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To cite this article:

Gavin J. Kilduff, Robb Willer, Cameron Anderson (2016) Hierarchy and Its Discontents: Status Disagreement Leads to Withdrawal of Contribution and Lower Group Performance. *Organization Science*

Published online in Articles in Advance 18 Mar 2016

. <http://dx.doi.org/10.1287/orsc.2016.1058>

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# Hierarchy and Its Discontents: Status Disagreement Leads to Withdrawal of Contribution and Lower Group Performance

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Research on status and group productivity has highlighted that status hierarchies tend to emerge quickly and encourage contributions to group efforts by rewarding contributors with enhanced status. This and other status research has tended to assume that status hierarchies are agreed-upon among group members. Here, we build on recent work on status conflict in investigating the prevalence and consequences of situations in which group members hold differing perceptions of the status ordering—that is, of who ranks where—which we call status disagreement. Across two studies of interacting groups, we examined several different types of status disagreement and found that disagreements in which two group members both viewed themselves as higher in status than the other, or *upward disagreements*, were uniquely harmful for groups. These types of disagreements led the involved members to reduce their contributions to the group, substantially decreasing group performance. However, other forms of dyadic status disagreements, as well as overall levels of status consensus, did not significantly affect group functioning. Furthermore, we found that individuals higher in personality dominance were those most likely to be involved in these harmful upward disagreements. These findings demonstrate the importance of more thoroughly considering status disagreement as a dimension that can vary in quantity and type across groups. In doing so, they contribute to understanding of status dynamics and group performance and suggest important implications for teams within organizations.

*Keywords:* status; hierarchy; status disagreement; small groups; group performance

*History:* Published online in *Articles in Advance*.

## Introduction

Researchers in management, sociology, and social psychology have long been interested in how groups form status hierarchies and the consequences of these hierarchies for both groups and individual members. Although potentially disadvantageous for members of low rank (e.g., Berger et al. 1977, Marmot 2004), research suggests that status hierarchies can have positive effects on group productivity (Blau 1964, Emerson 1962, Magee and Galinsky 2008). Because individuals generally value improved status (Ellis 1994), and group members tend to accord status to those perceived to be the highest contributing members (Hardy and Van Vugt 2006, Willer 2009b), hierarchies can serve to motivate group members to contribute more to group efforts (Huo et al. 2010, Willer 2009a). Indeed, this function of status hierarchies has been argued by some to explain why hierarchies emerge so quickly and appear to be ubiquitous in human groups (Bales et al. 1951, Gould 2003).

Critical to this functional view of status hierarchies is the assumption that they are widely agreed upon. With a few exceptions (Bendersky and Hays 2012, Rosa and

Mazur 1979), researchers to date have generally assumed, implicitly or explicitly, that human status hierarchies are formed cooperatively and consensually, with group members holding a collectively shared perception of who is high versus low in status (e.g., Bales et al. 1951; Berger et al. 1972, 1980; Ridgeway 1984, 1987). However, there are reasons to believe that groups may vary in the extent to which they achieve consensus in their hierarchies. There is inherent ambiguity and uncertainty associated with assessing individuals' competence and status (e.g., Anderson and Kilduff 2009a). Moreover, high status entails a number of psychological, material, and social benefits (Ellis 1994), suggesting that individuals may be reluctant to set aside their self-interest and acquiesce to status hierarchies that limit their standing. Thus, the assumption of consensus status hierarchies, fundamental to the functional model, may be less ubiquitous than typically thought.

In this paper, we explore status disagreement as a key dimension that varies across groups and affects group performance. We explore the frequency and consequences of several different types of status disagreement and argue

that disagreements in which two individuals both believe that they outrank the other are particularly detrimental to group functioning.

## Theory

### Status Hierarchies and the Potential for Status Disagreement

Status is defined as an individual's relative standing in a group based on prestige, honor, and voluntary deference, and a status hierarchy refers to the ordering of individuals along this dimension (Anderson et al. 2001, Berger et al. 1972, Magee and Galinsky 2008). We define status disagreement as the extent to which individual members of a group hold disparate perceptions of who ranks where. For example, if Mike, Laura, and Lee make up a group, and Laura and Lee each hold different perceptions of who ranks first, second, and third within the group, then there would exist status disagreement. Status disagreements are discrepancies in individuals' privately held perceptions of the status ordering, not necessarily public disputes over divergent status claims. Thus, the term "disagreement" is meant only to indicate a divergence in perceptions, not an overt dispute or conflict.

Status hierarchies can be a source of discrimination and disadvantage for those of lower rank (e.g., Berger et al. 1977); however, they can also serve an important role in motivating individuals' contributions to group efforts (Halevy et al. 2011, 2012; Magee and Galinsky 2008; Willer 2009b). Research from sociology (Willer 2009b, Simpson and Willer 2008), economics (Andreoni and Petrie 2004), biology (Milinski et al. 2002, Zahavi and Zahavi 1997), psychology (Hardy and Van Vugt 2006, Barclay 2004, Flynn et al. 2006), and anthropology (Chagnon 1988, Lemonnier 1996, Smith and Bird 2000, Price 2003) has linked individuals' group-oriented behavior to improved reputation. For example, research on status and collective action finds that individuals who make contributions to group efforts earn social and material benefits for their prosocial acts, including improved status (Hardy and Van Vugt 2006, Willer 2009b). Thus, hierarchies are thought to motivate group members to contribute to their groups, because doing so results in increased status. These processes highlight the functional side of status hierarchies, although it is worth noting several recent papers that highlight the potential downsides of hierarchy and the challenges inherent to realizing its benefits (Anderson and Brown 2010, Anderson and Willer 2014, Bunderson and Reagens 2011). For example, hierarchical differences in groups can interfere with knowledge sharing, experimentation, and anchoring on shared goals, thus hampering group learning (Bunderson and Reagens 2011).

Fundamental to most research on status is the assumption that groups develop agreed-upon status hierarchies (e.g., Berger et al. 1977). Group members are thought to

evaluate one another in terms of their current, or expected future, contributions to the group, and higher status is collectively allocated to those expected to make more valuable contributions. Early research on status in groups assessed status via patterns of communication and found relatively stable inequalities between members in the initiation and reception of conversation "acts," suggesting generally high levels of status consensus (Bales et al. 1951). However, when explicitly measured from individuals' private perceptions of the group hierarchy, status consensus versus disagreement was found to vary across groups and was discussed as a potentially important determinant of group functioning (Heinicke and Bales 1953). Since that early work, however, theories of status organization have generally depicted hierarchies as consensual, with little discussion of status disagreement as an important construct that might vary across groups (Berger et al. 1972; Ridgeway 1984, 1987).

Although empirical studies generally find significant agreement in status perceptions (e.g., Anderson and Kilduff 2009b; Berger et al. 1972, 1980), there is rarely perfect consensus (e.g., Heinicke and Bales 1953, Zaccaro et al. 1991), and even in a group with a high level of status consensus, there could still exist isolated disagreements between one or two pairs of individuals. Therefore, status disagreements may in fact be fairly commonplace.

Indeed, there are several reasons for why status disagreements might arise in groups. Assessing group members' relative levels of competence, value, and expected contributions is an imprecise and inherently subjective process (Anderson and Kilduff 2009a, Anderson and Willer 2014). Status characteristics, which function as cues to competence and value, can vary in the extent to which they (1) are observable and (2) generate uniform perceptions of competence and value across perceivers, both of which create the potential for disparate evaluations of an individual's status by different group members. Certain diffuse status characteristics, such as age, gender, or functional background, are easily observable, but group members may hold different perceptions of the value signaled by these different categories. More specific status characteristics such as ability on the group task may generate more uniform expectations of value across group members, but may be less observable and thus harder to accurately perceive (Bunderson and Barton 2011). For instance, factors such as assertiveness and overconfidence can falsely inflate others' assessments of ability (Anderson et al. 2012, Anderson and Kilduff 2009b). Such invalid signals of competence are prone to subjective interpretation, and astute perceivers may see through them where others do not, undermining status consensus. Over time, group members may come to more accurately perceive their teammates' relative levels of skill and task expertise (Bunderson 2003), but even then, there could still be disagreement over which skills are most important at a given point in time and

over what constitutes group success—for example, within cross-functional teams working on complex tasks such as revising a firm’s strategy or addressing organizational inefficiency (Owens and Sutton 2002).

