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Pluralistic Ignorance in
Corporate Boards and
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Persistence in
Response to Low Firm
Performance

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This study examines how a social psychological bias referred to as pluralistic ignorance may occur in corporate boards and how this bias could contribute to strategic persistence in response to relatively low firm performance. Our theory suggests that under conditions of low performance, there may be a systematic tendency for outside directors to underestimate the extent to which fellow directors share their concerns about the viability of the firm's corporate strategy. This reduces the propensity for individual directors to express their concerns about the current corporate strategy in board meetings, decreasing the likelihood that boards will initiate strategic change in response to low firm performance. We also posit factors that may moderate the extent to which pluralistic ignorance occurs on boards. We suggest that demographic homogeneity among outside directors (with respect to gender, functional background, education, and industry of employment) and the density of friendship ties among them will significantly moderate the occurrence of pluralistic ignorance on boards. We test our hypotheses with original survey data from a large sample of outside directors at medium-sized U.S. companies and find support for our theory. We discuss contributions of our theory and findings to the literatures on corporate governance, strategic persistence and change, and group decision-making processes in organizations. ●

A large body of theory and research in organization studies and strategic management has sought to explain why top executives often fail to initiate strategic changes in response to poor firm performance. A major theme in this literature is that strategic persistence in response to poor performance results, in part, from a range of cognitive biases or "perceptual distortions" in executive decision making (Starbuck, Greve, and Hedberg, 1978: 113; Starbuck and Milliken, 1988; Milliken and Lant, 1991; Barker and Duhaime, 1997). For instance, top executives have been shown to overattribute poor firm performance to uncontrollable or temporary conditions in the external environment and underattribute performance problems to the current corporate strategy (Staw, McKechnie, and Puffer, 1983; Salancik and Meindl, 1984; Lant, Milliken, and Batra, 1992; Barker and Duhaime, 1997). Executives fall prey to such attribution biases for a variety of reasons. They may become socialized into belief systems that take for granted the value of the current strategy. To the extent that they helped to formulate the strategy or previously endorsed the strategy, implicitly or explicitly, executives may be reluctant to acknowledge to themselves, colleagues, or external constituents that the strategy is not working (Starbuck, Greve, and Hedberg, 1978; Whetten, 1987; Milliken and Lant, 1991; Tripsas and Gavetti, 2000). Moreover, there is evidence that executives tend to respond to poor performance by restricting their search for new information, ignoring information that reflects negatively on the current strategy, or engaging in a biased pattern of advice seeking that affirms their strategic assumptions and bolsters their confidence in the current strategy (e.g., Schwenk, 1984; D'Aveni and MacMillan, 1990; McDonald and Westphal, 2003).

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Corporate governance scholars have suggested that boards of directors may play a critical role in counteracting executives' tendencies to persist with failing strategies (McDonald and Westphal, 2003; Sundaramurthy and Lewis, 2003). Normative theories of corporate governance, such as agency theory, suggest that boards of directors are well positioned to monitor executive decision making objectively on behalf of shareholders (Fama and Jensen, 1983; Beatty and Zajac, 1994). Outside directors, in particular, should be less likely than top executives to make biased attributions of poor firm performance. As non-employee directors, they should be less influenced by cultural beliefs in the organization that take for granted the value of the current strategy. Moreover, given that outside directors do not normally formulate strategy (Clark, 1986; Walsh and Seward, 1990; Finkelstein and Hambrick, 1996), they should be less reluctant than top executives to acknowledge weaknesses in the current strategy.

Yet there is considerable qualitative and anecdotal evidence that boards often fail to check executives' tendencies to persist with failing strategies, regardless of the number of outside directors on the board (Chatterjee and Harrison, 2001; Ingley and Van der Walt, 2001; Sundaramurthy and Lewis, 2003). One explanation for the board's passivity in such circumstances is that, in many cases, outside directors are not truly independent of top management. Outside directors may have social ties to the chief executive officer (CEO) or professional ties to the firm that make them reluctant to challenge the CEO's view about the viability of the current corporate strategy (for a review, see Chatterjee and Harrison, 2001). Empirical evidence from the corporate governance literature does not consistently support this explanation, however. Although there is some evidence that boards comprising outsiders who lack social ties to management are more effective in controlling agency costs from overly generous executive compensation contracts, "golden parachutes," and related policies, there is less evidence that directors' independence affects the likelihood of strategic persistence in response to poor performance or environmental change (Goodstein, Gautam, and Boeker, 1994; Westphal, 1998; McDonald and Westphal, 2003); moreover, survey research on board behavior suggests that outside directors who lack social ties to the CEO or professional ties to the firm are not necessarily more likely to challenge top managers on strategic issues (Westphal, 1998, 1999).

In this study, we offer a different explanation for why boards may often fail to prevent strategic persistence in the face of poor performance. Although individual outside directors may be more objective and less biased about corporate strategy than top managers, they may yet fail to spur needed change due to a different kind of social psychological bias that is characteristic of group decision making: "pluralistic ignorance." The concept of pluralistic ignorance was popularized in Harvey's (2001: 18) writings on the "Abilene Paradox," in which the author attempted to explain his family's decision to persist with an ill-fated road trip to Abilene, Texas, despite the fact that each member of the family had private reservations about the trip; as Harvey put it, "Here we were, four

sensible people who . . . had taken a 106-mile trip across a godforsaken desert in a furnace-like temperature through a cloud-like dust storm to eat unpalatable food at a hole-in-the-wall cafeteria in Abilene, when none of us had really wanted to go." The Abilene Paradox is an instance of the more general phenomenon of pluralistic ignorance, defined by social psychologists as "a situation in which virtually all members of a group privately reject group norms, [practices, or policies, or have concerns about them] but believe that virtually all other group members accept them" (Miller, Monin, and Prentice, 2000: 103). Research in social psychology has shown how pluralistic ignorance can lead to an "attitude-behavior disjunction" in which groups continue to follow or endorse norms, policies, or practices that most individual group members privately disagree with (Miller, Monin, and Prentice, 2000: 103). Pluralistic ignorance is a general phenomenon that can occur in a variety of circumstances in which events raise concerns among individuals about the viability of group policies or practices. But there is evidence that negative performance feedback in particular can trigger pluralistic ignorance in groups, as individual members become concerned about the viability of the group's strategy and practices but tend to underestimate the extent to which others share their concerns (Halbesleben, Buckley, and Wheeler, 2003).

In the present study we suggest how and why pluralistic ignorance can occur on corporate boards and examine the consequences for strategic persistence in response to poor firm performance. Drawing from theory and research on the social psychology of group decision making, we consider why the unique characteristics of corporate boards may make them prone to pluralistic ignorance and suggest specific factors that may moderate the extent to which pluralistic ignorance occurs on boards.

Our study contributes to research on strategic change by suggesting why boards of directors may often fail to prevent strategic persistence in response to relatively poor firm performance. At the same time, our study fills a critical gap in the corporate governance literature: as many authors have noted, very few large-sample studies have directly examined group dynamics or decision making processes of corporate boards (e.g., Kosnik, 1990; Finkelstein and Hambrick, 1996; Westphal, 1998). This research begins to fill that gap in the literature by showing how and when a particular group decision-making bias (i.e., pluralistic ignorance) can occur on boards. Moreover, while there is a growing body of theory and research in social psychology on pluralistic ignorance in group decision making, our study is perhaps the first systematic field study of pluralistic ignorance in business organizations.

PLURALISTIC IGNORANCE ON CORPORATE BOARDS

Pluralistic ignorance has been shown to occur in a wide variety of contexts. In Schank's (1932) classic study, members of a community group reported private reservations about norms prohibiting gambling and drinking, and yet they tended to believe that other members did not share their concerns; consequently, group members continued to follow norms

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that few privately supported. In their studies of bystander intervention, Latane and Darley (1970) showed that bystanders to a possible emergency tend to underestimate the extent to which other bystanders interpret the situation as an emergency, and this misperception inhibits them from intervening, even though many initially suspect that the situation is an emergency. More recent studies of group decision making have shown that when groups receive negative performance feedback that appears to raise concerns about the efficacy of the group's norms or practices, group members tend to underestimate the extent to which others share their concerns, and consequently, they continue to follow practices that most members privately suspect should be changed (for reviews, see Miller and Nelson, 2002; Halbesleben, Buckley, and Wheeler, 2003).

Miller and colleagues have described the social psychological dynamics that can lead to pluralistic ignorance in group decision making (Miller and McFarland, 1987, 1991; Miller and Nelson, 2002). They suggest that an important precursor of pluralistic ignorance is the hesitancy of group members to voice minority opinions. They note that group members take certain social risks when they express a minority opinion on an important issue. The small groups literature suggests that individual group members tend to be evaluated more negatively after expressing a minority opinion (for a review, see Moscovici and Doise, 1994). There is also evidence that individuals who express a minority viewpoint are typically more likely than individuals who express a majority viewpoint to experience "social distancing" from other group members: less attention is paid to their remarks and their opinion is sought out less often (Bogardus, 1959; Moscovici and Doise, 1994; Williams and Sommer, 1997). These findings are consistent with extensive evidence in the organizational behavior literature suggesting that people are biased in favor of those who share their beliefs and opinions and biased against those who do not share their points of view. Such bias is manifested in less positive assessments of the person's capabilities, less positive affect, and a tendency to avoid social interaction with the person (Tsui and O'Reilly, 1989; Williams and O'Reilly, 1998; Fiske, 2002). Similarly, research on intergroup relations has shown that individuals who express minority opinions on a salient issue may be categorized as out-group members by those who hold the majority position, resulting in out-group biases towards members of the minority (Islam and Hewstone, 1993). Out-group bias results in a tendency for members of the majority to discount the intellectual capability and trustworthiness of individuals who espouse the minority opinion (Khan and Lambert, 1998; Fiske, 2002). As a result, by expressing a minority point of view, individuals risk compromising their social status in the group and their social capital with other group members.

