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**CONSULTANTS IN THE CUPBOARD: HOW  
TYPE AND TIMING OF THIRD-PARTY  
INVOLVEMENT AFFECTS TEAM STRATEGIC  
DECISION OUTCOMES**

**CEO PUBLICATION  
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Management*

**January 2001**

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Running Head: Type and Timing of Third Parties in Teams

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**ABSTRACT**

Despite the widespread involvement of third parties such as consultants in organizational decision making, little empirical research has explored the effect of these individuals on team outcomes. Our study investigates the relationships among type of third party input (direction, devil's advocacy, or expert advice), timing of input, team heterogeneity, and team decision outcomes. Using an experimental design, we find that simply having a third party does not make teams more effective and results in less satisfaction with process. Input type interacts with timing to predict decision effectiveness, with direction having a more positive effect early in the team's process and expert advice having a more positive effect later in the process. Input type also interacts with team heterogeneity to predict decision effectiveness. With direction, heterogeneous teams are more effective than homogeneous teams. With devil's advocacy or expert advice, homogenous teams are more effective than heterogeneous teams.

**Key words:** teams, third parties, team heterogeneity, decision-making, team effectiveness, team member satisfaction.

**Consultants in the Cupboard:  
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Third parties have a profound impact on organizations today, playing a wide variety of roles in decision making. Attorneys are involved in decisions with direct, indirect, or potential legal implications related to acquisitions and alliances, human resource policies, and a range of other strategic decisions. Accountants play a major role in assessing tax and other implications for major and minor corporate investments and for measuring performance. Management consultancy practices at firms such as Andersen, McKinsey, Booz-Allen & Hamilton, and Price Waterhouse Coopers have been expanding at a prodigious rate. Since 1990, revenues in the business as a whole have been growing by 10% or more a year, and in the leading companies by as much as 20-30% (Wooldridge, 1997a). Andersen Consulting, one of the largest, has quadrupled its revenues in the first six years of its existence to more than \$4.2 billion a year, with predicted earnings of \$8 billion by 2000 (Wooldridge, 1997b).

Despite the extent of involvement of third parties in organizational decisions, existing research has done little to measure the impact of third parties on decision processes or outcomes. Third parties such as consultants are occasionally mentioned (e.g., Hambrick & Mason, 1984; Fischhoff & Goitein, 1984; Robinson, 1982; Miles & Snow, 1978), but as incidental players as opposed to central figures in strategic decision making. Third parties are rarely, if ever, the focus of theoretical or empirical research. The purpose of this study is to explore a set of relationships to help begin to understand how third parties influence strategic decisions, and empirically investigate the effects of third party involvement on decision-making processes and outcomes. Specifically, we test how the role and timing of third-party involvement in strategic decisions

affects outcomes including effectiveness and satisfaction in a simulated environment. We propose that appropriate third party involvement in team decisions can interact with timing and team heterogeneity to positively affect outcomes. To investigate these propositions, we use an experimental approach. This research approach has the advantage of providing an initial understanding as to how, in a controlled setting, these variables relate to each other.

### **SUMMARY OF RELATED RESEARCH**

Given that there is a lack of attention in the current strategy and teams literatures paid to third party influence, it is a challenge to determine how best to begin to explore these relationships. A rich literature has emerged that deals with top management team characteristics and strategic decision making in the strategy arena (Hambrick & Mason, 1984). Researchers in organizational behavior have also developed a considerable base of research regarding team processes and outcomes (Cohen & Bailey, 1998). These literatures can begin to inform us on the topic of potential third party influence on team outcomes, but span two very different approaches to research. Our challenge is to bridge these two literatures in a meaningful way to posit relationships between third party involvement in teams and strategic decision outcomes.

To begin, we draw on the research in related areas that has some bearing on decision-making processes from these two separate, but related, sets of literature. Our aim is to make contributions to each of these literatures, and investigate an area that may link the two in practice. The first literature we explore, primarily grounded in strategy, is the research on strategic decision-making and top management teams. This serves as the context for our arguments, and we draw implications from our study for organizational use of consultants. The second literature, primarily grounded in organizational behavior, is the research on team processes. We draw on this base for the methodology used in our study, as well as the theoretical rationale and empirical

precedent for many of our hypotheses.

### **Top Management and Strategic Decision-making**

Rooted in behavioral theory and the work of March and Simon (1958), management science has sought to understand how cognitive biases and limitations factor into decision-making at the firm level. Top managers, representing the dominant coalition of an organization, have long been recognized as principal architects of a company's strategy (Finkelstein & Hambrick, 1990; Hrebiniak & Joyce, 1985). Hambrick and Mason's article (1984) articulated the notion known as the 'upper-echelons perspective' that demographic characteristics of the top management team could act as surrogates or proxies for underlying values and cognitive bases of these teams. They argued by extension that these characteristics are related to organizational decisions, processes and outcomes. This notion has led to a long line of research investigating relationships between top management team demographics and decision-making modes (Schwenk, 1989; Melone, 1994); executive judgment (Priem, 1994); competitor actions and responses (Smith & Grimm, 1991); strategic typologies (Zahra & Pearce, 1990); and information processing and use of technology (Hitt & Tyler, 1991). More recently, researchers have sought to understand the determinants of executive beliefs and the role of social integration (Chattopadhyay, Glick, Miller & Huber, 1999; Smith, Smith, Olian, Sims, O'Bannon & Scully, 1994).

A specific attribute of management teams that has received considerable attention is the role of heterogeneity in top management team decisions and outcomes. The underlying argument is that teams that are homogeneous (made up of similar individuals) will differ from heterogeneous (diverse) teams in how they make and implement strategic decisions. This literature has investigated relationships between top management team heterogeneity and



performance (Michel & Hambrick, 1992; Murray, 1989), as well as specific strategic attributes such as strategic consistency (Wiersema & Bantel, 1992), capacity for innovation (Bantel & Jackson, 1989), and competitive moves (Hambrick, Cho & Chen, 1996).

While spanning considerable ground, findings relating top management team heterogeneity to other organizational phenomena have been inconclusive, with insignificant or modest results, or in some cases contradictory findings (see Hitt & Tyler, 1991; Finkelstein & Hambrick, 1990; Murray, 1989; West & Schwenk, 1996). These authors suggest a number of reasons why chief executive or top management characteristics may not explain much variance in performance or even in specific strategic actions. The deterministic view of firm behavior, for example, suggests that firm actions, let alone the actions of managers, matter little in the face of massive environmental forces (e.g. Hannan & Freeman, 1989; Aldrich, 1979). This research tradition suggests that leaders have little impact because of limited ability to control social structures and systems in which firms reside. Even less extreme views recognize that the variance explained in firm performance or specific action accounted for by managerial characteristics may be negligible under certain circumstances, and that managers operate within varying degrees of constraint or with a range of managerial discretion depending on industry characteristics (Finkelstein & Hambrick, 1990).

