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A functional model of hierarchy: Why, how, and when vertical differentiation enhances group performance

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Abstract

We propose that hierarchy is such a prevalent form of social organization because it is functionally adaptive and enhances a group's chances of survival and success. We identify five ways in which hierarchy facilitates organizational success. Hierarchy (a) creates a psychologically rewarding environment; (b) motivates performance through hierarchy-related incentives; (c) capitalizes on the complementary psychological effects of having versus lacking power; (d) supports division of labor, and, as a result, coordination; and (e) reduces conflict and enhances voluntary cooperation. Overall, we specify a causal model linking organizational structure (hierarchy), processes (motivation, leadership, coordination, and cooperation) and outcomes (performance). We also discuss three variables that moderate the need for and acceptance of hierarchy—(a) the level of task interdependence; (b) the legitimacy of hierarchical differentiation; and (c) the alignment of different bases of hierarchy—and link them to the mediating processes through which hierarchy facilitates organizational success.

Keywords

groups/teams, hierarchy, leadership, motivation, power, status

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From the beginning of its history, human ultrasociality and the challenges of survival in ancestral environments propelled individuals to organize in interdependent, cooperative groups, which provided their members with valuable resources, both material (e.g., physical security, food) and psychological (e.g., a sense of safety and belongingness; Neuberg, Kenrick, & Schaller, 2010). While offering many benefits, group living also presents numerous obstacles and potential costs. Whether it is big-game hunting and food-sharing in small hunter and gatherer groups or the production of innovative products in multinational corporations, successful group action almost always requires coordination and cooperation (Barnard, 1938; Olson, 1965). Thus, groups and organizations have always sought ways to curb vices (e.g., selfishness, gluttony) and harness virtues (e.g., prosociality) to achieve effective functioning (Campbell, 1975; Schelling, 1971).

We focus on hierarchy as a fundamental and prevalent form of social organization that allows groups to achieve the high levels of coordination and cooperation necessary to ensure survival and success (see also S.T. Fiske, 2010; Gruenfeld & Tiedens, 2010; Magee & Galinsky, 2008). We have organized our analysis in two sections. First, we identify five ways in which hierarchy can facilitate the survival and success of organizational groups: (a) by creating a psychologically rewarding environment for individuals; (b) by motivating individual performance through hierarchy-related incentives; (c) by capitalizing on the complementary psychological effects of low versus high power; (d) by increasing role differentiation, division of labor and coordination; and (e) by reducing conflict and enhancing voluntary cooperation. Second, we identify three variables—(a) the level of task interdependence; (b) the legitimacy of hierarchical differentiation; and (c) the alignment of different bases of hierarchy—which we think moderate the effects of hierarchy on group processes and outcomes. We then link these moderators to the five mediating processes through which hierarchy can benefit groups. Together, these two sections address three fundamental questions: *why*, *how*, and *when* does hierarchy enhance group functioning and performance.

The prevalence and diversity of hierarchal differentiation

Our review was motivated by both the prevalence and diversity of hierarchical forms. Hierarchy, defined as "an implicit or explicit rank order of individuals or groups with respect to a valued social dimension" (Magee & Galinsky, 2008, p. 354), is one of the most elementary and common forms of social organizations in primate groups, both human and nonhuman (A. P. Fiske, 1992; S. T. Fiske, 2010; Gould, 2002; Gruenfeld & Tiedens, 2010; Magee & Galinsky, 2008). Hierarchies are not only omnipresent in human groups, but they also emerge quickly and spontaneously from limited social interactions (Anderson & Kilduff, 2009; Ridgeway, 1987; Ridgeway & Diekema, 1989; Tiedens & Fragale, 2003; van Vugt, 2006). Once formed, hierarchies shape the direction and magnitude of influence and control in groups (Cohen & Zhou, 1991; Keltner, van Kleef, Chen, & Kraus, 2008). As a result, they tend to be self-reinforcing (Magee & Galinsky, 2008) despite concerted efforts to attenuate their steepness by making the distribution of power and status more egalitarian (Gruenfeld & Tiedens, 2010).

Hierarchical differentiation comes in many shapes and forms. Hierarchy may emerge in a top–down fashion, whereby organizations differentiate among their members using formal authority structures (Blau & Scott, 1962; Weber, 1947) and pay dispersion (Bloom, 1999; Shaw, Gupta, & Delery, 2002), or from the bottom–up, as when status differences emerge informally in face-to-face interactions (Anderson, John, Keltner, & Kring, 2001; Anderson & Kilduff, 2009; Ridgeway, Boyle, Kuipers, & Robinson, 1998). Organizations

differ in how steep or strong the hierarchy is (i.e., how egalitarian they are; Bloom, 1999; Wade, O'Reilley, & Pollock, 2006), as well as in the nature of relationships between higher and lower ranks in the hierarchy (e.g., whether leaders nurture versus exploit followers; Bass & Bass, 2008; Judge & Piccolo, 2004; Schriesheim, Castro, & Cogliser, 1999).