Status disagreement could also result from individuals’ reluctance to accede to the group’s status hierarchy. High status in groups is associated with a host of benefits for individuals, including greater influence, access to scarce resources, social support, and physical health (Bales et al. 1951, Barkow 1975, Ellis 1994, Leary et al. 2001, Ridgeway and Walker 1995). Given these many benefits to high status, certain individuals may be particularly motivated to achieve it (e.g., Jackson 1984). In turn, in line with the broad literature on motivated perception (e.g., Kunda 1990, Taylor and Brown 1988), these individuals are apt to perceive themselves as higher in status than others, leading to disagreements between group members regarding who is higher versus lower in status. Specifically, individuals might hold inflated perceptions of the value of their own characteristics and credentials as a product of self-serving biases. They may also be more attentive to their own contributions to the group than they are to others’ (Epley et al. 2006) and view their contributions as more valuable.

For these reasons, we believe that status disagreement, or differences in group members’ individual perceptions of the status ordering, will be relatively common in groups. Status disagreement may be less common in groups with obvious differences in formal rank or socioeconomic status and long-tenured groups working on specific and objective tasks (e.g., math), but these only represent a subset of groups, and might still suffer from having multiple members who are high in status striving. In support of the idea that status hierarchy formation may not be as cooperative as it is generally depicted, a few theorists have proposed that individuals do indeed compete for status and that status differences in dyads can be partly driven by the outcomes of dominance contests, such as “staredowns” (e.g., Cheng et al. 2013, Henrich and Gil-White 2001, Rosa and Mazur 1979)—although truly aggressive and confrontational behavior is apt to be met with resistance within groups (Ridgeway 1987) and thus not may not be an effective pathway to status attainment.<sup>1</sup> There is also recent research on the group performance consequences of overt status or dominance contests (Bendersky and Hays 2012) that provides a key building block for our work, which we discuss in more detail below.

### Types of Status Disagreement and Their Effects on Contribution and Group Performance

There are various potential types of disagreements over the status ordering that could occur in groups, which may have differing consequences for group members’ behavior and the group’s performance. Thus, we develop a typology of specific types of status disagreement to

provide a fine-grained and systematic analysis. Broadly speaking, there are three ways in which pairs of group members might disagree over hierarchical rankings within the group. We focus on pairs of group members because this allows us to cleanly distinguish between these three types of disagreement. A group’s level of each form of disagreement, then, can be measured as the proportion of dyads within the group that are engaged in that type of disagreement.

(1) *Upward disagreement* occurs when two group members both believe that they rank above the other in a group’s status hierarchy.

(2) *Downward disagreement* occurs when two group members both believe that they rank below the other in a group’s hierarchy.

(3) *Third-party disagreement* occurs when two group members disagree about the relative position of one of the other group members (who is uninvolved in the disagreement).

The small body of research that has examined topics relating to status conflict (Bendersky and Hays 2012, Porath et al. 2008) has focused more on overt conflict as opposed to differences in private perceptions, and has also not considered these different forms of status disagreement or their relative consequences, either grouping them together or implicitly focusing on only one type. However, these different forms of disagreement may vary both in their frequency and their effects on group functioning; thus, we analyze them separately.

With regard to frequency, consistent with the idea that individuals may be reluctant to accept low-status positions, we anticipate that upward disagreements will be more common than downward disagreements. This again builds from a large body of research on the benefits of higher status (Bales et al. 1951, Barkow 1975, Ellis 1994, Leary et al. 2001, Ridgeway and Walker 1995). With regard to group performance, we predict that upward disagreement will uniquely threaten group success, by causing those individuals who are involved to reduce their contributions to the group. As mentioned above, a primary function of status hierarchies is to motivate contributions to the group by offering status as a reward (Hardy and Van Vugt 2006, Willer 2009b). Group members who contribute to the group and see their contributions rewarded with increased status and deference from their peers tend to respond with even greater contributions to the group (Willer 2009b). However, upward disagreements involve group members directly denying one another the status and prestige each expects and believes to hold within the group. Denials of prestige could include behaviors such as neglecting to ask a teammate for his or her opinion, ignoring or failing to support his or her ideas and arguments, failing to recognize his or her contributions, or giving him or her unsolicited directions or unwanted advice. Group members who do not receive the status and prestige that they expect from others are apt to

reduce their contributions to the group, thus harming group performance. Indeed, research from the justice literature finds that the experience of disrespect often leads to “retaliation by withdrawal” (Miller 2001, p. 543). Thus, when individuals feel disrespected, they respond with a reduced willingness to comply with requests and, importantly, reduced commitment to group goals. For example, feelings of injustice at work are associated with increased absenteeism (Miller 2001), and feelings of disrespect can negatively affect task performance (Lind et al. 1990). Withdrawal responses to disrespect can also occur involuntarily, by affecting factors like self-esteem and self-efficacy (Miller 2001).

Although the justice literature has historically examined feelings of disrespect as a consequence of authorities making decisions in a procedurally unjust fashion, it seems likely that members of groups may respond in similar fashion when they receive less respect from their peers than they feel they deserve. Indeed, updated conceptions of procedural justice encompass “team interaction among equals” (Tyler and Blader 2003, p. 350), and the group engagement model of procedural justice proposes that feelings of respect from one’s teammates is a key factor affecting psychological engagement and discretionary cooperative behavior within one’s group (Tyler and Blader 2003). Such discretionary cooperative behavior—that is, contributions that stem from group members’ internal motivations rather than incentives and sanctions—is in turn a key predictor of group success (Tyler and Blader 2000). Thus, we predict that groups experiencing high numbers of upward status disagreements among their members will suffer from reduced performance, as a result of reduced contributions by the individuals engaged in upward disagreements.

By contrast, downward disagreements should present little threat to group productivity, as the experience of being treated as higher in status than one expects will not generate feelings of disrespect and is thus unlikely to reduce one’s motivation to contribute. Last, third-party disagreements could potentially affect feelings of respect in a more indirect manner, or serve to undermine coordination for groups. However, we do not expect their effects on contributions to be as negative as upward disagreements, which involve two group members directly treating one another with less deference and respect than each expects; thus, we examine third-party disagreements in an exploratory manner.

**HYPOTHESIS 1.** *Groups with higher frequencies of upward status disagreements will perform worse on group tasks.*

**HYPOTHESIS 2.** *Individuals involved in upward status disagreements will contribute less to the group.*

**HYPOTHESIS 3.** *The negative association between upward status disagreements and group performance will be mediated by group members’ contributions.*

The counter hypothesis would be that upward status disagreement promotes greater contribution to the group. Perhaps people could react to not receiving the status they expect by further increasing their contributions in an attempt to change their teammates’ perceptions or prove them wrong. Indeed, Sleebos et al. (2006a, 2006b) argued and found that perceptions of a lack of respect from one’s future teammates for an upcoming task can actually motivate people to contribute more to the group, due to increased anxiety over acceptance into the group. These findings are surprising in light of the large body of research on the importance of respect to group engagement (for a review, see Anderson et al. 2015; also see Tyler and Blader 2003, Willer 2009b). We think these disparate findings may be due to the fact that Sleebos et al. (2006a, 2006b) examined situations in which group members had not yet interacted with their teammates or made contributions to the group. Participants were told that, based on their individual profiles, their future teammates saw them as below-average performers. In turn, this seemed to motivate them to “correct” or improve their teammates’ expectations of them by contributing more to the group when given the opportunity.

However, the experience of entering a group amid doubts about one’s value is likely different from experiencing less respect and deference than one believes one deserves based upon contributions already made over the course of group interaction. Initially low expectations may be motivating to individuals who assume that making high-quality contributions offers them a route to correct those expectations; receiving less respect than expected for contributions that are ongoing or already made is likely to have a very different effect on progroup motivation, because it offers evidence that one’s contributions are not being appreciated. A fundamental tenet of the justice literature is that people respond negatively to receiving less of an outcome that they feel they deserve, especially when the outcome is highly valued (such as with status; Miller 2001), and, again, respect is critical to group engagement (Tyler and Blader 2003). Thus, although we acknowledge that low initial expectations from others prior to group interaction may motivate increased effort, we predict that, in general, upward status disagreements experienced during group interaction will carry negative consequences for individuals’ contributions, and thus group performance.

### Related Constructs

It is important to consider how status disagreement relates to other potentially overlapping constructs. Various studies have examined the legitimacy of status hierarchies as part of a broader literature on legitimacy in general (for a review, see Johnson et al. 2006). Much of this work has focused on how legitimation processes can entrench the status expectations associated with members of different demographic categories or other social roles (Johnson et al. 2006, Ridgeway 2001); a smaller body of work has looked

at legitimacy of status hierarchies as something that can potentially vary among members of small groups (e.g., Ridgeway and Berger 1986). Legitimacy has traditionally been conceptualized along two distinct, but related, dimensions: validity and endorsement. Validity refers to the extent to which “the elements of a social order are seen as consonant with norms, values, and beliefs that individuals presume are widely shared” (Johnson et al. 2006, p. 55); in the case of status hierarchies in groups, this refers to the extent to which group members’ status corresponds to the value placed on their respective individual characteristics and abilities by the larger society. Endorsement refers to the apparent support of peers; in the case of status hierarchies, the extent to which they appear to be supported by other members of the group (Johnson et al. 2006, Walker et al. 1986).