We argue that one possible additional reason for inconclusive findings may be that the extant research has ignored the powerful impact of third parties such as consultants. Consultants play a very important role in organizational decisions, and may supplement or interact with managers' cognitive capabilities. That role, however, varies widely by company—that is, companies vary in whether, how, and when they involve consultants in strategic decisions (Saxton, 1995; Greiner & Metzger, 1983). Consultant involvement may directly affect firm

outcomes such as performance, and may also interact with top management team demographics to affect outcomes. Yet, this consultant involvement differs considerably across firms. Thus, it is the *differential* effect of consultant involvement that is of strategic interest. We hope to build on the top management team research, then, by investigating how third party involvement might interact with team composition to affect strategic decision outcomes.

### **Team Processes**

The literature on teams and groups defines a work team as a group of individuals working interdependently to solve problems or accomplish tasks (Gibson, 1999; Sundstrom, De Meuse, & Futrell, 1990). Within this literature, research regarding team decision processes is extensive. More specifically, team researchers have had a central interest in understanding how team decision making can be improved (Cohen & Bailey, 1998; McGrath, 1984). This has generated a wealth of theoretical and empirical studies, many of them laboratory studies. The historical view of groups emphasized motivational approaches that stress the role of attitudes toward one's own group and those of others (Brewer & Kramer, 1985). The focus has been on the role of the individual member and his or her attachment to the group as well as the structure and stability of the group.

This research has demonstrated that the primary features of group formation and maturity are identity, interdependence, and social structure (Cartwright & Zander, 1968; Erez & Earley, 1993; Turner, 1987). The identity component refers to a collective awareness among group members that they constitute a distinct social entity. Interdependence within a group allows members to maintain their interactions with one another. Finally, a group must have a social structure such that interactions become stabilized and regulated by role and status differentiations and members come to share social norms and values that prescribe beliefs and attitudes relevant

to the group (Erez & Earley, 1993).

Building upon this research, numerous investigations have examined how heterogeneity of member characteristics affects team decision making, communication, and outcomes (Burt, 1982; Gibson, 1999; Jackson, May & Whitney, 1995; Levine & Moreland, 1990). While the relationships are complex, this research has yielded the general finding that heterogeneity enhances team creativity and breadth of solutions to a problem, but homogeneous teams are more satisfied or experience more positive affect (Jackson et al., 1995; Jackson, 1992). Empirical evidence demonstrates that this impact may change over time, as a team progresses through its lifecycle (McLeod, Lobel, & Cox, 1996).

Recently, researchers have become increasingly interested in the impact of cultural values on team processes (Berry, 1997; Gibson, 1999; Granrose & Oskamp, 1997). For example, Gibson (1999) examined the impact of cultural values on cognitive processes such as belief formation in teams. Specifically, the degree of individualism versus collectivism was investigated. Individualism and collectivism are two key cultural values that have a demonstrated impact on work behavior (see Earley & Gibson, 1998 for a review of this research). In a collectivistic group setting, feedback and knowledge pertaining to the group is more valued than is knowledge pertaining to any one individual member of the group.

Findings from two intercultural studies conducted by Gibson (1999) support the role of individualism-collectivism. In teams where collectivism was low, group beliefs were not related to group effectiveness. In contrast, where collectivism was high, the relationship between group beliefs and group effectiveness was strong and positive. Arguably, it is under circumstances of low collectivism that groups have the most difficulty combining and integrating information about past performance, task constraints, or context. When groups actively share information

about their group and value it, their beliefs are better aligned with actual effectiveness. Thus, this research highlights the potential impact that cultural values have on group processes.

In summary, top management strategy research, as well as team process research, suggest that the best performing teams have established a highly effective approach to solving problems and making decisions that allows them to make the most of new challenges and opportunities. Both literatures have identified team composition as an important variable affecting processes and outcomes. The operationalization of heterogeneity may differ across the two literatures (i.e., age, tenure, functional background, education for top management teams; perceptions, attitudes for micro research on teams). The underlying theory, though, is consistent—demographic attitudes and values may signal underlying differences in decision-making approaches and outcomes, and teams with diverse perspectives may differ systematically from homogeneous teams.

Here we focus on the fact that these teams do not exist in a vacuum. They often take advantage of third party input of numerous kinds at various stages in the decision-making process. We utilize the previous research described above as the basis for the current study, both in terms of methodology and theory. However, we extend this knowledge base by investigating the role that third parties play in the strategic decisions made by teams that are homogeneous, as compared to those that are heterogeneous, both in terms of demographics and cultural values.

Thus, our study empirically investigates the impact of the type of input provided by third parties on the effectiveness of decisions under several conditions. More specifically, the impact of input type is examined when third parties intervene at two different points in time (either early or mid-way through the decision making process) and when teams are either heterogeneous or homogeneous. Timing and team heterogeneity are each expected to moderate the influence of

input type. The theoretical underpinnings, hypotheses, methods and potential implications of this study are described below.

### **THEORETICAL BACKGROUND AND HYPOTHESES**

From a theoretical perspective, third parties can be broadly defined to include any individual or set of individuals formally employed or contracted by an organization to provide input for strategic decisions. Excluded from this definition are informal contractors such as family, friends, and other acquaintances. For our purpose, we focus on consultants as the type of third parties with the greatest impact on strategic decisions, in part because attorneys and accountants are limited legally as to their input to organizations regarding strategic matters. When accountants provide strategic advice, for example, it is typically through their consulting divisions.

Third parties and specifically consultants do make appearances in strategy literature and related books. Robinson (1982) recognized that third parties, including consultants, lawyers, accountants, and bankers, play an important role in organizational decisions. Greiner and Metzger (1983) wrote a book devoted to the topic, and described why and when companies might use consultants. Covin & Fisher (1991) discussed tactics consultants might use to boost sales, and others have documented the explosive growth of the consulting industry in domestic as well as international engagements (Ashton, 1991; Suryanarayanan, 1989; Wooldridge, 1997b). Ginsberg and Abrahamson (1991) noted the value of external advocates as change agents. There is also a body of literature that investigates third-party intervention in dispute resolution (e.g., Karambayya & Brett, 1989). However, despite this literature, there is limited empirical evidence that demonstrates that teams with third parties will be more effective than those without.

What has been better captured are some of the negative possible outcomes of group

processes such as groupthink (Janis, 1972). While team processes can be effective, teams can also lapse into insular thinking, relying on a set of assumptions each member buys into without challenging. An external voice may alleviate these problems, and expand the cognitive base for decisions (March & Simon, 1958). Consultants, specifically, may reduce uncertainty and help organizations move toward better decisions. Based on what evidence does exist, then, we argue that the simple presence of a trained outside perspective can provide valuable insight into strategic decisions, whether that input is content or process related. Involvement of a third party in any form potentially provides expertise and objectivity that can positively affect decision outcomes. The following hypothesis reflects this notion:

*Hypothesis 1: Third party involvement will be positively related to the effectiveness of strategic decision making teams.*

While the aforementioned literature does mention the importance of third parties, and more specifically the importance of consultants, and yields some insight about consulting as an industry, it does not, inform us as to *how* third parties affect strategic decision processes. It also does not investigate, in any systematic way, how third party involvement may interact with team characteristics to affect decision outcomes. Thus we turn to factors that may further impact these relationships.

