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When and why hierarchy steepness is related to team performance

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This study develops and tests a contingency theory on the functions of status hierarchy steepness in teams. Findings from a field study among 438 employees working in 72 work teams across diverse business settings demonstrate that task complexity moderates the relationships between status hierarchy steepness, different types of team conflict, and team performance. Steeper status hierarchies were negatively related to both process and task conflict, and hence increased team performance in teams working on tasks with lower complexity but did not yield such clear conflict and performance effects in teams working on more complex tasks. By showing that various levels of task complexity determine whether status hierarchy steepness has a conflict-regulating function that drives team performance, this research generates valuable insights about the context dependency of team responses to status hierarchy steepness.

Keywords: status hierarchy steepness; task complexity; intra-team conflict; team performance

It is well documented that status asymmetries (i.e., differences in the amount of prominence, respect, and influence individuals enjoy in the eyes of others; Anderson, John, Keltner, & Kring, 2001, p. 1094) unavoidably emerge within work teams, even when members are of equal status at first sight (Bales, 1950; Berger, Cohen, & Zelditch, 1972; Berger, Ridgeway, Fisek, & Norman, 1998). Team members assess each other's status based on the possession of attributes they consider valuable and share their assessments through displaying status-claiming and status-granting behaviours during face-to-face interactions (Berger, Conner, & Fisek, 1974; Berger, Fisek, Norman, & Zelditch, 1977). Such subjective inferences lead teams to naturally develop an informal status hierarchy based on the rank ordering of individual members along relevant status dimensions (Magee & Galinsky, 2008; Ridgeway & Walker, 1995).

Given that informal status hierarchies represent a core principle underlying social relations between individuals (Fiske, 1992), management scholars acknowledge the importance of examining their consequences for the functioning of work teams (e.g., Magee & Galinsky, 2008; Overbeck, Correll, & Park, 2005; Pearce, 2001; Ravlin & Thomas, 2005). In this scholarly discipline, and in ethology (e.g., De Vries, Stevens, & Vervaecke, 2006; Stevens, Vervaecke, De Vries, & Van Elsacker, 2005) as well as social psychology (e.g., Anderson & Brown, 2010; Halevy, Chou, Galinsky, & Murnighan, 2012), a team's status hierarchy tends to be conceptualized in terms of *hierarchy steepness*, which refers to the overall degree of asymmetry in members' social status within the team (Anderson & Brown, 2010). This conceptualization represents a meaningful and reliable way to consider status differences in teams (cf. Christie & Barling, 2010) because it gets directly at "the size of the absolute differences between adjacently ranked individuals" (De Vries et al., 2006, p. 585) and is indeed commonly associated with important team outcomes (Anderson & Brown, 2010). Hierarchy steepness is similar to what Harrison and Klein (2007) labelled "separation" with regard to vertical rather than horizontal differences within teams.

Status literature currently presents divergent perspectives on the functions of status hierarchy steepness in teams. Some scholars propose that the well-defined patterns of deference that emerge from steeper hierarchies should benefit team performance because they offer an "evolutionary" solution to intra-team conflict and coordination problems among the members (e.g., Halevy, Chou, & Galinsky, 2011; Keltner, Van Kleef, Chen, & Kraus, 2008). They argue that awareness about each other's status position within a team provides role clarity and helps avoid costly fights that can harm the achievement of collective team goals (Magee & Galinsky, 2008; Sirot, 2000; Sneddon, Hawkesworth, Braithwaite, & Yerbury, 2006). Yet, other scholars emphasize that in teams with steeper status hierarchies, members at the top can exert too much

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influence over team decisions (Bales, Strodtbeck, Mills, & Roseborough, 1951; Berger, Rosenholtz, & Zelditch, 1980) and receive more recognition for their task contributions than those lower in the hierarchy (Belliveau, O'Reilly, & Wade, 1996; Van der Vegt, Bunderson, & Oosterhof, 2006). As this disparity can create feelings of unfairness and suppresses the potentially useful voice of low-status members, steeper hierarchies should instigate conflict and, hence, compromise team performance (cf. Anicich, Swaab, & Galinsky, 2015; Greer, 2014; Greer, Schouten, De Jong, & Dannals, 2014).

Empirical research has indeed produced mixed findings, with some studies confirming that status hierarchy steepness can reduce team conflict and, hence, facilitate team performance (e.g., Halevy et al., 2012; Ronay, Greenaway, Anicich, & Galinsky, 2012), whereas other studies found negative performance effects, presumably caused by higher levels of rivalry among the team members (e.g., Bloom, 1999; Depken, 2000; see also Greer, 2014). These equivocal findings influenced yet another group of scholars to call for a contingency theory on the functions of status hierarchy steepness in teams, arguing that team effects of hierarchy steepness depend on the kind of task or work environment a team is dealing with (Anderson & Brown, 2010; Halevy et al., 2011). Indeed, the task contexts of organizational work teams may vary greatly, making it likely that hierarchy steepness effects hinge on unique task characteristics. In this paper, we therefore set out to examine when hierarchy steepness will be functional for teams and why.

There are two ways in which our research contributes to knowledge on the functions of status hierarchy steepness in teams. First, we examine whether task complexity, a key task characteristic that refers to the degree to which a task is unpredictable, high in variability, and non-repetitive in nature (Van de Ven, Delbecq, & Koenig, 1976; Withey, Daft, & Cooper, 1983), moderates the relationships between status hierarchy steepness and a number of important team outcomes. Our central prediction is that teams executing less complex tasks (i.e., tasks with clear standard operating procedures and straightforward solutions; Gladstein, 1984) will benefit more from a steeper status hierarchy than teams carrying out more complex tasks.

Second, although literature points at team conflict as the main explanatory mechanism behind the performance effects of hierarchy steepness (e.g., Greer, 2014; Halevy et al., 2011; Ronay et al., 2012; Simpson, Willer, & Ridgeway, 2012), it is unclear whether status hierarchy steepness has uniform effects on the distinct conflict types that can exist within teams (i.e., process, task, and relationship conflict; Greer & Van Kleef, 2010). We therefore examine in detail whether task complexity determines how hierarchy steepness relates to these different types of conflicts. We predict that in teams executing less complex tasks, steeper hierarchies will particularly reduce process and task conflict (not relationship conflict), and that this explains why these teams benefit from such hierarchies (see Figure 1).