The risks associated with expressing minority opinions provide the foundation for pluralistic ignorance in workgroups. Research on group decision making has shown that when there are social risks to expressing a minority opinion and individuals are uncertain about whether their opinion is shared by others, before voicing their opinion they will tend

to look for evidence from the statements of other group members that their opinion is shared (Miller and McFarland, 1987; Bassili, 2003). Thus when individuals receive performance information that causes them to question the merit of a group norm, practice, or strategy, they will tend to hesitate in expressing their concerns until at least some other group members express similar concerns (Miller and McFarland, 1991). If other group members follow the same decision rule, however, then no one will express their concerns about the practice or strategy in question.

Research on pluralistic ignorance has shown how this social dynamic, in which group members hesitate to express their concerns about a group position or practice until others have done so, can cause people to systematically underestimate the extent to which others share their concerns (Miller and McFarland, 1987; Vorauer and Ratner, 1996; Miller and Nelson, 2002). A number of studies by Miller and colleagues have shown that people tend to interpret a lack of expressed concern about group practices among other group members as indicating agreement with those practices, even though they readily attribute their own reticence to express concerns to social inhibition. This appears to result from a general lay dispositionism in interpreting the behavior of others: people tend to overattribute the behavior of others to internal preferences or "approach motivation," while attributing their own behavior to situational causes or avoidance motivation (e.g., avoiding social costs from expressing an opinion) (Miller and Nelson, 2002: 1066). As a result, a "spiral of silence" can ensue (Noelle-Neumann, 1993: 1) whereby individuals who have private concerns about a group practice tend to assume from the lack of expressed concern by others that they are in the minority, making them less likely to state their concerns, which then makes others less likely to air their concerns, and so forth.

Pluralistic ignorance is typically defined at the group level as the extent to which group members (plural) underestimate the degree to which others share their concerns (Merton, 1957; D. T. Miller, personal communication; Miller and McFarland, 1987; O'Gorman, 1986; Weick, 1996; Suls and Green, 2003), in part because the biases of individual group members are interdependent. They should only persist to the extent that they are shared by others. If other group members are less biased than a focal person about the extent to which their concerns are shared, then they will express their concerns more fully to the group, thus lessening the focal person's bias. Moreover, known antecedents and consequences of pluralistic ignorance are group-level factors. For instance, Miller and McFarland (1991) have shown that the attribution biases that underlie pluralistic ignorance depend on mutual observability among group members. As discussed further below, our theoretical perspective suggests that communication and social integration resulting from demographic homogeneity and dense friendship ties among group members may represent important moderators of pluralistic ignorance. Moreover, prior research on pluralistic ignorance has typically sought to explain the persistence of group-level phenomena, such as group norms, strategies,

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and policies (Weick, 1996; Miller, Monin, and Prentice, 2000; Halbesleben, Buckley, and Wheeler, 2003), and such phenomena are affected more by the collective biases of group members than by the biases of any one individual.

Though pluralistic ignorance has been observed in a variety of contexts, it may be particularly likely to occur among outside directors on corporate boards. On one level, there are social risks from expressing a minority opinion on corporate boards. Boards of major companies comprise prominent individuals who control access to prestigious positions, financial capital, and other resources (Hillman and Dalziel, 2003). Thus most directors are concerned with maintaining the respect of fellow board members and consequently may be hesitant to risk compromising that respect by voicing an opinion that is not shared by others. Although there is variance across boards in the level of social cohesion among directors, on average the level of social cohesion among outside directors is low. In particular, the average level of friendship ties is low, and as part-time employees with busy schedules, outside directors who lack personal ties usually interact little outside formal board meetings (Westphal, 1998). A low level of social cohesion has been shown to increase the perceived risk of voicing minority opinions (Kramer, 1990; Moscovici and Doise, 1994), and low levels of social interaction outside formal meetings reduce the likelihood that directors will discover shared concerns. At the same time, the traditional boardroom configuration results in a high level of mutual observability. Individual directors, who may have a concern about current strategy, can directly monitor the behavior of other directors during board meetings. Observing other directors who fail to raise concerns about the current strategy leads to the biased pattern of attributions noted above, resulting in pluralistic ignorance.

We focus on pluralistic ignorance among outside rather than inside directors for two reasons. First, while inside directors may sometimes have concerns about the viability of their strategy, the corporate governance literature suggests that outside directors, as non-managers, should tend to be more objective about management's corporate strategy than are managers themselves. Outside directors should be less socialized into cultural beliefs in the organization that take for granted the benefits of the current strategy, and they are likely to be less threatened by negative performance feedback. Although outside directors must approve strategic decisions, they are likely to be less psychologically invested in strategic decisions than insiders are, in the sense that they typically have a smaller role than insiders in determining the content of corporate strategy (Lorsch, 1989); they also have less at stake in the outcomes of strategic decisions than top managers do, with respect to either personal reputation or financial repercussions (Davis, 1993; Black, Cheffins, and Klausner, 2004). Accordingly, threat-rigidity processes that are thought to promote biased attributions of firm performance among top managers should tend to be less pronounced among outside directors. Second, outside directors can be considered a group unto themselves, in that they have a different role from inside directors in board discussions (Alder-

fer, 1986; Lorsch, 1989; Hillman and Dalziel, 2003; Sundaramurthy and Lewis, 2003). Whereas inside directors tend to adopt the role of management representatives, and are expected to present and explain strategic proposals and report firm performance to outside directors, the latter are expected to provide advice to insiders on strategic issues and ostensibly to raise concerns about strategy when necessary to protect shareholder interests (Lorsch, 1989; Hillman and Dalziel, 2003; Sundaramurthy and Lewis, 2003). Unless otherwise stated, our use of the term "directors" in this study refers to outside directors.

Low firm performance seems especially likely to elicit concern among directors about the current corporate strategy. From a problemistic search perspective, managers define problems according to their experience and position in the organization (Cyert and March, 1963; Ocasio, 1997). Just as finance managers tend to define organizational problems in terms of finance issues and marketing managers define problems in terms of marketing issues, so outside directors, who are involved primarily with issues of corporate strategy, are likely to define performance problems in terms of corporate strategy issues. This line of argument leads to an initial hypothesis regarding the general tendency for pluralistic ignorance to occur on corporate boards. Specifically, when directors receive negative information about firm performance (i.e., information suggesting that the firm is performing worse than competitors and below historical levels), so that there are grounds for some level of concern about the appropriateness of the firm's strategy, we expect that directors will tend to underestimate the extent to which other outside directors share their concern. Here, we assume a non-linear relationship between firm performance and directors' private concern about strategy, such that the level of concern will be generally low when performance is above aspiration levels and generally high when performance is below aspiration levels (i.e., there will be a non-linear increase in directors' concern when performance drops below aspiration levels). This assumption is consistent with theory and research on aspiration levels, which suggests that managers are "boundedly rational decision makers [who] try to simplify evaluation by transforming a continuous measure of performance into a discrete measure of success or failure" (Greve, 1998: 59; see also March and Simon, 1958; March, 1988; Mezias, 1988). This literature also supports our premise that aspiration levels are jointly influenced by the performance of competitors and the focal firm's prior performance (for a review, see Greve, 1998). Thus we hypothesize:

Hypothesis 1: When firm performance is relatively low, outside directors will tend to underestimate the extent to which fellow directors share their concerns about the firm's current strategy.

Moreover, our theoretical argument suggests that a key mechanism underlying pluralistic ignorance is the failure of directors to express their concerns about corporate strategy, as individual directors overattribute a lack of expressed concern among their colleagues to confidence in the current strategy. Thus we expect that on boards of firms with relatively low performance, the degree to which pluralistic igno-

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Pluralistic ignorance is present will depend on the extent to which directors fail to express their concerns about corporate strategy:

Hypothesis 2: When firm performance is relatively low, the less outside directors have expressed their concerns about the current corporate strategy, the greater the tendency for directors to underestimate the extent to which fellow directors share their concerns about the firm's current strategy.

Social and Psychological Moderators of Pluralistic Ignorance

There are social and psychological factors that could mitigate or exacerbate pluralistic ignorance among directors. In particular, the density of personal friendship ties and the level of demographic homogeneity among outside directors may influence the propensity for directors to express their concerns about corporate strategy, thus determining the extent to which pluralistic ignorance is present on boards.

Personal friendship ties. On one level, personal friendship ties between group members should lower the perceived risk of voicing a minority opinion. Friends develop positive attitudes about each other from accumulated interactions (Lazarsfeld and Merton, 1954; Shah, 1998). Thus a friend is less likely than an acquaintance to evaluate a person more negatively because he or she voices a minority opinion on a particular issue. Moreover, friends are normatively obligated to support and help one another, regardless of their idiosyncrasies (Allan, 1979; Silver, 1990). To the extent that individual directors have friendship ties to other board members, therefore, they take fewer risks in airing a minority opinion, i.e., there is a reduced risk that other directors will respond by withholding positive affect, social interaction, or valued resources such as access to prestigious positions, capital, or expertise. Accordingly, when friendship ties among outside directors are relatively dense, individual directors should be less hesitant to express their concerns about current corporate strategy before other directors have done so. Moreover, friendship ties between managers increase the frequency of informal communication between them (Krackhardt, 1990; Ibarra and Andrews, 1993; Shah, 1998). As a result, outside directors who are connected by personal friendship ties should not only be less reluctant to express their concerns about corporate strategy to each other, but they should also have more frequent opportunities to do so. Therefore, friendship ties among outside directors should tend to facilitate the discovery of shared concerns about strategy, thus reducing the likelihood or extent of pluralistic ignorance:

Hypothesis 3: (a) When firm performance is relatively low, the higher the density of personal friendship ties among outside directors, the less outside directors will underestimate the extent to which fellow directors share their concerns about the firm's current strategy; (b) this relationship will be mediated by a greater tendency for outside directors to express their concerns about corporate strategy.

