Recategorization. In the present study, subjects did not perceive each other as highly similar, but they did not view themselves as comprising subgroups either. Making the common group identity salient in some way may have increased perceived similarity and allowed influence attempts to have more effect on opinion change. Along these lines, Gaertner and his colleagues (Gaertner, Dovidio, Anastasio, Bachman, & Rust, 1993) have found that training group members to view the group as a single group instead of subgroups divided along gender lines reduced intergroup bias. Moreover, bias was reduced by increasing the attractiveness of former out-group members. Training to reduce negative stereotypes, as mentioned above, would be one way to increase attractiveness.

Teamwork training. The above theoretical implications and the practical implications derived from them support the distinction made by several theorists (e.g., Cannon-Bowers et al., 1992; Cannon-Bowers, Salas, & Converse, 1993; Rentsch & Hall, 1994) and research findings (e.g., Hirokawa, 1980; Maier & Maier, 1957; Oser, McCallum, Salas, & Morgan, 1989) between teamwork and taskwork. Teamwork includes communication and interaction among members while taskwork involves the requirements of the task itself. Rentch and Hall (1994) and Cannon-
Bowers et al. (1993) promote the idea that teams share schemas or mental models about what teamwork and taskwork involve and how it should take place. Furthermore, teamwork should not be ignored as a predictor of effective task outcomes. Oser et al. (1989), for example, found that behaviors related to team functioning were related to mission performance. Likewise, Hirokawa (1980) and Maier and Maier (1957) found that implementing or discussing a procedure for work group or team interaction led to more effective outcomes. The point here is that although training of work groups or teams may often focus on competence at the task, interpersonal competence is important as well. This would include accurate perceptions or attributions of group members and willingness to give and receive valid influence.

Limitations

The purpose of this study was to investigate the effects of sex composition and values composition among individuals who had not met before, and hence, knew nothing about each other before the initiation of the study. By using college students, other demographic diversity variables such as age and education could be controlled. Race was also controlled. Although these aspects were intentional in the design of the study, it is recognized that individuals differ in more than two attributes in real life. Even in the present study, subjects could differ on values other than the value of interest. However if, as was the case for relativism (the other value measured by the EPQ) in this study, there were no differences across conditions, other variables
unrelated to idealism would likely be randomly distributed across conditions as well.

A further limitation is that subjects were not permitted to interact over a long period of time. Established and ad hoc groups often engage in different decision making processes, including resolution of conflict (Hall & Williams, 1966). It may be that as individuals interacted repeatedly, categories which are initially salient come to affect perceived similarity less as psychological variables such as values become more well-known. Certainly, stereotypes of others become more accurate when individuals are in frequent contact with members of the stereotyped group (Triandis & Vasiliou, 1967).

Although subjects were involved and interested in the group task, it was the case that decisions made not relevant for group itself; that is, they did not affect group members beyond the duration of the experiment. Obviously, this would not be the case for work groups or teams in organizations where the decision would have to be implemented by the group and would affect organizational life.

It should be noted that we are not attempting to judge whether polarization results in "good" or "bad" decisions. Whether the choice is the optimal one is largely a function of the particular decision to be made and the actual situational favorability as the decision is put into place. Nevertheless, other research efforts in which assessments of decision quality can be made would add to the picture of how process mediates diversity variables and outcomes.
Future Research

Future research should continue to explore diversity variables other than demographic ones, and to study diversity variables concurrently. Demographic variables do not always function as indicators of psychological variables, and as these findings have shown, demographic and psychological variables do not have the same effects on processes and outcomes.

When choosing which variables to consider in terms of composition, the context of the decision and the decision-making group must also be taken into consideration. Diversity appears to be contextually driven. As this study has shown, male-oriented decision tasks had a differential effect for males and females initial decisions. Likewise, certain values may be implicated in the decisions themselves. Although the values investigated in the present study did not effect polarization and internalization, other values may be more strongly related to the decision to be made. Additionally, certain values or other composition variables may be related to the organizational context. Future research should take into account the environment and task content when selecting which group composition variables to investigate.

