Strategic Management Journal
Strat. Mgmt. J., **31**: 1031–1053 (2010)
Published online EarlyView in Wiley Online Library (wileyonlinelibrary.com) DOI: 10.1002/smj.848
Received 25 June 2007; *Final revision received 3 February 2010*

SHARING THE WEALTH: SOCIAL COMPARISONS AND PAY DISPERSION IN THE CEO'S TOP TEAM

JAMES W. FREDRICKSON,[1]* ALISON DAVIS-BLAKE,[2] and WM. GERARD SANDERS[3]
[1] *Department of Management, The University of Texas at Austin, Austin, Texas, U.S.A.*
[2] *Carlson School of Management, The University of Minnesota, Twin Cities, Minneapolis, Minnesota, U.S.A.*
[3] *Jones Graduate School of Business, Rice University, Houston, Texas, U.S.A.*

The antecedents and consequences of pay dispersion are studied using theory that focuses on the social comparisons that occur among members of the CEO's top team. Results from a sample of large public firms indicate that when members of this elite group were similar on a variety of dimensions, and thus likely to compare their pay, the board allowed less dispersion. In addition, pay dispersion was negatively related to company performance, particularly when it exceeded what could be justified by characteristics of the industry, firm, or team. But the strength of that relationship depended on how uniformly members of the team would benefit from subsequent performance gains. Specifically, the negative effect was particularly strong in firms where major differences in compensation—that is, some executives were given significantly more stock options—combined with a volatile stock price to provide only a few team members with the opportunity to realize very large financial gains in the future. The study demonstrates that the social-psychological factors that affect comparisons among members of the CEO's top team impact the board's pay setting process, which in turn affects pay dispersion, and ultimately firm performance. Copyright © 2010 John Wiley & Sons, Ltd.

INTRODUCTION

Several theoretical perspectives suggest that pay dispersion within top management teams (TMTs) has important consequences for how such teams function, and for how their firms perform. Some, particularly those based on tournament theory, argue that pay dispersion has positive effects because it promotes intra-team competition and provides an economic incentive that encourages the 'cream to rise to the top' of the rank-order tournament (Eriksson, 1999; Green and Stokely, 1983; Lazear and Rosen, 1981; Rosen, 1986). In contrast, perspectives anchored in social-psychological arguments, such as social comparison theory, suggest the opposite—that pay dispersion will negatively affect decision making and teamwork. Studies supporting that logic have reported that top team pay dispersion is associated with increased executive turnover, higher acquisition premiums, and decreased firm performance (Bloom and Michel, 2002; Carpenter and Sanders, 2002; Hayward and Hambrick, 1997; Siegel and Hambrick, 2005). But few investigators, no matter what their conclusion on the likely effects of top team pay dispersion, have addressed its *antecedents*, and we are aware of no empirical work that has addressed both.

Keywords: social comparisons; executive compensation; pay dispersion; top management teams
* Correspondence to: James W. Fredrickson, The University of Texas at Austin, Department of Management, 1 University Station B6300, Austin, TX 78712, U.S.A.
E-mail: James.Fredrickson@mccombs.utexas.edu
[Correction added after online publication 3/11/10: A reference on page 21 was incorrectly published as Gerhard and Rynes. It should be Gerhart and Rynes. This has been corrected both in-text and the References list.]

In this study we attempt to answer two related questions: (1) what are the antecedents of pay dispersion among members of the chief executive officer's (CEO's) top team, and (2) is such dispersion related to firms' economic performance? Because the board of directors sets executive compensation, it ultimately determines the level of pay dispersion. Therefore, we develop a theoretical framework that focuses on the social comparison factors that are likely to affect the board's pay setting process, and thus the resulting pay dispersion. Our theoretical framework also predicts how pay dispersion among members of the CEO's top team, in turn, affects firm performance.

The perspective taken here is based on the belief that for both theoretical and empirical reasons, new insight can be gained on executive team pay dispersion by focusing on such dispersion among *non-CEO members* of the top team. (We use the terms 'CEO's top team' and 'non-CEO members of the top team' interchangeably throughout.) The incumbent CEO has already won the rank-order tournament and TMT pay dispersion may even be an artifact of his or her outsized compensation. Moreover, the individuals that form the CEO's top team are typically achievement-oriented, power-seeking, and status-driven (Finkelstein and Hambrick, 1996), they are particularly concerned with how their pay stacks up to that of other team members (Frank, 1985), and large differences are likely to create perceptions of inequity among those who are less well compensated. These executives work closely to help formulate and implement the firm's strategy (Hambrick, 1995), they must often cooperate despite being in competition for resources and recognition, and they form the pool from which the heir apparent (i.e., the winner of the next tournament) is most likely to be selected (Shen and Canella, 2003; Zhang and Rajagopalan, 2003). As a result, there is reason to believe that because members of the CEO's top team are highly subject to any competitive or cooperative dynamics generated by pay dispersion, it will be particularly consequential when it exists in this elite group.

In addressing the antecedents of pay dispersion, we focus on differences among the CEO's top team members with respect to their board membership, stock ownership, and the length of their working relationship. Although there may be other factors that affect the social context in which this elite group operates, we believe that those studied here provide a representative and unobtrusive set of indicators that tap into dimensions of which members are aware, and that affect intra-team dynamics and comparisons. Moreover, these factors were chosen because of their strong theoretical foundation and the fact that they are amenable to empirical testing. We also develop hypotheses about the main effects of pay dispersion on performance, as well as a contextual factor—the extent to which executives' fates are equally tied to firm performance—that can exacerbate the impact of pay dispersion. In addition, we control for a variety of characteristics—CEO, job-related, economic, firm, and industry—that can also affect pay dispersion.

THEORY DEVELOPMENT AND HYPOTHESES

For nearly a century, scholars in a wide variety of disciplines—most notably economics, psychology, sociology, and management—have theorized and conducted research on compensation (Gomez-Mejia and Balkin, 1992; Gerhart and Rynes, 2003). That work has generally addressed questions relating to (a) pay level (i.e., differences between organizations), (b) pay structure (i.e., differences within organizations), or (c) payment delivery systems (i.e., the form that pay takes), and the issue of dispersion within the CEO's top team is one of organizational pay structure. While scholars have invoked an array of theories to examine executive compensation, a social psychological view is uniquely suited to answering our primary research questions.[1] Finkelstein and Hambrick articulated the basis for that conclusion by asserting that 'the setting of executive compensation has several unique attributes that support a "social" explanation' (Finkelstein and Hambrick, 1996: 275). Therefore, as discussed below, in this study we take a social comparison perspective to explain the antecedents and consequences of pay dispersion among members of the CEO's top team.

[1] Theories as varied as tournament theory, labor markets, resource dependence, agency, equity, relative deprivation, distributive justice, contingency, expectancy, social comparison, marginal productivity, human capital, managerial power, and governance are just a sampling of the alternative perspectives taken.

DOI: 10.1002/smj

Comparisons of pay within the CEO's top team

Many years ago, Barnard argued that *for executives* 'the real value of differences of money rewards lies in the recognition or distinction assumed to be conferred thereby' (Barnard, 1938: 145). Similarly, in commenting on the role of executive pay, Main and colleagues argued that 'while few would dispute the importance of money, it is the status derived from it that may be most important, and this is known through a process of social comparison' (Main, O'Reilly, and Wade, 1993: 624). So for TMT members, pay is first and foremost a measure of *comparative* success (Donaldson and Lorsch, 1983; Finkelstein and Hambrick, 1996; Main *et al*., 1993).

Social comparison theory argues that individuals routinely compare themselves with referent others whom they see as being similar on attributes such as demographic characteristics, ability, or position (Festinger, 1954), but it has only recently been applied in empirical studies of TMT compensation (e.g., Bloom and Michel, 2002; Carpenter and Sanders, 2002; Henderson and Fredrickson, 2001; Siegel and Hambrick, 2005). Yet top team members typically have much in common, which makes them likely referents for one another (Andrews and Henry, 1963; Finkelstein and Hambrick, 1996; Hills, 1980; O'Reilly, Main, and Crystal, 1988; Wade, O'Reilly, and Pollock, 2006). For example, members of the CEO's top team generally occupy positions at similar levels in the organizational hierarchy. They are also likely to be highly motivated, achievement-oriented, power-seeking, and status-driven (Finkelstein and Hambrick, 1996). In addition, top executives in a given firm have generally been subjected to similar organizational filters (e.g., selection and promotion processes), so they, more than members of society at large, are likely to be quite similar in their work experiences, education, perspective, and temperament (March and March, 1977). Moreover, top executives have succeeded in getting to that level, in part, because they are highly competitive, which makes them particularly prone to make social comparisons of pay (Lazear, 1989).

Within the group of highly motivated, achievement-oriented, and status-driven individuals that comprise a CEO's top team, large differences in pay will likely lead to perceptions of inequity among those who are less well compensated, and the feeling that they are being deprived of what they too deserve (Cowherd and Levine, 1992). Such feelings can cause impaired social relations among team members and reduced behavioral integration within the team (Hambrick, 1995; Siegel and Hambrick, 2005). Moreover, feelings of deprivation can even lead to political behavior (Milgrom and Roberts, 1988) and attempts to undermine the efforts of other team members (Lazear, 1989). This view is developed at length in the next section.

By focusing on pay dispersion among non-CEO members of the top team, we are not implying that CEO pay and external comparisons are unimportant. Rather, we control for those factors empirically and confine our theoretical focus to comparisons within the CEO's top team.

Equity and the CEO's top team

Equity theory is conceptually related to social comparison theory and warrants direct consideration here. Twenty-seven years ago, Wallace and Fay (1983: 69) argued that 'the critical theme that exists at the center of *all* compensation theory and practice (is) equity.' According to equity theory, individuals make subjective assessments of the ratio of their inputs (e.g., effort) and outcomes (e.g., compensation) to those of referent others. A perceived imbalance is said to create dissonance, and may lead the perceivers to take actions such as decreasing their inputs, trying to negotiate higher pay, or ultimately leaving the organization. On the other hand, if the difference in pay is seen as justified based on the 'other's' greater inputs or outcomes, it is accepted as being fair. So in discussing perceived equity, Gomez-Mejia and Balkin (1992: 7) conclude that 'truth is in the eyes of the beholder.'

The reason that equity requires direct consideration here is because it might be suggested that when looking at pay through a social lens, significant differences may be logically justifiable, in which case members of the CEO's top team could conclude that their contribution/outcome ratios support major pay differences. For example, most executives are likely to expect a president to be paid more than a vice president. So differences in pay that are justifiable based on clear indicators such as rank seem less likely to be problematic than those that cannot be easily explained by such factors. And our empirical analysis will explicitly

DOI: 10.1002/smj

address that issue. But when it comes to pay differences among members of the CEO's top team, the issue of equity is perhaps more nuanced than first meets the eye.