Demographic homogeneity. The level of demographic homogeneity among outside directors could also influence whether and to what extent pluralistic ignorance is present on corporate boards. On one level, there is abundant evi-

dence from research on demography and group decision making that similarity on salient demographic characteristics tends to increase social integration among group members, including the level of communication between them (Pfeffer, 1983; Smith et al., 1994; Williams and O'Reilly, 1998). Demographic similarity has been shown to increase interpersonal trust, which in turn increases the openness of communication among group members (Kanter, 1977; O'Reilly, Caldwell, and Barnett, 1989; Zenger and Lawrence, 1989; Williams and O'Reilly, 1998). Therefore, in the present context, demographic similarity should tend to enhance interpersonal trust among board members, thus making individual directors less hesitant to express their concerns about the firm's current strategy before others have done so. Smith et al. (1994) also found that demographic homogeneity in top management teams was associated with the frequency of informal, social interaction among managers. Thus outside directors who are demographically similar to each other should not only be more willing to share their concerns about strategy in board meetings, but they should also have more frequent opportunities to voice shared concerns in informal interaction outside formal meetings. As a result, outside directors who are demographically similar to each other should be more likely to discover shared concerns about corporate strategy, thus attenuating pluralistic ignorance:

Hypothesis 4: (a) When firm performance is relatively low, the greater the demographic homogeneity among outside directors, the less outside directors will underestimate the extent to which fellow directors share their concerns about the firm's current strategy; (b) this relationship will be mediated by a greater tendency for outside directors to express their concerns about corporate strategy.

The social psychological literature on decision-making failures clearly distinguishes pluralistic ignorance from groupthink, a mode of decision failure that has received more attention in the organizational behavior literature. Though both pluralistic ignorance and groupthink may lead to decision failure, the determinants of each are distinct. Social cohesion among group members is thought to exacerbate the presence of groupthink, but our theoretical perspective suggests that social cohesion from friendship ties and demographic homogeneity actually attenuates pluralistic ignorance. With groupthink, groups persist with failing strategies because social cohesion and other features of the group context enhance individual group members' perceptual biases about the viability of the group's strategy (Esser, 1998). With pluralistic ignorance, groups persist with failing practices or strategies because individual members misperceive each other's beliefs about the current strategy, and these misperceptions are likely to be enhanced by low levels of social cohesion.

Pluralistic Ignorance and Strategic Persistence

As suggested by Noelle-Neumann (1993) in her discussion of the spiral of silence, pluralistic ignorance not only reflects but also reinforces the failure of group members to fully express their concerns about group policies and practices. Thus, given the social risks in expressing what is perceived to be a minority opinion, when outside directors underestimate the

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extent to which fellow directors share their concerns about corporate strategy, each individual director will tend to feel inhibited from expressing his or her concerns, and consequently outside directors as a group will fail to voice their collective concern about corporate strategy to top management. The failure of outside directors to express their concern about strategy should, in turn, decrease the likelihood of strategic change in response to conditions of poor firm performance.

The literature on corporate boards and strategic change, as discussed previously, suggests that the willingness of outside directors to express their strategic concerns in board meetings may be critical to avoiding strategic persistence in response to poor performance. Outside directors should be less prone than top executives to making biased attributions of poor firm performance and thus may play an important role in counteracting managers' tendencies to persist with failing strategies (Finkelstein and Hambrick, 1996). Moreover, the expression of strategic concerns by a large portion of outside directors in board meetings should be a potent impetus to change. Once directors have voiced their concerns, top managers ignore them at considerable personal risk. By failing to take actions that address board members' expressed concerns, CEOs jeopardize the goodwill of their directors, increasing their risk of dismissal and compromising their social capital (Kimberly and Zajac, 1988). As noted above, outside directors of large companies control access to valued positions, financial resources, and expertise, and thus CEOs are likely to respect their concerns in order to maintain good relations with them (Kimberly and Zajac, 1988; Lorsch, 1989). Accordingly, the expressed concerns of outside directors in board meetings should be a potent impetus to strategic change, and conversely, the failure of outside directors to express their strategic concerns should significantly reduce the likelihood of strategic change. Overall, our theoretical perspective suggests that pluralistic ignorance among outside directors can impede strategic change in response to poor performance by inhibiting directors from expressing their concerns about strategy in board meetings. Thus our theoretical argument leads to a final, two-part hypothesis on the consequences of pluralistic ignorance for strategic persistence:

Hypothesis 5: (a) The relationship between the level of outside directors' concern about the firm's current strategy and subsequent strategic change will be negatively moderated by the extent to which outside directors perceive that other directors are not concerned about the firm's current strategy; (b) this interaction will be mediated by a reduced tendency for outside directors to express concern about corporate strategy in board meetings.

METHOD

Sample and Data Collection

The sample frame for this study included boards of mid-sized, public companies between \$500,000 and \$100 million in sales, as listed in the Reference USA index of U.S. industrial and service firms. We chose this sample frame for three reasons: (1) to exploit a large database of director information provided by a management consulting firm, which covers

directors of mid-size firms; (2) to improve the survey response rate, which would likely be lower for directors of very large firms; and (3) to enhance our knowledge of corporate governance practices among an understudied population of firms. In wave 1, we sent survey questionnaires to all outside directors at a random sample of 225 companies. We took several steps to maximize the survey response rate (Linsky, 1975; Groves, Cialdini, and Couper, 1992; Fowler, 1993; see Westphal, 1998; McDonald and Westphal, 2003): (1) we used feedback from the pre-test to revise our questionnaire, making it easier and more attractive to fill out; (2) the cover letter emphasized that the survey was part of an ongoing research effort on corporate governance issues conducted by faculty in several major business schools and that thousands of directors had participated in prior surveys; (3) the cover letter included an appeal to participants by directors at a well-known management consulting firm and several top executives from large U.S. companies; and (4) we sent two additional rounds of questionnaires to all non-respondents at four-week intervals. We received responses from 603 directors from 174 companies, resulting in a director response rate of 45 percent.

The survey questionnaire asked directors to assess the strategy and board behavior of the focal firm and of other firms in the population in which they served as outside director, with the companies listed by name. In a second wave of the survey, we sent questionnaires to other outside directors at all boards in the population for which at least one outside director had responded in wave 1 ($N = 416$). We obtained responses from 999 directors from 372 companies, for a director response rate of 46 percent. We excluded boards from the final sample if complete data were not available for at least 75 percent of outside directors on the board, resulting in a sample of 228 boards (36 percent of the sample frame).

To assess the representativeness of the sample, we compared directors and boards in the final sample with those excluded from the final sample due to non-response or missing data, using the Kolmogorov-Smirnov (K-S) two-sample test (Siegel and Castellan, 1988). This test determines whether the distribution of a given variable is different for directors or boards in the final sample versus others in the sample frame (i.e., including differences in kurtosis, skewness, and other features of the distribution, as well as differences in central tendency). There were no significant differences with respect to the archival variables examined in the study, including measures of demographic homogeneity, board size, board vs. CEO power, directors' functional background, educational affiliation, educational degree type, gender, or tenure on the board (these measures are discussed further below); p -values ranged from .144 to .891. There were also no significant differences between firms in the final sample and those in the sample frame with respect to firm characteristics examined in the study, including firm size, product market diversification, and geographic diversification; p -values ranged from .313 to .770. In separate analyses, we also tested for sample selection bias with a multivariate

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approach, using the Heckman sample selection model (Heckman and Borjas, 1980). The selection equations included the archival variables listed above, as well as variables that describe features of the survey itself (e.g., whether the respondent was in wave 1 or wave 2 of the survey). The results were very similar to those presented below and remained consistent with our hypotheses. Moreover, the selection parameter in these models was not significant.

To measure directors' subsequent expressed concern about strategy, we sent a follow-up survey one year after the initial survey to all outside directors of firms in the initial sample. At least one director of 201 companies responded (88 percent of the initial sample and 31 percent of the initial sample frame). Again, K-S tests and Heckman selection models suggested that there was no sample selection bias with respect to the archival variables examined in our study.

We obtained data on director and board characteristics and ownership from *Standard and Poor's Register of Corporations, Directors, and Executives*; *The Dun and Bradstreet Reference Book of Corporate Management*; *Who's Who in Finance and Industry*; EDGAR Online, and a database provided by a large management consulting firm. Data on product market diversification, industry concentration, firm size, and performance came from COMPUSTAT and EDGAR Online, and data on geographic diversification came from COMPUSTAT, *Dun & Bradstreet's American Corporate Families and International Affiliates*, and Mergent Online.

Measures

Concern about strategy. We measured directors' concern about strategy and directors' perception that other board members are concerned about strategy using multi-item scales in the survey questionnaire (see Appendix A for specific items). The scales included multiple response formats to minimize response bias (DeVellis, 1991). To increase the construct validity of the measures, we conducted a qualitative pre-test involving in-depth interviews with 21 outside directors (Fowler, 1993). The purpose of the interviews was to make sure that respondents interpreted each question as expected. We conducted factor analysis on the survey items using the principal factors method with promax rotation. A scree test indicated two factors, with questions regarding directors' concern about strategy loading on one factor and questions about the perceived concern of others loading on the second factor. Inter-item reliability was high, with alphas of .94 for concern about strategy and .88 for perceived concern of others.

As discussed above, pluralistic ignorance is typically defined at the group level. Our theoretical perspective suggests that the biases of individual group members are interdependent: if others are less biased than a focal person about the extent to which their concerns are shared, then they should tend to express their concerns more fully to the group, thus lessening the focal person's bias. Thus we would expect limited variance within boards in the extent to which directors misperceive the concerns of others. In this respect, the relationship between pluralistic ignorance and individual-level percep-

tions is a kind of consensus composition model (Chan, 1998). The validity of such a model can be demonstrated by providing empirical evidence of limited within-group variance on the individual-level variables of interest (Glick, 1985; Rousseau, 1985; Chan, 1998). Thus we calculated the r_{wg} index, a measure of within-group agreement, as well as the intraclass correlation coefficient (ICC), which estimates the proportion of total variance that can be explained by group membership. The r_{wg} index was .93 for director concern about strategy and .94 for perception of others' concern, well above the .70 threshold commonly used to justify aggregation (George, 1990). The ICC was significant at $\alpha = .001$ for director concern about strategy and perception of others' concern ($F = 2.91$ and 3.16 , respectively). When using the ICC procedure, a significant F-test is commonly used to justify the aggregation of data to the group level (Klein et al., 2001). These results support our theoretical expectations and suggest that within-board variance in director perceptions is sufficiently small to warrant aggregation to the board level.