In a related manner, the importance of the particular diversity variable for the context of the decision may also affect salience of that variable in terms of group composition. Although it was recognized as an important parameter, salience was not manipulated in this study. A significant body of previous research has demonstrated the
effect of salience on categorization and conformity. It has not investigated, however, the conditions under which salience occurs. Unlike the Abram's et al. (1990) proposition that the mere presence of a group leads to categorization according to a group identity, this study shows that, at least in some cases, categories must be made salient. Competition between group members for scarce resources such as promotions or raises may be one specific factor which makes sex categorization salient. Future research should investigate the effects of salience of group composition more intentionally.

Although Driskell and Salas (1992) point out the importance of laboratory research for testing theory, an important parallel stream of research to the present one would be to investigate homogeneity and heterogeneity in work groups or teams with repeated, on-going interactions. It is plausible that through greater interaction and fuller knowledge of other group members, individuals would come to categorize fellow group members in a more detailed, less superficial manner. In time, processes and outcomes may be more strongly impacted by psychological attributes such as values rather than physical attributes of group members.

Based on the results of this study, a fruitful avenue of future research would be to further investigate the role of influence among groups. Although past research on the topic has been extensive, social psychological research and organizational research appear to have pursued separate paths. Social psychological research has typically considered group composition factors such as sex, size and minority
influence. In contrast, organizational research has focused on contextual factors such as air time (Bottger, 1984) or perceived expertise (Littlepage, Schmidt, Whisler, & Frost, 1995) as indicators of influence. Clearly, these streams have much to offer each other. As found in the present study, for example, air time is a function of group composition. Thus, it is important for contextual as well as interpersonal factors to be investigated in conjunction. Structural, social and interpersonal cues may, in fact, create occasions for interaction in terms of influence attempts or susceptibility to influence (e.g., Barley, 1986; Brass & Burkhardt, 1993; Courtwright, Fairhurst, & Rogers, 1989). Moreover, similar results (e.g., greater informational influence) may be brought about by characteristics of the group itself (sex and sex composition as in the present study) or by group intervention (training in reasoning orientation as in Innami, 1994).

Final Comments

The current research highlights the reality that both objective and subjective, both internal and external forces impact the team environment. Actual similarity or diversity of group members does not automatically engender perceptions of similarity or diversity. Interpersonal perceptions are therefore malleable, at least to some extent. At the same time, similarity and diversity do not necessarily lead to different outcomes even if there are differences in the intervening processes.
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Appendix A: Ethics Position Questionnaire
Name ___________________________ Phone Number _________________________

Best time to be reached ____________________________________________

Times usually available to participate in experiments:

  Mondays: ____________________________
  Tuesdays: ____________________________
  Wednesdays: ____________________________
  Thursdays: ____________________________
  Fridays: ____________________________
  Saturdays: ____________________________

  ____ Male  ____ Female

  ____ African-American  ____ White  ____ Hispanic  ____ Asian  ____ other

--------------------------------------------------------------------------------------------------------

Directions: Each of the general statements below represents a commonly heard opinion and there are no right or wrong answers. You will probably disagree with some items and agree with others. We are interested in the extent to which you agree or disagree with such matters of opinion. Indicate the extent to which you agree or disagree by placing in front of the statement the number corresponding to your feelings where:

1=Completely disagree  4=Slightly disagree  7=Moderately agree
2=Largely disagree  5=Neither agree nor disagree  8=Largely agree
3=Moderately disagree  6=Slightly agree  9=Completely agree

___ 1. A person should make certain that their actions never intentionally harm another even to a small degree.

___ 2. Risks to another should never be tolerated, irrespective of how small the risks might be.

___ 3. The existence of potential harm to others is always wrong, irrespective of the benefits to be gained.

___ 4. One should never psychologically or physically harm another person.

___ 5. One should not perform an action which might in any way threaten the dignity and welfare of another individual.
6. If an action could harm an innocent other, then it should not be done.

7. Deciding whether or not to perform an act by balancing the positive consequences of the act against the negative consequences of the act is immoral.

8. The dignity and welfare of people should be the most important concern in society.

9. It is never necessary to sacrifice the welfare of others.

10. Moral actions are those which closely match ideals of the most "perfect" actions.

11. There are no ethical principles that are so important that they should be a part of any code of ethics.

12. What is ethical varies from one situation and society to another.

13. Moral standards should be seen as being individualistic; what one person considers to be moral may be judged to be immoral by other person.