### **Type and Timing of Involvement**

Third parties can provide a number of different kinds of input into the strategic decision-making process. There is an almost endless combination of types of input and motivations for the involvement of outsiders, ranging from strategic to political (Pfeffer, 1981). By way of summary, these functions can be grouped into three basic types of input: expert, devil's advocate, and direction (Saxton, 1995). While we recognize that these types may not be completely

comprehensive, we believe they represent a reasonable spectrum of types of consultant involvement for our research purposes at this stage. First, third parties provide expert information. As an expert, the third party brings specific knowledge or skills related to an industry or function that are otherwise unavailable inside the domain of the organization (Saxton, 1995). In this capacity, the third party may be able to tap information resources, such as competitors, which the team itself is unable or unwilling to use. The third party is also often able to offer valuable insight into strategic problems as faced by other firms that may be transferable to the team. In this way, uncertainty may be reduced about cause/effect relationships and ranges of possible outcomes.

A second type of input provided by third parties is devil's advocacy. In this capacity, the third party may ask penetrating questions that shows ways to think about a problem that otherwise would not have occurred to the decision makers. In this manner, the third party serves a function similar to the role of devil's advocate as described by Schwenk (1990), or may also provide dialectical inquiry. This type of input is often provocative in that it helps to identify unrealized information needs, aids in the formulation of difficult and perhaps unanticipated questions, and challenges the status quo (Saxton, 1995). Equally important, this second type of input also assists the team members in redefining the role each plays in the decision-making process. Role redefinition is a crucial step in breaking out of habitual routines that often stifle innovative solutions to problems (Hackman & Gersick, 1990).

Finally, third parties can provide input that helps to clarify the goals, objectives and mission of the team, and builds consensus for implementation (Saxton, 1995; Schwenk, 1990). This type of input assists the team in establishing direction and momentum toward effective accomplishment of desired outcomes. In this regard, teams often require assistance in the

delineation of mission and objectives and/or assistance in the formulation of second order goals and actions steps that serve as means to accomplishing the relevant ends. Research investigating a variety of problem solving and decision-making teams in organizations suggests that this is a key type of input into the team process that can be easily over looked, but is often critical in achieving superior team performance (Hackman, 1990; Mohrman, Cohen & Morhman, 1995).

We anticipate that all three types of input can potentially increase the effectiveness of decisions made by management teams, but that certain characteristics of the process and team will moderate the impact of the third party. One key potential moderator of third party involvement is the timing of the input provided. Early research on teams indicated that they go through predictable stages as they progress through their life cycle (Jewell & Reitz, 1988; Tuckman & Jensen, 1977). These theories suggest that in the early stages of group formation, group members learn about one another, and develop norms for behavior relating to attendance, motivation, and communication (Feldman, 1984; Blau, 1995). During later phases, groups struggle with problems of conflicting views and practices (Jewell & Reitz, 1988). The most successful teams resolve these conflicts and are able to develop smooth interpersonal relations.

More recently, investigations and observations of team cycles have focused on decision-making and project teams. This research suggests that team members often go along unalarmed until the midpoint of their project cycle—that in the life cycle of a team, there is often a discernable point approximately half-way through a task when members become galvanized into action. At this time, members suddenly wake up and realize that half of the time is gone and only half is left to get the decisions made and the work done (Gersick, 1991). Often groups panic at this point, and then they get down to work. In other words, periods of inertia in teams are often broken by bursts of energy and change. Gersick (1991) refers to this phenomenon as “punctuated



equilibrium.” This model suggests that there are really two phases in the life of any given team. During the first phase, members deal with conflicts, get information, and work through pertinent issues. A mid-point crisis then occurs. This crisis is often a point of tension in which members may look to outsiders for assistance. Following the crisis and midpoint transition, a second phase develops in which teams then go through another series of interactions to work out the details of their decisions and/or tasks. The completion of this phase leads to project finalization. This view has analogues in the strategy literature in models of strategic decision making whereby the recognition and diagnosis of a problem may be separate from searching for solutions and selecting a response (e.g. Mintzberg, Raisinghani & Theoret, 1976).

Some teams begin utilizing third party input from the onset of their interactions regarding a given project. However, other teams either do not have access to, or do not request, third party input until they reach the mid-point crisis for a given project. Whether the third party input is provided early in the decision making process or later following the mid-point crisis is expected to have a strong impact on the dynamics of the third party involvement, and the subsequent effectiveness of the strategic decisions. For example, the second type of input described above (devil’s advocacy) provokes the group into thinking more broadly and redefining roles and processes. This type of input encourages healthy conflict within the group. Previous research suggests that when introduced early in the group process, conflict can have a positive impact on decisions (Schwenk, 1990). In other words, contradictory perspectives may prove most useful during the early stages of group interaction in which problems are formulated and defined. We would argue that it is also at these early stages that direction provided by a third party is more effective. On the other hand, when a team has identified the problem and is faced with moving forward with implementation, conflict introduced by a devil’s advocate may be unproductive, and

direction may be unnecessary. Due to information needs that have been identified through the group processes, though, expert advice may be most helpful in the later stages of the group's process (after the midpoint). Based on these perspectives, the following hypotheses are proposed:

*Hypothesis 2: Timing of input moderates the relationship between third party input type and effectiveness of strategic decision-making teams, such that:*

*2a: Devil's advocacy is more effective when provided early in the team's process than when provided later in the team's process.*

*2b: Direction is more effective when provided early in the team's process, than when provided later in the team's process.*

*2c: Expert advice is more effective when provided later in the team's process than when provided earlier in the team's process.*

### **Heterogeneity of Teams**

We further suggest that the utilization of third party input will depend in part upon the degree of demographic and cultural heterogeneity within teams. Heterogeneity is a team level index of the degree of similarity between members of a team (Murray, 1989). Changing workforce demographics and new organizational forms are increasing the heterogeneity of work teams in general, and decision-making teams in particular. Recent research suggests that team heterogeneity influences social, cognitive, and affective processes in teams; these short-term behavioral manifestations, in turn can influence longer-term consequences such as organizational performance (Jackson et al., 1995).