Thus in the primary analyses we tested hypothesis 1 by examining whether there was a significant, positive difference between directors' concern about strategy, averaged across directors on the same board, and the average perceived concern of other board members. To test hypotheses 2 and 3, we then examined whether this difference was significantly reduced when demographic homogeneity and the density of friendship ties were relatively high.

Although pluralistic ignorance is typically defined as a group-level construct, some prior studies have operationalized the phenomenon at the individual level. To compare our results with prior research, we also conducted director-level analyses. These analyses estimate the difference between a focal director's concern about strategy and the director's perception that other board members are concerned about strategy. We report the results of these analyses separately below. Because our measures use responses from the same sample of directors to assess directors' concern about strategy and the perceived concern of others, there is a potential identification problem in our models. Thus we derived standard errors for these measures from bootstrapped estimates of the standard deviations (Manski, 1993; Sacerdote, 2001).

Expressed concern about strategy. We measured directors' expressed concern about strategy using multi-item scales in the initial survey and the follow-up survey (see Appendix A). Both scales gauge the extent to which directors have expressed concern about strategy during the 12 months preceding the survey. The scale in the initial survey was used to assess the role of prior expressed concern about strategy in contributing to pluralistic ignorance, and the scale in the follow-up survey was used to assess the role of expressed concern in mediating the consequences of pluralistic ignorance for strategic change. Factor analysis again suggested that the survey items in each scale loaded on a single factor, and inter-item reliability was high ($\alpha = .94$ for the initial survey and $.93$ for the follow-up survey). To assess interrater reliability, we compared responses of different directors at the same board using the weighted kappa coefficient ($N = 170$) (Cohen,

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1968; Barker et al., 2004). Values above .75 have been interpreted as indicating "excellent agreement" (Fleiss, 1981: 218). In this case, kappas exceeded .75 for all four survey items, indicating high levels of interrater agreement. Moreover, the intraclass correlation coefficient (ICC) for the scale was .90, which also indicates a high level of agreement.

Density of personal friendship ties among outside directors. To assess the density of friendship ties among outside directors, respondents were asked to consider their personal relationship with each of the other outside directors (listed by name) and to indicate whether they considered each person to be an acquaintance or a personal friend. Prompting respondents to differentiate between acquaintances and friends creates a more precise measure of perceived friendship (Allan, 1979; Segal, 1979; Westphal, 1998). This approach to operationalizing friendship ties is common in the social network literature (Brass, 1984; Krackhardt, 1992). In addition, there was a high correlation between this measure of friendship and two other questions on the survey that assessed the closeness of the respondent's relationships with other directors. There was also evidence for interrater reliability: additional analysis showed a high level of agreement (92 percent) between respondents about the status of their personal relationship as friends vs. acquaintances. We asked respondents to assess their relationships with other directors who were on the board at the time of the survey and one year prior to the survey. In the primary analyses, we used data on friendship ties one year prior, because expressed concern about strategy is measured over the prior year, but friendship ties changed very little over the course of a year, and thus results were identical using data on friendships at the time of the survey. We measured density of friendship ties as the number of such ties between outside directors divided by the number of possible ties (Wasserman and Faust, 1994).

Demographic homogeneity. We examined homogeneity with respect to four demographic characteristics that have been shown to provide a salient basis for in-group/out-group categorization among directors of U.S. corporations. First, there is evidence from a number of studies that *functional background* can provide a salient basis for in-group categorization (i.e., categorization as a marketing person, finance person, etc.). In-group biases from common functional backgrounds have been shown to affect the selection of executives and outside directors, and functional background similarity in CEO/director relationships has also been shown to bias directors' evaluation of CEO performance and to enhance social integration among outside directors (Useem and Karabel, 1986; Fligstein, 1987; for a review, see McDonald and Westphal, 2003). More generally, there is considerable evidence from the larger literature on organizational demography that functional background provides a meaningful basis for social categorization in workgroups (Williams and O'Reilly, 1998). Following a number of prior studies, we classified functional background into three categories: throughput functions (engineering, operations, or research and development), output functions (marketing or sales), and peripheral functions

(finance and law) (Hambrick and Mason, 1984; Chaganti and Sambharya, 1987; McDonald and Westphal, 2003).

There is also considerable evidence that the *industry of employment* provides a salient basis for social categorization among corporate leaders (Lorsch, 1989; Demb and Neubauer, 1992; Porac, Wade, and Pollock, 1999; McDonald and Westphal, 2003). Porac, Thomas, and Baden-Fuller (1989) showed that employment in the same industry provides a meaningful basis for social identification among top executives, and Smith et al. (1994) found that homogeneity in industry experience enhanced informal communication and social integration on top management teams. Moreover, Westphal and Milton (2000) provided evidence that the industry of employment is a salient basis for in-group identification among outside directors and that homogeneity with respect to the industry of employment enhances social integration on boards.

There is also abundant evidence from the larger literatures on relational demography and intergroup relations that *gender* can provide a salient basis for in-group categorization in organizations (Tsui, Egan, and O'Reilly, 1992; for reviews, see Williams and O'Reilly, 1998; Pelled, Ledford, and Mohrman, 1999). Westphal and Milton (2000) showed that gender provides a salient basis for in-group identification among directors. Although gender diversity on corporate boards is limited, it has increased in recent years, particularly at small and mid-sized companies (Korn/Ferry, 2002); further, there is evidence that increases in gender diversity from complete homogeneity (i.e., all male directors) to relatively low levels of heterogeneity can significantly reduce social integration in small groups (Williams and O'Reilly, 1998; Rosen et al., 1999; Chattopadhyay, 1999).

The extensive sociological literature on corporate elites also suggests that *educational affiliation* (i.e., a degree from a prestigious institution) can provide a meaningful basis for social categorization (Useem and Karabel, 1986; Palmer and Barber, 2001); an Ivy League education, in particular, remains a salient indicator of social status among corporate leaders (Baltzell, 1958; Zweigenhaft and Domhoff, 1998; Domhoff, 2002). A range of stereotypes, some positive and some negative, may be applied to individuals who have such credentials (Domhoff, 2002; D'Aveni, 1990), enhancing the potential for in-group/out-group biases. There is evidence that educational affiliation provides a basis for in-group favoritism in director selection and promotion decisions. For example, incumbent directors with an Ivy League degree favor director candidates who have the same credentials, and incumbents who do not have an Ivy League degree favor candidates who also lack such credentials (Useem and Karabel, 1986). More recently, Westphal and Milton (2000) provided evidence that having an Ivy League degree provides a salient basis for in-group identification among outside directors and that homogeneity with respect to educational affiliation enhances social integration on boards.

We measured homogeneity on each demographic characteristic using a variant of Blau's (1977) index of homogeneity,

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defined as $(P_i)^2$, where P_i is the proportion of outside director dyads sharing the i th category, that is, the same functional background, primary industry of employment, gender, educational affiliation (having or not having an Ivy League degree).

Strategic change. We examined two dimensions of corporate strategy: *product market diversification* and *geographic diversification*. These are key elements of a firm's corporate strategy and have received extensive research attention (Rumelt, 1974; Kim, 1989). While prior research on corporate governance and strategic change has tended to focus on product market diversification in measuring corporate strategy (Finkelstein and Hambrick, 1996), recent research has begun to consider how boards may influence geographic diversification (e.g., Sanders and Carpenter, 1998; Carpenter, Pollock, and Leary, 2003). Thus we examined change in both dimensions of diversification to assess the generalizability of our results. We used the entropy measure of product market diversification, which operationalizes diversification according to the number of segments in which a firm competes and the relative contribution of each segment to total sales (Palepu, 1985). Hoskisson, Johnson, and Moesel (1994: 1222) found the entropy measure "to have good construct validity relative to other diversification measures." We used Sanders and Carpenter's (1998) abbreviated version of Sullivan's (1994) validated scale of geographic diversification (see also Sambharya, 1996), which includes three components: (1) the ratio of foreign sales to total sales; (2) foreign assets divided by total assets; (3) the number of country subsidiaries, calculated as a percentage of the highest value in the sample. The three component variables are summed to form a composite measure (Sullivan, 1994). Prior studies have demonstrated acceptable inter-item reliability for the three component variables (Sanders and Carpenter, 1998), and reliability was high for our sample as well ($\alpha = .85$).

In the primary models, we assessed strategic change by estimating diversification in a subsequent year, i.e., year $t+3$, where t is the time of the survey (D_{t+3}) and controlling for the prior value (D_{t-1}) (Johnston and DiNardo, 1997). Similar approaches to estimating change have been widely used in the organizational and strategy literatures (e.g., Haveman, 1993; Geletkanycz and Hambrick, 1997; Kraatz and Zajac, 2001). In separate analyses, we used change scores to estimate change in diversification (e.g., $D_{t+3} - D_{t-1}$), following the procedures recommended by Edwards (1995), and the results were identical to those reported below. Moreover, in separate models we estimated diversification in year $t+2$ (D_{t+2}); the results remained consistent with our hypotheses.

Firm performance. In the primary models, we operationalized firm performance as return on equity. In separate analyses, we operationalized performance as market-to-book value, and the results remained supportive of our hypotheses. We measured prior firm performance as average return on equity during the prior three-year period ($t-3$ to $t-1$, inclusive), and we measured the performance of competitors as the average return on equity of firms that had the same primary Standard Industrial Classification (SIC) code. The results were robust to alternative operationalizations of prior performance and com-

petitor performance, including average performance over the prior two-year period or four-year period; average performance of competitors weighted by their market share in the focal firm's primary industry segment; and average performance of competitors in each industry in which the focal firm had operations, weighted by the focal firm's market share in each segment.