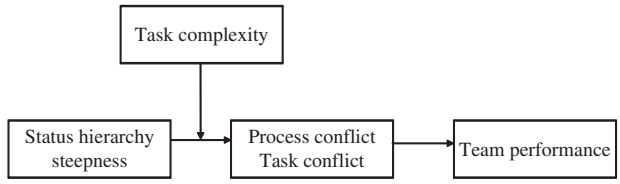

Figure 1. The conceptual model.

Theory and hypotheses

In teams, status hierarchy steepness represents the magnitude of the absolute or aggregate differences between the adjacently ranked team members' status levels (De Vries et al., 2006). This means that a team's hierarchy steepness is theoretically minimized when all members score the same on prominence, respect, and influence, and is theoretically maximized when half of the members score at the maximum on each of these status dimensions whereas the other half scores at their minimum. In practice, status hierarchy steepness will lie somewhere between these two extremes. In more egalitarian teams with a relatively flat hierarchy, the status differences between team members will be rather small or negligible, whereas in teams with a steeper hierarchy, the status differences among members will be larger.

There is growing empirical evidence that the functions of hierarchy steepness in teams may indeed be strongly influenced by the task conditions under which teams operate (Anderson & Brown, 2010; Halevy et al., 2011). Studies have found, for example, that for a steeper hierarchy to regulate conflict and translate into high team performance, it matters whether a team functions in a stable or changing environment (e.g., He & Huang, 2011), whether a team's task is fairly routine or requires creativity (e.g., Burns & Stalker, 1961), and whether a team's task prescribes procedural independency or interdependency among the team members (e.g., Halevy et al., 2012; Ronay et al., 2012). According to Anderson and Brown (2010), many of these moderating factors can be clustered into one overarching contingency variable, namely the *complexity* of team tasks (i.e., the extent to which tasks are unpredictable, variable, and non-repetitive; Van de Ven et al., 1976; Withey et al., 1983). However, the precise relationships between hierarchy steepness, different types of conflict, and team performance under varying levels of task complexity still need to be investigated. In the sections below, we will present our hypotheses for these relationships.

Task complexity, hierarchy steepness, and intra-team conflict

Past research on hierarchy steepness mostly articulated general conflict consequences of hierarchy steepness. Yet, conflict in teams is traditionally categorized into three types. *Process conflict* refers to controversies about the logistical aspects of task accomplishment such as the delegation of resources, roles, and duties (Greer & Jehn, 2007; Jehn, 1997). *Task conflict* refers to disagreements about opinions, goals, and values in relation to the substantive content of the task (Jehn, 1995; Jehn & Bendersky, 2003). *Relationship conflict* refers to tension and friction among team members with respect to personal norms, values, preferences, and interpersonal style (De Dreu & Van Vianen, 2001; Jehn & Mannix, 2001).

Literature suggests that the degree to which teams execute complex tasks is less likely to determine how hierarchy steepness relates to relationship conflict than how it relates to process and task conflict. The effects of hierarchy steepness on relationship conflict are generally complex because a steeper hierarchy can motivate members to defer to others in order to minimize social costs (Gould, 2003; Whyte, 1943; Wilson & Sober, 1994), but it can actually also trigger interpersonal clashes among them because of unfairness perceptions (Anderson & Brown, 2010; Harrison & Klein, 2007; Siegel & Hambrick, 2005). More importantly, however, relationship conflicts primarily stem from social dynamics that are not work related (Greer & Jehn, 2007). Accordingly, it can be expected that the task context in which teams operate has little influence on the degree to which they take place. Task contexts are, however, likely to influence the degree to which hierarchy steepness affects process conflict and task conflict in teams because these conflict types do stem from work-related dynamics (Greer & Jehn, 2007).

It is relatively clear how hierarchy steepness will affect process conflict in teams that perform less complex tasks. Members of such teams have straightforward outcome expectations and perform well by using standard routines (Gladstein, 1984; Lorsch & Morse, 1974; McDonough & Leifer, 1983; Tushman, 1979). So, it is not needed that all members participate actively in debates about who should be doing what, how, and when. In fact, such debates may then only stimulate time-consuming disagreements and unnecessary deviations from common operating procedures (Dewar & Werbel, 1979; Jehn, 1995). A steeper hierarchy can prevent this from happening because clear top-down task directives from higher-status members reduce ambiguities about the scheduling of task activities (De Kwaadsteniet & Van Dijk, 2010; Overbeck et al., 2005; Scott, 1987; Tiedens, Unzueta, & Young, 2007).

It is, however, less clear how hierarchy steepness will affect process conflict in teams that perform more complex tasks. Members then have to cope with fewer predefined task procedures, which results in process ambiguities (Campbell, 1988; Daft & Macintosh, 1981; Van de Ven & Ferry, 1979). Some scholars argue that, under such circumstances, it becomes more important that all members can debate freely about how to work together. Yet, research suggests that these teams can experience disruptive process disputes when there are too many high-status "stars" posturing how to move forward (Groysberg, Polzer, & Elfenbein, 2011; see also Ronay et al., 2012; Swaab, Schaerer, Anicich, Ronay, & Galinsky, 2014). We therefore hypothesize that:

> *Hypothesis 1a:* Task complexity moderates the relationship between hierarchy steepness and process conflict, such that hierarchy steepness is more negatively related to process conflict when task complexity is lower.