One process that may be influenced by team heterogeneity is the manner in which third party input is interpreted, integrated and utilized. Teams in which members are dissimilar (heterogeneous) with regard to demographic and cultural characteristics have a very different information processing structure than do teams in which members are highly similar (homogenous) regarding these characteristics. For example, homogenous team members all tend to perceive and interpret incoming information in a similar manner (Jackson, 1992). This

phenomenon may serve to narrow the scope of considerations in homogenous teams. For these teams, the type of third party input described above which serves to broaden and redefine roles and processes (devil's advocacy) or simply provides expert advice by contributing knowledge beyond a group's similar set of experiences (expert) may be most helpful. In heterogeneous teams, on the other hand, this same type of input may be unnecessary, or even unwelcome. Rather, input that helps a heterogeneous group focus on the goal of the task at hand (direction) may be more productive. The following hypotheses summarize the expected impact of team heterogeneity:

*Hypothesis 3: Team heterogeneity moderates the relationship between third party input type and the effectiveness of strategic decision-making teams, such that:*

*3a: Devil's advocacy is more effective for homogeneous teams than for heterogeneous teams.*

*3b: Direction is more effective for heterogeneous teams than for homogenous teams.*

*3c: Expert advice is more effective for homogeneous teams than for heterogeneous teams.*

### **Team Member Satisfaction**

Past research has demonstrated that decision-making processes may affect *satisfaction* differently than decision effectiveness. As noted previously, this research differentiates outcomes such as affect or positive feelings about the group interaction, from outcomes such as creativity and breadth of solutions. This research has demonstrated that homogeneous teams experience greater positive affect than heterogeneous teams (Jackson et al., 1995; Levine & Moreland, 1990). Related strategy research has concluded that heterogeneous teams with a higher degree of conflict produce better decisions, but experience lower satisfaction than their homogeneous counterparts (e.g., Schweiger, Sandberg & Ragan, 1986). Extending the theoretical argument underlying these findings, we argue here that the simple presence of a third party might 'upset the

apple cart' or add uncertainty and diversity of opinion to any group. Regardless of role, this will lead to lower average positive affect among participants. Further, this input will be particularly notable when third parties interrupt groups that have already established norms of group behavior and begun the decision-making process (that is, when they are inserted at the midpoint of the decision-making process). We therefore posit:

*Hypothesis 4: Satisfaction with team processes is lower in teams with third party involvement than in teams without third party involvement.*

*Hypothesis 5: Satisfaction with team process is lower when the timing of third party involvement is late in the decision-making process than when it is early in the decision-making process.*

## METHODS

The hypotheses were tested using data collected from simulated top management teams participating in a complex, multiparty role-play. Several characteristics of the simulation were experimentally manipulated. This design allowed for random assignment to conditions and therefore helped us to avoid many potentially confounding characteristics of a natural organizational context, an approach we believed was important and necessary in the early stages of exploring the relationships of interest. Assuming adequate internal validity of our study (discussed below), we can be relatively confident that differences in teams can be attributed to the experimental manipulations of type, timing, and heterogeneity. This provides for a very robust test of our hypotheses. While we recognize that an experimental design may not approximate the richness or complexity of how third parties interact in organizations, we believe the experimental approach is not only valid, but also an important contribution of this study. Management research has long recognized the need for a combination of field and laboratory research (Schwenk, 1982). In fact, such a design is most appropriate when the researcher is

trying to isolate the effects of manipulating a small set of independent variables (third party role and timing) on the dependent variable of interest (decision effectiveness) (Fromkin & Streufert, 1983). It is also useful in the early stages of model development, when there is little empirical precedent for research on third party involvement in strategic decisions.

### **Sample**

Five hundred and thirty participants representing a variety of ethnic groups, age groups, educational backgrounds, and work backgrounds participated in the study as an educational experience in executive management courses addressing strategy and organizational behavior. These participants were randomly assigned to 106 five-person teams. Due to absences and classroom attrition, the final sample size consisted of 484 participants divided into 106 teams ranging in size from four to five participants. Analysis of variance with team size as the independent variable indicated that size of the teams did not account for a significant portion of the variance in any of the key variables of interest.

In the final sample, the participants ranged in age from 18 to 46; the average age was 24 years. The sample consisted of 46% reporting female and 54% reporting male. Ethnicity of participants varied significantly, as did reported country of birth, where responses ranged among 35 different countries. Work experience ranged from 1 year to 23 years, with an average of 5 years. Managerial experience ranged from 1 to 16 years with an average of 2 years. Work team affiliations ranged from 1 to 20 years, with an average of 4 years. As such, our sample contributes to the external validity of our study. The teams resembled many of the management teams we have observed in organizational contexts, particularly in small organizations and high technology entrepreneurial firms, where more managers tend to be in the 24-34 age group (Reynolds, Hay & Camp, 1999).

## **Procedure**

Design. A 4 x 2 experimental design was utilized to test the hypotheses. The first factor contrasts type of third party input (either expert information, devil's advocacy, direction, or no input). The second factor contrasts timing of third party input (either at the onset of the session or at the mid-point of the session). Team heterogeneity was manipulated by sampling a demographic and culturally diverse population and deliberately forming teams in order to maximize heterogeneity or homogeneity. Specifically, students were grouped by age, sex, work experience and ethnicity. For the heterogeneous teams, assignment to groups was random within ethnic and demographic type, such that each heterogeneous team consisted of multiple categories, but within each category, who ended up in which team condition was random.

Task. The task utilized was a modified version of Looking Glass, Inc. (Lombardo, McCall & DeVries, 1989). Looking Glass is a complex in-basket simulation in which team members role play top managers of various departments in a glass manufacturing firm. The realism of the experience derives in large part from its field interview origins. All problems faced are modeled on those actually experienced by managers on the job, thus Looking Glass is a flexible, realistic, and engaging way of assessing managerial behavior.

Each division of the Looking Glass company consisted of five managers who interacted with each other collectively as a group. Previous research indicates that the simulation has external validity and is sufficiently engaging to develop group identity and study managerial processes (Chatman & Barsade, 1995; Lombardo et al., 1989). Participants' formal evaluations of their experience in the simulation indicate that they become attached to their group and reflective about the causes and consequences of their groups' performance. Furthermore, participants given the opportunity to interact socially following the simulation often remain in their roles and discuss

potential explanations for their groups' performance, long after the simulation is adjourned. Post hoc discussions with participants indicated that they felt the simulation was realistic, they were highly engaged, and identified strongly with their team.

The study was conducted in six stages: (1) participants completed brief demographic and cultural surveys, (2) surveys were utilized to randomly form teams which either maximized or minimized heterogeneity, (3) teams were given three to four weeks to interact and perform minor exercises in order to establish team identity, (4) participants were introduced to the simulation, randomly assigned roles within their teams and given an in-basket folder containing a series of memos discussing various problems and issues which would require their attention during the simulation; they were asked not to discuss these materials with anyone outside their team; (5) the simulation session was run by adapting the physical setting so as to simulate a corporate board room, and participants were informed that they had 2 hours to conduct a top management team meeting; at the end of this period, each team was asked to record in writing the problems they had identified, the priority given each problem, analysis that had occurred, and any decisions that had been made regarding each problem; participants were then asked to complete a comprehensive survey assessing the manipulations; (6) during the final session, the researchers conducted a de-briefing.