Individuals in organizations are differentiated along multiple dimensions of hierarchy, including power (asymmetries in control over resources; Fast & Chen, 2009; French & Raven, 1959; Keltner et al., 2008; Kipnis, 1972), status (asymmetries in respect and admiration from others; Anderson, Spataro, & Flynn, 2008; Berger, Cohen, & Zelditch, 1972; Berger, Rosenholtz, & Zelditch, 1980), and participation (asymmetries in how much group members contribute to group tasks and activities; Anderson & Kilduff, 2009; Cohen & Zhou, 1991; McCaffrey, Faerman, & Hart, 1995). There is also considerable diversity in the individual qualities and behaviors that lead to the attainment of status, power, and leadership positions in organizations (competence and achievements: McCoy & Major, 2007; Schmidt & Hunter, 1998; assertiveness: Ames & Flynn, 2007; narcissism: Brunell et al., 2008; strategic displays of prosocial behavior: Flynn, Reagans, Amanatullah, & Ames, 2006; Hardy & van Vugt, 2006; Willer, 2009; and different personality dimensions: Anderson et al., 2008; Cheng, Tracy, & Henrich, in press; Judge, Bono, Ilies, & Gerhardt, 2002).[1]

The prevalence and diversity of hierarchy suggests that individuals and groups have a strong (though not always conscious and explicit) preference for this form of social organization (Gruenfeld & Tiedens, 2010; Hofstede, 1980; Rokeach, 1973; Tiedens, Unzueta, & Young, 2007; Triandis & Gelfand, 1998). From a social-evolutionary perspective that assumes a natural selection of social organization forms, the fact that hierarchy exists in all cultures (A. P. Fiske, 1992; S. T. Fiske, 2010) and has persisted from the dawn of history attests to its *adaptive functional value*. In this sense, hierarchy is one of those "recipes for living that have been evolved, tested, and winnowed through hundreds of generations of human social history. On purely scientific grounds, these recipes might be regarded as better tested than the best of psychology's [. . .] speculations on how lives should be lived" (Campbell, 1975, p. 1103; see also Magee & Galinsky, 2008; van Vugt, 2006; van Vugt, Hogan, & Kaiser, 2008).[2]

Recognizing the potential functional value of hierarchy in organizations, the following sections theoretically integrate social psychological and organizational perspectives on power, status, and hierarchy into a functional model that explains *why*, *how,* and *when* hierarchy facilitates group functioning and performance. We go beyond previous accounts of hierarchy in organizations (e.g., Gruenfeld & Tiedens, 2010; Magee & Galinsky, 2008) by outlining five distinct yet complementary ways in which hierarchy may enhance group functioning and performance, and by discussing three variables that likely moderate the effects of hierarchy on group processes and outcomes.

Five ways in which hierarchy can enhance performance

Proposition 1: Hierarchy creates a psychologically rewarding environment

Hierarchies fulfill certain fundamental psychological needs better than egalitarian social arrangements (Gruenfeld & Tiedens, 2010). These include, among other things, the needs for power and achievement (McClelland, 1975; Schwartz, 1992) and the needs for certainty, predictability, and structure (Fromm, 1941; Kruglanski & Webster, 1996; Whitson & Galinsky, 2008). Hierarchies can fulfill the needs for power and achievement by providing opportunities for advancement and using other extrinsic rewards (e.g., status symbols) that satisfy these goals. They allow fulfillment of the needs for certainty, predictability, and structure by establishing a clear chain of

command and spheres of authority, as well as corresponding expectations concerning who reports to whom about what, when and how. By providing their members with an environment that helps fulfill these fundamental needs, hierarchical units achieve higher levels of organizational identification and commitment. Uncertainty-identity theory (Hogg, 2007), in particular, proposes that the need to reduce uncertainty pushes individuals to categorize themselves as group members and identify strongly with their groups. Organizational identification and commitment, in turn, enhance performance (Riketta, 2002, 2005).

Hierarchy is also psychologically rewarding because it validates individual beliefs in meritocracy and social mobility (Jost, Blount, Pfeffer, & Hunyady, 2003; McCoy & Major, 2007) and is consistent with the preference for equity over equality as a fair and just resource-allocation norm (which is particularly robust in Western, capitalistic societies; Adams, 1965; Fischer & Smith, 2003; Gomez, Kirkman, & Shapiro, 2000; Rokeach, 1973). Differential allocation of resources in organizations also meets employees' notions of social justice because employees typically differ in task-related skills, knowledge, experience, and contributions to group success (Humphrey, Morgeson, & Mannor, 2009). Moreover, affording comparable levels of power and status to employees with different levels of competence and contributions constitutes artificial uniformity, rather than equality. Thus, hierarchical arrangements may be seen as contributing to both outcome and procedural fairness. Perceptions of social justice instill legitimacy into the system, which in turn, promotes voluntary deference and cooperation (Tyler, 2006).

Proposition 2: Hierarchy functions as an incentive system

Considerable evidence suggests that hierarchy enhances performance because it functions as an incentive system in organizations (Magee & Galinsky, 2008; Ridgeway, 1987). Hierarchy allows organizations to use promotion, differential pay, and various status symbols (e.g., job title, office size, and parking location) to formally reward individual actions that benefit the organization as a whole (Gruenfeld & Tiedens, 2010). In addition, people spontaneously and informally confer status, give power, and bestow leadership upon those who act on behalf of the group (Hardy & van Vugt, 2006; van Emmerik, Lambooy, & Sanders, 2002; Willer, 2009), thereby motivating themselves and others to excel in their jobs and even go the extra mile (e.g., engage in extra-role behaviors and organizational citizenship behaviors) to promote organizational success. In addition to material rewards, advancing in the organizational ladder also fulfills the powerful need for respect, esteem, and appreciation from others (Henry, 2009; Maslow, 1943).