Empirical evidence in social psychology indicates that individuals routinely overestimate their abilities and contributions relative to those of others (Dunning and Story, 1991; Duval and Silva, 2002; Kruger and Dunning, 1999; Moore and Small, 2007). Referred to as 'self-enhancement,' this human tendency has been shown to be particularly strong when there is ambiguity regarding individuals' contributions and performance (Fiske and Taylor, 2008), and is pronounced among top executives (Chatterjee and Hambrick, 2007; Hayward and Hambrick, 1997; Hiller and Hambrick, 2005). Such executives typically have the characteristics described earlier and have generally experienced a lot of success during their careers, which often makes them the targets of ingratiating behaviors (Mowday, 1978; Kipnis and Schmidt, 1988; Westphal, 1998). As a result, their dispositions and personalities leave these individuals prone to making self-enhancing comparisons with other top executives (Hayward and Hambrick, 1997; Hiller and Hambrick, 2005). Thus, for members of the CEO's top team, their own contributions are likely to be very salient while the contributions of others can be difficult to observe and evaluate (Tversky and Kahneman, 1974). This is compounded by the fact that jobs at this level tend to be more a function of the individual rather than any job description, they are becoming ever more broadly defined (Gomez-Mejia and Balkin, 1992), and can be quite interdependent (Hambrick, 1995). This is particularly the case in large organizations. (As discussed later, the CEO's top team includes the four highest paid executives in large public firms who are not the CEO.)

This is not to suggest that all members of the CEO's top team contribute equally or that there might not be logically justifiable differences in their pay. Rather, members of the CEO's top team are prone to believe that their contributions to the firm are at least as consequential as those of other members. As a result, they will be more likely to focus on differences in how they are treated by the firm than on differences in contributions to the firm. And, because of the status implications of large pay differences, members of this elite group will be overtly sensitive to them. Moreover, we expect that most boards of directors will be similarly sensitive when they set that pay.

Role of the board of directors

In publicly held U.S. firms, the compensation committee of the board of directors typically sets the pay of the CEO and other TMT members, ultimately with the approval of the entire board (Lorsch, 1989). The CEO is invariably on the board and has a strong influence on what his or her top team members are paid (Wade *et al*., 2006), but evidence suggests that board members have generally become more sensitive to pay differences within the team (Lublin, 1998b). For example, a decade ago John Thompson, then vice chairman of the executive search firm Heidrick and Struggles, indicated that board involvement in setting TMT pay was 'in the middle of a sea change' that was designed to insure that firms are 'keeping senior talent below the CEO level' (Lublin, 1998b: R5). Because of the potential consequences of top executive pay decisions for strategy (Sanders, 2001a) and firm performance (Bloom and Michel, 2002), board members (including the CEO) are likely to be concerned about how the entire TMT is compensated, including the magnitude of pay differences among the non-CEO members. It is not surprising that several studies indicate that boards of directors have become quite involved in decisions about executive compensation (e.g., Useem, 1993; Westphal and Zajac, 1997).

Evidence suggests that those who allocate pay do so in a manner that avoids unnecessary dissatisfaction among the recipients because such dissatisfaction could strain relationships among recipients and with allocators, reduce recipients' satisfaction and performance, and ultimately, reduce organizational performance (Freedman and Montanari, 1980; Greenberg, 1987; Leventhal, Karuza, and Fry, 1980). Research on non-executives has established that in situations where interpersonal cooperation is vital but competition could damage interdependent work, allocators tend to provide relatively equal rewards, even when individual performance is quite different (Deutsch, 1985; Lawler, 1971; Leventhal *et al*., 1980). Although that perspective is typically used to describe relationships between an individual allocator and recipient, there is good reason to believe that in this instance it applies to an allocating group (i.e., the board) and a group of similar recipients (i.e., the CEO's

DOI: 10.1002/smj

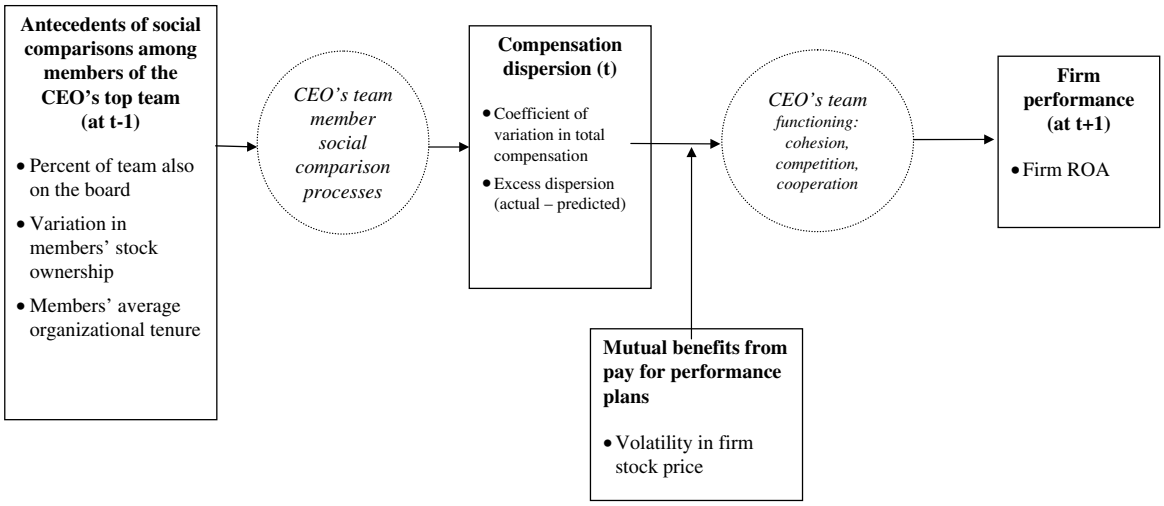

Figure 1. A social comparison model of compensation dispersion within a CEO's top team

top team). Specifically, given the potential consequences of pay dispersion suggested earlier, the CEO and other board members are likely to work closely together before allocating pay in a way that would greatly increase or decrease the level of dispersion within the CEO's top team.

The possibility that members of the CEO's top team will react negatively to substantial pay differences between them can create pressure on the board to compress the pay of those members. However, the amount of pressure for pay compression depends partly on opportunities that executives have to make social comparisons of that pay. For example, Leventhal and his colleagues (Leventhal, 1976; Leventhal, Michaels, and Sanford, 1972) and Frank (1984) found that people in groups that had a high level of interaction preferred equal rewards. Similarly, Pfeffer and his colleagues (Pfeffer and Davis-Blake, 1990, 1992; Pfeffer and Langton, 1988) reported that in public colleges and universities, where compensation is a matter of public record, pay was more compressed among both faculty and high-level administrators than in private institutions, where such pay information is not in the public domain.

Because the social comparisons that occur when pay is dispersed can have largely negative consequences for the team and for the firm, the board is likely to structure the pay of the CEO's top team members to avoid those consequences. Specifically, when characteristics of the team's social context increase the likelihood and intensity of social comparisons of pay, the board is likely to create a relatively compressed distribution to mitigate the consequences of pay dispersion. Alternatively, when the social context inhibits social comparisons of pay, or creates an environment that justifies pay dispersion, the board is likely to be less concerned with pay compression and may tolerate higher levels of pay dispersion. Furthermore, and presaging our later hypotheses, when the pay of members of the CEO's top team is not compressed by the board, negative consequences should result for team functioning and firm performance.

The theoretical model in Figure 1 outlines the relationships that we expect between social comparison dynamics, pay dispersion among members of the CEO's top team, and firm performance. In the balance of this section, hypotheses are developed about factors that are likely to affect opportunities for social comparisons of pay among members of the CEO's top team, and hence, the dispersion of that pay. Specifically, we consider the effects of differences in executives' board membership, stock holdings, and company tenure. These factors are likely to influence comparisons among executives and each has a strong theoretical explanation for doing so. In addition, they can be measured objectively, which aids empirical testing.

Hypotheses on antecedents

Common board membership

One of the factors likely to affect pay comparisons among members of the CEO's top team is their

DOI: 10.1002/smj

participation on the board of directors. Specifically, as the proportion of top team members who are members of the board of directors increases, social interaction and comparisons among those members are also likely to increase. Even if they are in jobs that require little day-to-day contact, members who serve on the board are brought together regularly and have more opportunity for social comparisons (Lorsch, 1989). Furthermore, theory suggests that individuals may place themselves and other organizational members in categories based on perceived similarities in demographic characteristics, structural position, prestige, or social standing (Ashforth and Mael, 1989; Kramer, 1991; Tajfel, 1981; Turner, 1985). Therefore, members of the CEO's top team who serve on the board are likely to perceive themselves as being in the same social category (i.e., inside directors), and such members are particularly likely to view one another as referents and targets for social comparisons.

Similarly, members of the CEO's top team who are not on the board are likely to see those who *are* as being categorically different—they have achieved a level of status and prestige that nondirector executives have yet to realize. As a result, board membership creates two classes of executives, and we know that comparisons of pay are likely to be more intense *within* those two classes than *across* them (Frank, 1985). Executives who are on the board, as well as those who are not, are likely to look within their group for points of comparison for interpreting their 'scorecard for managerial success' (Finkelstein and Hambrick, 1996: 286).

In addition to being likely referents for one another, members of the CEO's top team who are also on the board may have access to sensitive information (e.g., the details of employment contracts) that is not available to the firm's other executives. In fact, a wide range of information that is generally confidential (e.g., succession plans, verbal agreements about compensation), and may be technically illegal to share, is sometimes available to such board members. Access to such information, in turn, allows those team members to compare their rewards on non-financial dimensions as well. Because those additional comparisons could expose differences, the board will likely feel compelled to minimize differences in the pay of team members who are also on the board in order to increase team cohesion and decrease behavioral fragmentation (Hambrick, 1995).

As members of the CEO's top team are appointed to the board of directors, two classes of executives are created (e.g., those on the board and those not) and pay dispersion is likely to increase. However, this effect should be nonlinear, because at either extreme all such members will (or will not) be on the board and, therefore, be logical referents for each other. As a result, we predict that as the proportion of non-CEO top team members on the board increases, initially two classes of executives will emerge that will allow greater pay dispersion; but with very high proportions of common board membership, social comparisons and pressure for pay compression will increase, which will reduce pay dispersion. Hence, the first hypothesis:

> *Hypothesis 1: There will be an inverse 'U' relationship between the proportion of the CEO's top team members who are also board members and the level of pay dispersion among them.*

Distribution of ownership

Members of the CEO's top team do not share equally in the firm's ownership, and variation in ownership has implications for social comparisons, and ultimately, top team pay dispersion. For example, consider a situation in which two members of the CEO's top team are major current shareholders and other executives have only nominal holdings. Theory suggests that these two owner-managers and the other nonowner managers will perceive themselves as categorically different (Kramer, 1991). In addition, research suggests that large variances in social standing and wealth lead to less sharing of time in nonwork, social settings (Turner, 1985). The ultimate effect of such differences in self-categorization is to further reduce interaction among top team members, decrease the likelihood of social comparisons, and justify the observed differences in how individuals in the categories are treated.