Control variables. We controlled for the level of product market diversification and geographic diversification in models of directors' concern about strategy. To the extent that diversification strategies are motivated in part by managerial self-interest, as suggested by agency theory (Amihud and Lev, 1999), directors may be more concerned about corporate strategy when the level of diversification is high. We also controlled for the *number of outside directors* on the board. Given that social integration tends to be lower in large groups (Janis, 1989), directors may be less likely to discover shared concerns about strategy when the number of outside directors is large. Moreover, we controlled for firm size in all models, measured as *number of employees* (expressed in thousands), given evidence that the level of board involvement is inversely correlated with firm size (Judge and Zeithaml, 1992). The results were robust to alternative measures of firm size, including total sales. We also controlled for *board power* vis à vis the CEO, as directors' perceptions may have more influence on strategic change when boards are powerful vis à vis the CEO (Finkelstein and Hambrick, 1996; Golden and Zajac, 2001). Our measure of board power includes three indicators that have been widely used in prior research: CEO tenure relative to the average tenure of outside directors, separation of the CEO and board chair positions, and director ownership (see Finkelstein and Hambrick, 1996). These measures were standardized and summed into a composite measure.

We controlled for *environmental instability* in models of strategic change, given evidence that firms in unstable environments tend to change corporate strategy more frequently (Zajac and Shortell, 1989). We measured environmental instability as the absolute change in the concentration ratio of a firm's three largest business lines, weighted by sales, during the prior three-year period (Wiersema and Bantel, 1992). We also controlled for firm performance in models of strategic change, given that poor performance could influence the likelihood of change independent of the board. For instance, poor performance could prompt threat rigidity processes in management decision making (Staw, Sandelands, and Dutton, 1981; Sutton, 1990), thus reducing the likelihood of change independent of pluralistic ignorance among outside directors. We measured firm performance as *return on equity*. Finally, we controlled for *industry* in models of corporate strategy by including dummy variables at the two-digit SIC-code level (coefficients for these variables are not reported in the tables but are available from the authors). Controls were measured for the prior year ($t-1$).

Because expressed concern about strategy was measured in a subsequent survey, relationships between the independent variables and expressed concern about strategy should not

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be vulnerable to reverse causality. Nevertheless, in separate models of strategic change, we controlled for directors' prior expressed concern about strategy, using the measure of expressed concern from the initial survey. This measure included the same survey items as the measure from the follow-up survey. The results were very similar to those presented below.

Analysis

We conducted an analysis of covariance to test hypothesis 1, which posited that outside directors will tend to underestimate the extent to which fellow directors share their concerns about the current corporate strategy when firm performance is low. We compiled a dataset with two records per firm: record 1 included directors' concern about strategy, and record 2 included directors' perception that other board members were concerned about strategy. The two records were otherwise identical; that is, each record included all the control variables listed above. We then created a new variable (*concern about strategy*), set equal to directors' concern about strategy in record 1 and directors' perception that others were concerned about strategy in record 2. We regressed this measure on a dummy variable set equal to 1 for directors' concern about strategy and 0 for directors' perception that others were concerned (*directors' concern vs. perception of others' concern*), together with the control variables; a positive and significant coefficient for the dummy variable would provide support for hypothesis 1. To test hypotheses 2–4, we interacted this dummy variable with our measures of prior expressed concern about strategy, demographic homogeneity, and density of personal friendship ties. This modeling approach is formally equivalent to estimating the difference between directors' concern about strategy and their perception of others' concern as a function of the independent variables, and separate analyses confirmed that the hypotheses were supported using either approach (e.g., the interaction between density of friendship ties and the dummy variable for directors' concern vs. perception of others' concern in the analysis of covariance model is not significantly different from the effect of friendship ties in models that estimate the difference between directors' concern and perception of others' concern). In the individual-level analyses, we corrected for bias in the coefficients that could result from including multiple records per company by using the Newey-West robust variance estimator for clustered data (Rogers, 1993).

Our theoretical argument and hypotheses suggest that pluralistic ignorance with regard to concern about strategy will be limited to firms with low performance, because directors' concern about strategy should be generally low when performance is high. Theory and research on aspiration levels would suggest that there may be a nonlinear relationship between firm performance and directors' concern about strategy, such that when performance is above aspiration levels, the level of concern about strategy will be generally low and when performance is below aspiration levels, the level of concern will be generally high (Mezias, 1988; Greve, 1998). This assumption was strongly supported by the data. We fol-

lowed prior theory and research in operationalizing aspiration levels according to the historical performance of the firm and the average performance of competitors (Greve, 1998). When performance is below the firm's historical average (based on the prior three-year period) and below the average performance of competitors (i.e., firms operating in the focal firm's primary industry), the mean level of directors' concern about strategy is significantly greater than when firm performance is above the firm's historical average and the average of competitors ($t = 8.35, p < .001$). At the same time, firm performance was not significantly correlated with concern about strategy for (1) the subsample of firms whose performance was below aspiration levels or (2) the subsample of firms whose performance was above aspiration levels. This pattern of results is consistent with the expected nonlinear relationship between concern about strategy and performance. Thus we tested the hypotheses for firms that were below the firm's historical average and below the average performance of competitors. We used the Heckman model to correct for sample selection bias in the analysis. The Heckman model includes two equations: the selection model estimates the likelihood that firm performance is below the firm's aspiration level for the full sample, and the hazard rate from that model is then included in a regression model to estimate directors' concern about strategy for the subsample of firms that are below aspiration levels ($N = 109$). This procedure allows us to generalize the results to the full sample of mid-sized companies.

As an alternative to the Heckman models, in separate analyses, we tested interactions between (low) firm performance and the independent variables for the full sample of companies. For instance, we estimated the interactive effect of firm performance and density of friendship ties on the difference between directors' concern about strategy and their perception of others' concern. As one would expect, the interaction effects were significant, and the simple effects from these models were consistent with results of the Heckman models presented below (e.g., the effect of friendship ties on the difference between directors' concern about strategy and their perception of others' concern was significant at low levels of firm performance).

We used multiple regression analysis to estimate change in corporate strategy. In the primary models, we analyzed strategic change by estimating diversification in a subsequent year (year $t+3$) and controlling for the prior value, which can create serial correlation. To adjust for this, we specified the prior level of diversification as an instrumental variable in the models (Greene, 1997).

RESULTS

Descriptive statistics and bivariate correlations are provided in table 1. The results of Heckman selection models of directors' concern about corporate strategy are provided in table 2. The results provide strong support for hypothesis 1. As shown in all four models, after controlling for factors that could influence the level of directors' concern about corporate strategy, there is a highly significant, positive difference

Table 1

Descriptive Statistics and Pearson Correlation Coefficients (N = 228)

Independent variable	Mean	S.D.	1	2	3	4	5	6
1. Directors' concern about strategy	6.80	.50						
2. Directors' perception of others' concern about strategy	4.77	.86	.13					
3. Expressed concern about strategy	.00	.99	.10	.45				
4. Educational affiliation homogeneity	.42	.14	-.02	.14	.16			
5. Gender homogeneity	.77	.10	.01	.20	.16	.14		
6. Functional background homogeneity	.36	.17	-.06	.22	.19	.35	.17	
7. Industry of employment homogeneity	.39	.13	-.03	.07	.08	.29	.23	.31
8. Density of friendship ties	.31	.11	.04	.18	.15	.12	.06	.08
9. Board power	.00	1.04	.04	.09	.05	.06	.04	.19
10. Number of outside directors	8.80	1.72	.01	-.07	-.13	.08	-.04	.05
11. Number of employees (in thousands)	3.06	3.58	.09	.03	.06	.03	.01	-.05
12. Return on equity	.05	.22	-.33	-.07	-.06	.00	-.01	-.12
13. Environmental instability	.03	.05	.06	.03	.04	-.02	-.02	-.16
14. Product market diversification	.59	.55	.10	-.11	.26	.05	.07	-.13
15. Geographic diversification	.60	.53	.07	-.15	.19	-.03	-.02	-.06
Independent variable	7	8	9	10	11	12	13	14
8. Density of friendship ties	.15							
9. Board power	.08	.12						
10. Number of outside directors	.03	.06	.02					
11. Number of employees (in thousands)	-.03	.02	-.04	.09				
12. Return on equity	-.02	.07	.03	.01	.11			
13. Environmental instability	-.05	.00	.04	-.01	-.07	-.09		
14. Product market diversification	-.09	.07	-.08	.01	.33	-.14	.15	
15. Geographic diversification	-.06	-.03	.10	.02	.31	-.08	.23	.26

between directors' reported concern about corporate strategy and their perception that other members of the board are concerned about strategy at firms with relatively low performance (i.e., low relative to competitors and historical levels). Thus the results indicate a tendency for outside directors at firms with relatively low performance to underestimate the extent to which fellow directors share their concerns about the firm's current corporate strategy. As shown in model 2, there is also support for our second hypothesis. The results indicate that among firms with relatively low performance, as prior expressed concern about strategy decreases, the difference between the level of directors' reported concern about strategy and directors' perception of others' concern about strategy becomes significantly more positive.

Hypothesis 3 is also supported. The results in model 3 indicate that as the density of friendship ties among outside directors increases, the difference between directors' reported concern about strategy and directors' perception of others' concern about strategy is significantly reduced at firms with low performance. A separate analysis of simple effects showed that although there is a significant difference between directors' concern about strategy and their perception of others' concern at average levels of friendship ties, this difference becomes non-significant at relatively high levels of friendship ties (i.e., approximately 1.3 standard deviations above the mean). Moreover, the data also indicated that friendship ties reduce the difference between reported concern about strategy and the perception of others' concern by increasing the latter (i.e., the perceived concern of other board members) rather than by decreasing the former (i.e., directors' reported concern); though friendship ties were