Importantly, hierarchical differentiation is motivating for both high- and low-ranked group members. Groups and organizations reward individual sacrifice with status and power; to meet others' expectations and maintain their high-rank, leaders often exert more effort and devote more energy to organizational goals. Thus, after being rewarded with higher rank, leaders reciprocate by increasing their contributions to the collective effort, which in turn allows them to maintain their high rank while at the same time serving organizational goals (Gould, 2002; van Emmerik et al., 2002; Willer, 2009).

Hierarchies also motivate lower ranked members to increase their contributions to the organization for four complementary reasons. First, complying with the demands of leaders *directly* decreases the likelihood of immediate sanctions and increases the likelihood of immediate rewards. Second, deferring to and cooperating with high-ranked members of the organization *indirectly* benefits low-rank members by increasing organizational success and enlarging the pie of resources that are divided among organizational members. Importantly,

membership in successful organizations can lead to long-term benefits in the form of future positions in other organizations even for low-ranked members. Third, there is evidence that low-ranked members take pleasure in positive interactions with high-rank members (Gould, 2002). Finally, observing the formal and informal rewards high-ranked members in an organization receive, leads them to increase their efforts to achieve these rewards themselves (Magee & Galinsky, 2008).

Proposition 3: Hierarchy gives rise to complementary psychological processes

The beginning of the 21st century witnessed a spike in scholarly research on the consequences of having versus lacking power for individual affect, behavior, and cognition. This research points to distinct and often opposing effects of having versus lacking power on the psychology of individuals. Power liberates, leading to action and optimism as well as abstract, creative, independent thinking; in contrast, lacking power inhibits and leads to risk aversion and greater adherence to default options (Galinsky, Gruenfeld, & Magee, 2003; Galinsky, Magee, Gruenfeld, Whitson, & Liljenquist, 2008; Keltner, Gruenfeld, & Anderson, 2003; Magee, Galinsky, & Gruenfeld, 2007). Power is associated with illusory perceptions of control (Fast, Gruenfeld, Sivanathan, & Galinsky, 2009), whereas lack of control and power enhances illusory pattern perception such as superstitions and conspiratorial conjectures (Whitson & Galinsky, 2008) and impairs executive functions (Smith, Jostmann, Galinsky, & van Dijk, 2008). Finally, power hinders perspective-taking and facilitates instrumental, objectifying views of others, whereas powerlessness facilitates vigilance, attention, and responsiveness to one's environment (S. T. Fiske, 2010; Galinsky, Magee, Inesi, & Gruenfeld, 2006; Gruenfeld, Inesi, Magee, & Galinsky, 2008; Keltner et al., 2003).

All of these effects can also explain another robust finding in the power literature: having power leads individuals to be more goal-directed, focusing on central, goal-relevant aspects of stimuli and channeling behavior toward accomplishing one's currently held goals (Bargh, Raymond, Pryor, & Strack, 1995; Chen, Lee-Chai, & Bargh, 2001; Galinsky et al., 2003; Guinote, 2007). For example, the powerful prefer to describe actions in terms of the goals they serve, compared to the powerless (Smith & Trope, 2006). The tight link between power and goal focus also explains why the powerless show decrements in executive functioning (Smith et al., 2008). Proper executive functioning requires effective goal focus, and impairments result from difficulty in actively maintaining a goal (Engle, 2002). As a result, lacking power impairs executive functions, making participants worse at parsing out irrelevant information and planning ahead to achieve their goals (Smith et al., 2008).

Although the effects of having versus lacking power are contradictory at the level of the individual, they are complementary at the level of the group. The results reviewed above suggest that hierarchy, which by definition involves variance within groups in levels of power, authority, influence, and control, should introduce variance in group members' thinking and behavior as well. Specifically, those who have power see the big picture, initiate, and lead whereas those who lack power attend to details, conform, and follow (van Vugt, 2006). Thus, one way in which hierarchy enhances performance is through its differential, yet complementary effects, on the behavior and cognition of leaders versus followers. To use a mechanistic analogy, in the same fashion that vehicles need a steering wheel, a gas pedal, and a brake pedal to get safely from point A to point B, so do groups and organizations need people who can show the way, people who enthusiastically push toward the attainment of desired goals, and people who vigilantly pay attention to the affordances and constraints of the situations that surround them. We acknowledge,

of course, that both vehicles and organizations are more complex; the aim of this illustrative analogy is to highlight the complementary nature of the effects of having versus lacking power at the group level of analysis. Our point is that hierarchy breeds and enforces complementary behaviors and thought processes that are critical to the survival and success of groups, which are significantly less likely to occur in a perfectly flat organizational environment (if such an environment exists at all; see Gruenfeld & Tiedens, 2010).

Proposition 4: Hierarchy increases coordination

Try to imagine an organizational team that is perfectly egalitarian—a team in which each member is absolutely equal to all others. Surely such a team would do a poor job managing an operating room in a hospital or fighting in the battlefield. Equally unimaginable, of course, is that such a team would excel as an airline crew or as a professional basketball team. These examples of organizational teams have at least three things in common: organizational members occupy different roles (e.g., surgeon versus nurse); different roles are associated with different ranks or levels of authority (e.g., commander versus soldiers); and the joint task necessitates a clear division of labor and requires high levels of coordination (e.g., point-guard and center).