It is also relatively clear how hierarchy steepness will affect task conflict in teams that perform less complex tasks. Members of such teams know what to expect, can work with little task information, and hardly face task problems (Bigley & Roberts, 2001). It is therefore not necessary that all members have equal say in the execution of team tasks. It is actually more likely that a steeper status hierarchy, which makes only one or a few members responsible for developing important task strategies, will help teams to avoid costly conflicts over the attainment of task goals (Anderson & Brown, 2010). For teams performing more complex tasks, however, it is less clear how hierarchy steepness will affect task conflict. Clear guidelines from just a few high-status members may then reduce the uncertainties that such tasks entail (see Fein, 2012). But, because the remaining members are then prohibited to demonstrate task knowledge (see Moreland, Argote, & Krishnan, 1996), steeper hierarchies may also obstruct the integration of different task perspectives that is required for the execution of complex tasks (Alexander, Chizhik, Chizhik, & Goodman, 2009; Greer et al., 2014). Consequently, our next hypothesis is:

> *Hypothesis 1b:* Task complexity moderates the relationship between hierarchy steepness and task conflict, such that hierarchy steepness is more negatively related to task conflict when task complexity is lower.

Task complexity, hierarchy steepness, and team performance

From our argumentation earlier, it follows that task complexity will also determine how hierarchy steepness affects team performance. Literature indeed suggests that hierarchy steepness effects will be stronger and more positive when task complexity is relatively low (rather than high). For example, experimental team network studies have found that in teams executing less

complex tasks, clear differences among members on the basis of their network positions (which serve as an indirect proxy for status) influenced team performance more positively than in teams executing more complex tasks (e.g., Cohen, Bennis, & Wolkon, 1961; Guetzkow & Simon, 1955; Leavitt, 1951; Shaw, 1954). A large field study among 182 work teams replicated this finding (Cummings & Cross, 2003). Our performance hypothesis therefore reads:

> *Hypothesis 2:* Task complexity moderates the relationship between hierarchy steepness and team performance, such that hierarchy steepness is more positively related to team performance when task complexity is lower.

This hypothesis resonates with scholars arguing that hierarchy steepness enhances team performance because steeper hierarchies have a conflict regulation function (e.g., Halevy et al., 2011). Yet, it remains to be investigated whether the hypothesized performance-enhancing effects of hierarchy steepness under lower levels of task complexity actually result from the fact that hierarchy steepness prevents the occurrence of time-consuming process discussions and redundant task misinterpretations. Conflict literature consistently demonstrates a negative relationship between process conflict and team performance (Behfar, Mannix, Peterson, & Trochim, 2011; De Wit, Greer, & Jehn, 2012; Passos & Caetano, 2005; Vodosek, 2007), but the relationship between task conflict and team performance is somewhat less clear (De Church & Marks, 2001; Lovelace, Shapiro, & Weingart, 2001). Quite some studies have found that, under certain circumstances, moderate levels of task conflict can create a synthesis among diverse viewpoints that facilitates team performance (e.g., Jehn, 1995; De Dreu, 2006; cf. Jehn, Greer, Levine, & Szulanski, 2008). Nonetheless, meta-analytical evidence suggests that its overall impact on team performance is rather disruptive because performance gains are primarily realized when teams work on more complex tasks for which such opinion unification is needed (De Dreu & Weingart, 2003). So, when teams work on less complex tasks, task conflict rather seems to hurt than help team performance (see also Hackman, Brousseau, & Weiss, 1976; Jehn, Northcraft, & Neale, 1999). Considering these findings, we predict that, in teams performing less complex tasks, hierarchy steepness should indeed have positive performance effects because it reduces both process and task conflict. Our final hypothesis is:

> *Hypothesis 3:* The moderating effect of task complexity on the relationship between hierarchy steepness and team performance is mediated by both process conflict and task conflict, but only at lower levels of task complexity.

Note that we are aware of research demonstrating that teams can also have unique struggles over members' relative standing in a team's hierarchy (i.e., status conflicts; Bendersky & Hays, 2012). These conflicts are without doubt relevant for explicating the performance effects of hierarchy steepness in teams. Unfortunately though, our data collection took place before the measurement scale of status conflicts became publicly available, making it impossible to examine whether task complexity also determines how hierarchy steepness affects this form of conflict. However, as status conflict rarely seems to happen in isolation from the other types of conflicts and is particularly highly correlated with relationship conflict (minimum $r = .57$, $p < .01$; Bendersky & Hays, 2012, p. 334), scholars have recently positioned status conflict as an additional dimension of interpersonal tensions that can exist within teams (cf. Bendersky et al., 2014). Indeed, just like relationship conflicts, status conflicts primarily arise from social dynamics and may thus be less task related than process and task conflict (Bendersky & Hays, 2012). As we cannot draw definite conclusions on these relations on the basis of our data, we will elaborate further on the role of this fourth type of conflict in the discussion section.

Method

Sample

To test the earlier hypotheses, we collected data from 82 ongoing, cross-functional organizational work teams from the Netherlands and Germany. Each team consisted of a supervisor (i.e., senior-, middle-, or first-line manager) and five or more team members (i.e., subordinates). All teams shared common objectives, performed interdependent tasks, and were held accountable for collective outcomes (Kozlowski & Bell, 2003), but they worked in different task contexts. There were 39 teams that operated in the profit sector (i.e., banking, consultancy, information technology, trade/commerce, construction, hospitality, agriculture, real estate, telecommunication, and transportation), 32 teams that operated in the non-profit sector (i.e., education, healthcare, and government services), and 11 teams operating in other sectors. The work teams included member roles such as account managers, financial administrators, engineers, human resources consultants, as well as teachers and social service advisors.

Because status is a relational attribute that exists in the eyes of others (Ravlin & Thomas, 2005; Washington & Zajac, 2005), one can only obtain reliable judgments of a member's status position within a team if at least a few of the other members evaluate a focal person's social standing. We therefore relied on a 50% member response rate per team as an inclusion criterion (see also Bunderson, 2003; Rulke & Galaskiewicz, 2000). There were seven work teams that did not fulfil this criterion (i.e., that had less than 50% participating members), of which 2 teams also

lacked supervisor responses. In addition, there were three other teams without supervisor ratings of team performance. Our final sample for hypotheses testing therefore consisted of 72 work teams from 63 organizations (which included 72 supervisor responses and 438 team member responses). The overall response rate among the participating work teams was 91% and the average within-team response rate was 93%. On average, the team size was 6.67 (*SD* = 2.18). The average team member age was 38.83 years (*SD* = 11.68), and 55% were female. Ninety-nine percent had a vocational qualification or higher, and employees had an average tenure of 4.90 years (*SD* = 5.38) with their work teams. Among team supervisors, the average age was 45.19 years (*SD* = 10.73), 66% were male, and 99% had a vocational qualification or higher. Supervisors' average work team tenure was 5.69 years (*SD* = 6.55).