Third party manipulations. One-fourth of the teams were assigned a third party who provided input consisting of additional industry-related expert information, one-fourth were assigned a third party who acted as a devil's advocate, one-fourth were assigned a third party who provided direction, and one-fourth of the teams received no third party involvement. In half of the teams with third party involvement, the third party interacted with the team from the onset of the simulation; in the other half, the third party began interacting after the first hour of interaction had

elapsed.

Several techniques were used to increase the external and internal validity of the third party manipulation. First, the role of the third party was played by confederates who were upper level students in the advanced stages of training in business consultation processes, and thus had a vested interest and skills necessary to play the role. Second, to prepare for the simulation, the consultants attended an intensive four-hour training which involved participation in a modified Looking Glass simulation, along with detailed discussion of third party input behaviors. Consultants were divided into three consulting “firms”: *Advocates Incorporated*, *Experts International*, and *Direction Unlimited*, with each consulting firm offering consulting inputs corresponding to the descriptions provided earlier regarding the different possible types of input. During the training, participants received an in-basket folder based on the type of consulting their firm delivered and then received written and verbal instructions regarding specific behaviors and assistance their firms would offer. Next, each firm met with the researchers, practiced role-playing the behaviors, and discussed how these behaviors play out in actual experience. Both researchers have extensive consulting experience, totaling over 7 years of full-time work in a consulting environment. Finally, third parties were blind to the hypotheses and the exact characteristics of each experimental condition; they were asked not to read others' third party or observer materials.

Observation. Ten expert observers taking part in a Ph.D. program in management monitored the teams over a one-month period. Numerous precautions were taken in order to increase the internal validity of the observations. First, the observers attended an intensive eight-hour training that involved participation in a modified Looking Glass simulation, review of team behavioral dimensions, discussion of components of effective teams, trial observation sessions, and calibration sessions. These sessions allowed for practice and adjustment in the rating



process to ensure consistency across raters. Observers received a binder containing an observation protocol, written descriptions of all effectiveness dimensions, sample ratings forms, commonly asked questions, and blank rating forms for observing the teams. Second, observers were blind to the hypotheses and experimental conditions and were randomly assigned to monitor 10-12 teams each. They were asked not to read the third party or participant materials. Third, each observer monitored one team session at a time, observing each session in its entirety. Post hoc analyses of variance indicated no significant differences in ratings due to observer effects, demonstrating that the raters were using the observation guidelines in a consistent manner.

## **Measures**

Experimental conditions. As described above, input type and timing were directly manipulated within the context of the simulation. Five manipulation checks scored using a scale from 1=strongly disagree to 5=strongly agree indicated that the manipulations were effective for both type and timing. Perceptions of input type varied significantly across experimental conditions. Furthermore, perceptions of expert behavior were highest in the expert condition, perceptions of directive behavior were highest in the direction condition, and perceptions of devil's advocacy behavior were highest in the advocate condition. In all instances, Scheffe's tests for multiple comparison demonstrated statistically significant ( $p < .05$ ) mean differences in perceptions of consultant behavior across conditions. Similarly, perceptions of timing of consultant involvement also varied significantly across experimental conditions. Participants perceived the consultants became involved early in the early condition and perceived that the consultants became involved late in the late condition.

Heterogeneity. To test our heterogeneity hypotheses, we were specifically interested in

the degree to which members of a team differed with regard to a range of different demographic and cultural characteristics, thus we needed to arrive at a set of composite heterogeneity scores that captured dispersion within a team. In addition to a demographic survey, participants also completed the 16-item measure of individualism and the 16-item measure of collectivism developed by Triandis (1995). These measures ask respondents to indicate the extent to which they agree or disagree with value statements using a scale from 1=strongly disagree to 5=strongly agree.

Heterogeneity was then measured by calculating dispersion for each demographic and cultural characteristic within each team (Hambrick, Cho, & Chen, 1996). This measure captures the degree to which individuals differ in a team with regard to the characteristics in question. For continuous variables (age, length of team affiliation, length of employment affiliation, managerial experience, individualism, and collectivism), we calculated the coefficient of variation (by dividing the standard deviation by the mean for the group). For categorical variables (gender, ethnicity, class standing, and major (function), we calculated the Herfindal-Hirschman index (1 minus the sum of squares of the percentage of team members in each category) for each characteristic within each group. This resulted in nine heterogeneity scores for each group (age heterogeneity, employment heterogeneity, managerial heterogeneity, individualism heterogeneity, collectivism heterogeneity, gender heterogeneity, ethnic heterogeneity, class heterogeneity, and major (functional) heterogeneity).

Following the precedent set by Murray (1989), these indicators were then factor analyzed. Five factors emerged: (1) affiliations (team affiliations, employment affiliations, and ethnicity); (2) demographics (gender, age, and major); (3) expertise (class standing and managerial expertise); (4) individualism; and (5) collectivism. For each team, we created scale scores

representing each of these factors by averaging across the indices that loaded on a given factor (e.g., a team's score for *expertise* was created by averaging their scores on class standing heterogeneity and managerial expertise heterogeneity). Thus for the final analyses, each team was represented by five heterogeneity indices, representing different facets of heterogeneity.

As previously outlined, in the literature on team heterogeneity the argument is made that differences in demographic characteristics among team members result in differences in perceptions. Beyond objective indicators of demographic characteristics, we were also interested in capturing the extent to which individual team members *perceived* differences among the team. We asked each team member to rate the degree to which they perceived heterogeneity using three items and a scale ranging from 1=strongly disagree (heterogeneous) to 5=strongly agree (homogeneous). Principal components analysis confirmed one factor having an eigen value of 1.85 and accounting for 61.7 percent of the variance. Factor loadings ranged from .73 to .81. The reliability of the scale (alpha) was .70. Scores on the three items were averaged for each individual. We used scores on this "perceptions of heterogeneity scale" as a second test of our heterogeneity hypothesis.

Team effectiveness. Observers rated the teams on five team effectiveness dimensions using a scale ranging from 1=strongly disagree that this describes the team, to 5=strongly agree that this describes the team. The items were adapted from a scale previously used in the groups literature with strong reliability and validity (e.g., Gibson, 1999) capturing standard dimensions of effectiveness, including: appropriateness of problem prioritization, quality of analysis, feasibility of solutions generated, innovativeness of solutions, and practicality of solutions (Goodman, Ravlin, & Schminke, 1990; Cohen & Bailey, 1998; Campion, Medsker, & Higgs, 1993; Jackson, 1992; Schwenk, 1990). Factor analysis confirmed all items loaded on a single

factor, having an eigen value of 3.57 and accounting for 59.5 percent of the variance. Factor loadings ranged from .58 to .84. The reliability for this scale (alpha) was .85. Scores on the five items were averaged to arrive at a single team effectiveness score for each team.