The preceding line of reasoning suggests that social comparisons will be most likely among members of the CEO's top team with *similar* shareholdings in their firm. Owner-managers are likely to view other owner-managers as relevant referents, while those with small equity holdings are likely to view other managers with similarly small holdings as their most relevant referents. Moreover, executives in these two groups are

DOI: 10.1002/smj

likely to perceive an important difference between owners and nonowners. As a result of this self-categorization process, similar current shareholdings by members of the CEO's top team are likely to promote more social comparisons because they perceive themselves as being in the same group. This creates pressure on the board to minimize differences in team members' pay. In contrast, when there is significant variation in those holdings, executives are categorized in different groups and social comparisons across groups are likely to be more limited, which reduces pressure on the board to compress pay.

Differences in shareholdings may also reflect power differences within the CEO's top team, and that possibility is entirely consistent with a social comparison argument. Specifically, there are a variety of ways in which executives who are major shareholders are different from those with modest shareholdings, and the greater the difference, the less likely it is that executives in those two groups will view one another as referents. So although a relationship between *ownership* dispersion and *pay* dispersion might be interpreted as simply an example of the powerful taking more for themselves (Finkelstein and Hambrick, 1996), the literatures on social identity and comparison suggest that a power explanation is incomplete. This is particularly the case in a setting such as that described here, where members of the CEO's top team have only indirect influence over their own compensation. Therefore, we expect that differences in executives' stock ownership positions will predict pay dispersion, and hypothesize that:

Hypothesis 2: There will be a positive relationship between the variation in stock ownership among members of the CEO's top team and the level of pay dispersion among them.

Tenure

Executives' tenure is an important aspect of their experience, and it has the potential to affect a variety of top team processes. As suggested above, problems that result from social comparisons by top team members are more likely to arise among members who have a lot in common. Commonalities create perceptions of similarity that, in turn, lead to expectations of similar treatment; and as discussed below, the organizational tenure of members of the CEO's top team can influence such perceptions and expectations.

Of particular importance here is the fact that the organizational tenure of top team members effects social processes within the team (Finkelstein and Hambrick, 1996). For example, when such members share a long organizational tenure, they exhibit a higher level of social integration and experience lower turnover (Wagner, Pfeffer, and O'Reilly, 1984). This is because extended tenure among members enhances their social bonds. In contrast, teams that have had little time together have a limited opportunity to develop such bonds. And these social bonds have important implications for executive pay.

Specifically, executives who are in the same organization for an extended period of time have a higher likelihood of working together and getting to know one another. Moreover, 'high levels of contact among group members increase the likelihood that social comparisons will occur…and such comparisons increase pressure toward pay compression' (Finkelstein and Hambrick, 1996: 297). This is because preferences for equal pay tend to increase when a group has a stable, long-term relationship. In such circumstances, individuals are more likely to see themselves as team members who share a common fate (Leventhal *et al*., 1972; Cook and Hegtved, 1983; Deutsch, 1985).

The above arguments suggest that long, shared organizational tenure by members of the CEO's top team increases the likelihood of social comparisons among them, and creates increased expectations of similar pay. Consequently, as the average tenure of this elite group increases, there will be commensurate pressure on the board to treat its members similarly in terms of their pay. That logic leads to the following hypothesis:

Hypothesis 3: There will be a negative relationship between the average organizational tenure of the CEO's top team members and the level of pay dispersion among them.

Anecdotal evidence suggests that some firms offer highly compressed pay levels to members of the CEO's top team while other firms allow pay to fluctuate widely between members. The preceding hypotheses identify several factors that may

DOI: 10.1002/smj

help explain why those differences exist. However, another important question remains: what, if any, are the performance consequences of pay dispersion among members of the CEO's top team? We now turn our attention to the significance of pay dispersion among this elite group of executives for organizational performance.

Performance hypotheses

A well functioning executive team increases the likelihood that a firm will formulate and implement strategy successfully (Hambrick, 1995), and compensation is one factor that can facilitate or impede team functioning (Carpenter and Sanders, 2002; Hambrick, 1995). However, most research on executive pay focuses on incentive alignment instead of on the effects of incentives on social processes (see Gomez-Mejia and Wiseman, 1997; Murphy, 1999, for extensive reviews of the executive incentive alignment literature). But several scholars have recently acknowledged the possible performance impact of compensation arrangements that affect the relative pay of those at the top of a firm (Carpenter and Sanders, 2002; Bloom and Michel, 2002; Siegel and Hambrick, 2005; Wade *et al*., 2006).

Regarding pay dispersion among members of the CEO's top team, there are three interrelated reasons that lead us to expect that increased pay dispersion among this elite group will result in lower levels of firm performance. First, pay dispersion is likely to result in less cohesion within the team. As noted earlier, disparate pay among TMT members can lead to fragmentation within the team, with members working on their own priorities rather than firm-level needs (Hambrick, 1995). A second and admittedly related reason for expecting a negative relationship between pay dispersion and firm performance is that such dispersion will result in a more 'competitive' model of team dynamics (Lazear, 1989; Lazear and Rosen, 1981; Rosen, 1986). Of course, the ability of dispersed pay to encourage intra-team competition is the theoretical foundation of tournament theory. However, even Lazear (1989) has noted that such a model can result in 'hawkish' behavior, where executives not only work toward *their* priorities but also are willing to undermine rivals in the rank-order tournament in order to improve their odds of becoming the next CEO. Such behavior is likely to work against the best interests of the firm and over time should be reflected in lower performance. This led Lazear to suggest that pay differences should be minimized 'when workers have the ability to affect each other's output,' (Lazear, 1989: 563), which is typically the case among members of the CEO's top team.

Finally, pay dispersion among members of the CEO's top team will likely result in less cooperation within the team (Becker and Huselid, 1992; Gerhart and Rynes, 2003; Henderson and Fredrickson, 2001). A well functioning team typically requires members to work together, rather than merely operating as a group of independent individuals (Hambrick, 1995). As a result, Gerhart and Rynes have asserted that 'too much emphasis on pay for performance may harm teamwork and cooperation' (Gerhart and Rynes, 2002: 243). Similarly, after reviewing the research on pay dispersion, Baron and Pfeffer concluded that the 'evidence shows that wage inequality is related negatively to job satisfaction and also to the likelihood of collaboration on work' (Baron and Pfeffer, 1994: 200). Therefore, it is not surprising that Pfeffer and Langton (1988) found less pay dispersion in academic departments in which a higher proportion of faculty members collaborated on research. To the extent that larger amounts of pay dispersion undermine cooperation, it should adversely affect how well the team functions (Siegel and Hambrick, 2005).

In summary, there is strong reason to believe that high levels of pay dispersion among members of the CEO's top team will lead to lower levels of cohesion, more competitive behaviors, and less cooperation. As previously mentioned, in this study the CEO's top team is defined as the four highest paid executives who are not the CEO, so it is hard to imagine that a firm could function well if this elite group lacks cohesion, has members whose actions undermine others, and who do not cooperate. Moreover, both board and executive team members appear to be acutely aware of the potential impact of pay dispersion on the functioning of a top team. Consequently, we expect that pay dispersion among these executives will ultimately lead to lower levels of firm performance, as follows:

Hypothesis 4: The level of pay dispersion among members of the CEO's top team will be negatively related to subsequent firm performance.

DOI: 10.1002/smj

Mutuality in pay-for-performance benefits

The preceding argument asserts that pay dispersion is generally counterproductive in the highest reaches of management. Similarly, the research reviewed above suggests that a strong emphasis on pay-for-performance can harm teamwork and cooperation (Gerhart and Rynes, 2003); but, of all employees, top-level executives are the ones most likely to be comfortable with pay arrangements tied to performance. Indeed, for this elite group, receiving pay that is directly tied to performance may be an important validating feature of the 'scorecard' that determines their relative status among the corporate elite. This leads us to our next hypothesis concerning the mutuality of pay-for-performance benefits. Specifically, that the negative effects of pay dispersion are likely to be most pronounced in situations where members of the CEO's top team do not benefit similarly from the firm's performance.

Top executives' total compensation generally has both cash (e.g., salary and bonus) and long-term components (e.g., stock options, restricted stock). Therefore, members of the CEO's top team may differ not only in their total pay but also in the proportion from cash and long-term sources. In addition, because some forms of pay, particularly stock options, are more attractive to executives than others, differences in stock option pay may affect not only the *level* of total pay dispersion but also can cause even more pronounced social comparisons among non-CEO top team members. Specifically, there is reason to believe that when top executives' pay packages are not equally tied to company outcomes—when their economic fates are not similarly linked to firm performance—it can exacerbate the social dynamics discussed above.

It was argued earlier that members of the CEO's top team who are similar on a variety of critical variables would view one another as being in the same category or group. Consequently, if some members of the group receive extraordinary benefits for firm performance while others receive little, the negative effects of social comparisons can be particularly pronounced and we predict that *firm performance* will ultimately suffer. Moreover, the very nature of stock options makes their potential impact unusually great (Wiseman and Gomez-Mejia, 1998). That is because under certain circumstances, those executives who are given large grants of stock options can receive exceedingly large financial windfalls in the future (Sanders, 2001b).

For example, consider a top team that has four non-CEO members. If two executives receive large stock option grants and two others receive only minimal grants, option pay will contribute to increased pay dispersion among team members in the year that those options are granted and initially valued. But in addition to the general negative effects of pay dispersion on performance (Hypothesis 4), in this case the impact may be even more pronounced. That is because those executives who received the large stock option grants stand to realize much more in *the future* (when the options are exercised) than those executives who did not receive such grants. This is true even if firm performance rises to only modest levels (Sanders, 2001b), but is particularly so when there are opportunities to redeem options for big gains in the future. Because options remain in the executives' portfolio until they are exercised or expire, they are a continual reminder of pay differences in previous years. And executives are aware of that; they know how stock options work. Therefore, members of the CEO's top team who did not receive equal treatment with regard to options are likely to see themselves as not only being underserved by the amount of the initial value but also having been excluded from potential *future economic windfalls,* thus exacerbating the negative effect of their social comparisons.

If the above description is accurate, it is useful to consider the context in which stock options are likely to create the most inequality among members of the CEO's top team. Specifically, it is well known from the Black-Scholes (1973) option pricing formula in finance theory that future stock option values are a positive function of firm *stock price volatility*—the greater the volatility in stock prices, the more valuable are options in that stock. Given the prior arguments, this leads to the relatively straightforward conclusion that pay dispersion will be particularly bad for top team cooperation and cohesion, and worsen intra-team competition, when the volatility of a firm's stock price portends high levels of realized stock option (or restricted stock) gains in the future. In such situations, top executives will readily recognize that some team members have received compensation levels that outstrip their own, and that in the future

DOI: 10.1002/smj

those same executives will be in a position to exercise stock options for extraordinary gains, while others will be left out of the options lottery. This leads to the concluding hypothesis:

Hypothesis 5: The negative effects of pay dispersion on performance will be strongest in firms whose stock price is highly volatile.