Note that the majority of teams were Dutch (93%), but there was a small subsample of five German teams. Comparative analyses revealed that these teams did not possess unique characteristics (e.g., in terms of size, industry, or demographic composition) that could potentially influence the results we obtained.[1]

Procedure

Teams were recruited by undergraduate business students who assisted in this research in return for course credit. Their assignment was to set out a broad survey on team task characteristics, team processes, and team performance. So, all respondents were blind to the objectives of the study. The students first introduced the research project to the team supervisors and informed them that participation was voluntary and that confidentiality was guaranteed. Once they established agreement of participation, students distributed separate survey versions to the members of the team and the supervisor to minimize concerns about same-source bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The team member survey was distributed during organized meetings so that the members could fill out the surveys in a controlled setting where communication was minimized. Team members rated one another's status, and indicated their perceptions of task complexity and the presence of process, task, and relationship conflict in their team. At the same time, the supervisors had to complete their survey, which independently assessed the team's overall performance, in a separate room. All measures were translated to Dutch and German using a double-blind back-translation procedure.

Measures

Hierarchy steepness

As indicated earlier, status was measured by means of a peer-rating (i.e., round robin) design where every team member was asked to evaluate the status of the other members.[2] We therefore used the following single-item measure to capture status: "To what extent is this person influential, respected, and prominent in the work team? (Anderson et al., 2001)[3]". We used a continuous response scale ranging from 1 (*not at all)* to 7 (*very much*) to capture the fine-grained status differences that may exist within work teams. For each team member, we aggregated the separate status ratings into one overall status score. To obtain hierarchy steepness, we subsequently calculated the standard deviation of all the individual member status scores within a team (see also Greer & Van Kleef, 2010). Higher values of the standard deviation indicated a steeper team status hierarchy.

Task complexity

Task complexity was measured with four items adapted from Morgeson and Humphrey's (2006) job complexity scale (e.g., "The work in my team requires me to do one task or activity at a time"; reverse coded). All items were rated on a response scale from 1 (*strongly disagree*) to 7 (*strongly agree*) and, together, formed a reliable scale (Cronbach's alpha was .79).

Intra-team conflict

Process conflict was measured with three items from Shah and Jehn (1993; e.g., "How often do you have disagreements about resource allocations in your work team?"). Task and relationship conflicts were measured with six items from the Intragroup Conflict Scale (e.g., "How often are there conflicts about ideas in the work team?" and "How often is there emotional conflict in your work team?"; Jehn, 1995). All items were rated on a response scale from 1 (*never*) to 7 (*always*), and formed reliable scales for process, task, and relationship conflict (Cronbach's alpha's were .88, .86, and .80, respectively).

Team performance

Since our sample comprised rather diverse work teams with different tasks and responsibilities, we used a broad measure of team performance (Ancona & Caldwell, 1992; cf. Van der Vegt, De Jong, Bunderson, & Molleman, 2010). We asked each supervisor to compare the performance of his or her work team with that of relevant other work teams with similar composition, tasks and customers on five criteria (e.g., "productivity" and "effectiveness"). All criteria had to be rated on a response scale from 1 (*far below average*) to 7 (*far above average*), and together formed a reliable scale (Cronbach's alpha was .85).

Control variables

Past research has shown the necessity to statistically control for the team mean of an attribute when testing the relationship between the separation or the dispersion of that attribute and other variables (cf. Harrison & Klein, 2007, p. 1214). We therefore controlled for the mean level of status within the work teams in our sample (see also Halevy et al., 2012). We further controlled for team size and team tenure in our analyses as these compositional features are commonly associated with team performance (e.g., Ancona & Caldwell, 1992; Katz, 1982).

Data analysis strategy

Measurement aggregation

As our hypothesized model needs to be tested at the team level of analysis, we first examined whether team members' responses to our individual-level measures could be aggregated to their corresponding higher-order levels. We computed inter-rater agreement indexes for each measure (r_{wg}'s; James, Demaree, & Wolf, 1984) as well as their ICC_1 and ICC_2 scores that captured within-team relatedness (James, 1982). The results confirm that measurement aggregation is warranted, as members of the same team tended to converge in their assessment of each other's status and on their perceptions of task complexity and the distinct conflict types. See Table 1 for an overview of results.

Table 1. Median within-group agreement ($r_{wg(j)}$) and intraclass correlation coefficients for the study variables.

Variables	*Median* $r_{wg(j)}$	*SD*	*F-value*	*ICC (1)*	*ICC (2)*
1. Status	.77	.20	3.31***	.27	.70
2. Task complexity	.87	.24	2.62***	.20	.62
3. Process conflict	.90	.14	2.61***	.19	.62
4. Task conflict	.86	.22	2.02***	.13	.51
5. Relationship conflict	.86	.12	2.52***	.19	.60

Note: N = 72 teams. *** $p < .001$. For status, median r_{wg} is reported.

Table 2. Structural model comparisons (Models 1–3).

Models	χ^2	*df*	*CFI*	*SRMSR*	*GFI*
Model 1	129.13	59	.99	.04	.96
Model 2	725.79	64	.89	.07	.79
Model 3	128.74	61	.99	.04	.96

Note: N = 72 teams. CFI = comparative fit index, SRMSR = standardized root mean square of the residuals, GFI = goodness-of-fit index.

Convergent and discriminant validity

We also examined the convergent and discriminant validity of the task complexity and intra-team conflict measures by performing confirmatory factor analyses with the LISREL 8.80 computer package. We tested three possible models. For a complete overview of results, see Table 2.