14. Different types of moralities cannot be compared as to "rightness".

15. Questions of what is ethical for everyone can never be resolved since what is moral or immoral is up to the individual.

16. Moral standards are simply personal rules which indicate how a person should behave, and are not to be applied in making judgements of others.

17. Ethical considerations in interpersonal relations are so complex that individuals should be allowed to formulate their own individual rules.

18. Rigidly codifying an ethical position that prevents certain types of actions could stand in the way of better human relations and adjustment.

19. No rule concerning lying can be formulated; whether a lie is permissible or not permissible totally depends on the situation.

20. Whether a lie is judged to be moral or immoral depends upon the circumstances surrounding the action.
Appendix B: Choice Dilemma Questionnaire
Managerial Decision Task

Instructions. On the following pages, you will find a series of situations that are likely to occur in everyday life. The central person in each situation is faced with a choice between two alternative courses of action, which we might call X and Y. Alternative X is more desirable and attractive than alternative Y, but the probability of attaining or achieving X is less than attaining or achieving Y.

For each of the following situations, you will be asked to indicate the minimum odds of success you would demand before recommending that the more attractive or desirable alternative, X, be chosen. For some of the scenarios you will also be asked to give your reasons for choosing those particular odds. (Because of time constraints you will not be asked to do this for each scenario).

Read each situation carefully before giving your judgement. Try to place yourself in the position of the central person in each of the situations.

Example (do not answer)

Henry is a writer who is said to have considerable creative talent but who so far has been earning a comfortable living by writing cheap Westerns. Recently he has come up with an idea for a potentially significant novel. If it could be written and accepted, it might have considerable literary impact and be a big boost to his career. On the other hand, if he is not able to work out his idea or if the novel is a flop, he will have expended considerable time and energy without renumeration.

Imagine that you are advising Henry. Please check the lowest probability that you would consider acceptable for Henry to write the novel.

Henry should write the novel if the chances that the novel will be a success are at least:

___ 1 in 10
___ 2 in 10
___ 3 in 10
___ 4 in 10
___ 5 in 10
___ 6 in 10
___ 7 in 10
___ 8 in 10
___ 9 in 10

Place a check here if you think Henry should attempt the novel only if it is certain (i.e., 10 in 10) that the novel will be a success.
1. XYZ Company is a small manufacturing company established in the 1940's. Many of its employees have worked there all their lives. Although other manufacturing companies are growing, XYZ Company has lost business because it cannot compete with rival companies' prices. The president of XYZ Company is concerned about rising costs and the continued profitability of the company. Stockholders are becoming displeased with the decreasing returns on their investment. The president of XYZ Company has learned about a new production technology that would put the company on a solid financial footing as well as pleasing stockholders. On the other hand, however, the new technology requires fewer workers—part of the savings of the new technology is the lower cost of labor. If XYZ Company lays off workers, the remaining workers have threatened to strike. The president must decide whether to continue as the company always has, but with danger of losing money, or to use the new technology which may raise profits but would likely require laying off loyal, long-time workers. Furthermore, it is unlikely that business would increase enough to ever hire them back.

Imagine that you are advising the president of XYZ Company. Please check the lowest probability that you would consider acceptable for the new technology to be installed.

The president should install the new technology if the chances that no employees will be laid off are at least:

____ 1 in 10
____ 2 in 10
____ 3 in 10
____ 4 in 10
____ 5 in 10
____ 6 in 10
____ 7 in 10
____ 8 in 10
____ 9 in 10

Place a check here if you think the president should install the new technology only if it is certain (i.e., 10 in 10) that no employees would need to be laid off.

BELOW, PLEASE LIST YOUR REASONS FOR CHOOSING THESE ODDS
2. College X's football team is playing its traditional rival, College Y, in the final game of the season. The game is in its final seconds, and College X is behind by one point. The captain of College X's team must decide whether it would be best to settle for an extra point field goal or to attempt a two point conversion.

Imagine that you are advising College X's team captain. Please check the lowest probability that you would consider acceptable for the two point conversion to be attempted.