Legitimacy and status disagreement may be correlated, but are conceptually distinct. With respect to validity, members of a group might hold differing perceptions of the group’s status ordering, due to the subjective nature of evaluating value as discussed above, yet each might still see his or her subjectively perceived hierarchy as consistent with his or her perception of broader social norms, which are also subjective. Indeed, it is possible that motivated reasoning could cause individuals’ legitimacy perceptions to shift, if, for example, an individual perceives herself to outrank another and then justifies that by reasoning that the social value assigned to her characteristics is greater than the social value of the other’s characteristics. Thus, upward status disagreement could exist between members even as each is convinced that his or her perceived hierarchy is legitimate.

Endorsement more closely overlaps with our conceptualization of status disagreement, but there are still some important distinctions. First, we focus on agreement or disagreement between pairs of group members, whereas endorsement captures the extent to which each individual perceives status consensus among all other group members. This is an important conceptual distinction and also opens the door for status disagreement to exist in tandem with relatively high perceived endorsement—if, for example, two group members disagree over their relative status but each believe that the rest of the group endorses their own perceived hierarchy. Second, we delineate three different types of dyadic status disagreement and investigate their consequences independently from one another, whereas endorsement implicitly groups them together. Third, whereas endorsement refers to the apparent level of status consensus in the group, status disagreement assesses actual levels of agreement versus disagreement. Indeed, legitimacy researchers have been careful to point out that endorsement is about “apparent, though not necessarily actual, consensus among actors” (Johnson et al. 2006, p. 57) and that legitimacy more generally can form “regardless of whether any particular individual privately agrees with this correspondence” (Johnson et al.

2006, p. 62). Thus, we see our conceptualization of status disagreement as related yet distinct from prior treatments of hierarchy legitimacy.

There has also been some isolated work on hierarchical stability, the extent to which a hierarchy changes from one time point to another or is *perceived* to be changeable (e.g., Jordan et al. 2011). Again, this is conceptually distinct from status disagreement. One could imagine a group in which the status hierarchy is changing or malleable, but for which individuals’ perceptions of the hierarchy are in agreement at any given point in time, changing together as the hierarchy changes. Conversely, there could be groups in which individual members hold differing perceptions of the hierarchy while each remaining convinced that this hierarchy is unlikely to change. It is possible that status disagreement and hierarchy instability are related; differences in status perceptions between group members might spur changes in the status hierarchy over time, for example, if someone who feels undervalued begins to contribute less and consequently drops in status rank. However, whether individual group members disagree over their relative status (as in the case of upward or downward status disagreement) or the relative status of other pairs of group members (as with third-party disagreement) and whether the status hierarchy changes over time are distinct variables. Furthermore, hierarchical stability is a group-level construct and does not allow for differentiation between the different types of disagreement that may arise over status rankings.

### Existing Support for the Negative Effects of Upward Status Disagreement

Some recent research provides indirect support for the theorized downsides of upward status disagreement. Research on dominance complementarity finds that people are more comfortable and satisfied with interaction partners who complement, rather than mimic, their levels of dominance behavior (Tiedens and Fragale 2003, Tiedens et al. 2007). This is consistent with the idea that achieving agreement around who ranks relatively higher or lower in status should facilitate motivation and contribution. However, this work has not examined status perceptions, making it unclear whether dominance complementarity rests on such agreement in status perceptions, and has not examined performance outside of measures related to rapport and relationship satisfaction. Furthermore, it has only examined dyads and suggests a similar prediction for both upward and downward disagreements, as both would entail a lack of dominance complementarity. We believe, however, that upward disagreement will be particularly pernicious because it involves disrespect.

In addition, as mentioned above, a recent study found that groups of students who reported engaging in behaviors related to conflict over status—such as forming intragroup coalitions, trying to assert dominance, and disagreeing

about the relative value of members' contributions—performed worse than groups that had less status conflict (Bendersky and Hays 2012). This is clearly consistent with our ideas; however, this work relied on measures of overt conflict, leaving open the question of how differences in underlying status perceptions will affect group functioning. Furthermore, these researchers did not differentiate overall disagreement from the three types of status disagreement we examine.

Last, a recent study found that teams of stock analysts made up of a high proportion of externally high-status individuals suffered from decreased performance (Groysberg et al. 2011). This is consistent with our claims regarding the consequences of upward status disagreement, as teams of stars are likely to all claim high status; however, no measures of status disagreement or contributions were collected.

Overall, we believe we make several contributions to the literatures on status and group dynamics. First, we directly test the assumption of status consensus by measuring rates of agreement versus disagreement in group members' private perceptions of their own and their teammates' status in the group and examine the consequences of disagreement for group performance. Past work has examined overt conflict behavior (Bendersky and Hays 2012); however, whether groups typically experience agreement across members' private perceptions of the hierarchy and whether this affects performance remain open questions. Second, we present a new typology of three different types of status disagreement and independently examine the frequency and consequences of each, as well as aggregate disagreement. Third, we explore how upward disagreement can harm group performance by examining contributions to the group as a key mediating mechanism, thus testing the functionalist arguments discussed above. Given the importance of team performance to organizations, we believe that this work also carries important implications for management practices, which we outline in the general discussion.

## Empirical Overview

We tested our theoretical claims across two studies of interacting face-to-face groups. Study 1 involved short-term groups working together in a controlled laboratory setting. Study 2 was a field study of student groups working together across 10 weeks on a class project. In both studies, we measured upward status disagreement as well as the other types of dyadic status disagreement and overall status disagreement. We then examined their respective relationships with group performance, thus testing Hypothesis 1. In Study 2, to more fully test our theoretical model, we employed a longitudinal design and also measured group members' contributions to the group, providing for tests of Hypotheses 2 and 3. We also explored the role dominant individuals may play in promoting upward status disagreement.

## Study 1

### Participants

Participants were 132 undergraduate students (63.6% female; mean age, 20.4 years; SD, 1.2) at a West Coast university placed into 33 four-person same-sex groups. The percentage of participants who identified as Asian or Asian American was 66.7%, 23.5% were Caucasian, 6.8% were Latino or Hispanic, 2.3% were African American, and 0.8% indicated "other." In assembling these groups in the laboratory, we ensured that members did not know each other, to avoid any effects of preexisting relationships.

### Procedure

Each participant arrived at the lab separately and was led to his or her own individual room. Participants were given instructions for the upcoming group task, which involved generating a proposal for a new Web-based company—specifically, choosing a name and product or service, and then briefly outlining the company's goals, business strategies, and initial marketing approach. Participants were given five minutes to read over this information and were informed that the group with the best proposal would receive a \$400 prize. They were then led to the "group room," where they worked together for 45 minutes and then completed a post-task survey, from which our measure of status disagreement was drawn.

### Measures

*Status Disagreement.* Following the group task, participants were asked to rank all members of the group, including themselves, in terms of their status. To make this as concrete and clear as possible, we asked participants to rank how much each group member "led the group (made decisions, coordinated group activities, and motivated the group)," with one being the highest rank and four being the lowest. Although leadership and status can be viewed as conceptually distinct, they are highly correlated in small, informal task-focused groups such as those studied here (Anderson and Kilduff 2009b, Brion and Anderson 2013, Heinicke and Bales 1953, Berger et al. 1972),<sup>2</sup> and studies of status processes have similarly employed leadership rankings as a measure of status (e.g., Brion and Anderson 2013, Heinicke and Bales 1953, Kilduff and Galinsky 2013).

From these round-robin rankings, we were then able to calculate rates of the three types of status disagreement for each group. Pairs of group members who thought that they outranked each other were coded as being in *upward disagreements*. For example, an upward disagreement existed if member A believed that she ranked higher than member B, whereas member B believed that she ranked higher than member A. Conversely, pairs of group members who thought they each ranked below the other were coded as being in *downward disagreements*.

Finally, a pair of group members was coded as being in a *third-party disagreement* if they disagreed over the relative status of the other two group members—for example, if member A thought that member C outranked member D, but member B thought that D outranked C. To measure the amount of upward, downward, and third-party disagreement within groups, we summed up the total number of each type of disagreement within each group and divided by the number of possible disagreements (six per group for each form of disagreement), thus, capturing the proportions of dyads that were in upward, downward, and third-party disagreements.

In addition, we assessed overall status consensus with two measures. First, we used a commonly used measure of intrarater agreement,  $r_{wg}$ , which is a weighted measure of average variance across raters (James et al. 1984, Van Kleef et al. 2010). Second, we used the social relations model (SRM; Kenny and La Voie 1984) to output *target variance* estimates for rankings for each group (*partner by partner covariance* in the language of SRM’s software package SOREMO; Kenny 1995). Larger target variance values indicate greater consensus in how members of the group perceive each other (Kenny 1994, Kenny et al. 1994).