Role differentiation and hierarchical differentiation tend to covary in organizations (Baron & Pfeffer, 1994; Gruenfeld & Tiedens, 2010). Both types of differentiation facilitate a clear division of labor that specifies who does what and when, thereby supporting smooth and efficient interactions among interdependent organizational members (Magee & Galinsky, 2008). Hierarchy should also support effective transactive memory processes in organizations (Austin, 2003; Brandon & Hollingshead, 2004; Liang, Moreland, & Argote, 1995; Moreland & Myaskovski, 2000). Hierarchy functions as a strong psychological situation (Cooper & Withey, 2009; Mischel, 1977) that induces clear and relatively uniform expectancies concerning the appropriate behaviors of people in different ranks. Essentially, hierarchy facilitates smooth social interactions by simplifying them (Tiedens et al., 2007; Zitek & Tiedens, 2010). Every kid in every school knows his or her place in the social hierarchy (in much the same way that every employee in every organization knows his or her placement in the organizational hierarchy) because it reduces uncertainty and enhances predictability in interactions with others.

This proposition is consistent with the results of a recent research showing that social hierarchy can create a pattern of voluntary deference that facilitates tacit coordination. Kwaadsteniet and van Dijk (2010) created laboratory situations that required two individuals to coordinate their actions (i.e., choose a particular option) without communicating with one another to receive some payoffs. Each individual faced two options and they were only rewarded with payoffs when both participants chose the same options: the first benefited party A more than B; the second benefited party B more than A. Differences in status helped the parties to coordinate their actions by leading them to simultaneously choose the option that benefited the supervisor more than the subordinate. Thus, status served as a powerful heuristic cue that helped interdependent individuals agree on who should defer to whom and how the available resources should be divided.

Importantly, to effectively solve coordination problems, there needs to be consensus concerning each group member's position in the hierarchy (Anderson & Kilduff, 2009; S. T. Fiske, 2010; Gruenfeld & Tiedens, 2010); unstable hierarchies offer little predictability and therefore are unlikely to increase mutually beneficial coordination. As a result people are remarkably accurate in their assessments of their own and other people's status (Anderson, Srivastava, Beer, Spataro, & Chatman, 2006);

despite the endless ways in which humans self-enhance (Kruger & Dunning, 1999; Taylor & Brown, 1988), with regards to status they are tightly calibrated in estimating their own rank.

People have a strong desire to behave in ways that are appropriate (March, 1994; Weber, Kopelman, & Messick, 2004); knowing their place in the hierarchy provides a compellingly simple answer to the question "what should a person like me do in a situation like this?"; the answer is—whatever is expected of me and afforded to me based on my position in the hierarchy. Overall, hierarchy facilitates tacit coordination by offering psychologically prominent and stable solutions to shared problems (Schelling, 1980; cf. Meyerson, Weick, & Kramer, 1996). It contributes to the formation of a governance structure—explicitly or implicitly—that promotes direction and deference, allowing for concerted, coordinated, and ultimately efficient action.

Proposition 5: Hierarchy reduces conflict and enhances cooperation

The above section on coordination implicitly assumes that different organizational members share the same goals and only need to find the optimal way to synchronize their contributions for everyone's benefit. Although this is sometimes the case, many resources in organizations are finite (i.e., constitute a fixed-pie). As discussed above, because hierarchy creates both implicit and explicit incentive systems it produces an internal competitive structure and environment within organizations (i.e., employees often compete for salary, promotion, recognition, and voice, etc.). Conflict within organizational teams is often detrimental for performance (De Dreu & Weingart, 2003; De Wit, Greer, & Jehn, 2010; Halevy, 2008), whereas cooperation is often crucial for organizational success (Dukerich, Golden, & Shortell, 2002; Ostrom, 1998; Tetrick, Shore, McClurg, & Vandenberg, 2007). Thus, another way in which hierarchy can promote the survival and success of organizations is by reducing debilitating conflict and enhancing voluntary cooperation.

Low-ranked group members avoid conflict and cooperate with high-ranked members because it serves both their short-term and their long-term interests. For example, in stable primate hierarchies, mere displays of power and strength are sufficient to deter low-ranked group members from challenging the existing social order and ensure their continuous cooperation (De Waal, 1989; S. T. Fiske, 2010). Similarly, low-power negotiators often accept exploitative offers from high-power counterparts simply because their alternative is worse than the exploitative agreement (Hoffman, McCabe, Shachat, & Smith, 1994; Magee et al., 2007; Thompson, Wang, & Gunia, 2010). Thus, subordinates often comply with the demands of power holders simply because the latter control valuable resources that the former desire and the alternative path of noncooperation pays less (Gruenfeld & Tiedens, 2010).

Hierarchy can also reduce conflict by "enlarging the pie": to the extent that hierarchy enhances cooperation that leads to organizational success, both high- and low-ranked group members should receive more resources. This is the kind of (self-interested) reasoning that motivates nonstar players in professional sports teams to accept their place and cooperate continuously with high-status team members. Consistent with this analysis, a recent study by Halevy, Chou, Galinsky, and Murnighan (2010) found that hierarchy correlates positively with cooperative behaviors in professional basketball (National Basketball Association) teams (e.g., assists, defensive rebounds); cooperation, in turn, mediated the effects of hierarchy on success rate.