Table 2

Heckman Selection Models of Directors' Concern about Corporate Strategy*

Independent Variable	Board-level Results			
	Model 1	Model 2	Model 3	Model 4
Directors' concern about strategy vs. perception of others' concern	1.848 ^{***} (0.156)	1.846 ^{***} (0.172)	1.936 ^{***} (0.186)	1.935 ^{***} (0.186)
Directors' concern vs. perception of others' concern X: Prior expressed concern about strategy		-0.795 ^{***} (0.105)		-0.754 ^{***} (0.100)
Density of friendship ties			-2.420 ^{**} (0.880)	-1.196 (0.884)
Educational affiliation homogeneity			-1.579 [*] (0.873)	-0.946 (0.845)
Gender homogeneity			-2.545 ^{**} (0.950)	-1.489 (0.956)
Functional background homogeneity			-2.138 ^{***} (0.516)	-0.928 (0.511)
Industry of employ. homogeneity			-0.714 (0.820)	-1.060 (0.824)
Educational affiliation homogeneity	0.321 (0.217)	0.319 (0.220)	0.626 [*] (0.289)	0.423 (0.292)
Gender homogeneity	0.586 (0.360)	0.581 (0.355)	1.022 [*] (0.433)	0.657 (0.418)
Functional background homogeneity	0.342 (0.201)	0.326 (0.206)	0.511 (0.259)	0.387 (0.263)
Industry of employment homogeneity	0.278 (0.246)	0.262 (0.247)	0.356 (0.304)	0.335 (0.318)
Density of friendship ties	0.484 (0.287)	0.491 (0.291)	0.762 (0.395)	0.572 (0.399)
Prior expressed concern about strategy	0.092 ^{**} (0.034)	0.102 ^{**} (0.038)		0.108 ^{**} (0.040)
Board power	0.045 (0.034)	0.047 (0.035)	0.043 (0.031)	0.042 (0.032)
Number of outside directors	-0.017 (0.022)	-0.016 (0.023)	-0.007 (0.023)	-0.009 (0.023)
Number of employees	-0.007 (0.010)	-0.006 (0.010)	-0.003 (0.008)	-0.002 (0.008)
Return on equity	-0.270 [*] (0.117)	-0.279 [*] (0.117)	-0.284 [*] (0.124)	-0.261 [*] (0.123)
Prior product market diversification	0.171 ^{**} (0.067)	0.170 ^{**} (0.066)	0.170 [*] (0.068)	0.167 [*] (0.068)
Prior geographic diversification	-0.009 (0.052)	-0.007 (0.051)	0.001 (0.051)	0.004 (0.050)
Constant	1.187 [*] (0.510)	1.134 [*] (0.516)	1.061 [*] (0.457)	1.012 [*] (0.459)
Wald χ^2	360.46 ^{***}	414.66 ^{***}	407.12 ^{***}	423.53 ^{***}
LR test of independent equations ($\rho = 0$)	10.19 ^{**}	7.68 ^{**}	6.65 ^{**}	5.73 [*]

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$; z-statistics are one-tailed for hypothesized effects, two-tailed for control variables.

* N = 456 observations for 228 companies in selection model and 218 observations for 109 companies in second-stage model. Standard errors are in parentheses.

strongly and positively associated with the perceived concern of other board members at low-performing firms, such ties were not significantly related to directors' reported concern about strategy.

There is also evidence that the effect of friendship ties is mediated by expressed concern about strategy. As shown in model 4, the hypothesized effect of friendship ties becomes non-significant when expressed concern about strategy is entered in the model, providing initial evidence for mediation. We also formally tested for mediation using the procedure recommended by Baron and Kenny (1986) and Sobel (1982). This test showed that expressed concern about strategy sig-

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nificantly mediated the hypothesized effect of friendship ties on the difference between directors' reported concern about strategy and directors' perception of others' concern about strategy ($z = 2.39$).

The results in model 3 also generally support hypothesis 4. Specifically, for three of the four demographic characteristics, as demographic homogeneity among outside directors increases, the difference between the level of directors' reported concern about strategy and directors' perception of others' concern about strategy is significantly reduced at firms with low performance. This result held for homogeneity in educational affiliation, gender, and functional background but was not significant for industry of employment.¹ A separate analysis of simple effects again indicated that although there is a significant difference between directors' concern about strategy and their perception of others' concern at average levels of demographic homogeneity, this difference becomes non-significant at relatively high levels of homogeneity in educational affiliation, gender, and functional background (i.e., approximately 1.2–1.6 standard deviations above the mean, depending on the particular demographic characteristic). Again, the data indicated that demographic homogeneity reduced the difference between reported concern about strategy and the perception of others' concern by increasing the latter (i.e., the perceived concern of other board members); although homogeneity was positively associated with the perceived concern of other board members at low-performing firms for three of the four demographic attributes, it was not significantly related to directors' reported concern about strategy for any of the attributes.

Moreover, there is evidence that expressed concern about strategy mediates the effects of demographic homogeneity on pluralistic ignorance. As shown in model 4, the hypothesized effects of homogeneity become non-significant when expressed concern about strategy is entered in the model, which provides initial evidence for mediation. Moreover, the Sobel (1982) test confirmed that expressed concern about strategy significantly mediated the effects of homogeneity in educational affiliation, gender, and functional background on the difference between directors' reported concern about strategy and directors' perception of others' concern about strategy ($z = 2.15, 2.43, 2.38$, respectively, for the three demographic characteristics). The analysis of covariance model is formally equivalent to estimating the difference between directors' concern about strategy and their perception of others' concern as a function of the independent variables; the results supported our hypotheses using either approach. In addition, as discussed above, we conducted a parallel set of analyses at the individual-director level. The results of these analyses are provided in Appendix B, and they are nearly identical to the results of our primary, board-level models.

The results of instrumental variable regression models of change in corporate strategy are displayed in table 3. Models 1–3 estimate change in product market diversification, and models 4–6 estimate change in geographic diversification. Hypothesis 5 predicted that the relationship between outside

1 Our analyses indicated that multicollinearity was not a problem in these models: the highest variance inflation factor (VIF) was less than ten in all models, and the mean VIF was not significantly greater than one in any model.

Table 3

Instrumental Variable Regression Models of Change in Corporate Strategy*

Independent Variable	Product Market Diversification			Geographic Diversification		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Directors' concern about strategy × perception of others' concern (inverted)†		-0.247*** (0.076)	-0.082 (0.076)		-0.274** (0.094)	-0.090 (0.094)
Expressed concern about strategy			0.112*** (0.026)			0.132*** (0.032)
Directors' concern about strategy	0.042 (0.030)	0.042 (0.032)	0.028 (0.033)	0.054 (0.038)	0.060 (0.041)	0.042 (0.041)
Perception of others' concern (inverted)†	-0.076 (0.052)	-0.078 (0.052)	-0.053 (0.053)	-0.101 (0.064)	-0.098 (0.065)	-0.069 (0.065)
Prior geographic diversification	0.144*** (0.037)	0.144*** (0.036)	0.143*** (0.036)	0.664*** (0.088)	0.663*** (0.088)	0.661*** (0.088)
Prior product market diversification	1.089*** (0.068)	1.078*** (0.067)	1.081*** (0.068)	0.134** (0.047)	0.134** (0.047)	0.131** (0.047)
Number of employees	0.021*** (0.006)	0.020*** (0.006)	0.021*** (0.006)	0.019** (0.007)	0.020** (0.007)	0.020** (0.007)
Return on equity	-0.233 (0.118)	-0.208 (0.117)	-0.204 (0.117)	-0.277 (0.146)	-0.266 (0.147)	-0.262 (0.147)
Number of outside directors	0.008 (0.015)	-0.018 (0.015)	-0.017 (0.015)	-0.026 (0.018)	-0.025 (0.018)	-0.023 (0.018)
Environmental instability	1.257* (0.599)	1.188* (0.594)	1.178 (0.595)	1.425 (0.738)	1.408 (0.741)	1.377 (0.740)
Board power	0.024 (0.026)	-0.011 (0.026)	-0.008 (0.026)	-0.013 (0.032)	-0.015 (0.032)	-0.012 (0.032)
Constant	-0.488 (0.424)	-0.259 (0.432)	-0.251 (0.433)	0.559 (0.523)	0.518 (0.540)	0.545 (0.540)
F	30.97***	34.98***	35.46***	20.51***	23.22***	23.63***
R ²	.56	.65	.68	.46	.54	.56

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$; t-tests are one-tailed for hypothesized effects, two-tailed for control variables.

† Standard errors are in parentheses.

† This variable is inverted so that higher values indicate lower perceived concern of other directors.

directors' concern about corporate strategy and subsequent strategic change would be negatively moderated by directors' perception that other board members are not concerned about the current corporate strategy. The results in models 2 and 5 support this hypothesis: the interaction between directors' concern about strategy and their perception of others' concern (inverted) is negative and significant in both models, indicating that directors' concerns about corporate strategy are less likely to prompt strategic change to the extent that directors perceive that their colleagues do not share their concerns. Moreover, this result held for both dimensions of corporate strategy.

Hypothesis 5 also predicted that the moderating effect of directors' perception that others do not share their concerns about strategy on (lower) strategic change would be mediated by a reduced tendency for directors to express their concerns about strategy in board meetings. As shown in models 3 and 6, the hypothesized interaction between concern about strategy and perception of others' concerns (inverted) becomes non-significant when the measure of expressed concern is entered in the models, again providing initial evidence for mediation. Moreover, the Sobel test confirmed that expressed concern about strategy significantly mediated the interaction effect of directors' concern about strategy and perception of others' concerns on change in product market

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diversification ($z = 2.16$) and change in geographic diversification ($z = 2.29$). In separate models, we controlled for directors' prior expressed concern about strategy, based on responses to the initial survey, and the results were unchanged. We also ran separate models of subsequent expressed concern about strategy and strategic change in which the perceived concern of other directors was specified as an instrumental variable, estimated from the prior level of expressed concern. The results were very similar to the results displayed in table 3 and provide further evidence that the underestimation of others' concerns that results from low levels of prior expressed concern tends to result in even lower levels of subsequent concern and ultimately decreases the likelihood of strategic change in response to poor performance.