Satisfaction. For the final series of hypotheses, we were interested in the extent to which individual team member satisfaction with the group process could be predicted based on the type of third party involvement. To capture individual level of satisfaction, each team member was asked to rate the extent to which they were satisfied with the team process using a scale ranging from 1=highly dissatisfied to 5=highly satisfied.

## RESULTS

Table 1 reports the means, standard deviations, and correlations for the independent and dependent variables.

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Insert Table1  
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### Hypothesis 1

To test hypothesis 1, a one-way analysis of variance of team effectiveness was conducted with input type as the independent variable. This analysis contrasts teams with no consultant, with a devil's advocacy consultant, with an expert consultant, and with a direction consultant. Results indicated that type of third party involvement did not account for a significant portion of the variance in team effectiveness ( $F=.81$ ,  $df=(3,102)$ , ns). This provides no support for hypothesis 1, and suggests that third party involvement, in and of itself, does not universally contribute to effectiveness. This was confirmed by comparing means on team effectiveness for teams with a third party consultant (of any type) to teams without a third party consultant. Results indicated no significant differences across conditions (mean difference = .04,  $t=1.25$ , ns),

providing no evidence that teams were more effective simply because they had a third party consultant.

## Hypothesis 2

To test hypothesis 2 regarding the moderating effect of timing on the impact of type of involvement, we used the SPSS General Linear Model Procedure to run analysis of variance for categorical factors with categorical covariates. The dependent variable was team effectiveness. The independent variables were type of third party involvement (devil's advocate, direction, or expert), timing of third party involvement (early or late), and the type x timing multiplicative interaction. Results are presented in Table 2.

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Insert Table 2  
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Our findings support a moderating role of timing of input overall, though only one of the three sub-hypotheses were supported. There were no significant main effects for type or timing. The interaction effect for type x timing was significant ( $SS=3.85$ ,  $F=3.31$ ,  $p<.05$ ), providing support for the umbrella hypothesis that type and timing interact to affect team outcomes. Subsequent analyses of the type x timing interaction indicated that devil's advocacy involvement had a more positive effect when provided later in the process than when provided earlier in the process (mean effectiveness for early = 3.87, mean effectiveness for late = 4.28); however, the difference in means across the two conditions was not significant (mean difference = -.41,  $t=-1.24$ , ns), providing no support for hypothesis 2a. As predicted in hypothesis 2b, direction had a more positive effect when provided early in the process. The teams receiving direction early were significantly more effective than teams receiving direction late in their process (mean for early = 4.36; mean for late = 3.70;  $t=2.11$ ,  $p<.05$ ). Expert involvement had a marginally more positive

effect later in the process (mean effectiveness for early = 3.73, mean for late = 3.82). The difference in means across the two conditions was not significant (mean difference = -.09,  $t = -.39$ , ns), offering no support for hypothesis 2c.

### Hypothesis 3

To test hypothesis 3 that heterogeneity moderates the impact of involvement type on team effectiveness, the SPSS General Linear Model procedure was used to run analysis of variance for categorical factors and continuous covariates. Six separate models were tested, each using a different index of heterogeneity (collectivism heterogeneity, individualism heterogeneity, affiliation heterogeneity, expertise heterogeneity, demographic heterogeneity, and team members perceptions of heterogeneity). Team effectiveness was the dependent variable. The independent variables were type (devil's advocate, direction, or expert), heterogeneity, and the type x heterogeneity multiplicative interaction. Results for models one through five are depicted in Table 3; results for model six are depicted in Table 4.

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Insert Table 3 and 4 about here  
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We obtained support for a moderating effect of heterogeneity and hypothesis 3 for certain heterogeneity measures. In the model testing individualism heterogeneity, the interaction effect of type x individualism heterogeneity was significant, indicating that this type of heterogeneity moderates the impact of type on team effectiveness ( $SS=4.47$ ,  $F=2.58$ ,  $p<.05$ ). Our sub hypotheses again received mixed support. To interpret support for them, we examined the interaction effect by conducting post hoc analyses comparing teams highest (66<sup>th</sup> percentile and above) and lowest (33<sup>rd</sup> percentile and lower) in individualism heterogeneity. In support of hypothesis 3b, these analyses indicated that in the direction condition (in which the third party

provided direction), highly heterogeneous teams performed better than homogenous teams (mean for heterogeneous = 4.48, mean for homogeneous = 3.71; mean difference = -.77,  $t=-2.00$ ,  $p<.05$ ). In the devil's advocate condition and expert condition, there were no significant differences between the heterogeneous and homogeneous teams, providing no support for hypothesis 3a or 3c, respectively. In the models testing collectivism heterogeneity, affiliation heterogeneity, expertise heterogeneity, and demographic heterogeneity, there were no significant interaction effects for type x heterogeneity.

As a second test of hypothesis 3, we ran analysis of variance using the team member *perceptions* of heterogeneity (as opposed to *objective* heterogeneity in terms of cultural and demographic indicators, as described above). Given that we were interested in an individual-level predictor (team member perceptions), this analysis was conducted at the individual level. Again, we used the SPSS General Linear Model procedure for categorical factors and continuous covariates. Results are presented in Table 4. Team effectiveness was the dependent variable. The independent variables were type of involvement (devil's advocate, direction, or expert), individual perceptions of heterogeneity, and the type x heterogeneity multiplicative interaction.

In general, these results provide some support for hypothesis 3. We obtained a significant interaction effect, indicating that heterogeneity perceptions moderate the relationship between type of input and team effectiveness. Exploring these perceptions further, tests for the sub-hypotheses were very intriguing, this time offering support for the two sub-hypotheses (3a and 3c) that were not supported when we utilized objective heterogeneity measures. Specifically, we compared teams highest (66<sup>th</sup> percentile and above) and lowest (33<sup>rd</sup> percentile and lower) in perceptions of heterogeneity. In support of hypothesis 3a, in the devil's advocate condition, teams that were perceived as highly similar (homogenous) were significantly more effective than

teams that were perceived as dissimilar (heterogeneous) (mean for homogenous = 4.25, mean for heterogeneous = 3.67, mean difference =  $-.57$ ,  $t=-3.16$ ,  $p<.01$ ). In support of hypothesis 3c, in the expert condition, teams that were perceived as highly homogenous were significantly more effective than teams that were perceived as heterogeneous (mean for homogenous = 4.07, mean for heterogeneous = 3.44, mean difference =  $-.63$ ,  $t=-4.83$ ,  $p<.001$ ). There were no significant differences in the direction condition, offering no additional support for hypothesis 3b.