We first tested the fit of the hypothesized four-factor model in which the task complexity items loaded on their corresponding latent construct and the intra-team conflict items loaded on three latent constructs representing process, task, and relationship conflict (Model 1). As can be seen from Table 2, the overall fit of this model to the data was satisfactory (χ^2 [59, 430] = 129.13, $p < .001$) based on the recommended comparative fit index [CFI] ≥ .95, standardized root mean square of the residuals [SRMSR] ≤ .05 and goodness-of-fit index [GFI] ≥ .95 (Hu & Bentler, 1999; Kline, 2005). The hypothesized model was thus appropriate for testing our hypotheses. To further evaluate the discriminant validity of these scales, we also examined whether task complexity and intra-team conflict items loaded on two latent constructs (Model 2). As Table 2 demonstrates, the fit of this alternative model was significantly worse than that of our hypothesized model ($\Delta\chi^2$[5] = 596.66, $p < .001$). Finally, we also reran our model with an additional, overarching second-order factor that mapped the three latent constructs of process, task, and relationship conflict (Model 3). This third model showed equally good fit indices as our hypothesized model ($\Delta\chi^2$[2] = .39, *n.s.*, see Table 2). For this reason, and because the correlations for the three conflict types were quite high (see Table 3 with descriptive statistics below), we will present the results for the composite intra-team conflict scale in a supplementary analyses section.

Because team performance was assessed at the team level, the sample size-to-number of variables ratio would not pass the recommended threshold for obtaining reliable CFA results ($N/p \geq 5$; Bryant & Yarnold, 1995; Gorsuch, 1983). We therefore ran a separate model to test whether the five performance items loaded on a single factor. The overall fit to the data and the fit indices were satisfactory (χ^2[5, 72] = 6.16, *n.s.*, [CFI] = .99, [SRMSR] = .04, and [GFI] = .97), and all factor loadings were significant at the .001 level or better.

Hypotheses testing

We tested our moderation hypotheses using ordinary least square (OLS) regressions. As recommended by Aiken and West (1991), we first standardized all variables and computed interaction effects by multiplying the respective predictors. We subsequently regressed process, task and relationship conflict and team performance on the control variables, hierarchy steepness, task complexity, and the interaction term of hierarchy steepness and task

Table 3. Descriptive statistics and Pearson zero-order correlations among the study variables.

Variables	*Mean*	*SD*	1	2	3	4	5	6	7	8
1. Team size	6.67	2.18								
2. Team tenure	4.81	3.79	.22							
3. Mean status	4.75	0.48	−.07	−.03						
4. Hierarchy steepness	0.74	0.31	.00	−.08	−.40**					
5. Task complexity	5.48	0.71	.15	.22	.31**	−.22				
6. Process conflict	2.34	0.64	−.10	.07	−.20	−.09	.04			
7. Task conflict	3.62	0.64	−.06	−.13	−.18	.01	.09	.64**		
8. Relationship conflict	2.69	0.62	−.13	.05	−.15	.01	.02	.70**	.67**	
9. Team performance	5.40	0.73	.11	.13	.19	−.02	.18	−.34**	−.31**	−.29*

Note: $N = 72$. * $p < .05$, ** $p < .01$.

complexity. We tested our mediation hypotheses with an SPSS macro that runs conditional indirect effects models (Preacher, Rucker, & Hayes, 2007) because the strength of the interactive effect of task complexity and hierarchy steepness on team performance was expected to go through process and task conflict.

Results

Descriptive statistics

Table 3 presents the means, standard deviations, and Pearson zero-order correlations for all variables at the team level. As expected, team performance was negatively related to process, task, and relationship conflict ($r = -.34$, $p < .01$; $r = -.31$, $p < .01$; and $r = -.29$, $p < .05$, respectively). Furthermore, in line with previous meta-analytical evidence (e.g., De Wit et al., 2012), the three types of conflict were strongly positively correlated with each other (minimum $r = .64$, $p < .01$). None of the control variables were significantly related to the three conflict types and team performance, but as there is convincing prior evidence (e.g., Bunderson & Boumgarden, 2010; Christie & Barling, 2010; Greer & Van Kleef, 2010) showing that these compositional variables are relevant covariates in our model, we included them in all analyses (see also Harrison & Klein, 2007).

Main analyses

The OLS regression results for the three types of conflict and team performance largely confirmed our first two hypotheses. We found fully significant cross-over interactions between task complexity and hierarchy steepness on all relevant measures after the control variables and main predictor effects had been taken into account. So, although task complexity did not moderate the relationship between hierarchy steepness and relationship conflict ($B = .10$, *n.s.*), it did determine the degree to which hierarchy steepness was related to both process and task conflict (in each case; $B = .14$, $p < .05$). Task complexity also significantly interacted with hierarchy steepness when predicting team performance ($B = -.15$, $p < .05$).

Additional simple slope analyses (Aiken & West, 1991) confirmed that under less complex task conditions, hierarchy steepness was significantly and negatively related to process conflict (−1 *SD:* $B = -.25$, $\beta = -.39$, $SE = .10$, $p < .05$). Moreover, hierarchy steepness was then also negatively related to task conflict and positively related to team performance, although these slopes did not yield statistical significance at the .05 level (task conflict: −1 *SD:* $B = -.19$, $\beta = -.29$, $SE = .10$, $p = .07$; team performance: −1 *SD:* $B = .21$, $\beta = .29$, $SE = .12$, $p = .08$). Yet, in all three cases, relations with hierarchy steepness remained neutral and non-significant (well above the .10 level) under more complex task conditions (process conflict: +1 *SD:* $B = .03$, $\beta = .04$, $SE = .11$, *n.s.;* task conflict: +1 *SD:* $B = .10$, $\beta = .16$, $SE = .11$, *n.s.;* team performance: +1 *SD:* $B = -.09$, $\beta = -.13$, $SE = .12$, *n.s.*). For graphical depictions of the patterns of results, see Figures 2–4.

We also found that both process and task conflict were negatively related to team performance ($B = -.23$, $p < .01$ and $B = -.20$, $p < .05$, respectively), offering initial support for our third hypothesis that the two conflict types would explain the interactive effect of hierarchy steepness and task complexity on team performance. The moderated mediation macro of Preacher et al. (2007) confirmed that this interaction effect indeed became non-significant ($\geq .10$) when either process or task conflict was inserted as the mediating variable (in each case; $B = -.11$, *n.s.*). At lower levels of task complexity, hierarchy steepness affected team performance indirectly, either through process conflict or through task conflict. In both cases, the confidence intervals did not include zero (.007–.248 and .003–.169, respectively). These effects were not observed at moderate to high levels of task complexity. Together, these results confirm Hypothesis 3[4]. For an overview of results, see Table 4.