**Group Performance.** Two independent judges, blind to our hypotheses and research questions, individually evaluated all group proposals. Specifically, they scored groups’ work in terms of “quality” and “thoroughness,” each from 0 to 15 points, for a total score out of 30 points. The judges’ grades were highly intercorrelated,  $\alpha = 0.91$ , and thus were averaged to form an aggregate score (mean, 24.9; SD, 4.2). It is worth noting that our measures of status disagreement and group performance were collected from different sources (status disagreement was identified from participants’ private perceptions of the status hierarchy, whereas performance was based on independent judges’ assessments of groups’ written proposals), thus avoiding any issues with shared method variance.

## Results

**Frequency of Status Disagreement.** We first examined the frequency of status disagreement. With respect to overall consensus, the mean  $r_{wg}$  value across groups was 0.85, indicating fairly high agreement on average ( $r_{wg}$  ranges from 0 to 1). However, scores ranged from 0.31 to 1.00, with a standard deviation of 0.17, indicating substantial variation across groups. With respect to the three specific types of status disagreement, upward disagreements were the most common; 27 of 33 (82%) groups contained at least one upward disagreement, and the mean level of upward disagreement was 0.23 (SD, 0.17), indicating that 23% of all dyads were involved in upward disagreements. Third-party disagreements were the next most common, occurring in 23 groups (70%); the mean was 0.17 (SD, 0.14), indicating that 17% of dyads disagreed over the relative standing of the other two group members. Downward disagreements, by contrast, were quite rare, occurring in only five groups (15%) and 3% of dyads (SD, 0.08). Thus, consistent with our prediction, disagreements over higher rank were more common than third-party disagreements and much more common than disagreements over lower rank. The three types of status disagreement were not significantly correlated with one another ( $r(31) = -0.09, p = 0.61$  for upward and downward disagreement;  $r(31) = 0.18, p = 0.33$  for upward and third-party disagreement;  $r(31) = 0.23, p = 0.19$  for downward and third-party disagreement).

**Status Disagreement and Group Performance.** To explore whether status disagreement was associated with diminished group performance, we independently regressed group performance on each of our measures of status disagreement (see Table 1). As seen in Models 1 and 2, overall status consensus was not significantly related to group performance ( $\beta = 0.27, t(31) = 1.56, p = 0.13$ ; and  $\beta = 0.18, t(31) = 1.00, p = 0.33$ , respectively). However, when we examined the more specific types of status disagreement, we found that the rate of upward

**Table 1 Standardized Coefficients from OLS Models Analyzing the Effects of Status Disagreement on Group Performance in Study 1**

| Independent variable           | Model 1<br>(Overall<br>consensus) | Model 2<br>(Overall<br>consensus) | Model 3<br>(Upward<br>disagreement) | Model 4<br>(Downward<br>disagreement) | Model 5<br>(Third-party<br>disagreement) | Model 6<br>(Three<br>types) | Model 7<br>(Three<br>types) |
|--------------------------------|-----------------------------------|-----------------------------------|-------------------------------------|---------------------------------------|--|-----------------------------|-----------------------------|
| Overall Consensus ( $r_{wg}$ ) | 0.270                             |                                   |                                     |                                       |  |                             |                             |
| Overall Consensus (SRM)        |                                   | 0.177                             |                                     |                                       |  |                             |                             |
| Upward Disagreement            |                                   |                                   | -0.345*                             |                                       |  | -0.401*                     | -0.406*                     |
| Downward Disagreement          |                                   |                                   |                                     | -0.223                                |  | -0.298                      | -0.319                      |
| Third-party Disagreement       |                                   |                                   |                                     |                                       | 0.021                                    | 0.161                       | 0.190                       |
| Female                         |                                   |                                   |                                     |                                       |  |                             | 0.139                       |
| Ethnic Diversity               |                                   |                                   |                                     |                                       |  |                             | 0.092                       |
| R <sup>2</sup>                 | 0.073                             | 0.031                             | 0.119                               | 0.050                                 | 0.000                                    | 0.208                       | 0.224                       |
| F                              | 2.45                              | 1.00                              | 4.29*                               | 1.63                                  | 0.013                                    | 2.54                        | 1.56                        |
| N                              | 33                                | 33                                | 33                                  | 33                                    | 33                                       | 33                          | 33                          |

\* $p < 0.05$ .

disagreements within groups was negatively related to group performance (Model 3,  $\beta = -0.34$ ,  $t(31) = -2.05$ ,  $p = 0.05$ , all reported tests are two-tailed), consistent with our hypothesis. Thus, groups with a higher frequency of pairs of members in which both members believed they outranked the other tended to perform worse on the group task. The  $R^2$  was equal to 0.12, indicating that 12% of the variance in groups' performance was captured by upward disagreement. Neither downward disagreement ( $\beta = -0.22$ ,  $t(31) = -1.28$ ,  $p = 0.21$ ) nor third-party disagreement ( $\beta = 0.02$ ,  $t(31) = 0.12$ ,  $p = 0.91$ ) was significantly related to group performance (Models 4 and 5). We also ran a model in which we included all three types of status disagreement simultaneously and found that upward disagreement remained significantly and negatively related to group performance ( $\beta = -0.40$ ,  $t(29) = -2.36$ ,  $p = 0.03$ ), but neither downward disagreement nor third-party disagreement was significant (Model 6). Finally, we ran a full model containing all three measures of status disagreement as well as controls for gender and ethnic diversity of groups, which yielded similar results (Model 7).<sup>3</sup> Further exploratory analyses indicated that there were no significant interactions between status disagreement and gender composition of the groups, suggesting that status disagreement operates similarly in male and female groups. We also ran exploratory models that included interactions between the different types of status disagreement, but none of these interactions were significant.<sup>4</sup>

## Study 2

Study 2 aimed to extend the findings of Study 1 in several ways. First, although the laboratory setting provides some advantages, such as being able to assemble groups with no prior history, it was important to test whether similar effects would occur in real task groups working together for a longer period of time. In Study 2 we examined groups of business students as they worked on a class project over the course of 10 weeks. Second, because of the cross-sectional nature of Study 1, it was possible that poor performance drove upward disagreement rather than the other way around. In Study 2, therefore, we employed a longitudinal design, measuring group members' perceptions of the hierarchy early on in the groups' lifetimes and performance at the end. Third, we measured group members' contributions to test our theory for why upward disagreement harms group productivity. Fourth, we measured group conflict. We thought it important to examine the extent to which status disagreement, which we measure based purely on individuals' private perceptions of the hierarchy, relates to overt conflict behavior. Our theoretical story emphasizes reduced commitment and motivation to contribute to the group, but it remains an open question whether discordant perceptions of the group's hierarchy also manifest in overt conflict. Indeed,

increased group conflict could present a second pathway by which upward status disagreement harms group performance.

Finally, in Study 2 we investigated the role that dominant individuals might play in promoting upward disagreements. As discussed in the introduction, a number of factors may cause group members to hold disparate perceptions of the status ordering. Here, however, we explore one particular personality trait that relates strongly to status striving and is thus apt to predict upward status disagreement specifically. Individuals high in trait dominance are particularly driven to attain status over, and cause deference in, others, and more reluctant to accept low-status positions (Brown and Miller 2000, Horowitz et al. 2006, Jackson 1984, Ridgeway 1987). Thus, they would seem especially likely to engage in the kind of motivated perception that leads to heightened status expectations and disagreements over who ranks higher in a group.

## Participants

Participants were undergraduate students enrolled in an organizational behavior class at a West Coast university. For their final project, they worked in groups of four to six students; only groups providing complete status ranking and peer-rated behavior data were included in our analyses. The final sample size was 268 individuals (54.1% male; mean age, 21.4 years; SD, 1.95) across 57 groups (average group size, 4.7). The percentage of participants who identified as Asian or Asian American was 57.6%, 31.7% were Caucasian, 4.6% were Latino or Hispanic, 3.4% were Middle Eastern, 1.5% were African American, and 1.1% indicated "other." A total of 55.2% of participants were majoring in business; the rest came from a wide variety of majors.

## Procedure

Participants were randomly assigned to groups and worked together for 10 weeks on a project involving analysis of a real-world organization. Approximately one week after groups were formed, participants completed a brief online survey (time 1 survey) that included our measures of status disagreement and personality dominance. At that time, groups had already held a "kickoff" meeting in class on the day of group formation and had also been required to hold at least one meeting outside of class, providing for substantial working interaction between group members. Past research suggests that groups form status hierarchies quickly, and that these hierarchies tend to remain stable (Bales et al. 1951, Kalma 1991, Kilduff and Galinsky 2013). Thus, this should have been sufficient time for groups to form hierarchies. Nine weeks later, immediately before handing in the group project, participants completed a second online survey (time 2 survey). On this survey, participants rated the group's performance, each other's contribution behavior, and the amount of conflict in the group.