METHOD

Sample

We randomly sampled 250 of Standard and Poor's (S&P) 500 firms in 1992 and collected data on those firms for the years 1992 through 2006. It is important to note that this period includes years both before and after the passage of the Sarbanes-Oxley bill in 2002. That legislation imposed major reporting requirements on firms and added risk for top executives, and can be seen as a major change in the governance environment. Therefore, our data are not only contemporary but also allow us to test the robustness of our hypothesized relationships in light of this shock to the governance milieu. Due to the lag structure of the analysis, complete data were available on 2,021 firm years in the models predicting compensation dispersion (i.e., 1993 to 2005) and 2,227 in the models predicting firm performance (i.e., 1993 to 2006).

The Securities and Exchange Commission (SEC) requires firms to disclose the compensation of their CEO and the four highest paid executives who are not the CEO. Therefore, *the CEO's top team* was operationalized as the four highest paid executives who are not the CEO and compensation and ownership data were obtained from S&P's Execucomp database. This characterization is based on definitions of the (CEO inclusive) TMT used by Bloom and Michel (2002), Carpenter and Sanders (2002), Henderson and Fredrickson (2001), and Main *et al*. (1993). We also used a variety of control variables that were obtained from the firms' proxy statements and COMPUSTAT. All time variant independent and control variables were lagged one year (t−1). Because our theory and models are two stage in nature, the structure of those models can be characterized as follows: antecedents of pay dispersion$_{(t-1)}$ → pay dispersion$_{(t)}$ → firm performance$_{(t+1)}$.

Measures—dependent variables

An executive's total compensation typically includes both cash (salary, bonus, and other annual cash perquisites), and long-term components (stock options, restricted stock, and long-term accounting-based incentive plans). We used the modified Black-Scholes present value method computed by Execucomp to value options. Restricted stock was valued at the current market value of the firm's common stock, and long-term accounting-based incentive plans were valued at the expected payout reported by the firm (Lambert, Larcker, and Weigelt, 1993). To compute our pay dispersion dependent variable we followed Allison's (1978) recommendation on the measurement of inequality and used the coefficient of variation (CV). Specifically, to assess *compensation dispersion*, we calculated the coefficient of variation (multiplied by 100 for ease of presentation) in the total compensation of the non-CEO top team members. This measure has been used in other studies of pay dispersion (Pfeffer and Davis-Blake, 1990; Siegel and Hambrick, 2005). We also estimated our results using the Gini coefficient instead of the coefficient of variation and found results equivalent to those presented here. For Hypotheses 4 and 5, we used firm return on assets (ROA) as our indicator of *firm performance* (Carpenter and Sanders, 2002; Henderson and Fredrickson, 2001).

Measures—independent variables

The independent variables for the first stage of our analysis (i.e., the models predicting pay dispersion) were characteristics of the firm and the CEO's top team that have the potential to affect social comparisons among members of that team. The theoretical justification for these variables was provided in the prior section, and each has very straightforward measures. For example, common *board membership* was discussed as encouraging comparisons of pay and was measured as the percentage of the CEO's top team who were on the board of directors. Because we hypothesize an inverse 'U' relationship, we included the main effect and its squared term to test the hypothesis. As mentioned earlier, when analyzing the variance of a continuous variable across a group of subjects, the coefficient of variation is the preferred measure (Allison, 1978). Therefore, *variation in stock ownership*, which was argued to effect comparisons of

DOI: 10.1002/smj

pay, was assessed using the coefficient of variation in the number of shares of common stock owned by each member of the CEO's top team. Because stock options may be considered a form of ownership (i.e., rights to future ownership), we also gauged ownership variation by measuring *variation in unexercised stock options* (options granted in previous years but not yet exercised) using the coefficient of variation in the number of unexercised stock options still owned by each such executive.[2] It was also argued that the amount of time that members of the CEO's top team are together can influence social comparisons, so *average tenure* was measured as the average organizational tenure (in years) of those executives. Finally, we measured *stock price volatility* using the modified Black-Scholes option pricing volatility parameter. In some models, stock price volatility is also included as a control because it may affect how firms allocate pay.

The second stage of our analysis estimated models in which pay dispersion was used to predict firm performance. For these models we used two alternative approaches to measuring pay dispersion. First, we used the measure of pay dispersion outlined above, the coefficient of variation in pay levels among the CEO's top team members. In addition, we created two other measures of pay dispersion (used in separate analyses) that explicitly recognize the endogeneity of the theoretical process we have outlined. Specifically, our theoretical argument (and others for which we control) explicitly predicts that, given the particular level of a theoretical condition, some level of pay dispersion is expected. For example, one would justifiably expect higher levels of pay dispersion when there are several management ranks represented in the CEO's top team (e.g., a president is likely to be paid more than any vice president). But according to our theory, even in such a circumstance, when there are also strong pressures for social comparison, we would expect lower levels of pay dispersion than would otherwise be the case. Therefore, we also estimated models in the second stage of our analysis that explicitly accounted for the fact that we would expect different levels of pay dispersion in different conditions. Accordingly, we created measures for two new variables. First, we created a measure for *expected dispersion*, which is the predicted level of pay dispersion for each firm that was generated by the fully specified model (i.e., with the control and independent variables) used in the first stage of our analysis. Second, we created another variable, *excess dispersion*, which is measured as the difference between the *actual* levels of pay dispersion and *expected* dispersion. Our theory suggests that what we have termed *excess dispersion* should be negatively associated with subsequent firm performance, but it does not make a prediction about levels of dispersion that would be justifiably expected (i.e., using expected dispersion) given a particular firm and team's circumstance.

Measures—control variables

We also controlled for a number of other likely determinants of pay dispersion within the CEO's top team by including attributes of the firm (i.e., firm size, growth opportunities, need for cooperation, number of ranks within the TMT, board size, and firm performance), as well as the level of pay granted to those executives, characteristics of the CEO (i.e., outsider, tenure, duality), industry, institutional holdings, and the pre-and-post Sarbanes-Oxley time periods.

There is empirical evidence that organizational size is associated with increased compensation dispersion in TMTs (Bloom and Michel, 2002; Henderson and Fredrickson, 2001). Firm size is associated with job variety (Weber, 1946), and such variety is likely to be associated with the level of pay dispersion. *Firm size* was measured as the natural logarithm of firm sales. Analyses conducted using the natural logarithm of the number of employees yielded nearly identical results. We also controlled for a firm's growth opportunities because high growth firms may pay relatively high levels of compensation to attract necessary talent. Specifically, we used the *market-to-book* ratio as our measure of growth as it has been a common proxy for such opportunities in many types of studies (Siegel and Hambrick, 2005).

A firm's top executives may differ in their responsibilities yet be very similar to one another in rank. This is important because Deutsch (1985) has reported that in groups of equally ranked

[2] As noted by an anonymous reviewer, variation in unexercised stock options may also reflect variation in past years' compensation awards. And variation in option portfolios might be a reflection of persisting and unobserved heterogeneity, which results in pay dispersion. Thus, variation in option holdings may be related to variation in current pay dispersion for reasons other than differences in executives' ownership positions.

DOI: 10.1002/smj

members, norms of equality in the distribution of rewards are particularly strong. Similarly, Simon (1957) and Mahoney (1979) have argued that differences in hierarchical level between individuals can be a key driver of pay dispersion, and that firms routinely use salary differences to reinforce differences in power and authority that are implied by differences in hierarchical level. As a result, pay dispersion may be lower when the CEO's top team is composed primarily of similarly ranked executives than when members hold more hierarchically differentiated job titles. Therefore, we assessed the *number of ranks* by counting in the proxy statement the number of different firm-specific titles (e.g. executive vice president, vice president) held by the CEO's top team members.

It is worth noting that although it is a common premise that different jobs command different pay, we argued earlier that for those at the top level of large organizations, jobs are often a function of the individual, and are increasingly broadly defined (Gomez-Mejia and Balkin, 1992). Moreover, in this study executives routinely held titles such as president, vice chairman, chief operating officer, and executive vice president. Even the chief financial officer was sometimes not included, the chief information officer was rarely included, and other functionally specific job titles were extremely uncommon. We mention this to point out that although external labor market forces undoubtedly impact the level of executive pay in different functions, in this study it is unlikely that the market for functionally specific skills played a large role. Moreover, there is no reason to believe that its potential impact would be systematic.

Although we argued that it is difficult to imagine how a company can perform well if the members of the CEO's top team do not work as a cohesive, cooperative team, some have noted that the need for cooperation among such executives may vary by firm. Therefore, we used two indicators previously used by other investigators to gauge the need for cooperation: *R&D intensity* and *diversification*. Regarding the first measure, several authors have argued that high levels of pay dispersion will be particularly problematic in firms that are R&D intensive because such activity requires a high level of team work and behavioral integration (Gomez-Mejia and Balkin, 1992; Siegel and Hambrick, 2005). *R&D intensity* was measured as the log of R&D expenditures plus a constant (Henderson and Fredrickson, 2001). While the ratio measure of R&D intensity (R&D/sales) is a more common measure, firm size (the denominator in such a measure) is already included as a control variable. Therefore, to decrease the chances of biased results, we used the log-transformed value of R&D expenditures. Similarly, it has been suggested that in highly diversified companies such as conglomerates, top executives are effectively running autonomous businesses, and require relatively little coordination and cooperation across those businesses (Michel and Hambrick, 1992; Hill, Hitt, and Hoskisson, 1992). Therefore, *diversification* level was measured using the entropy measure for total diversification (Palepu, 1985), such that $\text{diversification}_a = \Sigma\ P_{ia}\ \ln(1/P_{ia})$, where P_{ia} is the proportion of a firm a's sales in business segment i.

Although the compensation committee typically sets the pay of the CEO and other top team members, such compensation ultimately requires the approval of the full board of directors (Lorsch, 1989, Westphal and Zajac, 1995). Given that larger groups may find it more difficult to achieve consensus (Zander, 1994), board size could affect the pay setting process. Therefore, *board size* (total number of members) is included as a control variable. Board size was highly skewed, so its value was log transformed.

Because high performing firms have more slack resources to use in paying their executives, firm performance might be expected to have a positive association with the level of top team pay dispersion. Also, if strong firm performance is disproportionately attributed to the CEO (Meindl, Ehrlich, and Dukerich, 1985), such performance could increase the CEO's pay more than the pay of other team members (Finkelstein and Hambrick, 1989). Therefore, we controlled for *firm performance* using ROA (Bloom and Michel, 2002, Henderson and Fredrickson, 2001).