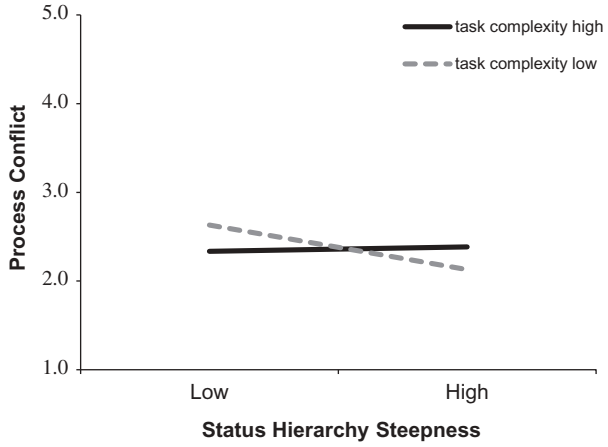

Figure 2. Interactive relationship of status hierarchy steepness and task complexity with process conflict.

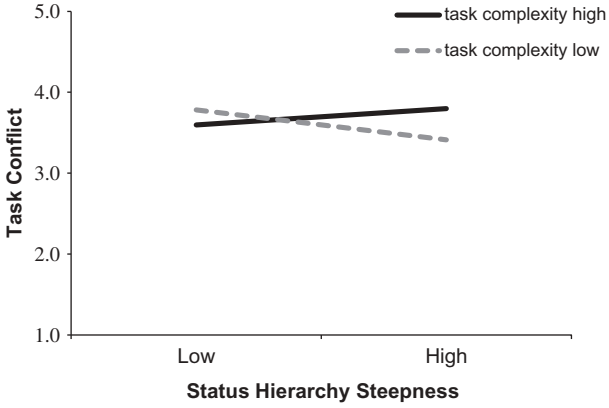

Figure 3. Interactive relationship of status hierarchy steepness and task complexity with task conflict.

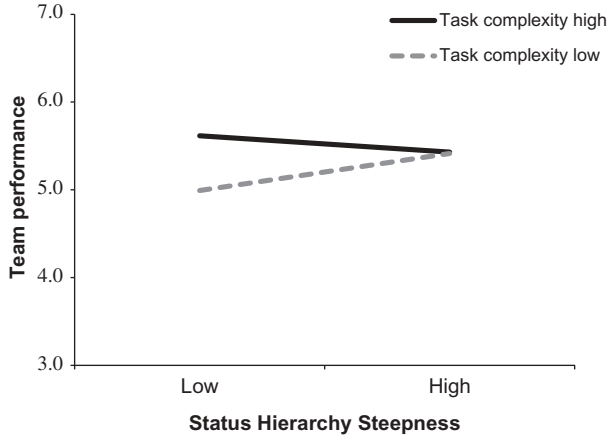

Figure 4. Interactive relationship of status hierarchy steepness and task complexity with team performance.

Supplementary analyses

We additionally tested our hypotheses with the composite team conflict scale and found similar patterns of results as for process and task conflict separately. So, task complexity also moderated the relationship between hierarchy steepness and this overarching conflict construct (B = .13, p < .05), such that the relationship between hierarchy steepness and the conflict scale was only negative and significant under less complex task conditions (−1 *SD:* B = −.19, β = −.33, SE = .09, p < .05). This relationship was non-significant under more complex task conditions (+1 *SD:* B = .07, β = .12, SE = .09, *n.s.*). The composite team conflict scale was also negatively related to team performance (B = −.24, p < .01), and the interactive effect of hierarchy steepness and task complexity on team performance dropped to non-significance when the composite conflict scale was added to the equation (B = −.10, *n.s.*). Bootstrap analyses further confirmed that this scale mediated the relationship between hierarchy steepness and performance at low levels of task complexity; a bootstrapped 95% confidence interval around the indirect effect did not contain zero (.011 to .219; sample size = 5000). So, although our hypotheses are also confirmed for the composite team conflict scale, these results are likely to be driven by the effects that we obtained for process and task conflict[5]. For an overview of these supplementary analyses, see the Appendix.

Discussion

This study tested a contingency theory on the functions of status hierarchy steepness in organizational work teams. The results demonstrated that hierarchy steepness reduced process and task conflict, and hence, benefitted team performance under less complex task conditions, but had no influence on these types of conflict and team performance under more complex task conditions. It was also found that, regardless of how complex the tasks were that the teams needed to execute, status hierarchy steepness had no effect on team members' experience of relationship conflict.

Theoretical implications

Our research has several important implications for the status literature. First, our findings imply that inconsistent findings on the consequences of hierarchy steepness for team functioning can in part be explained by the various levels of task complexity under which these teams had to operate (Anderson & Brown, 2010). So, hierarchy steepness is not universally good or bad for teams. Rather, its effects depend on the work context in which teams operate. This implication underscores the importance of further examining when steeper

Table 4. Regression analyses results and conditional indirect relationships.