The team captain should call for the two point conversion if the chances that the play will be a success are at least:

___ 1 in 10
___ 2 in 10
___ 3 in 10
___ 4 in 10
___ 5 in 10
___ 6 in 10
___ 7 in 10
___ 8 in 10
___ 9 in 10

Place a check here if you think the team captain should attempt the two point conversion only if it is certain (i.e., 10 in 10) that the play will work.

BELOW, PLEASE LIST YOUR REASONS FOR CHOOSING THESE ODDS
3. Kathy's school is sponsoring a formal dance at the end of the year. Kathy cannot afford to purchase a gown, so she must make one. In order to have it finished in time, she must start sewing before she knows whether someone will ask her to the dance with him. If she is asked, Kathy will be prepared with a beautiful dress and will have saved a lot of money. On the other hand, Kathy is shy and is by no means certain she will have a date. If this is the case, she will have wasted a lot of time and money for a dress she will not have the opportunity to wear.

Imagine that you are advising Kathy. Please check the lowest probability that you would consider acceptable for Kathy to go ahead and make the dress.

Kathy should make the dress if the chances of her being asked to the dance are at least:

1 in 10
2 in 10
3 in 10
4 in 10
5 in 10
6 in 10
7 in 10
8 in 10
9 in 10

Place a check here if you think Kathy should make the dress only if it is certain (i.e., 10 in 10) that she will be asked to the dance.

Below, please list your reasons for choosing these odds.
4. An electrical engineer, who is married and has one child, has been working for a large electronics corporation since graduating from college five years ago. The engineer is assured of a lifetime job with a modest, though adequate, salary, and liberal pension benefits upon retirement. On the other hand, it is very unlikely that the engineer's salary will increase before retirement. While attending a convention, the engineer is offered a job with a small, newly founded company which has a highly uncertain future. The new job would pay more to start and would offer the possibility of a share in the ownership if the company survived the competition of the larger firms.

Imagine that you are advising the engineer. Please check the lowest probability that you would consider worthwhile for the engineer to take the new job.

The engineer should take the new job if the chances of the new company's survival are at least:

- 1 in 10
- 2 in 10
- 3 in 10
- 4 in 10
- 5 in 10
- 6 in 10
- 7 in 10
- 8 in 10
- 9 in 10

Place a check here if you think the engineer should only take the new job if it is certain (i.e., 10 in 10) that new company will be successful.

Below, please list your reasons for choosing these odds.
5. An American is captured by the enemy in World War II and placed in a prisoner-of-war camp. Conditions in the camp are quite bad, with long hours of hard physical labor and a barely sufficient diet. After spending several months in this camp, the American notes the possibility of escape by hiding in a supply truck that shuttles in and out of the camp. Of course there is no guarantee that the escape would prove successful. Recapture by the enemy could well mean execution.

Imagine that you are advising the prisoner-of-war. Please check the lowest probability that you would consider acceptable for an escape to be attempted.

The prisoner should try to escape if the chances of success are at least:

____ 1 in 10
____ 2 in 10
____ 3 in 10
____ 4 in 10
____ 5 in 10
____ 6 in 10
____ 7 in 10
____ 8 in 10
____ 9 in 10

(place a check here if you think the prisoner-of-war should try to escape only if it is certain (i.e., 10 in 10) that his escape will be successful.)

GO TO THE NEXT PAGE (do not list reasons for your choice)
6. Mary, a college senior, has studied the piano since childhood. She has won amateur prizes and given small recitals, suggesting that she has considerable musical talent. As graduation approaches, she has the choice of going to medical school to become a physician, a profession which would bring certain prestige and financial rewards; or entering a conservatory of music for advanced training with a well-known pianist. Mary realizes that even upon completion of the piano studies, which would take many more years and a lot of money, success as a concert pianist would not be assured.

Imagine that you are advising this student. Please check the lowest probability that you would consider acceptable for the student to continue with musical training.

Mary should pursue musical training if the chances of success as a concert pianist are at least:

_____ 1 in 10
_____ 2 in 10
_____ 3 in 10
_____ 4 in 10
_____ 5 in 10
_____ 6 in 10
_____ 7 in 10
_____ 8 in 10
_____ 9 in 10

_____ Place a check here if you think the student should attempt pursue musical training only if it is certain (i.e., 10 in 10) that she will be successful as a concert pianist.