There are two reasons why it was critical to control for the level of pay in the CEO's top team. First, since prior research has shown that dispersion in rewards is greater when there are more rewards available to distribute (Pfeffer and Davis-Blake, 1990), such a control is needed when estimating pay dispersion. Second, with respect to our performance hypotheses, it is possible that highly performing firms pay their executives more and that any observed correlation between pay dispersion and firm performance could be an artifact of

DOI: 10.1002/smj

pay levels.[3] Consequently, we controlled for the mean level of compensation of the CEO's top team members (*TMT compensation level*) using their average pay, log transformed. (Using CEO pay level instead of TMT average compensation level as a control did not alter the findings.) Similarly, it is well known that CEOs who are hired from outside tend to be paid more than are insiders (Hambrick and Finkelstein, 1995; Henderson and Fredrickson, 2001), and they sometimes bring other top team members with them. Therefore, we added a control for *CEO outsiders,* coding this variable a '1' if the CEO had been in the organization two years or less prior to becoming CEO; otherwise it was coded '0' for an insider.

Industries are known to have different norms regarding executive pay (Finkelstein and Hambrick, 1989), but rather than include industry dummy variables, we measured industry pay dispersion more directly. Specifically, we controlled for industry pay norms by including a measure of *industry pay dispersion* that was calculated as the average level of top team pay dispersion of other firms (i.e., excluding the focal firm) in the focal firm's primary (two-digit Standard Industrial Classification code) industry.

We also controlled for several power and governance variables that might affect the distribution of rewards. For example, because long-tenured CEOs may be able to assert particular influence on how pay is allocated among members of their top team (Henderson and Fredrickson, 2001), we controlled for *CEO tenure*, which was measured as the number of years since the CEO took office. Similarly, *CEO duality* was controlled because it affects how much the CEOs are paid and may therefore affect what is available for other members of their top team (Sanders and Carpenter, 1998); it was coded as '1' when the CEO was also the chair of the board of directors and '0' otherwise. Finally, we controlled for *institutional ownership*, measured as the percentage of firm shares owned by institutional investors, because it too can affect how executive pay is allocated (David, Kochhar, and Levitas, 1998). Institutional ownership data were collected from Thomson-Reuters Institutional (13f) Holdings.

As noted earlier, the passage of the Sarbanes-Oxley legislation in 2002 imposed major reporting requirements on firms and added risk for top executives. That legislation was heralded by some as a major change in the governance environment and it also had the potential to affect top executive compensation. In addition, it might have an impact on compensation dispersion if it resulted in some executives receiving a pay premium because it made their jobs more complex.[4] Therefore, to assess the potential effects of this legislation we added a control variable *post SOX*, and coded the years prior to its existence as '0,' and those from 2002 on as '1.'

Method of analysis

The data used here include multiple observations of firms over several years. Consequently, ordinary least squares regression is inappropriate because panel data are often correlated across years within a firm, and the disturbances can be correlated across periods. Therefore, we employed a cross-sectional time series estimation model, using the XTREG procedure in STATA with robust standard errors. A Hausman test indicated that the random-effects model should be rejected in favor of the fixed-effects specification.

RESULTS

Table 1 reports the means, standard deviations, and correlations for all variables. Of particular interest is the fact that there is significant variation in the pay dispersion of CEOs' top teams across firms, with the coefficient of variation (multiplied by 100) in total compensation having a mean of 38.94 and ranging from 0.14 to 195.09 (the range is not shown in the table).

Table 2 reports the results for Hypotheses 1–3. Model 1 includes only the control variables for compensation dispersion among members of the CEO's top team, while Model 2 adds the main effects.

Of the control variables, market-to-book and industry pay dispersion norms were positively associated with compensation dispersion among members of the CEO's top team, as shown in Model 1. In contrast, diversification was negatively associated with such dispersion.

[3] We thank an anonymous reviewer for this observation.

[4] We thank an anonymous reviewer for this observation.

DOI: 10.1002/smj

Table 1.[a] Descriptive statistics and correlation matrix

	Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Compensation dispersion (×100)	22.00	25.05																					
2	Expected dispersion	22.00	17.98	0.71																				
3	Excess dispersion	0.00	17.67	0.70	−0.01																			
4	Firm ROA	5.05	6.02	0.04	0.13	−0.07																		
5	Board membership	0.34	0.19	0.19	0.25	0.01	0.05																	
6	Variation in stock ownership	59.59	69.38	0.61	0.82	0.04	0.04	0.22																
7	Variation in unexercised stock options	2.79	2.23	−0.47	−0.63	−0.03	−0.04	−0.14	−0.57															
8	Average tenure	11.31	4.88	0.28	0.38	0.01	0.12	0.46	0.38	−0.38														
9	Firm size	9.53	0.86	−0.22	−0.35	0.04	0.04	−0.01	−0.25	0.10	0.04													
10	R&D expenditures	2.78	3.14	−0.08	−0.05	−0.06	0.18	0.00	−0.10	0.01	0.22	0.23												
11	Diversification	1.19	0.92	−0.11	−0.17	0.01	0.04	0.02	−0.10	0.12	0.04	0.13	0.41											
12	Market-to-book	1.17	1.28	0.11	0.20	−0.05	0.51	0.05	0.05	−0.04	0.13	0.02	0.31	0.06										
13	Number of ranks	2.62	1.32	0.27	0.35	0.03	0.02	0.09	0.33	−0.25	0.15	−0.06	−0.06	−0.04	0.06									
14	TMT (non-CEO) compensation level	7.73	0.77	−0.22	−0.38	0.06	0.07	−0.03	−0.38	0.29	−0.14	0.48	0.18	0.12	0.17	−0.12								
15	Stock price volatility	0.30	0.18	−0.18	−0.24	−0.01	−0.04	−0.18	−0.21	0.20	−0.26	−0.05	−0.01	−0.04	−0.08	−0.08	0.06							
16	Industry pay dispersion	32.57	30.72	0.69	0.75	0.01	0.06	0.28	0.61	−0.59	0.51	−0.29	−0.04	−0.11	0.08	0.32	−0.41	−0.31						
17	Board size	13.08	3.22	−0.04	−0.17	0.12	−0.13	0.20	0.02	−0.01	0.10	0.13	−0.11	−0.01	−0.21	0.01	0.09	−0.15	0.02					
18	CEO outsider	0.07	0.26	0.11	0.14	0.02	0.02	−0.10	0.07	−0.07	−0.13	−0.05	0.01	−0.01	0.01	0.05	0.06	0.08	0.11	−0.08				
19	Duality	0.82	0.38	0.06	0.07	0.01	−0.02	0.07	0.06	−0.08	0.11	−0.02	0.04	0.02	−0.07	0.00	−0.05	−0.11	0.11	0.11	0.01			
20	CEO tenure	6.16	6.81	0.11	0.11	0.04	0.07	0.14	0.12	−0.14	0.12	−0.05	−0.17	−0.07	0.02	0.00	−0.07	−0.11	0.13	0.01	−0.18	0.07		
21	Institutional ownership	0.63	0.17	−0.15	−0.22	0.00	−0.06	−0.13	−0.19	0.17	−0.18	−0.02	−0.03	0.12	−0.09	−0.08	0.06	0.11	−0.23	−0.07	−0.01	0.01	0.00	
22	Post-SOX	0.49	0.50	−0.68	−0.72	−0.01	−0.05	−0.30	−0.68	0.71	−0.54	0.29	0.06	0.13	−0.05	−.32	0.42	0.31	−0.61	−0.03	−0.08	−0.12	−0.13	0.23

[a] Correlation coefficients greater than 0.04 are significant at $p<0.05$; those greater than 0.06 are significant at $p<0.01$.

DOI: 10.1002/smj

Table 2.[a] Determinants of compensation dispersion: cross-sectional time-series regression with fixed effects

	Pred. sign	Model 1	Model 2
Firm size		−0.92	−1.13
		(1.94)	(1.71)
R&D expenditures (ln)		−0.10	0.17
		(0.85)	(0.77)
Diversification		−1.63*	−0.93
		(0.85)	(0.87)
Market-to-book		1.36*	1.55**
		(0.61)	(0.61)
Number of ranks		0.50	0.34
		(0.34)	(0.33)
Prior performance		0.14	0.00
		(0.11)	(0.11)
TMT compensation level		0.44	1.79
		(1.26)	(1.08)
Stock price volatility		2.18	5.22
		(5.33)	(5.21)
Industry pay dispersion		0.33†	0.20
		(0.20)	(0.18)
Board Size		−0.71	−0.77*
		(0.52)	(0.51)
CEO outsider		−1.19	1.12
		(3.08)	(2.87)
Duality		0.96	0.71
		(2.19)	(1.98)
CEO tenure		0.10	0.18
		(0.12)	(0.12)
Institutional ownership		−0.81	1.74
		(4.03)	(3.42)
Post SOX period		−14.73	−21.75†
		(12.16)	(11.89)
Board membership	+		31.13**
			(11.08)
Board membership^2	−		−29.00**
			(12.55)
Variation in stock ownership	+		0.05***
			(0.02)
Variation in stock option portfolios	+		0.04*
			(0.02)
Average tenure	−		−0.62**
			(0.25)
Constant		30.96*	24.08
		(18.25)	(17.93)
R-squared within		0.49	.52
R-squared between		.42	.49

[a] Unstandardized regression coefficients, robust standard errors in parentheses. t tests are 1-tailed on study variables and two-tailed on controls. †$p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$. N=2,021.

Model 2 of Table 2 provides the results obtained when the variables associated with our hypotheses were added to the model. As shown there, the model provides support for each of the hypotheses related to the antecedents of pay dispersion presented earlier. Hypothesis 1, which was based on the expectation that social comparisons and pressures for pay compression would increase as more members of the CEO's top team joined the board, predicted a nonlinear (e.g., inverse 'U') relationship between the proportion of such board members and pay dispersion. Model 2 reveals that the main effect was positive and significant while the squared term was negative and significant, thus supporting Hypothesis 1.

Hypotheses 2 drew on arguments about the effects of self-categorization and social interaction to predict a positive relationship between *variation* in both non-CEO members' stock ownership and unexercised stock options and the level of dispersion in their pay. As shown in Model 2, both of those relationships were significant as predicted. Consistent with Hypothesis 2, the coefficient of variation in stock ownership was positive and significant. Similarly, the sign of the coefficient for unexercised stock options was also positive and significant, which is also consistent with that hypothesis.

Hypotheses 3, which considered the effect of organizational tenure, suggested that increased average tenure among members of the CEO's top team would increase social comparisons and pressure on the board and reduce compensation dispersion. Since the coefficient for average tenure was negative and significant, there is also support for that hypothesis.

Table 3 presents the results for the tests of the effects of compensation dispersion among members of the CEO's top team on firm performance. Model 1 introduces the control variables and indicates that market-to-book was positively associated with subsequent firm performance, while R&D expenditures exhibited a negative relationship.