## Time 1 Measures

*Status Disagreement.* One week after the groups had been formed, participants ranked each member of their group, including themselves, in terms of who would “lead the group (make decisions, coordinate group activities, and motivate the group)” over the course of the semester. Our measures of overall status consensus and upward and downward status disagreement in groups were identical to those used in Study 1. Our measure of third-party disagreement was identical to that used in Study 1 for four-person groups, but had to be expanded to accommodate groups of larger size, in which a given pair of group members could disagree over the relative rank of multiple other pairs of group members (specifically, three pairs of members in five-person groups, and six pairs of members in six-person groups). Thus, for each dyad in these larger groups, instead of coding them as either in third-party disagreement or not, we measured the proportion of third-party disagreement across all other pairs of group members, ranging from 0 to 1.

To examine the links between status disagreement and individual contributions, as well as trait dominance, we also created measures of status disagreement at the individual level, equal to the number of upward, downward, or third-party disagreements that an individual was involved in divided by the maximum number of disagreements that person could have been involved in (e.g., for upward disagreement, the number of other group members).

*Self-Reported Trait Dominance.* We measured trait dominance via the dominance subscale of the Personality Research Form (Jackson 1984), a widely used and well-validated measure of dominance tendencies (Ashour and England 1972, Brown and Miller 2000, Buss and Craik 1980, Knudson and Golding 1974, Slatcher et al. 2011). This scale consists of 16 true-or-false items ( $\alpha = 0.76$ ; mean, 11.5; SD, 3.17), such as, “I try to control others rather than permit them to control me,” “The ability to be a leader is very important to me,” and “I am not very insistent in an argument” (reverse scored).<sup>5</sup>

## Time 2 Measures

*Group Performance.* Participants rated their group’s performance with two items—“Compared to other teams our team was more effective” and “I was satisfied with my team’s performance”—on a scale from 1 (strongly disagree) to 7 (strongly agree). The items were highly correlated ( $r(264) = 0.75$ ,  $p < 0.001$ ) and thus combined into an aggregate measure of perceived performance. There was also substantial agreement among group members concerning group performance—the median  $r_{wg}$  coefficient (James et al. 1984, Van Kleef et al. 2010) was 0.71. Thus, we were justified in creating of an aggregate measure of group performance using the mean of group members’ responses (James 1982, George and James

1993). Finally, a hierarchical linear model-based analysis of variance (ANOVA) indicated that there was significant between-groups variation on this measure ( $ICC(1) = 0.23$ ,  $\chi^2(56) = 134.2$ ,  $p < 0.001$ ), allowing for the meaningful investigation of group-level predictors of performance (Hofmann 1997, Hofmann et al. 2000).

*Peer-Ratings of Contributions.* To assess the extent to which individuals contributed to the group, participants rated their teammates on three items, using a scale from 1 (strongly disagree) to 7 (strongly agree): “Contributed a great deal of work,” “Put forth a lot of effort,” and “Took initiative in completing group assignments” ( $\alpha = 0.96$ ). Based on analysis run with the social relations model, each of these items exhibited significant *relative target variance* (means, 0.41, 0.34, and 0.29, respectively), thus indicating significant consensus among group members as to who contributed more to the group (Kenny 1994, Kenny et al. 1994).

*Group Conflict.* Participants completed a 10-item group conflict scale that was closely adapted from prior work (Jehn and Mannix 2001), using the same 1 (strongly disagree) to 7 (strongly agree) scale. The scale included items related to each of the three categories of group conflict established by prior research (Jehn 1997, Jehn and Mannix 2001), e.g., “There is emotional conflict within the group” (relationship conflict), “There is conflict of ideas in the group” (task conflict), and “There is conflict about task responsibilities within the group” (process conflict). These 10 items were highly intercorrelated,  $\alpha = 0.87$ , and a factor analysis indicated one dominant factor that accounted for 48.2% of the variance. The only other factor with an eigenvalue above 1.0 corresponded to the three reverse-coded items, rather than any of the three dimensions of conflict; thus, we combined these 10 items into an aggregate measure of group conflict. Indeed, it is not uncommon for the dimensions of group conflict to be highly intercorrelated within small groups (De Dreu and Weingart 2003). The median  $r_{wg}$  was equal to 0.84, and there was also significant between-groups variance ( $ICC(1) = 0.31$ ,  $\chi^2(56) = 172.8$ ,  $p < 0.001$ ).

## Results

Given the nested nature of our dependent variables—contributions, performance, and conflict were collected at the individual level, and individuals were nested within groups—we used hierarchical linear modeling (HLM) to conduct our analyses. This allowed us to analyze both group-level as well as individual-level effects (Hofmann 1997). To implement these analyses, we used the software package HLM 6.08 (Raudenbush et al. 2008).

*Frequency of Status Disagreements.* We again began by examining the frequency of status disagreement. With respect to overall consensus, the mean  $r_{wg}$  value across groups was 0.56, indicating moderate agreement on

average. Scores ranged from 0 to 0.97, with a standard deviation of 0.32, indicating substantial variation in consensus across groups. All 57 course groups had at least one upward disagreement, and the mean was 0.40 (SD, 0.19), indicating that 40% of dyads were in upward disagreements. Third-party disagreements were also common, existing in 52 of 57 groups (91%) and in 25% of dyads (SD, 0.17). By contrast, downward disagreements were again much less common, occurring in 19 of 57 groups (33%) and in only 5% of dyads (SD, 0.09). Upward disagreement was negatively correlated with downward disagreement ( $r(56) = -0.38$ ,  $p = 0.003$ ) and uncorrelated with third-party disagreement ( $r(56) = -0.03$ ,  $p = 0.83$ ). Downward and third-party disagreement were not correlated ( $r(56) = 0.07$ ,  $p = 0.61$ ).

*Status Disagreement and Group Performance.* A series of hierarchical linear models were run with group performance as the outcome variable and the different types of status disagreement as level 2 (group-level) predictor variables. These models are called *intercepts-as-outcomes* models and assess the extent to which between-group variance in the outcome variable is related to group-level variables (Hofmann 1997, Hofmann et al. 2000; we illustrate an example below). As shown in Models 1 and 2 of Table 2, group performance was not significantly associated with overall status consensus ( $\beta = 0.11$ ,  $t(55) = 0.84$ ,  $p = 0.40$ ; and  $\beta = 0.00$ ,  $t(55) = 0.03$ ,  $p = 0.98$ , respectively). However, as seen in Model 3, group performance was negatively related to the frequency of upward disagreements ( $\beta = -0.44$ ,  $t(55) = -3.57$ ,  $p < 0.001$ ), consistent with Study 1. Neither downward disagreement (Model 4;  $\beta = 0.20$ ,  $t(55) = 1.50$ ,  $p = 0.14$ ) nor third-party disagreement (Model 5;  $\beta = -0.02$ ,  $t(55) = -0.13$ ,  $p = 0.90$ ) was significantly related to group performance. To assess the magnitude of the effect of upward disagreement on group performance, we compared the between-groups variance from a univariate model with upward disagreement as the only predictor variable to the between-groups

variance from the null model used to obtain ICC values, as described by Hofmann et al. (2000). This produced an estimated  $R^2$  of 0.31, indicating that the amount of upward disagreement within groups at time 1 accounted for a full 31% of the between-groups variance in reported group performance at time 2, nine weeks later. It is worth noting that our measure of upward disagreement was constructed via dyadic comparisons of participants' rankings of the status hierarchy, whereas the items used to measure group performance were collected nine weeks later and based on a simple rating scale; therefore, this finding is not due to common response tendencies.<sup>6</sup> Model 6 included all three types of dyadic status disagreement and found that upward disagreement remained negatively linked to performance. For illustrative purposes, the model in HLM is as follows:

$$\text{Level 1: Group performance} = \beta_0 + r$$

$$\text{Level 2: } \beta_0 = \gamma_{00} + \gamma_{01}(\text{upward disagreement}) + \gamma_{02}(\text{downward disagreement}) + \gamma_{03}(\text{third-party disagreement}) + u_0.$$

As in Study 1, we also ran models that included interaction terms between the types of status disagreement (not shown); none of these interactions approached statistical significance. In addition, we ran a model controlling for diversity in gender, ethnicity, and major, as well as the size of the group. As seen in Model 7 of Table 2, the negative relationship between upward disagreement and performance ( $\beta = -0.43$ ,  $t(49) = -3.22$ ,  $p = 0.002$ ) was robust to the inclusion of these controls. Diversity in major was also significantly negatively related to group performance ( $\beta = -0.27$ ,  $t(49) = -2.24$ ,  $p = 0.03$ ).