GO TO THE NEXT PAGE (do not list reasons)
7. A competent chess player is participating in a national chess tournament. In an early match the player draws the top-favored player in the tournament as an opponent. The merely competent player has been given a relatively low ranking in view of the performance in previous tournaments. During the course of play with the top-favored player, the merely competent player notes the possibility of a deceptive though risky maneuver which might bring a quick victory. At the same time, if the attempted maneuver should fail, the competent player would be left in an exposed position and defeat would almost certainly follow.

Imagine that you are advising the competent player. Please check the lowest probability that you would consider acceptable for the risky play in question to be attempted.

The competent chess player should make the risky play if the chances of victory are at least:

___ 1 in 10
___ 2 in 10
___ 3 in 10
___ 4 in 10
___ 5 in 10
___ 6 in 10
___ 7 in 10
___ 8 in 10
___ 9 in 10

Place a check here if you think the player should attempt the risky play only if it is certain (i.e., 10 in 10) that it will succeed.

STOP (do not list reasons for your choice)
Appendix C: Final Questionnaire
Decision Making: Assessment Questionnaire

I would like to get your perceptions about the group decisions you just made (choosing odds). Please answer the following questions as best you can.

1. Overall, how satisfied were you with the group decisions?
   1 2 3 4 5 6 7
   Unsatisfied Very satisfied

2. Overall, how satisfied were you with the way the group made its decisions?
   1 2 3 4 5 6 7
   Unsatisfied Very satisfied

3. Which person influenced the group's consensus decisions...
   most?
   second?
   third?
   all the same

4. Which person influenced your final individual decision ratings (after the group consensus decisions). Which person influenced you...
   most?
   second?
   all the same
   third?

5. How well did you like the other members of your group?
   1 2 3 4 5 6 7
   Neither liked Liked very well
   nor disliked

6. To what extent would you desire to work with the same group again on a decision making task?
   1 2 3 4 5 6 7
   Unlikely Very likely

7. How would this group compare to others you have come into contact with?
   1 2 3 4 5 6 7
   Very unfavorably Very favorably
8. To what extent do you perceive your group as being similar or dissimilar to each other?

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<td>Very dissimilar</td>
<td>Average</td>
<td>Very similar</td>
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</tbody>
</table>

Similarity

This perception is based on . . . (check all that apply)

- [ ] Personality
- [ ] Age
- [ ] Knowledge
- [ ] Race
- [ ] Values
- [ ] Gender

(Note: For the following questions, please check off the space provided and skip the item corresponding to your identification letter).

9. To what extent do you perceive yourself as being similar or dissimilar to Participant A?

- [ ] I am Participant A

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<tr>
<td>Very dissimilar</td>
<td>Average</td>
<td>Very similar</td>
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</tr>
</tbody>
</table>

Similarity

This perception is based on . . . (check all that apply)

- [ ] Personality
- [ ] Age
- [ ] Knowledge
- [ ] Race
- [ ] Values
- [ ] Gender

Based on his/her responses to the scenarios, would you describe this person as:

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<th>3</th>
<th>4</th>
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<th>7</th>
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<td>Realistic</td>
<td></td>
<td></td>
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To what extent would you desire to work with this person again on a decision making task?

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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tbody>
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<td>No preference</td>
<td>Very much</td>
<td></td>
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10. To what extent do you perceive yourself as being similar or dissimilar to Participant B?

- [ ] I am Participant B

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<tbody>
<tr>
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<td>Average</td>
<td>Very similar</td>
<td></td>
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</table>

Similarity

This perception is based on . . . (check all that apply)

- [ ] Personality
- [ ] Age
- [ ] Knowledge
- [ ] Race
- [ ] Values
- [ ] Gender
Based on his/her responses to the scenarios, would you describe this person as:

1 2 3 4 5 6 7
Idealistic Realistic

To what extent would you desire to work with this person again on a decision making task?

1 2 3 4 5 6 7
Not at all No preference Very much

11. To what extent do you perceive yourself as being similar or dissimilar to Participant C?

___ I am Participant C

1 2 3 4 5 6 7
Very dissimilar Average Very similar
Similarity

This perception is based on . . . (check all that apply)

___ Personality ___ Age
___ Knowledge ___ Race
___ Values ___ Gender

Based on his/her responses to the scenarios, would you describe this person as:

1 2 3 4 5 6 7
Idealistic Realistic

To what extent would you desire to work with this person again on a decision making task?