However, the effects of hierarchical differentiation on conflict and cooperation go well beyond mere compliance and obedience (Kelman, 2006; Milgram, 1974). Followers cooperate with leaders and authorities also because they identify with them (Hogg, 2001; Kelman & Hamilton, 1989). The motivational

and performance effects of transformational leadership are often attributed to the high levels of voluntary cooperation that charismatic leaders are able to inspire in followers (Dvir, Eden, Avolio, & Shamir, 2002; Shamir, House, & Arthur, 1993).

Finally, hierarchy facilitates cooperation also because followers endorse and have internalized ideologies and worldviews that support hierarchy (authoritarianism: Altemeyer, 1998; system justification: Jost, Banaji, & Nosek, 2004; social dominance: Sidanius & Pratto, 1999; beliefs in meritocracy: McCoy & Major, 2007). These beliefs, in combination with other conditions (e.g., organizational identification, the perceived legitimacy of authorities), allow hierarchical differentiation to reduce conflict and friction and enhance voluntary cooperation and deference in organizations (Tyler, 2006; Tyler & Blader, 2003; Tyler & Lind, 1992).

Summary

In this section we have discussed five complementary ways in which hierarchy can enhance performance. We have articulated how individual-level and group-level processes connect organizational structures to outcomes. Our discussion has presented these processes as conceptually distinct, which is useful for analytical and conceptual purposes, but they are often interwoven in one another. Although coordination and reduced conflict are theoretically distinct (the latter is necessary in situations characterized by goal incompatibility, whereas the former is necessary in situations characterized by goal compatibility: Campbell, 1982; Schelling, 1980), they tend to covary, and efficient group functioning requires that group members both prioritize group goals over personal goals and engage in coordinated action to achieve them. Thus, the different individual-level effects (being psychologically rewarding, motivating individual performance and contributions to the collective effort) and group-level effects (introducing complementarity, promoting coordination, reducing conflict and enhancing cooperation) of hierarchical differentiation sustain and feed one another, and should be seen and studied empirically as complementary and interdependent.

When is hierarchy beneficial for organizations?

Taken together, the five processes reviewed above explain *why* and *how* hierarchy solves problems that are crucial to the survival and success of groups, organizations and societies. Yet hierarchy is not always beneficial. Dispersed (as compared with compressed) pay is associated with increased attrition in corporations (Wade et al. 2006), as well as with lower on-field and financial performance of professional baseball teams (Bloom, 1999; for a more complete review, see Anderson & Brown, in press). In addition to these adverse effects, the fact that power is the great corruptor (S. T. Fiske, 2010; Kipnis, 1972) and the tendency of some hierarchies to be oppressive and exploitative (Sidanius & Pratto, 1999) have also contributed to a pervasive distaste for hierarchies. The widespread antagonism toward hierarchy is evidenced also in utopian novels (e.g., Bellamy, 1888/1960) that portray a world of perfect and absolute egalitarianism, envisioning environments that distribute resources, status, and opportunities equally.

To address this inconsistency in empirical findings and a frequently expressed wariness with hierarchy, this section considers *when* hierarchy is beneficial for group performance. We focus on three likely moderators of the effects of hierarchical differentiation on performance: the extent to which organizational members engage in interdependent tasks; the perceived legitimacy of hierarchical differentiation; and the extent to which different bases of hierarchy are aligned. In each case, we explain how the moderating variable might affect the five processes identified in this section.

Proposition 6: Procedural interdependence is a causal force that creates the need for hierarchy and therefore moderates the effects of hierarchy on group functioning and performance

Interdependence lies at the core of relationships (Kelley et al., 2003) and groups (Lewin, 1948). Organizational members are often interdependent in their outcomes (i.e., subjected to a common fate; Campbell, 1958; De Dreu, 2007). Indeed, organizational success and particularly the respect that accompanies it are public goods that are available to all the organizational members, regardless of how much they have contributed to its attainment (Dawes, 1980; Weber et al., 2004).

In addition to *outcome* interdependence, organizational members are often *procedurally* interdependent. For example, certain decision rules (Beersma & De Dreu, 2002) and task structures (Steiner, 1972) require participation and contributions from most if not all the members of a group or a work unit. On top of these two structural types of interdependence (in outcomes and procedures), interdependence is often conceived of both as a cultural dimension that captures people's shared understanding of the nature of their relationships (Hofstede, 1980; Schwartz, 1999), and as a mindset that captures a person's view of him- or herself in relation to others (i.e., self-construal: Markus & Kitayama, 1991; Singelis, 1994). Although the dimension of interdependence versus dependence is relevant to both social (Kelley & Thibaut, 1978) and task-oriented relationships in work environments (Weber, 1928/1978), our focus here is on procedural interdependence (henceforth simply interdependence) in task-oriented interactions (Tiedens & Jimenez, 2003; Tiedens et al., 2007).