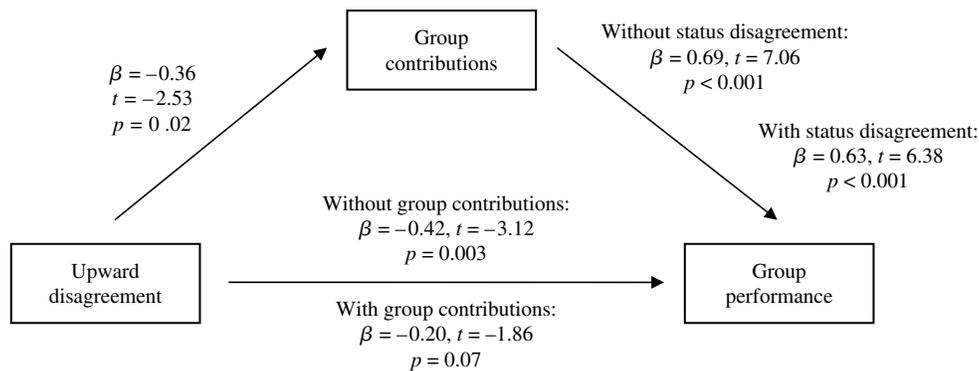
*Status Disagreement and Group Contributions.* Next, we investigated our theoretical mechanism for the negative effects of upward disagreement on group performance: contributions to the group. We first analyzed average peer-rated contributions at the group level. In a hierarchical linear model using group-level measures of the three types of status disagreement as level 2 predictor variables, we found

**Table 2 Standardized Coefficients from Group-Level Hierarchical Linear Models Analyzing the Associations Between Status Disagreement and Group Performance in Study 2**

| Independent variable           | Model 1<br>(Overall<br>consensus) | Model 2<br>(Overall<br>consensus) | Model 3<br>(Upward<br>disagreement) | Model 4<br>(Downward<br>disagreement) | Model 5<br>(Third-party<br>disagreement) | Model 6<br>(Three<br>types) | Model 7<br>(Three types<br>with controls) |
|--------------------------------|-----------------------------------|-----------------------------------|-------------------------------------|---------------------------------------|--|-----------------------------|---|
| Overall Consensus ( $r_{wg}$ ) | 0.113                             |                                   |                                     |                                       |  |                             |   |
| Overall Consensus (SRM)        |                                   | 0.000                             |                                     |                                       |  |                             |   |
| Upward Disagreement            |                                   |                                   | -0.437***                           |                                       |  | -0.424**                    | -0.428**                                  |
| Downward Disagreement          |                                   |                                   |                                     | 0.197                                 |  | 0.035                       | -0.063                                    |
| Third-party Disagreement       |                                   |                                   |                                     |                                       | -0.017                                   | -0.032                      | -0.036                                    |
| Gender Diversity               |                                   |                                   |                                     |                                       |  |                             | -0.098                                    |
| Ethnic Diversity               |                                   |                                   |                                     |                                       |  |                             | -0.119                                    |
| Major Diversity                |                                   |                                   |                                     |                                       |  |                             | -0.273*                                   |
| Group Size                     |                                   |                                   |                                     |                                       |  |                             | 0.163                                     |
| $R^2$                          | 0.000                             | 0.000                             | 0.310                               | 0.041                                 | 0.000                                    | 0.259                       | 0.367                                     |
| N                              | 57                                | 57                                | 57                                  | 57                                    | 57                                       | 57                          | 57  |

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

**Figure 1** Mediation of the Negative Relationship Between Upward Disagreement and Group Performance by Group Contributions in Study 2



Note. Downward disagreement and third-party disagreement have been omitted from the figure for stylistic purposes.

a negative relationship between upward disagreement and average contributions ( $\beta = -0.36$ ,  $t(53) = -2.53$ ,  $p = 0.01$ ), whereas downward ( $\beta = -0.13$ ,  $t(53) = -0.90$ ,  $p = 0.37$ ) and third-party disagreements ( $\beta = 0.08$ ,  $t(53) = 0.57$ ,  $p = 0.57$ ) were not significantly related to contributions. Thus, the more upward disagreements within a group, the fewer contributions its members made.

We then examined whether group contributions mediated the relationship between upward disagreement and group performance. As described above, upward disagreement within groups was negatively related to group performance and average group contributions; we also found that average group contributions was significantly related to group performance ( $\beta = 0.69$ ,  $t(55) = 7.06$ ,  $p < 0.001$ ). We then ran a hierarchical linear model of group performance with the three types of status disagreement and contributions entered simultaneously (Kenny et al. 1998). In this model, contributions to the group significantly predicted performance ( $\beta = 0.63$ ,  $t(52) = 6.38$ ,  $p < 0.001$ ), whereas the effect of upward disagreement was marginally significant ( $\beta = 0.20$ ,  $t(52) = -1.86$ ,  $p = 0.07$ ). A Sobel test of the indirect effect of upward disagreement on performance via contributions to the group was significant ( $z = 2.35$ ,  $p = 0.02$ ); this was confirmed by a bootstrapping-based mediation test with

ordinary least squares (OLS) regression analyses in place of HLM (Preacher and Hayes 2004; 95% confidence interval,  $[-1.73, -0.091]$ ). Thus, contributions to the group significantly mediated the negative relationship between upward disagreement and perceived group performance (see Figure 1).<sup>7</sup>

We also examined group contributions at the individual level, testing whether individual involvement in upward disagreement was associated with reduced contributions. We ran a set of random coefficient regression models in HLM (Hofmann 1997, Hofmann et al. 2000) with individual contributions as the outcome variable and individual-level measures of status disagreement as level 1 (individual-level) predictors, displayed in Table 3.<sup>8</sup> As seen in Model 1, individuals' involvement in upward disagreements was significantly and negatively related to their peer-rated contributions to the group ( $\beta = -0.22$ ,  $t(210) = -3.52$ ,  $p = 0.001$ ). Therefore, individuals who were engaged in more upward disagreements were rated as contributing less to the group's activities relative to their teammates. As seen in Models 2 and 3, neither individual-level downward disagreement nor individual-level third-party disagreement predicted contributions.<sup>9</sup> Model 4 included all three types of dyadic disagreement simultaneously and again found that only upward

**Table 3** Standardized Coefficients from Hierarchical Linear Models Analyzing the Effects of Three Types of Status Disagreement on Individual Contributions in Study 2

| Independent variable     | Model 1<br>(Upward disagreement) | Model 2<br>(Downward disagreement) | Model 3<br>(Third-party disagreement) | Model 4<br>(Three types) | Model 5<br>(Three types) |
|--------------------------|----------------------------------|------------------------------------|---------------------------------------|--------------------------|--------------------------|
| Upward Disagreement      | -0.217***                        |                                    |                                       | -0.218***                | -0.204**                 |
| Downward Disagreement    |                                  | 0.057                              |                                       | -0.014                   | -0.007                   |
| Third-party Disagreement |                                  |                                    | 0.079                                 | 0.073                    | 0.077                    |
| Female                   |                                  |                                    |                                       |                          | 0.122*                   |
| R <sup>2</sup>           | 0.026                            | 0.001                              | 0.003                                 | 0.025                    | 0.028                    |
| N                        | 268                              | 268                                | 268                                   | 268                      | 268                      |

Note. R<sup>2</sup> estimates were obtained using the method recommended by Hofmann et al. (2000).

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

disagreement predicted contribution level. For illustrative purposes, the model in HLM is as follows:

Level 1: Peer-rated contributions =  $\beta_0 + \beta_1(\text{upward disagreement}) + \beta_2(\text{downward disagreement}) + \beta_3(\text{third-party disagreement}) + r$

Level 2:  $\beta_0 = \gamma_{00} + u_0$

$\beta_0 = \gamma_{10} + u_1$

$\beta_0 = \gamma_{20} + u_2$

$\beta_0 = \gamma_{30} + u_3$ .