Based on the assumptions of social comparison theory that pay dispersion is dysfunctional for optimal team functioning, Hypothesis 4 predicted that there would be a negative association between such dispersion in the CEO's top team and firm performance. Consistent with that hypothesis, the coefficient for compensation dispersion (in Model 2) was negative and significant. In Model 4, the alternative measures that were developed to assess

Table 3.[a] Effect of compensation dispersion on subsequent firm performance: cross-sectional time-series regression with fixed effects

	Pred. sign	Model 1	Model 2	Model 3	Model 4	Model 5
Firm size		−0.13	−0.14	−0.33	0.13	0.07
		(0.63)	(0.64)	(0.55)	(0.68)	(0.70)
R&D expenditures (ln)		−0.77***	−0.77***	−0.76***	−0.76***	−0.73***
		(0.25)	(0.25)	(0.25)	(0.26)	(0.27)
Diversification		−0.26	−0.3	−0.29	−0.17	−0.15
		(0.23)	(0.23)	(0.22)	(0.22)	(0.21)
Market-to-book		2.11***	2.13***	2.09***	1.97***	2.02***
		(0.44)	(0.44)	(0.44)	(0.42)	(0.47)
Industry pay dispersion		0.01	0.01	0.02	0.01	0.03
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
TMT pay level		0.57	0.56	0.58	0.45	0.31
		(0.41)	(0.41)	(0.41)	(0.44)	(0.44)
Stock price volatility		6.34	6.32	3.96	6.78	10.53
		(7.25)	(7.26)	(5.38)	(7.58)	(7.82)
Pay dispersion	—		−0.02***	−0.03***		
			(0.01)	(0.01)		
Dispersion × stock price volatility	—			−0.32*		
				(0.19)		
Expected pay dispersion					0.01	−0.01
					(0.04)	(0.04)
Excess pay dispersion	—				−0.01*	−0.02**
					(0.005)	(0.01)
Expected dispersion × stock price volatility						0.37**
						(0.18)
Excess pay dispersion × stock price volatility	—					−0.28**
						(0.13)
Constant		0.0161	1.92	4.58	0.08	0.34
		(0.07)	(7.27)	(6.14)	(7.75)	(7.89)
R-squared		0.17	0.18	0.19	0.18	0.20

[a] Unstandardized regression coefficients, robust standard errors in parentheses. Coefficients multiplied by 100 for ease of presentation. Year dummies are included in the regressions, but are not shown; results are available from the authors. T-tests are one-tailed on study variables and two-tailed on controls. †$p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$. N=2,227.

pay dispersion—expected dispersion and excess dispersion—are added, and the original measure (of pay dispersion) is deleted. As noted in the table, the coefficient for excess dispersion was negative and significant while the coefficient for expected dispersion was positive but not statistically significant. Our theoretical argument makes no prediction about dispersion that may be justified (i.e., expected dispersion), but the significant negative coefficient for excess dispersion is consistent with Hypothesis 4 and the original result reported in Model 2.

Finally, Hypothesis 5 was based on a recognition that high levels of compensation dispersion can result in vast differences in future wealth that may be realized from long-term stock-based incentives like stock options. As a result, when conditions are ripe for some members to benefit unequally from subsequent firm performance, pay dispersion can be especially problematic. Consistent with that hypothesis, Model 3 reports that the coefficient for the interaction between pay dispersion and stock price volatility on performance was indeed negative and significant. Similarly, Model 5 adds interaction terms between both expected and excess dispersion and stock price volatility. The coefficient for the interaction of excess dispersion and stock price volatility on performance was negative and significant, which is also consistent with Hypothesis 5. However, the coefficient of expected dispersion and stock price volatility was positive and significant.

As a robustness check of the dispersion/performance results, we performed a *post hoc* test. In that analysis we replaced the original measure of pay dispersion (used in Models 2 and 3) in the

DOI: 10.1002/smj

CEO's top team, which assessed the dispersion on *all forms* of compensation, with a measure of dispersion that uses those components that are tied to future stock performance. Specifically, we used the coefficient of variation in stock option pay and restricted stock grants in place of total compensation dispersion. We also modified the interaction term so that it was the interaction of stock price volatility and the variation of stock-based forms of pay. The effect for that interaction on firm performance was again negative and significant. (The results for this test are not shown in the table but are available from the authors.)

DISCUSSION

Conclusions about antecedents

The highly motivated, achievement-oriented, and status-driven individuals who normally comprise a CEO's top team are concerned with how their pay stacks up to that of other team members, and are likely to react negatively if they see it as being inequitable. This study contributes to theory on social comparisons among members of the corporate elite by investigating the antecedents and consequences of pay dispersion within the CEO's top team. Theory suggests that comparisons are most likely among individuals who see themselves as being most similar, and even though a firm's top executives may have a lot in common, there are often important differences (Finkelstein and Hambrick, 1996). There is also reason to believe that in setting executives' pay, the board of directors will be sensitive to potential comparisons and the effect of differences (Freedman and Montanari, 1980; Greenberg, 1987; Leventhal *et al*., 1980) and will try to act accordingly. Therefore, we suggested that when characteristics of the social context encourage comparisons of pay among members of the CEO's top team, the board will feel pressure to minimize pay differences and will create a relatively compressed pay distribution. In contrast, when the context decreases the likelihood of comparisons of pay among team members, we expected the board to be less concerned about pay compression and more likely to endorse higher levels of dispersion.

The results of this study support the above view. Specifically, the boards of directors of firms studied here minimized differences in the pay of members of the CEO's top team when similarities in their board membership, equity-based compensation, unexercised stock options, and long firm tenure made them likely referents and targets of comparison for one another. Research has established that boards are influenced by *external* comparisons when setting *CEO pay* (O'Reilly *et al*., 1988), but our results suggest that in setting the pay of *the most elite of other top executives*, they are sensitive to the *internal* social context and potential comparisons among those executives. Moreover, board members appear to be sensitive to the possibility that high levels of pay dispersion may lead to undesirable levels of conflict among team members who have reason to see themselves as being similar, and who have otherwise been treated similarly (e.g., being put on the board) by the firm.

In combination, these results provide evidence that when characteristics of the social context lead members of the CEO's top team to see one another as being similar, the board is likely to feel pressure to minimize the potentially harmful effects of pay differences and reward them similarly. This supports Hambrick's observation that board members are not just concerned with firm performance or individual executives, but rather that 'the dynamics of the team itself, are matters of concern for the board of directors' (Hambrick, 1995: 124).

Conclusions about performance

There has been some disagreement among scholars and only limited empirical evidence regarding the effects of pay dispersion among top team members. In this study, we based our theoretical position on that offered by authors who have recently argued that top team compensation is an important factor that can impede or facilitate team performance (Bloom and Michel, 2002; Carpenter and Sanders, 2002; Siegel and Hambrick, 2005; Wade, *et al*., 2006), and hence that of the firm. This led us to predict a negative relationship between pay dispersion among members of the CEO's top team and firm performance.

The primary negative relationship reported here between dispersion in the pay of the CEO's top team and firm performance supports the view of those who have taken a social-psychological perspective on this relationship. However, none of that research explicitly accounts for the fact that some level of pay dispersion may be justifiable given industry, firm, and team characteristics. We

DOI: 10.1002/smj

accounted for that reality with our measures of *expected* and *excess* pay dispersion, and the results indicate that pay dispersion that is justified by such factors does not appear to have a deleterious effect on firm performance. As a matter of fact, in firms with high stock price volatility, expected levels of dispersion among members of the CEO's top team were positively related to performance. Yet we also found that when firms exceed these seemingly justifiable levels of pay dispersion, which many in the present sample did, the impact was very negative. Therefore, the results reported here support the view that pay dispersion among this elite group of top executives can have a negative effect on performance by fostering decreased team cohesion (Hambrick, 1995), increased competition (Lazear, 1989; Rosen, 1986), and less cooperation (Henderson and Fredrickson, 2001), particularly when such dispersion is not readily justifiable by such factors as differing ranks, ownership positions, and tenure. As a result, these findings may help resolve the apparently contradictory results in previous research, where some have reported that pay dispersion can enhance subsequent firm performance (Eriksson, 1999), while others have found negative effects for such dispersion (Cowherd and Levine, 1992; Siegel and Hambrick, 2005).

We also hypothesized that the contextual nature of pay dispersion's negative link with performance would be influenced by the extent to which comparisons of pay among top team members revealed differences in their opportunity to profit similarly from the firm's performance. The results supported that expectation. Specifically, pay dispersion among members of the CEO's top team was particularly detrimental in contexts where some members, because of the prospect of realizing large financial windfalls in the future, would profit greatly while others would not. Naturally, the prospect of being left out of such gains could be expected to lead to particularly unproductive behavior by those (excluded) executives. Therefore, this study provides additional support for scholars who have argued that although pay dispersion may have an impact on firm performance, that impact is indeed contingent (Siegel and Hambrick, 2005; Henderson and Fredrickson, 2001). However, it should be recalled that our results with respect to the antecedents of pay dispersion (reported in Table 2) suggest that boards of directors were generally sensitive to its potential impact. Specifically, our results suggest that by using one of the most salient actions open to them—setting executives' pay—boards can reduce the likelihood that the inevitable social comparisons will have negative consequences.

If, as our results suggest, compensation dispersion among members of the CEO's top team is generally a bad thing when it exceeds levels that firm, industry, and team characteristics would justify, a natural question is 'Why would some boards create or allow such high levels of pay dispersion?' We believe that the answer lies in the nature of how pay levels are determined. Specifically, executive compensation is determined by multiple factors, and although the board can act to mitigate against dispersion, there are also forces that tend to create it—for example, the need to pay executives hired from outside extremely well to attract them, the lobbying of individual executives who want to differentiate themselves and to gain the status associated with higher pay, and the desire to recognize and reward particular executives, perhaps as part of a retention program. This study demonstrates the conditions under which the forces that tend to compress pay will prevail. Moreover, we believe that it demonstrates as convincingly as is possible using secondary data, that (1) factors that influence social comparisons (that are beyond features of tournaments and pay for performance) affect the board's pay setting processes (and the resulting pay outcomes), and that (2) social comparison processes not only affect pay outcomes but also affect firm performance. Therefore, the pay of the CEO's top team may be influenced, in part, by tournament factors and by individual performance, but it is also affected by the boards' concern about dynamics within the team, and those effects are consequential because they have implications for firm performance.

Limitations and future research

Like all research, this study has limitations. The most obvious are those that stem directly from the nature of our sample. For example, since all of the firms represented in this study were listed in the S&P 500, we do not know if the results reported here generalize to smaller, private organizations; however, we suspect that they do not. For example, in small functionally organized firms, the contributions of individual members of the CEO's top team may be relatively easy to assess, and their value in the external labor market might

DOI: 10.1002/smj

vary substantially by function. Similarly, in private firms, where executive compensation is not a matter of public record, it should be easier to keep pay data secret, and in so doing, temper the otherwise inevitable comparisons. And given our findings on the relationship between pay dispersion and firm performance, such secrecy might be one of the little-discussed benefits of firms remaining private.