1 2 3 4 5 6 7
Not at all No preference Very much

12. To what extent do you perceive yourself as being similar or dissimilar to Participant D?

___ I am Participant D

1 2 3 4 5 6 7
Very dissimilar Average Very similar
Similarity

This perception is based on . . . (check all that apply)

___ Personality ___ Age
___ Knowledge ___ Race
___ Values ___ Gender
Based on his/her responses to the scenarios, would you describe this person as:

1 2 3 4 5 6 7
Idealistic Realistic

To what extent would you desire to work with this person again on a decision making task?

1 2 3 4 5 6 7
Not at all No preference Very much

13. Please rank your fellow group members, in order, from most similar to least similar to yourself.
   First: ______
   Second: ______ all the same _____
   Third: _____

14. Often, groups have a tendency to make decisions in one of two ways. Of the two typical ways in which groups make decisions, which comes closer to describing your group?

1 2 3 4 5 6 7
We compared We each gave
the odds that reasons
everyone initially others hadn't
put down thought of.

15. Did you pay more attention to your fellow group members' rankings (the specific odds they chose) or their reasons (arguments for supporting the rating they chose) when you were trying to reach a group consensus?

1 2 3 4 5 6 7
Rankings Reasons

16. Was it your fellow group member's rankings or their reasons for those rankings that had the most impact on your support of the group's consensus decisions?

1 2 3 4 5 6 7
Rankings Reasons

17. Did you pay more attention to your fellow group members' rankings (the specific odds they chose) or their reasons (arguments for supporting the rating they chose) when you formulated your individual decisions after the group consensus?

1 2 3 4 5 6 7
Rankings Reasons

18. Was it your fellow group member's rankings or their reasons for those rankings that had the most impact on your final individual decisions?

1 2 3 4 5 6 7
Rankings Reasons
19. To what extent would you be likely to agree with a decision the rest of the group made if you were not there to participate and shape the outcome?

1  2  3  4  5  6  7
Very unlikely  Very likely

20. How important to you was it that the group agreed with your views?

1  2  3  4  5  6  7
Very important  Not at all important

21. To what extent did you agree with the group's set of decisions?

1  2  3  4  5  6  7
None  Few  Some  Most  All

22. Please characterize the nature of the interaction in your group:

a) 1  2  3  4  5  6  7
Cautious  Risky

b) 1  2  3  4  5  6  7
Forced  Relaxed

c) 1  2  3  4  5  6  7
Friendly  Adversarial

d) 1  2  3  4  5  6  7
Informative  Not informative

e) 1  2  3  4  5  6  7
Cohesive  Not cohesive

23. Would you describe yourself as:

1  2  3  4  5  6  7
Idealistic  Realistic
Letter ID ______  

**Personal Assessment**

The items below inquire about what kind of person you think you are. Each item consists of a pair of characteristics, with the letters A-E in between. Each pair describes contradictory characteristics—that is, you cannot be both at the same time. The letters form a scale between the two extremes. You are to choose a letter which describes where you fall on the scale.