*Status Disagreement and Group Conflict.* We next examined the relationship between status disagreement and group conflict. Measured via  $r_{wg}$ , overall consensus was marginally negatively related to group conflict ( $\beta = -0.22$ ,  $t(55) = -1.70$ ,  $p = 0.09$ ). However, the target variance measure of consensus generated by SRM was not related to group conflict ( $\beta = -0.10$ ,  $t(55) = -0.83$ ,  $p = 0.41$ ). Upward disagreement ( $\beta = 0.21$ ,  $t(55) = 1.56$ ,  $p = 0.12$ ), downward disagreement ( $\beta = 0.11$ ,  $t(55) = 0.86$ ,  $p = 0.39$ ), and third-party disagreement ( $\beta = 0.04$ ,  $t(55) = 0.34$ ,  $p = 0.73$ ) were not significantly related to group conflict. Furthermore, upward disagreement continued to negatively predict group performance ( $\beta = -0.33$ ,  $t(54) = -3.22$ ,  $p = 0.002$ ) when controlling for group conflict, which also negatively predicted performance ( $\beta = -0.54$ ,  $t(54) = -5.30$ ,  $p < 0.001$ ). Therefore, the effects of upward status disagreements on group performance were not due to increased conflict. It is worth noting that although we did not measure status conflict, Bendersky and Hays (2012) found it to be correlated at  $r = 0.71$  with an aggregate measure of relationship, task, and process conflict, such as was used here. These results suggest that groups whose members engaged in more upward disagreements did not perform worse because they engaged in more conflict, but instead because their members contributed less to the group task.

*Do Upward Disagreements Affect Members Not Directly Involved?* Above, we reported that individuals' level of involvement in upward disagreement negatively predicted their peer-rated contribution to the group. However, it is also possible that group members in general might find upward disagreements distracting or demotivating, such that upward disagreements might reduce the contributions of all group members, not just those directly involved. To test this idea, we conducted a *contextual* analysis of individual contributions, following the procedure recommended by Kenny et al. (2002) for small groups data. Specifically, we ran a hierarchical linear model of individuals' contributions using two level 1 predictor variables: the focal individual's level of involvement in upward disagreement and the amount of upward disagreement in the group that did not involve the focal individual (that is, upward disagreements between other group members). Individuals' involvement in upward disagreements again negatively predicted their contributions ( $\beta = -0.22$ ,  $t(209) = -3.53$ ,  $p < 0.001$ ); however, the amount of upward disagreement within the group that did not involve

the focal individual was not a significant predictor of contributions ( $\beta = -0.02$ ,  $t(209) = -0.36$ ,  $p = 0.72$ ). Thus, it seems that there is something specifically demotivating about being involved in an upward disagreement with another group member that does not extend to those not directly involved.

*Predicting Status Disagreement.* Last, we investigated whether groups with more dominant members had more upward disagreements. The mean level of dominance in groups was significantly and positively predictive of upward disagreement ( $\beta = 0.32$ ,  $t(55) = 2.49$ ,  $p = 0.02$ ); however, there was no significant relationship between average dominance and overall status agreement ( $\beta = 0.03$ ,  $t(55) = 0.21$ ,  $p = 0.83$  for SRM target variance;  $\beta = 0.05$ ,  $t(55) = 0.39$ ,  $p = 0.70$  for  $r_{wg}$ ) or the frequency of downward disagreement ( $\beta = -0.21$ ,  $t(55) = -1.61$ ,  $p = 0.11$ ) or third-party disagreement ( $\beta = 0.02$ ,  $t(55) = 0.14$ ,  $p = 0.89$ ) in groups. Similarly, at the individual level, individuals higher in dominance were engaged in more upward disagreements ( $\beta = 0.14$ ,  $t(251) = 2.19$ ,  $p = 0.03$ ), but did not engage in more downward ( $\beta = -0.04$ ,  $t(251) = -0.67$ ,  $p = 0.50$ ) or third-party disagreements ( $\beta = 0.04$ ,  $t(251) = 0.70$ ,  $p = 0.49$ ).

## General Discussion

Consensus among group members in their hierarchical perceptions has historically been assumed in organizational, sociological, and psychological research on status, thus largely precluding the study of status disagreement, or differences in group members' perceptions of the status ordering. In this paper, we challenged this assumption and conducted an exploration into different types of status disagreement and their consequences for group performance. Across two studies, one that involved groups of strangers working together on a laboratory task and another that involved groups of students working on a semester-long class project, we found that consensus in perceptions of the hierarchy was far from a given. Levels of agreement versus disagreement varied substantially from group to group, with certain types of disagreement being quite common. Furthermore, we observed that status disagreement can have substantial implications for group performance.

In particular, our findings consistently pointed to one type of status disagreement as both widespread and consequential for group productivity. Upward disagreements, situations in which two group members both privately believed they outranked the other, were quite common and were significantly negatively related to group performance. Indeed, despite our measuring status disagreement and performance with different methods, and at different time periods (in Study 2), we observed that upward disagreement predicted substantial portions of the variance in group performance (12% in Study 1 and 31% in Study 2). Study 2 shed light on why this occurred.

Consistent with functionalist accounts of hierarchy, groups experiencing greater numbers of upward disagreements had a harder time motivating contributions from their members, specifically those who were involved in these upward disagreements. Furthermore, we found that more dominant group members were more likely to engage in these upward disagreements.

These findings make a number of contributions to our understanding of status hierarchies and group functioning. First, they build upon recent work (Bendersky and Hays 2012) in suggesting that the process of hierarchy formation is less consensual and cooperative than previously thought. Indeed, according to our data, a unanimously agreed-upon status hierarchy is more the exception than the norm; thus, existing models of status organization may need to be updated. Second, we have proposed a new typology of status disagreement by separately defining and examining overall consensus as well as upward, downward, and third-party disagreement. Third, supporting the importance of this typology, our work identifies upward status disagreement as a uniquely important factor for group performance. We are the first to directly examine the relationships between rates of disagreement in status perceptions and group performance, and our findings suggest that disagreements between pairs of group members over who ranks higher in the hierarchy are detrimental to groups. Furthermore, we found that upward status disagreement was unrelated to levels of group conflict and independently predicted group performance. This suggests that upward disagreement erodes group performance in a subtler manner than overt forms of conflict including status conflict (Bendersky and Hays 2012). Involvement in upward disagreement appears to cause group members to withdraw their contributions to the group's activities, thus hurting performance by a process of disengagement rather than disruption. These findings provide researchers with greater understanding of why some groups succeed where others fail, and relate directly to the ongoing discussion around whether status hierarchies are functional or not (Anderson and Brown 2010, Anderson and Willer 2014). In addition to factors such as the visibility of individual skill and the interdependence of the group task (Anderson and Willer 2014), a low frequency of upward disagreement may be necessary for groups to enjoy the benefits of hierarchy.

Last, by showing that dominant individuals are those most likely to become involved in upward disagreements, we have identified an important antecedent of this undesirable phenomenon. In addition to helping us understand the origins of upward disagreement, this may also help groups and their leaders to avoid, or at least manage, such disagreements. Although dominance may carry benefits for individuals in the form of increased status (Anderson and Kilduff 2009b, Cheng et al. 2013), it may be detrimental to groups, particularly if multiple group members are high along this trait.

### Practical and Organizational Implications

Given the prevalence of task-oriented groups within organizations, our findings carry some important practical implications. Broadly, managers would do well to be cognizant of the detrimental effects of upward status disagreements. Beyond this, it is worth thinking about specific actions that might be taken to reduce the prevalence of upward disagreement and/or its negative consequences. One possible measure could be to explicitly assign roles within groups, so that relative status rankings are clearer to group members, thus reducing the likelihood of disparate perceptions of the hierarchy. Indeed, recent research found that groups with more formalized structure experience increased learning performance (Bunderson and Boumgarden 2010). However, it is possible that individuals assigned to roles of lower status than they feel is deserved would reduce their contributions in a manner similar to what we observed here. A softer alternative might be to encourage group members to outline their relative levels and areas of expertise prior to the group beginning work on its activities. Although work in status characteristics theory (Berger et al. 1972, 1980) tends to assume that such task-related characteristics are revealed during initial group interaction, in reality this may not be the case, and so having an explicit discussion around this might facilitate consensus around the hierarchy. It is possible that having this kind of discussion might also better enable groups to adopt a “heterarchy” that shifts according to task demands (Aime et al. 2014). In turn, this might mitigate the negative effects of upward disagreement, because individuals would be more comfortable knowing that when their expertise is most relevant, they will be given greater influence over group activity. Thus, all group members might feel as though their qualifications and contributions are being given the respect and deference they warrant. Of course, it is also possible that these kinds of discussions around relative expertise could provide an arena for the kind of overt jockeying for rank that prior research has found to be detrimental (Bendersky and Hays 2012), so they would need to be conducted carefully.

Managers might also consider actually measuring status disagreement in much the same way as we have, periodically throughout a group's lifetime. In contrast to overt status conflict, which by the time it is observed may be difficult to resolve, status disagreement may be something that can be diffused. Indeed, perhaps simply pointing out its existence to those involved might be enough to facilitate resolution. Or, managers might keep this information private, but decide to take actions to provide additional status to those involved in upward disagreements—for example, in the form of positive feedback or external recognition. Doing so might not eliminate the status disagreement itself, but it might go a long way in mitigating its negative consequences for motivation and contribution. Finally, given our results

surrounding dominance as a predictor of upward disagreement, managers may want to avoid assembling teams that consist of several dominant individuals. These are but some of the potential interventions or corrective measures related to status disagreement that researchers may wish to examine.