	Process conflict		*Team performance*				*Task conflict*		*Team performance*		*Relationship conflict*		*Team performance*	
	Model 1		Model 1		Model 2		Model 1		Model 2		Model 1		Model 2	
Predictor	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*
Controls														
Team size	−.11	.08	.07	.09	.04	.09	−.05	.08	.06	.09	−.11	.08	.04	.09
Team tenure	.04	.08	.07	.09	.08	.09	−.10	.08	.04	.09	.04	.08	.08	.09
Mean status	−.20*	.08	.15	.10	.09	.10	−.18*	.08	.10	.10	−.13	.08	.12	.10
Main Effects														
Hierarchy steepness	−.11	.08	.06	.09	.02	.09	−.04	.08	.05	.09	−.03	.08	.05	.09
Task complexity	−.01	.09	.16	.10	.16	.10	.05	.09	.18	.10	.00	.09	.16	.10
Two-way interactions														
Hierarchy steepness * task complexity	.14*	.07	−.15*	.08	−.11	.08	.14*	.07	−.11	.08	.10	.07	−.12	.08
Mediator														
Process/task/ relationship conflict					−.21*	.09			−.18*	.09			−.18*	.09
ΔR^2	.06		.05		.07		.06		.05		.03		.05	
R^2 (Adjusted R^2)	.16 (.08)		.13 (.05)		.20 (.11)		.16 (.08)		.18 (.09)		.09 (.01)		.18 (.09)	
Conditional indirect relationship														
Moderator value							95 % Confidence Interval (BCA)							
−1 SD	.007, .248						.003, .169				−.009, .154			
M	−.007, .159						−.024, .088				−.036, .090			
+1 SD	−.089, .065						−.183, .018				−.137, .033			

Note: $N = 72$. Unstandardized regression coefficients are presented. * $p \leq .05$.
Bootstrap sample size = 5000. BCA = bias corrected and accelerated.
Model 1 for team performance is the same across the table; it is therefore presented only once.

hierarchies will facilitate team performance (and when they will not).

Second, our research has implications for theory development on the conflict regulating functions of hierarchy steepness in teams. The results showed that hierarchy steepness only related differently to process and task conflict under different levels of task complexity; it had no effects on relationship conflict. So, hierarchy steepness enhanced team performance under less complex task conditions because it particularly mitigated the two task-related types of conflict (i.e., conflicts about logistical process issues and conflicts about task content and task goals) and not because it reduced relationship conflicts about interpersonal issues. Although this finding confirms that hierarchy steepness indeed has a conflict regulating function (at least under certain task conditions), it also implies that hierarchy steepness affects some types of conflict more than others. This insight has important practical consequences for how conflicts arising from hierarchy steepness can best be managed.

Third, additional model testing revealed that the interactive effects of hierarchy steepness and task complexity on the two task-related conflict types and team performance occurred independently from other important status configurations that exist in teams (i.e., mean level of status and the degree to which there were status-based subgroups). These additional results confirm the robustness of our hypothesized relationships. At the same time, however, these findings also imply that different status configurations in teams may yield unique, and perhaps even opposite, effects on teams. Hierarchy scholars should therefore be aware of this possibility when theorizing on the functions of hierarchies in teams.

Strengths

This study has a few important strengths. For example, by examining organizational work teams across various business sectors, this study advances prior work on hierarchy steepness that examined samples operating under specific and fixed working conditions (e.g., sports teams, Christie & Barling, 2010; Halevy et al., 2012; experimental groups, Ronay et al., 2012). Moreover, whereas this past research relied on proxies of status (e.g., the possession of board memberships, higher performance or pay; Christie & Barling, 2010; Halevy et al., 2012; He & Huang, 2011; Trevor, Reilly, & Gerhart, 2012), we assessed status with peer ratings, as one's status position in a team is only meaningful to the degree that other members perceive it (Ravlin & Thomas, 2005).

Another strength of our work is that we used a continuous measure to operationalize hierarchy steepness, rather than a single ordinal dimension (see Berger et al., 1980; Ridgeway & Walker, 1995), which enabled us to take the magnitude of status differences into account (i.e., from smaller to larger). Moreover, we avoided issues of same-source bias (Podsakoff et al., 2003) by using different methods and sources to assess our dependent measures (i.e., a round-robin design for hierarchy steepness, team member self-reports for task complexity, and the three conflict types and independent supervisor ratings for team performance). Together, these strengths generate confidence that our results provide an accurate representation of hierarchy steepness effects in work teams.

Limitations and directions for future research

Despite the strengths of our study, there are some limitations as well. Foremost, we acknowledge that the amount of variance explained by our models is relatively small and that it is important to further examine the causality of the relationships between our study variables by means of longitudinal designs. But there are also a few theoretical issues that deserve detailed attention in further research. For example, some scholars argue that complex tasks consist of different components on the basis of coordination or team dynamics (Wood, 1986). It is therefore possible that the multidimensional nature of complex tasks partially explains why our conflict and performance effects of steeper status hierarchies were less clear under this task condition.

Another limitation of our work is that we only examined whether process, task, and relationship conflicts explained the performance effects of hierarchy steepness under different levels of task complexity. We mentioned earlier in this paper that, in order to gain a full understanding of these effects, it is also important to take status conflicts, which directly capture disputes about members' relative positions in the hierarchy, into account (Bendersky & Hays, 2012; Groysberg et al., 2011). Given that status conflicts associate more closely with relationship conflicts than with the two task-related types of conflict (i.e., process and task conflicts), we believe that the relationship between hierarchy steepness and status conflict is probably less influenced by unique task characteristics such as task complexity. It would be interesting, however, to examine when task complexity *will* determine this relationship. One could speculate, for example, that status conflicts become more task related when members evaluate each other's status primarily on the basis of task-related status cues (i.e., task experience and education; Bunderson, 2003) rather than on more diffuse status cues (e.g., gender; Berger et al., 1980). As with process and task conflicts, it may be that steeper hierarchies will then effectively reduce status conflicts in teams working on less complex tasks because there is no reason to doubt or dispute the expertise of the highest status members. Yet, in teams working on more complex tasks, hierarchy steepness may actually trigger status conflicts when one's status is based on task-related characteristics. Complex tasks constantly require members to gain new expertise (Bigley & Roberts, 2001), so members' status positions are debatable and more likely to change over time.

Disentangling the exact sources of status in teams is also important because members tend to respond differently to hierarchy steepness depending on whether the status distribution is perceived to be legitimate and fair (Magee & Galinsky, 2008; Tyler, 2006). Members who perceive the team's status hierarchy to be legitimate generally feel less motivated to change the status quo (Ellemers, Wilke, & Van Knippenberg, 1993). Yet, illegitimate status hierarchies tend to elicit status struggles over higher-status positions (Berger et al., 1998; Walker, Thomas, & Zelditch, 1986). So, an interesting question is whether teams that carry out less complex tasks will still benefit from a steeper hierarchy when some of the members perceive this hierarchy to be illegitimate. This may be the case when the hierarchy is largely based on diffuse status cues that are not task related.