1. Not at all aggressive \[A\ B\ C\ D\ E\] Very aggressive
2. Not at all independent \[A\ B\ C\ D\ E\] Very independent
3. Not at all emotional \[A\ B\ C\ D\ E\] Very emotional
4. Very submissive \[A\ B\ C\ D\ E\] Very dominant
5. Not at all excitable in a major crisis \[A\ B\ C\ D\ E\] Very excitable in a major crisis
6. Very passive \[A\ B\ C\ D\ E\] Very active
7. Not at all able to devote self completely to others \[A\ B\ C\ D\ E\] Able to devote self completely to others
8. Very rough \[A\ B\ C\ D\ E\] Very gentle
9. Not at all helpful to others \[A\ B\ C\ D\ E\] Very helpful to others
10. Not at all competitive \[A\ B\ C\ D\ E\] Very competitive
11. Very home oriented \[A\ B\ C\ D\ E\] Very worldly
12. Not at all kind \[A\ B\ C\ D\ E\] Very kind
13. Indifferent to others approval \[A\ B\ C\ D\ E\] Highly needful of other's approval
14. Feelings not easily hurt \[A\ B\ C\ D\ E\] Feelings easily hurt
15. Not all aware of feelings of others \[A\ B\ C\ D\ E\] Very aware of feelings of others
16. Can make decisions easily \[A\ B\ C\ D\ E\] Has difficulty making decisions
17. Gives up very easily \[A\ B\ C\ D\ E\] Never gives up easily
18. Never cries \[A\ B\ C\ D\ E\] Cries very easily
19. Not at all self-confident \[A\ B\ C\ D\ E\] Very self-confident
20. Feels very inferior \[A\ B\ C\ D\ E\] Feels very superior
21. Not at all understanding of others \[A\ B\ C\ D\ E\] Very understanding of others
22. Very cold in relations with others \[A\ B\ C\ D\ E\] Very warm in relations with others
23. Very little need for security \[A\ B\ C\ D\ E\] Very strong need for security
24. Goes to pieces under pressure \[A\ B\ C\ D\ E\] Stands up well under pressure
Appendix E: Script
Group Decision Making Study: Script

(As participants enter, direct them to a seat—if it is a mixed-sex group, males will be on one side and females on the other). (Offhand comment for same sex group) This is the first time we've had a group of all men (women).

Good morning (afternoon) and thank you for coming. My name is Jenny Dose and I'm a researcher here at Ohio State in the area of Industrial/Organizational Psychology. As you may have learned, industrial psychologists study people in organizational settings. One area that we study very extensively is how people make decisions.

This is a study on individual and group decision making. In terms of group decision making, we are studying decisions made by people who haven't known each other before but come together to make a decision. This is the case with ad hoc task forces in industry, where people from different departments who have no history of working together may come together to make a decision or solve a problem. You will be completing a series of tasks and questionnaires, including individual and group decisions. This will take the whole hour.

I am also looking at how group size affects how teams reach agreement and to spare me the task of taking extensive notes I'd like to tape record the group decision portion of the study. We tried a single microphone but it didn't pick up very well, so now I'm trying these clip ones. So just clip them on your shirt and try to ignore it.

First, I'd like to get some information from you to make sure my records are accurate.

(pass out record-keeping form)

(collect record-keeping form)

First, we will have some individual work. This task involves decision making between selected alternatives under conditions of uncertainty, that is, some risk is involved. Managers in a company are often required to make these types of decisions.

(Pass out CDQ)

Please follow along as I read the instructions and the first scenario. There are two points which I would like to call to your attention which may seem clear at the outset but are easily overlooked when you become involved in some of the situations. The first is that alternative X—the riskier alternative—is always assumed to be more desirable than the safer course, if X should be successful. The second point concerns the meaning of the odds you are being asked to mark. It
is not your task to decide what the odds might actually be in a life situation. . . . The odds you mark indicate the lowest odds you would be willing to take and still advise the central figure to give the risky alternative a try. . . . There is no time limit, so take your time and consider the twelve situations carefully. You may return to one if you wish to change your answer after seeing some of the others. Turn your paper over when you are finished. Are there any questions? I will be sitting over here grading papers but if you have questions as you go along let me know.

(Collect CDQ and hand out a second copy to each person.)

The questionnaire you now have in front of you is the same one which you just finished taking. Your have taken it in order to familiarize yourself with all the situations, and to give you some idea where you might stand on each one. What we are really interested in now is having the group discuss each question in turn and arrive at a unanimous decision on each. You will recognize that a unanimous decision is different from a majority vote, by the way. You may find this difficult. This time you may not return to a question; discuss each one until the group decision is reached and then go on to the next. Make sure everyone has a chance to speak. When the group reaches its decision, you are to mark it on the questionnaire so you have a record of the group's decision. You do not have to write down reasons for your choices. I am not going to participate in the discussion although I will be here to answer any procedural questions which may arise.

(Collect second copy. Hand out third.)

Now we will have some further individual work. Please sit in the desk chairs, so that your responses will be private. I now want you to go back over these situations and indicate your own present personal decisions. In some cases you may feel that the group decision was the best one which could have been made. In other cases you may disagree with the group decision. Your answer may also be the same or different as your initial individual response. Only I will see these responses; the group will not. This time please write down reasons for your responses on the pages that ask for them.