We see interdependence as a causal force that creates the need for hierarchy. Consequently, we propose that hierarchy should be most necessary and beneficial in environments characterized by high levels of interdependence, and least necessary and beneficial in environments characterized by low levels of interdependence. The moderating role of interdependence becomes apparent when one considers the five ways in which hierarchy can enhance performance discussed above. The group-level processes that facilitate the positive effects of hierarchy—complementarity, increased coordination, reduced conflict and enhanced cooperation—are relevant primarily in work environments that involve high rather than low levels of interdependence (Crawford and Haaland, 1972). Thus, we propose that procedural interdependence moderates the effects of hierarchy on group functioning and performance *primarily* through its effect on the group-level processes identified in the first section.

Building on Steiner's (1972) typology, we propose that hierarchy should be particularly beneficial in conjunctive tasks, but less beneficial (or even detrimental at times) in additive and disjunctive tasks. In additive tasks (e.g., a relay race), the final product is reached through the summing of individuals' independent efforts. Disjunctive tasks (e.g., solving a riddle) can be accomplished by a single group member who identifies a demonstrably correct solution to the group's problem. Thus, members of groups performing either additive or disjunctive tasks are interdependent only in terms of their outcomes, not in terms of their work process. In contrast, the combined and differentiated contributions of different members determine performance in conjunctive tasks. Critically, in conjunctive tasks, the success of the group hinges on how well group members can cooperate and coordinate with each other. Examples of organizational teams performing conjunctive tasks are abundant, from surgical teams and string quartets (Murnighan & Conlon, 1991), through airline crews and assembly-line groups (Thompson, 1967), to consulting, research and development, and new-product teams (Lovelace, Shapiro, & Weingart, 2001).

Basketball versus baseball. We see interdependence as potentially explaining the discrepancy between the results of Bloom (1999), who reported negative effects of hierarchical pay dispersion in professional baseball, and those of Halevy et al. (2010), who found positive effects for hierarchy in professional basketball teams. Indeed within three days of each other in the spring of 2010, the sports columnist Bill Simmons referred to baseball as "an individual sport masquerading as a team sport" and President Barak Obama referred to basketball as "the quintessential team sport." Baseball is characterized by "the autonomy of organizational parts," whereas basketball is characterized by greater interdependence, an increased need for coordination, and "voluntary cooperation between the parts" (Keidel, 1987, pp. 592–593). Interdependence is further exacerbated in basketball compared to baseball because opportunities to contribute during the game are finite and constrained: the number of shots is a limited resource and basketball players must often give up shots to more qualified players or those who are in better strategic positions. In contrast, the sequential rather than simultaneous participation of team members in offensive plays in baseball creates much less interdependence, with each batter getting approximately equal opportunities to hit. These differences potentially explain why hierarchy is beneficial in basketball yet detrimental in baseball.

The correlation between interdependence and hierarchy across cultures. Our proposition that hierarchy should be more functional and beneficial in environments that emphasize interdependence is consistent with findings showing that cultural emphases on interdependence and hierarchy tend to covary. Many national cultures are characterized by simultaneous emphasis on both collectivism and power distance (Hofstede, 1980); moreover, there is not a single country characterized by high collectivism and low power distance (Greunfeld & Tiedens, 2010). The concept of vertical collectivism (Triandis & Gelfand, 1998) captures the assimilation of these two cultural orientations in people's self-concept, and entails both prioritizing collective goals over individual goals and deference to authorities. Finally, unpublished data by Schwartz (2010) shows that at the level of national culture ($N = 78$ countries), hierarchy correlates positively and significantly with collectivism (embeddedness; $r = .46$), demonstrating that hierarchy is related to a cultural emphasis on interdependence. In addition, hierarchy at the country level is also correlated with mastery ($r = .44$)—a cultural emphasis on competence, ambition, success, active pursuit of interests, and instrumental exploitation of the environment to meet goals. This latter finding suggests that hierarchy is culturally interwoven with a desire for personal and group success. Similarly, House, Hanges, Javidan, Dorfman, and Gupta (2004) have also demonstrated positive correlations between collectivism, power distance, and emphasis on performance; importantly, they found these associations both at the level of organizations and at the level of societies (62 cultures).

In sum, we propose that (a) interdependence is a causal force that creates the need for hierarchy, and (b) that hierarchy can enhance performance, particularly in cases of high task interdependence, through its effects on the group-level processes identified in the first section. Evidence in support of this proposition comes from research showing that pay dispersion hurts performance in professional baseball but increases success rate in professional basketball. Further support is found in the multiple studies demonstrating strong associations between hierarchy, collectivism, and an emphasis on performance.

Proposition 7: Legitimacy moderates the effects of hierarchy on group functioning and performance

Legitimacy, defined as "the belief that authorities, institutions, and social arrangements are

appropriate, proper, and just" (Tyler, 2006, p. 376), facilitates the effective functioning of social systems. It does so by minimizing the need to use costly and unpopular methods of influence (i.e., coercive power; French & Raven, 1959; Raven, 2008) and by allowing leaders and power holders to appeal to followers' values and moral norms as means to achieve high levels of voluntary cooperation and deference to authorities (Tyler, 1997). We therefore propose that hierarchy (like any other social arrangement) is more likely to have positive effects on organizational performance when it has high rather than low legitimacy. In the following paragraph we explain how legitimacy moderates the effects of hierarchy through its effect on the five processes identified in the previous section.