Finally, we want to emphasize that it might be interesting to include measures of conflict management strategies into future hierarchy research. Previous literature has provided empirical support for the merits of conflict management in organizational work teams (e.g., Alper, Tjosvold, & Law, 2000; Hempel, Zhang, & Tjosvold, 2009), demonstrating that teams performed better when they endorsed a more constructive approach towards conflict rather than a destructive approach. As we found that steeper status hierarchies reduce process and task conflicts when teams perform tasks of low complexity, we expect that such constructive strategies may be less relevant under these circumstances. However, our performance effects of hierarchy steepness were neutral when teams performed complex tasks. So, under this task condition, it may be valuable to examine whether constructive conflict management strategies mitigate the negative effects and help accentuate the positive effects of status hierarchy steepness.

Conclusion and practical implications

In this paper, we have provided comprehensive evidence for using a contingency theory to specify the effects of hierarchy steepness on organizational work teams, as we show that teams only benefit from steeper status hierarchies under less complex task conditions. We further shed light on why hierarchy steepness can have an impact on team performance, as we found clear evidence that it particularly reduces task-related types of conflict (rather than relational conflicts). We therefore feel confident that the theory and results presented in this paper provide an important conceptual and practical toolkit that aids hierarchy researchers in resolving the puzzle on the functions of hierarchy steepness in organizational work teams.

In practice, most people are conditioned to think that hierarchies are universally bad. Organizations therefore often attempt to play down hierarchical differentiation in work teams. They, for example, strive to establish egalitarian structures in teams and/or motivate feelings of empowerment among employees (Gruenfeld & Tiedens, 2010; Leavitt, 2005). Our findings suggest that steeper hierarchies *do* have an important function under less complex task conditions as they then regulate process and task conflicts in teams and improve performance accordingly. In fact, given that hierarchy steepness did not yield straightforward negative effects in teams working on more complex tasks, our findings imply that organizations may even benefit from steeper hierarchies under this task condition as well, provided that managers closely monitor their effects on process and task conflict and manage these conflicts effectively in case they arise. So, on the basis of our research, we conclude that instead of abolishing steeper hierarchies, management should try to capitalize on their merits for team functioning.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes

1. Comparative analyses results can be obtained by contacting the corresponding author.
2. To be concise, we only present example items for each construct. All remaining construct items are available upon request from the corresponding author.
3. As we combined influence, respect, and prominence in the single status measure, we ran a validation study to test whether these status dimensions are indeed highly associated with each other and status, and distinct from related concepts such as formal power or leadership. We collected data among 60 working professionals from MTurk. Respondents had to think of a random member of a team they were once part of and had to rate that member separately on influence, respect, prominence, status, formal power, and leadership. In line with the definition of status, this member's scores on influence, respect, and prominence correlated highly with each other (lowest $r = .57$, $p < .001$) and with status (lowest $r = .74$, $p < .001$). The scores were also sufficiently distinct from formal power and leadership (highest $r = .24$, $p = .067$). Only prominence related significantly to leadership ($r = .37$, $p < .01$). A principal components analysis with varimax rotation further illustrated that influence, respect, prominence, and status loaded on a single factor (highest loading = .92, lowest = .72), whereas formal power and leadership loaded on a separate factor. All results are available upon request from the corresponding author.
4. We also tested to what extent process and task conflict explained the interactive effect of hierarchy steepness and task complexity on team performance when both were entered as mediators simultaneously. In this analysis, process conflict explained this effect more strongly (CI 90% = .0001–.2262) than task conflict (CI 90% = −.0089–.1240, sample size = 5000).
5. For exploratory reasons, we also tested two other regression models. In the first model, we added mean status as a second moderator to the equation (rather than as a control variable) to see how it would affect our

hypothesized relationships. Regression results revealed that there were no three-way interactions between status hierarchy steepness, task complexity, and mean status that significantly predicted team conflict or team performance (lowest $B = -.07$, $p = .17$ for the conflict types separately; $B = -.05$, $p = .27$ for the combined team conflict scale, and $B = .06$, $p = .37$ for team performance). In the second model, we tested whether our hypothesized relations would change when Meyer and Glenz's (2013) average silhouette width (ASW) faultline measure of status-based subgroups was added as a second moderator. We calculated this measure based on our status variable and a constant using the asw.cluster package in R. Yet, the three-way interactions between status hierarchy steepness, task complexity, and the ASW fault line measure did not significantly predict team conflict or team performance (lowest $B = -.02$, $p = .81$ for the conflict types separately; $B = -.01$, $p = .86$ for the combined team conflict scale, and $B = .04$, $p = .70$ for team performance). The fact that neither mean status nor status-based subgroups influenced the impact of hierarchy steepness on our measures under less complex and more complex task conditions increases confidence in the robustness of our results. All regression results including main, two-way and three-way interaction effects can be obtained from the corresponding author upon request.

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Appendix. Regression analyses results and conditional indirect relationships

	Intra-team conflict		*Team performance*			
	Model 1		Model 1		Model 2	
Predictor	*B*	*SE*	*B*	*SE*	*B*	*SE*
Controls						
Team size	−.09	.07	.07	.09	.04	.09
Team tenure	−.01	.07	.07	.09	.06	.09
Mean status	−.17*	.07	.15	.10	.09	.10
Main effects						
Hierarchy steepness	−.06	.07	.06	.09	.04	.09
Task complexity	.01	.08	.16	.10	.17	.10
Two-way interactions						
Hierarchy steepness * task complexity	.13*	.06	−.15*	.08	−.10	.08
Mediator						
Intra-team conflict					−.22*	.09
ΔR^2	.07		.05		.07	
R^2 (Adjusted R^2)	.15 (.08)		.13 (.05)		.21 (.12)	
Conditional indirect relationship						
Moderator value			95% confidence interval (BCA)			
−1 SD			.011, .219			
M			−.020, .112			
+1 SD			−.139, .034			

Note: $N = 72$. Unstandardized regression coefficients are presented. * $p < .05$.
Bootstrap sample size = 5000. BCA = bias corrected and accelerated.