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Insert Table 4  
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Finally, although we did not propose main effects of heterogeneity, the model testing affiliation heterogeneity demonstrated a significant main effect for this type of heterogeneity. To examine these effects, post hoc analyses were conducted comparing teams highest (66<sup>th</sup> percentile and above) and lowest (33<sup>rd</sup> percentile and lower) in affiliation heterogeneity. Homogenous teams were significantly more effective (mean = 4.11) than heterogeneous teams (mean = 3.79; mean difference =  $.33$ ,  $t=1.85$ ,  $p<.05$ ).

#### **Hypotheses 4 and 5**

To test hypothesis 4 regarding presence of a third party and team member satisfaction, we compared means in the conditions with and without third party consultants. For these analyses we were interested in the relationship between an individual-level predictor (presence of a consultant) and an individual-level outcome (team member satisfaction), thus we conducted the analysis at the individual level. Team members with a consultant were significantly less satisfied than team members without consultants (mean with = 3.93, mean without = 4.17, mean difference =  $.24$ ,  $t= 2.46$ ,  $p<.05$ ), providing support for hypothesis 4. To test hypothesis 5



regarding satisfaction in early as opposed to late consultant involvement, we compared means in the early and late conditions. There were no significant differences between these conditions (mean early = 4.01, mean late = 3.84, mean difference = .17,  $t=1.46$ ,  $p<.07$ ), providing no definitive support for hypothesis 5.

## DISCUSSION

Despite the existence of a large body of research on team dynamics, top management teams, and strategic decision-making, third party involvement in the decision-making process has remained largely ignored as a research topic. Yet, organizations spend large amounts of money involving consultants in forming and implementing strategy. Providing a better understanding of how third party involvement affects decision outcomes is an important research topic. This knowledge will enable us to better predict links between team composition, such as demographics, and strategic decision outcomes. Indeed, despite the plethora of research investigating main effects between top management team demographics and outcomes, results from the 'upper echelons' stream of research have remained largely inconclusive (Finkelstein & Hambrick, 1991). Inclusion of third party involvement as a boundary variable or moderator in these relationships may help to explain the lack of consistent findings in certain contexts.

In our study, we attempt to draw from two literatures that favor very different methodologies and approaches to provide some preliminary support for the importance of consultants in strategic decision making. The theoretical underpinnings and implications are consistent with top management team research, which serves as the context for our study. We utilized the experimental approach and relationships established in the teams literature for our hypotheses. By bridging the two literatures, we hope to offer some contribution to the top

management team strategic decision making research and the teams research in examining how consultants affect team strategic decision outcomes.

First, it is interesting to note the results from tests of main effects. Our results indicate that third party involvement does not universally contribute to effectiveness of strategic decision-making teams (hypothesis 1). No one type of third party input is better across all conditions. In fact our results for hypothesis 4 indicate that team members can be more dissatisfied with team process when third parties are present than when they are not. Thus, in this context, the simple presence of a consultant does not ensure better decisions (possibly much to the surprise of some managers and consulting firms!). From the perspective of managing teams, this suggests a cautionary note that the addition of outside influence should be done carefully and with attention to other factors—simply adding a team facilitator may not achieve the desired effect.

Our findings demonstrate that type of third party input, timing of the input, and heterogeneity of the team interact to affect decision outcomes, confirming the complexity of the decision-making process. Results for hypothesis 2 suggest timing is a critical moderator of the impact of third party input. Providing direction early in the process proved to be particularly productive for the team decision-making process. This relationship was also evident when direction was provided to heterogeneous teams, suggesting that the challenges diverse teams have in coming to a consensus and completing the decision-making process (Jackson, 1992) might be offset by the presence of a third party helping guide the team and keep the members on task.

Evidence for hypothesis 3 indicates that both *objective* heterogeneity and *perceived* heterogeneity can interact with third party roles to affect decision outcomes. These results varied across the heterogeneity measure employed, suggesting a richer and more complex set of

relationships than anticipated—heterogeneity is a multidimensional construct. Using measures of *objective* heterogeneity, direction was more effective for highly heterogeneous teams than homogenous teams, when the heterogeneity pertains to individualism. Thus, when individualism varies across team members, direction is more effective than when it does not vary.

Using measures of *perceived* heterogeneity, devil's advocacy and expert information contributed more when teams were perceived by members to be homogeneous than when perceived to be heterogeneous. This finding reinforces concerns that homogeneous teams can be limited in their diversity of perspectives and may be less creative (Jackson et al., 1995). The presence of a third party in a devil's advocate role may challenge the team's assumptions and decrease the likelihood that groupthink will set in (Janis, 1972). Consistent with strategic decision making research (Schweiger et al., 1986), the introduction of conflict may enable team outcomes to improve—even when provided by a consultant. Further, the advocate or expert role may help broaden the team's perspective and bring in information that is new or has been ignored. Both effects appear to lead to better decision outcomes for homogenous teams.

In short, in a controlled setting, we have established that third party involvement can interact with timing and team composition to enhance and sometimes mitigate the effects of team heterogeneity and homogeneity. Third parties may indeed facilitate the strategic decision-making process, but our findings suggest that it is not their direct involvement *per se* that matters; rather, it is the pluralism of perspective third parties may provide that facilitates good decisions—that is, third parties can be used selectively to offset problems related to decision team characteristics. Thus, to effectively use third parties, managers must understand how the consultant role and timing may interact with the team's inherent characteristics in making effective strategic decisions.

## **Limitations and Directions for Future Research**

In this study we have attempted to provide initial empirical evidence as to how third party involvement might affect strategic decision making. Clearly, though, conclusions we can draw in terms of managerial practice are limited without additional field research. Indeed, one of the key caveats in the use of student subjects is that findings must be carefully interpreted and boundary variables identified that might affect generalizability to other (particularly field) contexts (Greenberg, 1987). Though the available field research suggests that the three third party roles we selected are viable, they are certainly not exhaustive, nor are they necessarily mutually exclusive. For example, a third party may provide strategic direction at one time in an engagement, and later serve as an expert. Third parties also tend to interact with organizations over time in practice, and the nature of the contribution evolves with the relationship. Thus, prior relationship is an important boundary variable to consider.

Our study focused on independent assessments of effectiveness by observers as our primary dependent variable. While the multi-item nature of our measure, the complexity of the task, and empirical precedent (e.g., Goodman, Ravlin, & Schminke, 1990) suggested that this measure was appropriate, it is important to recognize that other performance measures should be considered as well in future research. A longitudinal measure that captures effectiveness and satisfaction at multiple points in time would be one improvement, particularly relevant in a field setting. Another would be the use of an objective measure of performance of a more specific task, where time to completion and accuracy could be assessed.

Regarding the experimental context, the third parties in our study were trained to a satisfactory degree for experimental purposes, but relationships might differ for professional consultants, and indeed quality and training of the consultant, and size and composition of the

consultant team, are additional variables that merit consideration in future research. In addition, third parties were introduced as part of the experimental manipulation—the role of executives in identifying and soliciting consultants is likely to affect their ability to contribute, and potentially the executives' satisfaction with their involvement. Consultant involvement was not requested actively by the teams in our experiment, which could have affected their productive involvement.