(Collect third copy. Hand out final questionnaire.)

Finally, I would like to get your reactions to the decisions you just made. I would like you to fill out this questionnaire, and again, only I will see it.

(Collect final questionnaire.)
Appendix F: Record-Keeping Form
Record-keeping form

Date:
Time:

Which is your letter ID? (please circle)  A  B  C  D

Your age:

<table>
<thead>
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<th>First name</th>
<th>Gender</th>
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<td>Participant A:</td>
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<tr>
<td>Participant B:</td>
<td></td>
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<tr>
<td>Participant C:</td>
<td></td>
</tr>
<tr>
<td>Participant D:</td>
<td></td>
</tr>
</tbody>
</table>

How well do you know each of the other participants?

**Participant A**

seen  seen  had acquaintance  friend  close  myself
today before class with friend
only with

**Participant B**

seen  seen  had acquaintance  friend  close  myself
today before class with friend
only with

**Participant C**

seen  seen  had acquaintance  friend  close  myself
today before class with friend
only with

**Participant D**

seen  seen  had acquaintance  friend  close  myself
today before class with friend
only with
Appendix G: Content Analysis Categories
Content Coding

Informational influence
1) Statement of a reason (engineers can always get another job)
2) Asking for a reason (why did you put that)
3) Agreement with a reason (Yeah)
19) Disagreement with a reason

Normative Influence
4) Statement "If it were me, I would..."
5) Statement "Most people would..."
6) Statement of opinion with no reason given (I think they should go for the field goal)
7) Agreement with one of the above statements (4, 5, or 6)
8) Asking for an opinion
9) Statement of odds (I put a 7 out of 10)
10) Request for odds (What number did you put?)
11) Agreement with odds (Yeah, I had that too; Just "yeah" after a statement coded as "10")
12) Proposition of consensus odds (Do you want to put 1 out of 10?)
13) Statement: "I don't remember what I put"
15) "I don't know what to put"
20) Statement which includes an opinion with a reason following but doesn't give specific odds ("They should go for it, because...")
21) Agreement with above type statement (20)
Other than Normative or Informational Influence

14) Other (discussing procedure, dislike the question, study, etc.)
16) Asking for influence but don't know if it is for opinion or odds or reason.
17) Unintelligible
18) "There's not enough information in the scenario"

Give influence: 1, 4, 5, 6, 9, 12, 20

Request influence: 2, 8, 10, 16

Agree with influence: 3, 7, 11, 21

Coding for written reasons:

Blue
0 = not stated in discussion
1 = stated in disc. by that person
2 = stated by other person

White
0 = not stated in discussion
1 = stated by person, not on blue sheet
2 = stated by another person, not on blue sheet
3 = stated by that person, on blue sheet
4 = stated by another person, on blue sheet
Appendix H: Tables
Table 28

Correlations for Dependent Variables

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* p < .05; ** p < .01
* Male=1; Female=2; ** Polar1=Polarization on Scenario 1; Intern1=Internalization on Scenario 1
Table 29

Correlations for Group Discussion Variables

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<td>-.06</td>
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<td>.84**</td>
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<td>J. Tot. Agree w/Info.</td>
<td>.05</td>
<td>.06</td>
<td>.16*</td>
<td>-.10</td>
<td>.09</td>
<td>.38**</td>
<td>.53**</td>
<td>.64**</td>
<td>.31**</td>
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<tr>
<td>K. Tot. Norm Infl.</td>
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<td>-.16*</td>
<td>.14*</td>
<td>.03</td>
<td>-.06</td>
<td>.67**</td>
<td>.83**</td>
<td>.64**</td>
<td>.72**</td>
<td>.12</td>
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<td>L. Tot. Give Norm.</td>
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<td>-.20**</td>
<td>.21**</td>
<td>.00</td>
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** M N

M. Tot. Agree w/Norm. --
N. Tot. Give .18** --
O. Tot. Agree .72** .22**

* p < .05
** p < .01
* Male=1, Female=2; "Rankreas.=Rankings(1) vs. Reasons(7)