A premise of our theoretical argument is that directors tend to perceive some risk to their social esteem in expressing concerns about the viability of the current corporate strategy when those concerns are not shared by others; in voicing such concerns, directors risk lowering their colleagues' opinion of their strategic judgment. We assessed the validity of this premise empirically by collecting additional survey data for directors in our sample frame. In a separate questionnaire sent to a random sample of 500 outside directors from the initial sample frame of mid-sized U.S. public companies, we included the following questions (each is based on a five-point Likert-type scale): (1) "If you were to express concern about the viability of the current corporate strategy at this firm, and other directors did not share your concern, to what extent do you think other directors might think less of your strategic judgment?" [Not at all . . . to some extent . . . very much so]; (2) "If you were to express reservations about the current corporate strategy at this firm, and most other directors did not share your reservations, to what extent would you be concerned that your input and advice would be solicited less frequently in future board or committee discussions?" [Not at all concerned . . . somewhat concerned . . . very concerned]; (3) "To what extent is it important to you that fellow outside directors at this firm respect your strategic judgment?" [Not very important . . . somewhat important . . . extremely important]. Of the 197 directors who responded to the survey (39 percent), a large majority of respondents checked 4 or 5 for all three questions (88 percent for question 1, 91 percent for question 2, and 94 percent for question 3), which supports our premise that directors tend to perceive some risk to their social esteem from expressing concerns about strategy their colleagues do not share and, not surprisingly, that they care about maintaining their colleagues' respect (K-S tests indicated no significant differences between the survey sample and the larger sample frame with respect to any of the archival variables examined in the study).²

DISCUSSION

Overall, the findings provide strong support for our theory of pluralistic ignorance on corporate boards. The first set of results showed a general tendency for outside directors of firms with relatively low performance to underestimate the

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We also investigated whether directors might feel less inhibited in expressing their concerns about strategy when they perceive some variation in the extent to which colleagues share their concerns (i.e., holding constant the average level of perceived concern). In separate analyses, we examined whether the perceived variation in concern of other directors moderates the effect of differences between directors' self-reported concern and the average perceived concern of others on the extent to which directors subsequently expressed concern about strategy. The three-way interaction between self-concern, average perceived concern of others, and perceived variation in others' concern was not significant. Thus although directors are less likely to express their concerns about strategy to the extent that they perceive their concerns are not shared, on average, by other directors, this relationship does not appear to depend on perceived variation in others' concern.

extent to which other board members shared their concerns. The results also provided strong evidence that the failure of directors to express their concerns about corporate strategy is a key mechanism underlying pluralistic ignorance on boards. These findings are consistent with our theoretical argument that individual directors overattribute a lack of expressed concern among their colleagues to confidence in the current strategy. Additional results provided evidence for specific social and psychological factors that moderate the extent to which pluralistic ignorance occurs on boards. In particular, the findings suggested that pluralistic ignorance is significantly reduced to the extent that friendship ties among outside directors are relatively dense and the demographic homogeneity of the board is relatively high. Also, consistent with our theory, results indicated that demographic homogeneity and friendship ties reduced pluralistic ignorance by increasing the propensity for outside directors to express their concerns about strategy.

Other results addressed the consequences of pluralistic ignorance for strategic change. Directors' concerns about corporate strategy were less likely to prompt subsequent strategic change to the extent that directors perceived that other board members did not share their concerns. This effect was mediated by a reduced tendency for directors to express their strategic concerns in board meetings: they were less likely to express their concerns about strategy when they perceived that others did not share their concerns, and this lack of expressed concern, in turn, reduced the likelihood of subsequent strategic change. These results held for two major dimensions of corporate strategy: product market diversification and geographic diversification. Accordingly, the results suggest that pluralistic ignorance on boards is a significant determinant of strategic persistence in response to low firm performance. More generally, the overall results suggest that strategic persistence can result from a spiral of silence (Noelle-Neumann, 1993) in which a reluctance to express concerns about strategy (resulting from demographic heterogeneity or sparse friendship ties among directors) increases the tendency for directors to underestimate the extent to which their concerns are shared by other directors, which further exacerbates their reluctance to share concerns with colleagues on the board.

Our theory and findings make significant contributions to the literatures on corporate governance, strategic persistence, and group decision-making processes in organizations. As several scholars have noted, there is very little systematic research on the decision-making processes of corporate boards (Kosnik, 1990; Finkelstein and Hambrick, 1996; Westphal, 1998; Bainbridge, 2002). The present study begins to fill this gap in the literature by identifying a systematic bias in directors' perceptions and suggesting how that bias can influence directors' behavior and subsequent strategic decision making.

Prior research on strategic persistence and change suggests that the failure to change corporate strategy in response to poor performance results, in part, from the biased perceptions that executives develop about their strategies. Psycho-

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logical commitment processes lead executives to overattribute low performance to uncontrollable or temporary factors in the environment and underattribute performance problems to their own strategic choices (for a review, see Barker and Duhaime, 1997). In addition, executives become socialized over time into belief systems that take for granted the merits of the current strategy (Starbuck, Greve, and Hedberg, 1978; Whetten, 1987; Tripsas and Gavetti, 2000). Our theory and findings suggest how perceptual biases can contribute to strategic persistence, but the bias examined in this study is different in kind from biases that have been identified in prior research on strategic decision making. While prior research has focused on how strategic persistence can result from individual-level, cognitive biases—executives' biased perceptions about strategy—our study suggests how persistence can also result from a social psychological bias: outside directors' biased perceptions about the strategic beliefs of other directors. Some governance scholars have suggested that outside directors can help avert strategic inertia because, as relatively independent and objective monitors of executive decision making, they should be less prone to making biased attributions of poor firm performance. In fact, outside directors of low-performing firms in our study generally did report private concerns about the viability of corporate strategy. Although outside directors may be less biased than executives about the viability of the current strategy, however, they still frequently fail to avert strategic persistence in the face of poor performance because they are biased about the beliefs that other directors have about the current strategy. This systematic bias reduces the tendency for directors to express concerns about strategy in board meetings, which in turn reduces the likelihood of strategic change in response to low performance.

Similarly, our theory and findings suggest that the tendency for firms to persist with underperforming strategies can result not only from failures in individual decision making but also from failures in group decision making. Pluralistic ignorance can be viewed as a group decision-making failure in that groups persist with low-performing strategies not because individuals fail to recognize weaknesses in the firm's strategy, but because group members fail to discover each others' shared concerns about the viability of the strategy (Vorauer and Ratner, 1996; Miller, Monin, and Prentice, 2000; Miller and Nelson, 2002). It is useful to compare pluralistic ignorance with groupthink, a group decision-making failure that has received more extensive research attention in the organizational literature (for a review, see Esser, 1998). With groupthink, groups persist with failing strategies because social cohesion, directive leadership, and other features of the group context exacerbate individual group members' perceptual biases about the viability of the current strategy. With pluralistic ignorance, by contrast, groups persist with failing strategies because group members misperceive each others' beliefs about the current strategy. These misperceptions, in turn, result from the failure of group members to communicate their concerns about the strategy. Thus, while social interaction and communication among group members is thought to exacerbate groupthink, as group members con-

vince each other that performance problems are not attributable to the current strategy, it is the absence of communication that exacerbates pluralistic ignorance.

This study also contributes to the literatures on pluralistic ignorance and group decision making. Though recent research in social psychology has advanced our understanding of the social psychological dynamics that underlie pluralistic ignorance, few studies have sought to identify the specific conditions under which those dynamics are more or less likely to occur. Our theoretical argument suggested that demographic homogeneity and density of friendship ties among group members may significantly moderate pluralistic ignorance in groups, and the findings supported our theory: as demographic homogeneity and friendship tie density increased, pluralistic ignorance on boards was significantly reduced. Moreover, while pluralistic ignorance has been shown to occur in a wide variety of contexts, from fraternities to community activist groups to decision-making groups in the laboratory, there is little if any systematic research on this phenomenon in business organizations. Our study not only demonstrates how pluralistic ignorance can occur in the leadership of business organizations, and identifies key factors that determine the extent to which it occurs, but it also demonstrates that pluralistic ignorance can have significant consequences for important organizational outcomes such as the level of corporate diversification.

Our study may also contribute to the corporate governance literature by helping to explain why boards of low-performing firms often fail to protect shareholders' interests in strategic decision making. Theories of board effectiveness generally attribute weak governance by corporate boards to low levels of board independence from management. From this perspective, directors neglect to express their concerns about corporate strategy because they have social ties to the CEO or professional ties to the firm that make them reluctant to challenge the CEO's strategy or because the CEO uses his or her leadership position to control the agenda of board meetings and limit opportunities for directors to voice their concerns (for reviews, see Finkelstein and Hambrick, 1996; Sundaramurthy and Lewis, 2003). Yet empirical research does not consistently support this explanation for weak board control over strategic decision making. Although there is evidence that the board's independence affects certain policy outcomes, including executive compensation and CEO succession (Westphal and Zajac, 1994, 2001), there is little evidence that it has a significant effect on corporate strategy, and recent survey research does not suggest that independent directors are any more likely than non-independent directors to challenge top managers on strategic issues (for reviews, see Bhagat and Black, 1998; Westphal, 1998; Lynall, Golden, and Hillman, 2003). Our study provides an alternative explanation for the frequent failure of boards to exert influence over corporate strategy under conditions of poor firm performance. Our findings suggest that directors often hesitate to express their concerns about the viability of corporate strategy in board meetings, not because they lack independence from management but because they systematically

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underestimate the extent to which fellow directors share their concerns.

Accordingly, our theory and findings have implications for corporate governance reform. Recent efforts at reform, including the Sarbanes-Oxley Act and the New York Stock Exchange Guidelines, focus almost entirely on increasing the board's independence from management. Our study would imply that board reform should place greater emphasis on measures that improve the process of board decision making by increasing the likelihood that outside directors will discover shared concerns about strategy or other organizational practices. Our findings suggest that pluralistic ignorance can be reduced by measures that increase social cohesion among outside directors or through the use of decision-making aids such as dialectical inquiry or the devil's advocate method (Katzenstein, 1996) that increase the tendency for group members to voice what are perceived to be dissenting opinions. Research has already shown that simply informing group members about the potential for pluralistic ignorance can significantly reduce its occurrence for extended periods of time (Schroeder and Prentice, 1998). Thus increasing awareness among corporate leaders about pluralistic ignorance and its consequences for strategic decision making has the potential to improve the board's effectiveness.

Our findings suggest that increasing demographic diversity on boards can have significant side effects that have not been considered in academic or popular discourse on board reform. In particular, higher levels of diversity among outside directors with respect to functional background, educational affiliation, and gender tend to exacerbate pluralistic ignorance, ultimately increasing strategic persistence in the face of poor firm performance. These effects were more pronounced for functional background and gender than for educational affiliation or industry of employment, perhaps because the latter characteristics tend to be less salient to outside directors. Ethnicity may also provide an especially salient basis for social categorization on boards (Westphal and Milton, 2000), and thus future research should examine whether ethnic diversity also contributes to pluralistic ignorance. Ethnic and gender diversity has increased considerably on corporate boards in recent years (Hillman, Cannella, and Harris, 2002). Assuming that this trend continues, it will become increasingly important for boards to adopt measures such as those discussed above that reform the process of board decision making.