Theories of social influence (e.g., Kelman, 1961) distinguish between compliance and internalization. These processes correspond to different orientations toward authorities: a rule orientation and a value orientation (Kelman, 2006; Kelman & Hamilton, 1989). Compliance or a rule orientation is associated with a focus on material interests: group members demonstrate public and instrumental conformity to authoritative demands to obtain rewards or avoid punishments. Influencing through compliance is inefficient because it depends on the existence of costly monitoring and sanctioning systems. In contrast, internalization or a value orientation, which is the deepest and most sustainable response to influence, means that one has incorporated authorities' expectations from followers with her existing beliefs, attitudes, and personal values to form an internally consistent and independently maintained worldview.

Consistent with the view of power as a social affordance (Keltner et al., 2008), legitimacy means that followers have internalized power holders' entitlement to rule and lead, and are therefore likely to obey authoritative demands because they personally feel that they ought to do so (Tyler, 2006). Followers' internalized commitment to legitimate hierarchies increases organizational performance in several complementary ways. First, it sustains higher levels of cooperation within groups at a lower cost because it reduces the need for monitoring and sanctioning systems necessary to enforce compliance. Importantly, monitoring and sanctioning systems are costly not only because they require resources, but also because they signal distrust and discourage voluntary cooperation in organizations (Chou, Halevy, & Murnighan, 2010; Gneezy & Rustichini, 2000; Tenbrunsel & Messick, 1999). Thus, legitimate hierarchies have higher overall levels of cooperation in addition to paying virtually no costs to sustain it.

Second, legitimacy decreases friction and debilitating conflict that emerge in both human (Tyler, 2006) and nonhuman primate groups (S. T. Fiske, 2010) when low-status group members challenge high-status group members' entitlement to lead. Interestingly, in unstable primate hierarchies where underlings constantly challenge dominant group members, the higher ranking members experience more chronic stress than the former, due to the need to constantly fight to defend their position (S. T. Fiske, 2010; Jordan, Galinsky, & Sivanathan, 2010; Sapolsky, 2004).

Third, legitimacy supports the positive effects of hierarchy on performance through complementarity and coordination because it stabilizes institutional arrangements. Both complementarity and coordination are more likely when a hierarchy is stable enough to produce uniform and lasting expectations concerning the division of labor and role-appropriate behaviors. In addition, both complementarity and coordination become more likely when followers accept rather than challenge their positions in the hierarchy. This argument is supported by research showing that illegitimacy attenuates the effects of power on behavioral approach (Lammers, Galinsky, Gordijn, & Otten, 2008).

Finally, in addition to its effects on the group-level processes that connect hierarchy

and group performance, legitimacy also affects the individual-level processes that carry the effects of hierarchy. Legitimate hierarchical arrangements that are seen as fair should be more motivating and rewarding psychologically for individuals than illegitimate arrangements. Tyler (2006) concluded that "studies in work settings [. . .] demonstrate that the use of fair procedures not only encourages deference to authorities, but also motivates a variety of types of voluntary positive efforts on behalf of one's organization" (p. 383).

Proposition 8: The alignment of different bases of hierarchy moderates the effects of hierarchy on group functioning and performance

As noted in the introduction, hierarchy comes in many shapes and forms, and individuals in organizations are differentiated along multiple dimensions. Although power and status often covary, they are distinct constructs; thus, individuals can have power without status and vice versa (Keltner et al., 2003; Magee & Galinsky, 2008). The same is true for prestige and dominance—two distinct facets of status (Cheng et al., in press; Henrich & Gil-White, 2001). Although there is considerable research and theory on the consequences of having versus lacking power or status, little is known about what happens when these bases of hierarchy are misaligned rather than aligned.

Notwithstanding, several independent lines of research on low-status compensation (Henry, 2009), mismatch between levels of testosterone and status (Josephs, Sellers, Newman, & Mehta, 2006), and the consequences of power coupled with self-perceived incompetence (Fast & Chen, 2009), suggest that noncorrespondence between different bases of hierarchy may increase conflict, competition, and aggression, rather than coordination and cooperation. Hence, we propose that hierarchy is more likely to facilitate group functioning and performance when different bases of hierarchy (e.g., competence, prestige, dominance, power) are aligned rather than misaligned. As with the previous two moderators (interdependence and legitimacy), we expect this moderation to occur through misalignment's influence on the five processes that carry hierarchy's effects to group functioning and performance.

Misalignment of different bases of hierarchy decreases hierarchy's ability to fulfill the basic human needs for structure and predictability, as well as the ability to effectively motivate individual performance through hierarchy-related incentives. If status and power are misaligned, it also implies that different individual behaviors are rewarded with respect versus control over resources. As a result, the needs for achievement and power, which often go together (Schwartz, 1992), cannot be fulfilled simultaneously.

In addition to influencing the individual-level processes that carry hierarchy's effects to group functioning and performance, misalignment of different bases of hierarchy can also diminish hierarchy's beneficial consequences through its effects on the group-level processes of complementarity, coordination, and cooperation. It is questionable whether powerful low-status group members and powerless high-status group members show complementary patterns of thinking and behavior that, when brought together, serve the group as a whole. In addition, because both powerful low-status group members and powerless high-status group members may feel entitled to lead and direct the group, it is unclear who should defer to whom and what is the appropriate role differentiation in the group. Because hierarchy's ability to enhance coordination and cooperation depends on its stability and continuity, misalignment of different bases of hierarchy might lead to intragroup status, power, and dominance competitions that reduce teams' performance (Bendersky & Hays, in press; Kilduff & Anderson, 2010) and lead group members to invest their limited resources in

attaining status and power instead of promoting group goals (Bendersky & Shah, in press).