In addition, we defined the CEO's top team as being composed of those individuals (excluding the CEO) who were identified in firms' SEC reporting as its most highly paid executives. Doing so may have understated the true number of team members, but since we needed compensation data on all executives of interest, and because firms typically do not report that data on more than the five required by the SEC, we had no reliable alternative. In addition, recent research indicates that numbers reported by CEOs closely approximate the number used here (Carpenter, Geletkanycz, and Sanders, 2004; Colbert *et al*., 2008).

A more important limitation of this work stems from the fact that we argued that the level of pay dispersion among members of the CEO's top team is likely to affect the functioning of that team, but we did not assess members' actual behavior. Thus, our results reflect associations between pay dispersion and firm performance, but we have not definitively proven causation because the intervening processes are yet to be documented, measured, and modeled. A growing body of anecdotal and empirical evidence suggests that TMT pay dispersion is likely to promote a variety of undesirable behaviors (e.g., Bloom and Michel, 2002; Finkelstein and Hambrick, 1996; Lublin, 1998a, 1998b; O'Reilly *et al*., 1988; Lazear, 1989), however, that evidence is in a relatively formative stage. Therefore, it would be useful to know more about the actual behaviors created by pay dispersion among firms' top executives, but that will likely require real-time observation. For example, our measure of average tenure was used as a proxy for shared experience, and highlights an opportunity for future research to more closely investigate the actual nature of such experiences among top team members and their impact on social comparisons.

We also acknowledge that it might be possible that boards that anticipate declining performance and hire 'superstars' to help them avert a negative situation cause high levels of pay dispersion. But that scenario, while theoretically possible, assumes a very high level of predictive ability on the part of the CEO and the board. Specifically, the causal chain would have to work like this, the CEO and the board (1) anticipate negative performance in advance, then (2) implement turnover (also in advance of the negative performance) in order to deal with the negative performance that may be coming. While this is possible, we think it is much more likely that turnover occurs in response to negative performance. In addition, the scapegoating literature (e.g., Grusky, 1963; Boeker, 1992) suggests that the causality is more likely to work in that direction. However, even if some CEOs and boards are more foresighted than is the norm, we think that such a scenario is unlikely to be systematic enough to have produced the results reported here.

Like all studies of executive compensation that assume board involvement but rely on archival data (e.g., Beatty and Zajac, 1994; O'Reilly *et al*., 1988), we did not assess the actual process by which the board sets executives' pay. So even though recent research indicates that the social-psychological processes that influence pay allocation at lower levels generalize well to board members (Westphal and Zajac, 1995), we do not know how the issue of social comparisons is invoked in the process of determining top team pay. For example, is it something that board members are overtly aware of and that is explicitly addressed during that process? Several authors have provided examples that suggest that in some firms this is indeed the case (Hambrick, 1995; Lublin, 1998b). Or is it that social comparisons enter much more subtly, say, when individual board members point out that executives who have left the firm have increasingly cited pay differences? We cannot answer those questions with this research; therefore, it will take additional work before scholars gain a true understanding of the internal processes that take place within the board (including the CEO) and with members of the CEO's top team in setting their pay.

Since ownership structure is known to affect a variety of organizational pay practices (Gomez-Mejia, Tosi, and Hinkin, 1987; Werner, Tosi, and Gomez-Mejia, 2005), it could be fruitful for future research to examine the social dynamics of top team pay in light of differences in such structure. In particular, the affect of family ownership on top team pay dispersion deserves attention.

DOI: 10.1002/smj

When families are significant owners of a firm, the composition of the top team often includes their members. Moreover, we know that family-member CEOs tend to receive lower compensation than those who are not in the family (Gomez-Mejia, Larraza-Kintana, and Makri, 2003), and that the social dynamics of the top team are significantly affected by the inclusion of family members (Cruz, Gomez-Mejia, and Becerra, 2010). Therefore, the nature of social comparisons, both its antecedents and consequences, may be significantly affected by family ownership.

A final opportunity for future research deals with how the features of a firm's stock price impact the behavior to top team members. Specifically, Devers, Wiseman, and Holmes (2007) found that stock price volatility affected how managers valued their option portfolios, but that this effect was moderated by stock price trend. Thus, the adverse effects of pay dispersion may be particularly strong in firms with a positive stock price trend, where executives are likely to perceive they are particularly disadvantaged when they receive fewer options than their top team colleagues.

Concluding observations

It should be noted that this research provides considerable support for emerging views of how boards of directors can influence firm performance. First, the results support the socio-political view of board/top team interactions (Westphal, 1999; Westphal and Fredrickson, 2001). While performing their normal governance responsibilities (e.g., setting top executives' pay), boards appear to be influenced by the social context in which executive interactions take place. Second, the findings also support research that suggests that boards indeed affect firm performance (Westphal and Fredrickson, 2001). Research that has attempted to assess board impact by focusing on factors such as board composition has found little evidence of performance effects (Dalton *et al*., 1998), but our findings suggest that boards influence firm performance through the substance of their decisions. Specifically, boards of directors regularly make decisions about what a firm's top executives will be paid, and in doing so, they determine the dispersion of that pay. The results reported here indicate that the effects of such decisions, which are a routine part of directors' jobs, are likely to be reflected in team functioning and ultimately firm performance. Therefore, instead of looking at their structural features (e.g., composition), investigators who are truly interested in understanding the impact of boards would be well advised to focus on the decisions that routinely define the board's role—for example, selecting executives, determining their pay levels, establishing their expenditure authority—and the context in which those decisions are made.

Although several scholars have recently addressed the issue of top team pay dispersion (Bloom and Michel, 2002; Carpenter and Sanders, 2002; Hayward and Hambrick, 1997; Siegel and Hambrick, 2005), the antecedents of such dispersion have received very little attention. By attempting to identify factors that affect how dispersed the compensation of a CEO's top team is likely to be, this study is among the first to systematically examine the social determinants of pay dispersion. The consistent pattern of results reported here provides empirical evidence that the prospect of social comparisons of pay among top team members, which have long been recognized as theoretically important (e.g., Andrews and Henry, 1963), significantly influence the level of pay dispersion within the CEO's top team, and those effects, in turn, affect firm performance. Therefore, this research also highlights the potential importance of that social phenomenon at the highest level of organizations.

ACKNOWLEDGEMENTS

Matt Bloom, Janet Dukerich, Sydney Finkelstein, Donald Hambrick, Andrew Henderson, Francisco Polidoro, Phyllis Siegel, and James Westphal provided helpful comments on earlier versions of this manuscript.

REFERENCES

Allison PD. 1978. Measures of inequality. *American Sociological Review* **43**: 865–880.

Andrews IR, Henry MM. 1963. Management attitudes toward pay. *Industrial Relations* **3**: 29–39.

Ashforth BE, Mael F. 1989. Social identity theory and the organization. *Academy of Management Review* **14**: 20–39.

Barnard CI. 1938. *The Functions of the Executive*. Harvard University Press: Cambridge, MA.

Baron JN, Pfeffer J. 1994. The social psychology of organizations and inequality. *Social Psychology Quarterly* **57**: 190–209.

Beatty RP, Zajac EJ. 1994. Managerial incentives, monitoring, and risk bearing: a study of executive compensation, ownership, and board structure in initial public offerings. *Administrative Science Quarterly* **39**: 313–335.

Becker BE, Huselid MA. 1992. The incentive effects of tournament compensation systems. *Administrative Science Quarterly* **37**: 336–350.

Black F, Scholes M. 1973. The pricing of options and corporate liabilities. *Journal of Political Economy* **81**: 637–657.

Bloom M, Michel J. 2002. The relationship among organizational context, pay dispersion, and managerial turnover. *Academy of Management Journal* **45**: 33–42.

Boeker W. 1992. Power and managerial dismissal: scapegoating at the top. *Administrative Science Quarterly* **37**: 400–421.

Carpenter MA, Geletkanycz MA, Sanders WG. 2004. The upper echelons revisited: antecedents, elements, and consequences of top management team composition. *Journal of Management* **30**: 749–778.

Carpenter MA, Sanders WG. 2002. Top management team compensation: the missing link between CEO pay and firm performance. *Strategic Management Journal* **23**(4): 367–375.

Chatterjee A, Hambrick DC. 2007. It's all about me: narcissistic chief executive officers and their effects on company strategy and performance. *Administrative Science Quarterly* **52**: 351–386.

Colbert AE, Kristof-Brown AL, Bradley BH, Barrick MR. 2008. CEO transformational leadership: the role of goal congruence in top management teams. *Academy of Management Journal* **51**: 81–96.

Cook KS, Hegtvedt KA. 1983. Distributive justice, equity, and equality. *Annual Review of Sociology* **9**: 217–241.

Cowherd DM, Levine DL. 1992. Product quality and pay equity between lower-level employees and top management: an investigation of distributive justice theory. *Administrative Science Quarterly* **37**: 302–320.

Cruz C, Gomez-Mejia LR, Becerra M. 2010. Perceptions of benevolence and the design of agency contracts: CEO-TMT relationships in family firms. *Academy of Management Journal* **53**(1): 69–89.

Dalton DR, Daily CM, Ellstrand AE, Johnson JL. 1998. Meta-analytic reviews of board composition, leadership structure, and financial performance. *Strategic Management Journal* **19**(3): 269–290.

David P, Kochhar R, Levitas E. 1998. The effect of institutional investors on the level and mix of CEO compensation. *Academy of Management Journal* **41**: 200–208.

Deutsch M. 1985. *Distributive Justice: A Social Psychological Perspective*. Yale University Press: New Haven, CT.

Devers CE, Wiseman RM, Holmes RM Jr. 2007. The effects of endowment and loss aversion in managerial stock option valuation. *Academy of Management Journal* **50**: 191–208.

Donaldson G, Lorsch JW. 1983. *Decisions at the Top*. Basic Books: New York.

Dunning D, Story AL. 1991. Depression, realism, and the overconfidence effect: are the sadder wiser when predicting future actions and events? *Journal of Personality and Social Psychology* **61**: 521–532.

Duval TS, Silva PJ. 2002. Self-awareness, probability of improvement, and the self-serving bias. *Journal of Personality and Social Psychology* **82**: 49–61.

Eriksson T. 1999. Executive compensation and tournament theory: empirical tests on Danish data. *Journal of Labor Economics* **17**: 262–280.

Festinger L. 1954. A theory of social comparison processes. *Human Relations* **7**: 117–140.

Finkelstein S, Hambrick DC. 1989. Chief executive compensation: a study of the intersection of markets and political processes. *Strategic Management Journal* **10**(2): 121–134.