### Limitations

The two studies presented here were designed to complement each other's strengths and weaknesses. The limitations in Study 1—the transient nature of the lab setting as well as its cross-sectional design—were addressed in Study 2 by the observation of real-world student groups over time. The main weakness in Study 2—the perceptual nature of our measure of group performance—was mitigated by the use of an objective performance measure in Study 1. However, there are some broad limitations of our data as a whole. First, the tasks employed in both studies were quite interdependent in nature. Status disagreement might not be as negatively related to performance among groups working on tasks that do not require group members to work together so closely. Consistent with this, collectively oriented task groups are often assumed to be a necessary condition to many theoretical claims about status dynamics (Berger et al. 1977, Ridgeway and Walker 1995), and certain status processes have been found to vary by the degree of task interdependence (Fragale 2006). More broadly, in addition to task interdependence, groups vary along many different dimensions, and thus it would be important to explore the generalizability of our findings in future work. It is worth noting, however, that in contrast to much of the research on status dynamics in groups, particularly within the status characteristics tradition (e.g., Berger et al. 1977), we studied face-to-face groups engaged in live interaction and working on tasks with substantial stakes for performance. Furthermore, we observed a similar pattern of results across short-term laboratory groups as well as longer-term course groups.

Second, the samples we employed were relatively homogeneous—participants were undergraduates of similar age, and the majority were of Asian, Asian American, or white ethnicity. The extent to which our findings generalize to other populations is another open question.

### Future Directions

There are several additional possibilities for future research on status disagreement. First, future research should consider variables that might moderate the relationships we observed. For instance, groups with more collectivistic norms or higher levels of member identification and commitment might be less prone to the pitfalls of upward disagreement, as individual members might be more willing to set aside their personal desires for the good of the group. This could lead to a reduced frequency of upward disagreements or to a reduction in the harmful effects of those that do exist. Indeed, existing research

on hierarchy suggests that a key factor to harnessing the benefits of hierarchy is a collective orientation among team members, especially those high in status (Bunderson and Reagans 2011). Furthermore, as mentioned above, perhaps groups with more flexible, shifting hierarchies will be hurt less by upward disagreements (Aime et al. 2014).

Second, it would be interesting to assess additional consequences of status disagreements—upward, downward, and third party. At the individual level, one could measure feelings of threat, discomfort, satisfaction, and identification with the group. At the dyad level, one could measure levels of dyadic rapport and liking. Such work could also start to more fully examine a second general mechanism whereby status disagreements may harm group performance—coordination deficits. As discussed above, research on dominance complementarity suggests that clear hierarchy in dyads facilitates rapport and positive working expectations (Tiedens et al. 2007); thus, we might expect that status disagreements can also hurt group members' ability to work together independent of motivation losses.

Third, future work should further explore the role that status disagreements play in status organizing processes. For instance, do status disagreements affect the status achieved by individuals? Given that contribution to the group is one of the primary paths to high status (e.g., Ridgeway 1987, Willer 2009b), our findings suggest that individual status might be harmed by involvement in upward disagreements, since they tend to undermine individuals' contributions. Furthermore, how and how frequently are upward disagreements resolved? And, when they are, what determines who ultimately “wins” or achieves the higher rank? Some recent work has examined the behaviors that individuals use to pursue status (for a brief review, see Anderson and Kilduff 2009a), but it would be interesting to see whether certain traits or behaviors are particularly relevant to success in instances of upward disagreement.

Fourth, it would be interesting to investigate the extent to which individuals are generally conscious of status disagreements. Within certain groups, members might be acutely aware of status disagreements, especially upward disagreements, or even anticipate such disagreements prior to group interaction. Within others, however, members may be generally unaware of the status disagreements they are involved in. Research on dominance complementarity has found that people are often unaware of whether or not they complement their interaction partners and do not realize that this affects their level of rapport and satisfaction with the relationship (Tiedens et al. 2007). The fact that we did not find a significant positive relationship between the frequency of status disagreements in groups and group members' reported levels of group conflict is consistent with the possibility that upward disagreements could reduce group engagement and contribution outside of conscious awareness. Future work could thus explore

awareness of status disagreements, whether conscious versus unconscious disagreements might carry different consequences, and, more generally, behavioral manifestations of status disagreements outside of group conflict. Investigating this question of awareness would also link back to research on the legitimacy of status hierarchies, which requires perceived consensus (Johnson et al. 2006).

Finally, it could be worth exploring whether certain types of people might react differently to status disagreement than others. For example, individuals high in neuroticism are thought to be especially averse to social disapproval, so it is possible that they might actually strive to overcome upward status disagreements by increasing, rather than decreasing, contributions (e.g., Bendersky and Shah 2012).

## Conclusion

Motivating contributions to collective efforts is a fundamental challenge faced by groups, and past work suggests that status hierarchies may play a key role in promoting such contributions. In the current research, we observed that status disagreement is a critical factor in this dynamic. Groups vary substantially in the extent to which their members agree in their privately held perceptions of the status ordering, and groups that are able to avoid disagreements over higher rank in particular are apt to succeed at a higher level.

## Acknowledgments

We thank Stephanie Tietbohl and Eric Mao for their research assistance and Sebastien Brion for helping to coordinate data collection in Study 2. This project was funded in part by the Institute for Research on Labor and Employment (IRLE) at the University of California, Berkeley.

## Endnotes

<sup>1</sup>Other work on dominance as a predictor of status in groups examines dominance in terms of more assertive and proactive behavior rather than aggression or intimidation and finds that it leads to increased competence perceptions from others (Anderson and Kilduff 2009b).

<sup>2</sup>Within groups in the laboratory, Anderson and Kilduff (2009b) observed that leadership rank had correlations of 0.90 with influence rank, 0.80 with respect and admiration rank, and 0.79 with influence rating (one-to-seven scale) in one study of 17 groups of four; these correlations were equal to 0.88, 0.73, and 0.75, respectively, in a second study of 25 groups. Within semester-long course groups, Brion and Anderson (2013) observed that leadership rank correlated with status rank at 0.85.

<sup>3</sup>Ethnic diversity was measured using Blau's (1977) heterogeneity index for categorical variables,  $D = 1 - \sum(p_i^2)$ , where  $p_i$  is the proportion of group members in the  $i$ th category (e.g., Sacco and Schmitt 2005, Swann et al. 2003).

<sup>4</sup>We also ran a model in which we used measures of status disagreement that were weighted by the magnitude of disagreement; for example, an upward disagreement in which A ranked himself as 1 and B as 4 and B ranked himself as 2

and A as 4 would be given a weight of 2.5, the average discrepancy between rankings. Results of these alternate analyses were substantively identical to those presented here—weighted upward disagreement was significantly negatively related to group performance, whereas weighted third-party and downward disagreement were not significantly related to performance.

<sup>5</sup>Note that this dominance scale captures both behavioral dominance tendencies as well as the desire to dominate over others. The inclusion of this second aspect differentiates it from the Wiggins et al. (1988) scale, which focuses just on assertive behavioral tendencies (also see Anderson and Kilduff 2009b).

<sup>6</sup>We also sought to rule out a potential alternative explanation for the negative relationship between upward disagreement and performance. It is possible that individuals involved in higher numbers of upward disagreements rated their groups as performing poorly due to the unpleasant nature of upward disagreement rather than accurately reporting group performance. To address this, we investigated whether these individuals perceived group performance differently than teammates involved in lower numbers of upward disagreements. We ran a model of perceived performance on individual-level upward disagreement and found that involvement in upward disagreements was not significantly related to individual perceptions of group performance ( $t(266) = -1.18, p = 0.24$ ), despite substantial statistical power. Thus, group members involved in higher numbers of upward disagreements did not perceive their group's performance significantly differently than members who were involved in fewer upward disagreements, helping to rule out this alternative explanation.

<sup>7</sup>This same pattern of mediation exists if models are run with control variables included and if OLS with bootstrapping mediation is used (the 95% confidence interval for the indirect effect of upward disagreement on group performance via contribution is  $[-1.71, -0.09]$ ; Preacher and Hayes 2004).

<sup>8</sup>Following Hofmann and Gavin (1998), we centered all Level 1 predictors around their grand means. Analyses were also run using group-mean centering with no meaningful differences in results. Degrees of freedom in these analyses are reduced by the number of groups.

<sup>9</sup>As in Study 1, we also ran all models with measures of status disagreement that were weighted by the magnitude of disagreement and achieved substantively identical results.

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