Pluralistic ignorance on boards could influence a wide range of organizational outcomes aside from corporate diversification. Future research should examine whether pluralistic ignorance can help explain ill-conceived or overly risky strategies in such areas as mergers and acquisitions, joint ventures and strategic alliances, or investment in new technologies. Moreover, although we have focused in this study on how pluralistic ignorance can occur in the context of poor performance, pluralistic ignorance could be triggered by a variety of events or circumstances that raise concerns among individuals about the viability of existing policies, norms, or practices. Adverse changes in the competitive environment, increased regulato-

ry scrutiny, the departure of a key top manager, or any of a variety of other adverse events has the potential to trigger pluralistic ignorance on boards.

Our theory of pluralistic ignorance may also shed light on recent corporate scandals. Despite what should have been clear red flags, directors at companies such as Enron failed to deter unethical behavior. Our theory suggests that even if directors had individually suspected wrongdoing, they may have been reluctant to express their concerns publicly because they underestimated the extent to which other directors shared their concerns. Thus pluralistic ignorance may help to explain why boards often fail in their decision-control function by failing to speak up about questionable business practices. Research is needed that examines the role of pluralistic ignorance in unethical behavior by top management. Dispelling pluralistic ignorance in the boardroom may ultimately prove to be important in curtailing corporate fraud. Decision theorists have tended to focus on how biases in individual decision making can contribute to unethical behavior, with particular attention to ethnocentrism in hiring, firing, and other personnel decisions (Messick and Bazerman, 1996). There has been less consideration of how biases in group decision making, such as pluralistic ignorance, could contribute to unethical decisions in organizations.

Given that our empirical analysis is limited to mid-sized, public companies, future research should examine whether our theoretical perspective generalizes to private firms as well as larger and smaller public firms. Further research is also needed on pluralistic ignorance at lower levels of the organization. Based on our theory and findings, it is most likely to occur in groups in which friendship ties are relatively sparse and demographic heterogeneity is relatively high. Accordingly, pluralistic ignorance may be particularly common in cross-functional groups, geographically dispersed groups, recently formed groups, or groups that meet sporadically.

Pluralistic ignorance may also occur among inside directors and other top managers. A limitation of our study is that we only examined pluralistic ignorance among outside directors on boards, without examining whether or to what extent pluralistic ignorance extends to insiders. Thus our study may not capture the full impact of pluralistic ignorance in organizations on strategic persistence in the face of low firm performance. Yet descriptive evidence from our survey data suggests that pluralistic ignorance may be less pronounced among inside directors than among outside directors. As part of a larger research project on strategic decision-making processes, we surveyed 373 inside directors of firms in the sample frame of mid-sized companies who were representative of inside directors in the larger population on relevant archival measures examined in our study, including organizational tenure, functional background, gender, and educational affiliation. Items in this survey included the same questions about the extent to which respondents have concerns about the current strategy. We conducted multiple regression analyses that estimated concern about strategy as a function of the control variables listed in table 2, together with a dichotomous indicator of insider vs. outsider status. The dichoto-

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mous variable was negative and strongly significant: at firms with relatively low performance, inside directors reported being less concerned about the current corporate strategy than outside directors ($p < .001$). Assuming that inside directors are not more likely than outside directors to underestimate the concern of their colleagues, it follows that insiders will be less prone than outsiders to underestimate the extent to which their concerns about strategy are shared: because they have fewer such concerns to begin with, the gap between their own concerns and the perceived concerns of others will be narrower.

There is also evidence from our survey data that social cohesion among inside directors is typically stronger than social cohesion among outside directors. T-tests showed that the density of friendship ties among inside directors is significantly greater than the density of such ties among outside directors ($p < .001$), and the frequency of informal interaction outside formal meetings is greater among inside than outside directors ($p < .001$) (results available from the authors). Given that our findings suggest that social cohesion reduces the tendency for directors to underestimate the concern of their colleagues, these descriptive results provide further evidence that pluralistic ignorance may be less pronounced among inside directors.

Nevertheless, pluralistic ignorance could still occur on top management teams. Although the average top management group may be more cohesive than the average group of outside directors, this may depend on how broadly the group is defined. Many top management teams have a core subgroup of officers who work closely together and a more peripheral group of managers, which may include division managers or subsidiary heads, who meet less frequently to discuss corporate strategy (Roberto, 2003). Although pluralistic ignorance may be less common among the core subgroup of officers, including inside directors, it may be much more common in the larger top management group. For instance, pluralistic ignorance may occur in settings in which a small subgroup of officers develop strategic proposals and then bring the proposals to a larger group of managers for feedback and input. It is also conceivable that, in such settings, groupthink or related decision-making biases could occur among the cohesive subgroup that develops strategic proposals, while pluralistic ignorance occurs among the larger group of managers who are expected to provide input or feedback about the proposals. Clearly there is a need for qualitative research and large-sample survey studies that examine the social psychological dynamics of decision-making processes in top management teams. More generally, we hope that our theory and findings prompt further empirical research on group decision-making processes in corporate leadership and governance.

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APPENDIX A: Survey Scales

Respondents assessed the survey items below on a 5-point scale. Except where noted, the scale ranged from 1 = "Not at all" to 5 = "Very much so," with "Somewhat" at the midpoint.

Directors' Concern about Strategy

1. To what extent are you concerned about the viability of the current corporate strategy at this firm?
2. To what extent are you comfortable with the current strategy of this firm?
3. To what extent do you believe this firm's strategy needs to be changed?
4. I am concerned about the effectiveness of this firm's corporate strategy.

Directors' Perception That Others Are Concerned about Strategy*

1. To what extent do you think other directors are concerned about the viability of the current corporate strategy at this firm?
2. To what extent are other directors comfortable with the current strategy of this firm?

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3. To what extent do you think other directors feel this firm's strategy needs to be changed?
4. Other directors are concerned about the effectiveness of this firm's corporate strategy. [1 = "Strongly disagree," 5 = "Strongly agree."]

Expressed Concern about Strategy

1. To what extent have outside directors expressed concern about the viability of the current corporate strategy in board meetings during the past twelve months?
2. How many times have one or more outside directors questioned the appropriateness of the current strategy for the firm in board meetings during the past twelve months? _____ times.
3. To what extent have board members voiced concern in board meetings—over the past year—about whether the firm's corporate strategy is working?
4. To what extent during the prior twelve months have outside directors suggested that the firm's corporate strategy should be changed or revised?
5. Over the past twelve months, how many times have you heard another director raise concerns about the viability of the current corporate strategy? _____ times. †

* The section of the questionnaire that included these questions was preceded by the following instructions: "Please answer the following questions for all outside directors on the board."

† This question was included only in the initial survey and was therefore not included in the measure of subsequent expressed concern.

APPENDIX B: Individual-level Results

Heckman Selection Models of Directors' Concern about Corporate Strategy*

Independent variable	Model 1	Model 2	Model 3	Model 4
Directors' concern about strategy vs. perception of others' concern	1.431 ^{***} (0.111)	1.321 ^{***} (0.111)	1.331 ^{***} (0.110)	1.299 ^{***} (0.110)
Directors' concern vs. perception of others' concern X: Prior expressed concern about strategy		-.736 ^{***} (.090)		-0.702 ^{***} (0.089)
Density of friendship ties			-2.403 ^{**} (0.837)	-1.080 (0.844)
Educational affiliation homogeneity			-1.404 [*] (0.741)	-0.885 (0.740)
Gender homogeneity			-2.178 ^{**} (0.859)	-1.309 (0.850)
Functional background homogeneity			-2.036 ^{***} (0.472)	-0.821 (0.477)
Industry of employ. homogeneity			-1.041 (0.758)	-0.930 (0.757)
Educational affiliation homogeneity	0.378 (0.235)	0.375 (0.235)	0.518 [*] (0.249)	0.334 (0.252)
Gender homogeneity	0.597 (0.363)	0.584 (0.356)	0.940 [*] (0.380)	0.453 (0.364)
Functional background homogeneity	0.385 (0.200)	0.374 (0.206)	0.463 [*] (0.222)	0.409 (0.229)
Industry of employment homogeneity	0.311 (0.282)	0.307 (0.279)	0.374 (0.310)	0.307 (0.311)
Density of friendship ties	0.465 (0.302)	0.457 (0.302)	0.549 (0.317)	0.440 (0.325)
Prior expressed concern about strategy	0.090 ^{**} (0.035)	0.099 ^{**} (0.039)		0.099 ^{**} (0.038)
Board power	0.045 (0.031)	0.043 (0.031)	0.042 (0.031)	0.044 (0.031)
Number of outside directors	-0.025 (0.022)	-0.025 (0.022)	-0.002 (0.022)	-0.024 (0.022)
Number of employees	-0.006 (0.007)	-0.006 (0.008)	-0.003 (0.007)	-0.006 (0.008)
Return on equity	-0.228 [*] (0.103)	-0.229 [*] (0.104)	-0.219 [*] (0.103)	-0.229 [*] (0.104)
Prior product market diversification	0.104 [*] (0.043)	0.104 [*] (0.043)	0.105 [*] (0.043)	0.105 [*] (0.044)
Prior geographic diversification	-0.031 (0.055)	-0.030 (0.055)	-0.020 (0.055)	-0.029 (0.055)
Constant	0.639 (0.460)	0.555 (0.459)	0.501 (0.452)	0.584 (0.449)
Wald χ^2	349.21 ^{***}	409.54 ^{***}	404.76 ^{***}	429.91 ^{***}
LR test of independent equations ($\rho = 0$)	23.34 ^{***}	19.52 ^{***}	19.06 ^{***}	18.69 ^{***}

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$; z-statistics are one-tailed for hypothesized effects, two-tailed for control variables.

* N = 2278 observations for 1139 directors in selection model and 1096 observations for 548 directors in second-stage model. Standard errors are in parentheses.