Summary

Although we have discussed interdependence, legitimacy, and alignment of different bases of hierarchy as three separate moderators of the effects of hierarchy on group functioning and performance, they are likely be intertwined and causally related. Interdependence, for example, may increase the perceived legitimacy of hierarchical arrangements: as the cross-cultural research reviewed above shows, hierarchical arrangements are endorsed more strongly and are likely to be judged as more fair (Fischer & Smith, 2003) in environments than emphasize interdependence rather than independence. Similarly, the extent to which different bases of hierarchy are aligned versus misaligned (as well as the particular bases that underlie a given hierarchy) may affect the extent to which group members perceive hierarchical arrangements as legitimate and fair. In addition, we propose that our three moderators are likely to have additive effects; a hierarchy is most likely to enhance group performance when different bases of hierarchy are aligned, the hierarchy is seen as legitimate, and when it exists in environments that emphasize interdependence. In contrast, hierarchies are least likely to enhance performance when different bases of hierarchy are misaligned, when the hierarchy is seen as illegitimate, and when the organizational environment emphasizes independence. Importantly, and as illustrated above, we suggest that the conditions of interdependence, legitimacy, and alignment shape the consequences of hierarchy in organizations through the five individual-level and group-level processes that carry hierarchy's effects to group functioning and performance.

Practical implications

Combining the current theorizing with the idea that "the performance of work groups and departments depends in part on their levels of hierarchical differentiation" (Magee & Galinsky, 2008, p. 385) calls for a careful "mechanism design" approach, whereby organizations enhance their performance by carefully designing systems of hierarchical differentiation that fit with the local work environment (e.g., the level of procedural interdependence, legitimacy for hierarchical differentiation, and the alignment of different bases of hierarchy).

Because hierarchies often emerge spontaneously, status is often ascribed based on characteristics that are either irrelevant (e.g., demographic), or worse yet, detrimental, to organizational goals, and power is often afforded to inappropriate leaders (Berger et al., 1972; Berger et al., 1980; Brunell et al., 2008). Although hierarchy is by no means a panacea to all organizational problems, conscious and careful crafting of hierarchies may well facilitate the survival and success of organizational groups. A better understanding of why, how, and perhaps most importantly, when hierarchy facilitates group functioning and performance, should allow managers to structure organizational units in ways that optimize success.

Conclusion

Individuals respond to hierarchies with strong emotional reactions; they either endorse them with enthusiasm or reject them with vitriolic distaste, but they rarely express indifference. This is plausibly because the existence of hierarchies, as well as an individual's particular position in a hierarchy, shape so many aspects of people's daily lives—from their living conditions, to the opportunities they get, to the ways they think, feel, and act. The ambivalence towards hierarchy dates back to ancient Greece, when Thucydides made his stark observation on the nature of hierarchy ("The strong do what they will; the weak endure what they must") and Plato propagated his meritocratic vision of the Athenian republic (i.e., the rule of the wise).

Current-day ambivalence towards hierarchy is characterized by a combination of explicit antagonism towards hierarchy coupled with an implicit preference for hierarchical arrangements (Gruenfeld & Tiedens, 2010; Tiedens et al., 2007); this ambivalence plausibly reflects a common recognition that power, as one primary basis of hierarchical differentiation, is simultaneously the great corruptor and the great liberator (S. T. Fiske, 2010).

In the current review and theoretical integration, we have tried to add to the understanding of *why* and *how* hierarchy enhances survival and success of groups and organizations, as well as *when* hierarchy is likely to have positive versus negative effects in organizations. In doing so, we have supported a functional view of hierarchical differentiation. Whereas many perspectives focus on distributive questions (i.e., who gets what), our approach takes the perspective of the system as a whole and is concerned with the maximization of collective outcomes (i.e., the survival and success of groups and organizations; Campbell, 1982; Gamson, 1968; Olson, 1965; Schelling, 1971). We hope that this paper will advance theoretical understanding of hierarchies' consequences, stimulate empirical research on the effects of hierarchical differentiation in organizations, and provide practitioners with tools for optimizing the role of hierarchy in organizations.

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Notes

1. As this paragraph illustrates, we acknowledge the various forms of hierarchy that exist in social and organizational groups. To simplify matters, the first section addresses hierarchy as a unitary construct, ignoring the important differences, for instance, between prestige-based and dominance-based hierarchies (Cheng et al., in press; Henrich & Gil-White, 2001; Raven, 2008). We explicitly address the implications of different types of hierarchy when we discuss possible moderators of the effects of hierarchy on group functioning and performance.
2. This argument does not imply that hierarchy is morally good or that it is equally beneficial to all the members of a group. Instead, it suggests that this particular form of social organization may have been selected in a long process of cultural evolution because hierarchical groups outperformed more egalitarian groups in meeting collective goals (e.g., group survival), particularly when groups were in direct competition for resources (e.g., during war). We also acknowledge the possibility that hierarchy may have persisted because leaders and other power holders molded and enforced social arrangements that, in addition to serving group interests, benefit them personally.

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