Interestingly, though, in interviews with field managers conducted as part of the background for this study and related research, it has become evident that managers and team members are often subjected to consultants despite their preferences otherwise. So, the unsolicited nature of the involvement may in fact be more realistic than one might initially expect.

The age and composition of our teams may also be a boundary condition that is representative of some work teams, but not necessarily top management teams (particularly for established *Fortune* 500 firms). Whether this would affect the relationships examined is an empirical question. With rapid growth of new companies particularly in the high-tech arena, top management teams are younger and more diverse than ever before in these sectors (Reynolds et al. 1999). The composition of the teams in this study, then, may be more reflective of certain industry contexts and ages of firms than others.

Finally, the nature of the experiment controlled for the set of problems, the organizational context, and the degree of information available. It is very possible that varying content, context, and information available would affect the dynamics of certain third party roles and timing. In terms of extensions, an interesting variation would be to compare results for each role when the input is provided by an outside consultant versus an internal team member. For example, it would be interesting to contrast the satisfaction of team members with a decision process using a devil's advocate role filled by a consultant, versus a devil's' advocate role assigned to an internal team

member. We suspect that the ongoing team functionality over time would benefit from an outsider providing the devil's advocate role, extending related work in the devil's advocate arena (Schwenk, 1990). Specifically, an outside devil's advocate may offer the benefits of devil's advocacy without the negative ramifications on group dynamics in the implementation phase (Schweiger et al., 1986). Certainly, while our study sheds light on the potential effect of consultants, field research helping identify additional boundary variables, and a combination of longitudinal case studies and larger cross-sectional studies are necessary to provide further support for the external validity of these findings.

## **Conclusion**

The results of this study have implications for theory, research and practice. This study provides insight for theory regarding strategic decision-making, third party intervention, group interaction processes, and team composition. Furthermore, the research provides a means of integrating knowledge associated with each of these streams. We found evidence that, under the right combination of timing and role, third party input has a positive effect on strategic decision outcomes. This initial first step in terms of theoretical contribution and empirical findings serves as a firm foundation for future investigations of team processes and strategic decision-making both in the field and in the simulated decision environment. In terms of practice, this research is part of a stream that could help guide both the appropriate content and timing of third party input, given the heterogeneity of a team. Achieving a fit between the needs of the team, and the role of third parties, will have the long run benefit of improving the effectiveness of strategic decisions. Involving outsiders such as third parties in strategic decision making can have many benefits. How that involvement is structured, and how to maximize the benefits of team heterogeneity, is a fertile area for future research. We demonstrate here that third party involvement is a key

consideration that shows substantial promise for informing us about strategic decision-making processes and outcomes.





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Table 1. Means, Standard deviations, and Inter-correlations of Variables Included in the Study

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Presence of a third party	.74	.44	1.00										
2. Type of involvement	1.47	1.13	.78***	1.00									
3. Timing of involvement	1.09	.79	.84***	.66***	1.00								
4. Collectivism heterogeneity <sup>a</sup>	.18	.06	.08	.03	.11	1.00							
5. Individualism heterogeneity <sup>a</sup>	.19	.08	.06	-.06	.08	.41***	1.00						
6. Affiliation heterogeneity <sup>a</sup>	.82	.33	.08	.02	.05	-.03	.04	1.00					
7. Expertise heterogeneity <sup>a</sup>	.75	.49	.02	.15	.02	.04	-.07	-.01	1.00				
8. Demographic heterogeneity <sup>a</sup>	.36	.06	.02	.10	-.06	-.05	.04	.25**	.16	1.00			
9. Perceptions of heterogeneity <sup>b</sup>	3.51	.77	-.03	-.08	-.01	-.13	-.27**	-.29**	-.01	-.32***	1.00		
10. Team effectiveness	3.95	.77	.03	-.06	.02	-.07	.11	-.15	-.16	-.21*	.28**	1.00	
11. Satisfaction	3.98	.62	-.17 <sup>†</sup>	-.19*	-.20*	-.31***	-.34***	-.05	.01	.13	.26**	.15	1.00

<sup>†</sup>p<.10 \*p<.05 \*\*p<.01 \*\*\*p<.001

<sup>a</sup>High scores indicate heterogeneity.

<sup>b</sup>Low scores indicate heterogeneity.

**Table 2. Results of GLM procedure for Effect of Type and Timing on Team Effectiveness**

Source	ss	Df	MS	F
Type	1.38	2	.69	1.19
Timing	.04	1	.04	.09
Type x timing	3.85	2	1.93	3.31*
Residual	58.35	99	.58	
Total	1715.87	106		

\*p<.05 \*\*p<.01 \*\*\*p<.001

**Table 3. Results of GLM procedure for Effect of Type and Heterogeneity on Team Effectiveness**

<i>Collectivism Heterogeneity</i>				
Source	ss	Df	MS	F
Type	1.00	3	.33	.55
Heterogeneity	.55	1	.55	.90
Type x heterogeneity	1.22	3	.41	.67
Residual	59.74	98	.61	
Total	1715.87	106		
<i>Individualism Heterogeneity</i>				
Source	ss	Df	MS	F
Type	2.92	3	.97	1.69
Heterogeneity	.04	1	.04	.08
Type x heterogeneity	4.47	3	1.49	2.58*
Residual	56.61	98	.58	
Total	1715.87	106		
<i>Affiliation Heterogeneity</i>				
Source	ss	Df	MS	F
Type	1.46	3	.49	.81
Heterogeneity	2.45	1	2.45	4.09*
Type x heterogeneity	1.24	3	.41	.69
Residual	58.61	98	.60	
Total	1715.87	106		
<i>Expertise Heterogeneity</i>				
Source	ss	Df	MS	F
Type	3.17	3	1.06	1.82
Heterogeneity	.97	1	.97	1.67
Type x heterogeneity	3.53	3	1.18	2.02
Residual	57.04	98	.58	
Total	1715.87	106		
<i>Demographic Heterogeneity</i>				
Source	ss	Df	MS	F
Type	2.23	3	.74	1.28
Heterogeneity	1.86	1	1.86	3.19†
Type x heterogeneity	2.02	3	.67	1.16
Residual	57.17	98	.58	
Total	1715.87	106		

†p&lt;.10 \*p&lt;.05 \*\*p&lt;.01 \*\*\*p&lt;.001



**Table 4. Results of GLM procedure for Effect of Type and Perceptions of Heterogeneity on Team Effectiveness**

Source	Ss	df	MS	F
Type	6.01	3	2.00	3.63*
Perceptions of heterogeneity	10.821	1	10.83	19.61***
Type x heterogeneity	4.45	3	1.48	2.69*
Residual	259.42	470	.55	
Total	7699.33	478		

\*p&lt;.05 \*\*p&lt;.01 \*\*\*p&lt;.001