Finkelstein S, Hambrick D. 1996. *Strategic Leadership: Top Executives and their Effects on Organizations (West's Strategic Management Series).* West: St. Paul, MN.

Fiske ST, Taylor SE. 2008. *Social Cognition: From Brains to Culture*. McGraw-Hill Higher Education: New York.

Frank RH. 1984. Are workers paid their marginal products? *American Economic Review* **74**: 549–571.

Frank RH. 1985. *Choosing the Right Pond: Human Behavior and the Quest for Status*. Oxford University Press: New York.

Freedman S, Montanari JR. 1980. An integrative model of managerial reward allocation. *Academy of Management Review* **5**: 381–390.

Gerhart B, Rynes SL. 2003. *Compensation: Theory, Evidence, and Strategic Implications.* Sage: Thousand Oaks, CA.

Gomez-Mejia LR, Balkin DB. 1992. *Compensation, Organizational Strategy, and Firm Performance (South-Western Series in Human Resources Management).* South-Western: Cincinnati, OH.

Gomez-Mejia LR, Larraza-Kintana M, Makri M. 2003. The determinants of executive compensation in family-controlled public corporations. *Academy of Management Journal* **46**: 226–237.

Gomez-Mejia LR, Tosi H, Hinkin T. 1987. Managerial control, performance, and executive compensation. *Academy of Management Journal* **30**: 51–70.

Gomez-Mejia LR, Wiseman RM. 1997. Reframing executive compensation: an assessment and outlook. *Journal of Management* **23**: 291–374.

Green JR, Stokely NL. 1983. A comparison of tournaments and contracts. *Journal of Political Economy* **91**: 349–364.

Greenberg J. 1987. A taxonomy of organizational justice theories. *Academy of Management Review* **12**: 9–22.

Grusky O. 1963. Managerial succession and organizational effectiveness. *American Journal of Sociology* **69**: 297–317.

Hambrick DC. 1995. Fragmentation and the other problems CEOs have with their top management teams. *California Management Review* **37**: 110–127.

Hambrick DC, Finkelstein S. 1995. The effects of ownership structure on conditions at the top: the case of CEO pay raises. *Strategic Management Journal* **16**(3): 175–193.

Hayward LA, Hambrick DC. 1997. Explaining the premiums paid for large acquisitions: evidence of CEO hubris. *Administrative Science Quarterly* **42**: 103–127.

Henderson AD, Fredrickson JW. 2001. Top management team coordination needs and the CEO pay gap: a competitive test of economic and behavioral views. *Academy of Management Journal* **44**: 96–117.

Hill CWL, Hitt MA, Hoskisson RE. 1992. Cooperative versus competitive structures in related and unrelated diversified firms. *Organization Science* **3**: 501–521.

Hiller NJ, Hambrick DC. 2005. Conceptualizing executive hubris: the role of (hyper-) core self-evaluations in strategic decision-making. *Strategic Management Journal* **26**(4): 297–319.

Hills FS. 1980. The relevant other in pay comparisons. *Industrial Relations* **19**: 345–351.

Kipnis D, Schmidt SM. 1988. Upward-influence styles: relationship with performance evaluations, salary, and stress. *Administrative Science Quarterly* **33**: 528–542.

Kramer RM. 1991. Intergroup relations and organizational dilemmas: the role of categorization processes. In *Research in Organizational Behavior*, Cummings L, Staw B (eds). JAI Press: Greenwich, CT; 191–228.

Kruger J, Dunning D. 1999. Unskilled and unaware of it: how difficulties in recognizing one's own incompetence lead to inflated self-assessments. *Journal of Personality and Social Psychology* **77**: 1121–1134.

Lambert RA, Larcker DF, Weigelt K. 1993. The structure of organizational incentives. *Administrative Science Quarterly* **38**: 438–461.

Lawler EE. 1971. *Pay and Organizational Effectiveness: A PsychologicalVview*. McGraw-Hill: New York.

Lazear EP. 1989. Pay equality and industrial politics. *Journal of Political Economy* **97**: 561–580.

Lazear EP, Rosen S. 1981. Rank-order tournaments as optimum labor contracts. *Journal of Political Economy* **89**: 841–864.

Leventhal GS. 1976. The distribution of rewards and resources in groups and organizations. In *Advances in Experimental Social Psychology*, Berkowitz L (ed). Academic Press: New York; 91–131.

Leventhal GS, Karuza J, Fry WR. 1980. Beyond fairness: a theory of allocation preferences. In *Justice and Social Interaction*, Mikula G (ed). Springer-Verlag: New York; 167–218.

Leventhal GS, Michaels JW, Sanford C. 1972. Inequity and interpersonal conflict: reward allocation and secrecy about reward as methods of preventing conflict. *Journal of Personality and Social Psychology* **23**: 88–102.

Lorsch JW. 1989. *Pawns or Potentates: The Reality of America's Corporate Boards*. Harvard Business School Press: Boston, MA.

Lublin JS. 1998a. A better way? A CEO and academic talk about alternative approaches to pay at the top. *Wall Street Journal,* 9 April: R12.

Lublin JS. 1998b. Golden heirs. *Wall Street Journal,* 9 April: R5.

Mahoney TA. 1979. Organizational hierarchy and position worth. *Academy of Management Journal* **22**: 726–737.

Main B, O'Reilly C III, Wade J. 1993. Top executive pay: tournament or teamwork? *Journal of Labor Economics* **11**: 606–628.

March JC, March JG. 1977. Almost random careers: the Wisconsin School Superintendency, 1940–1972. *Administrative Science Quarterly* **22**: 378–409.

Meindl JR, Ehrlich SB, Dukerich JM. 1985. The romance of leadership. *Administrative Science Quarterly* **30**: 78–102.

Michel J, Hambrick DC. 1992. Diversification posture and top management team characteristics. *Academy of Management Journal* **35**: 9–37.

Milgrom P, Roberts J. 1988. An economic approach to influence activities in organizations. *American Journal of Sociology* **94**: 154–179.

Moore DA, Small DA. 2007. Error and bias in comparative judgment: on being both better and worse than we think we are. *Journal of Personality and Social Psychology* **96**: 972–989.

Mowday RT. 1978. The exercise of upward influence in organizations. *Administrative Science Quarterly* **23**: 137–156.

Murphy KJ. 1999. Executive compensation. In *Handbook of Labor Economics* (Vol. 3B), Ashenfelter O, Card D (eds). North Holland: Amsterdam; Chap. 38.

O'Reilly CA III, Main BG, Crystal GS. 1988. CEO compensation as tournament and social comparison: a tale of two theories. *Administrative Science Quarterly* **33**: 257–274.

Palepu K. 1985. Diversification strategy, profit performance, and the entropy measure. *Strategic Management Journal* **6**(3): 239–255.

Pfeffer J, Davis-Blake A. 1990. Determinants of salary dispersion in organizations. *Industrial Relations* **29**: 38–57.

Pfeffer J, Davis-Blake A. 1992. Salary dispersion, location in the salary distribution, and turnover among college administrators. *Industrial and Labor Relations Review* **45**: 753–763.

Pfeffer J, Langton N. 1988. Wage inequality and the organization of work: the case of academic departments. *Administrative Science Quarterly* **33**: 588–606.

Rosen S. 1986. Prizes and incentives in elimination tournaments. *American Economic Review* **76**: 701–715.

Sanders WG. 2001a. Behavioral responses of CEOs to stock ownership and stock option pay. *Academy of Management Journal* **44**: 477–492.

Sanders WG. 2001b. Incentive alignment, CEO pay level, and firm performance: a case of 'Heads I win, tails you lose'? *Human Resource Management* **40**: 159–181.

Sanders WG, Carpenter MA. 1998. Internationalization and firm governance: the roles of CEO compensation, top team composition, and board structure. *Academy of Management Journal* **41**(2): 158–178.

Shen W, Cannella AA Jr. 2003. Will succession planning increase shareholder wealth? Evidence from investor reactions to relay CEO successions. *Strategic Management Journal* **24**(2): 191–198.

Siegel PA, Hambrick DC. 2005. Pay disparities within top management groups: evidence of harmful effects on performance of high-technology firms. *Organization Science* **16**: 259–274.

Simon H. 1957. The compensation of executives. *Sociometry* **20**: 32–35.

Tajfel H. 1981. *Human Groups and Social Categories: Studies in Social Psychology.* Cambridge University Press: Cambridge, UK.

Turner JC. 1985. Social categorization and the self-concept: a social cognition theory of group behavior. In *Advances in Group Processes*, Lawler E (ed). JAI Press: Greenwich, CT; 77–121.

Tversky A, Kahneman D. 1974. Judgment and uncertainty: heuristics and biases. *Science* **185**: 1124–1131.

Useem M. 1993. *Executive Defense.* Harvard University Press: Cambridge, MA.

Wade JB, O'Reilly CA III, Pollock TG. 2006. Overpaid CEOs and underpaid managers: fairness and executive compensation. *Organization Science* **17**: 527–544.

Wagner WG, Pfeffer J, O'Reilly CA III. 1984. Organizational demography and turnover in top-management groups. *Administrative Science Quarterly* **29**: 74–92.

Wallace MJ, Fay CH. 1983. *Compensation Theory and Practice (Kent Human Resource Management Series).* Kent: Boston, MA.

Weber M. 1946. *From Max Weber: Essays in sociology*. Gerth H, Mills C (eds). Oxford University Press: New York.

Werner S, Tosi HL, Gomez-Mejia LR. 2005. Organizational governance and employee pay: how ownership structure affects the firm's compensation strategy. *Strategic Management Journal* **26**(4): 377–384.

Westphal JD. 1998. Board games: how CEOs adapt to increases in structural board independence. *Administrative Science Quarterly* **43**: 511–537.

Westphal JD. 1999. Collaboration in the boardroom: behavioral and performance consequences of CEO-board social ties. *Academy of Management Journal* **42**: 7–24.

Westphal JD, Fredrickson JW. 2001. Who directs strategic change? Director experience, the selection of new CEOs, and change. *Strategic Management Journal* **22**(12): 1113–1137.

Westphal JD, Zajac EJ. 1995. Who shall govern? CEO/board power, demographic similarity, and new director similarity. *Administrative Science Quarterly* **40**: 60–83.

Westphal JD, Zajac EJ. 1997. Defections from the inner circle: social exchange, reciprocity, and the diffusion of board independence in U.S. corporations. *Administrative Science Quarterly* **42**: 161–183.

Wiseman RM, Gomez-Mejia LR. 1998. A behavioral agency model of managerial risk taking. *Academy of Management Review* **23**: 133–153.

Zander A. 1994. *Making Groups Effective* Jossey-Bass: San Francisco, CA.

Zhang Y, Rajagopalan N. 2003. Explaining new CEO origin: firm versus industry antecedents. *Academy of Management Journal* **46**: 327–338.

DOI: 10.1002/smj