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### The bright side of hierarchies

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## CHAPTER 3

### WHEN AND WHY HIERARCHY STEEPNESS IS RELATED TO TEAM PERFORMANCE

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Responding to recent calls, this field study among 72 work teams tested a contingency theory of the relationship between status hierarchy steepness and team performance. Across teams operating in diverse business sectors, we found that task complexity is an important moderator of this team-level relationship. When teams carried out tasks of low complexity, steeper status hierarchies were negatively related to intra-team conflict, which increased team performance. However, hierarchy steepness did not yield such clear conflict and performance effects in work teams executing more complex tasks. The findings contribute to status research by demonstrating the task conditions under which steeper status hierarchies benefit team functioning and by showing an explanatory mechanism that is driving this effect.

This chapter is based on a manuscript under review at the *European Journal of Work and Organizational Psychology*.

It is well documented that status asymmetries unavoidably emerge within work teams, even when members are of equal status at the initial stage of group interactions (Bales, 1950; Berger, Cohen, & Zelditch, 1972; Berger, Ridgeway, Fisek, & Norman, 1998). Team members assess each other's status<sup>4</sup> based on the possession of attributes they consider valuable and share their assessments through displaying status-claiming and status-granting behaviors (Berger, Conner & Fisek 1974; Berger, Fisek, Norman, & Zelditch, 1977). Such subjective inferences form “the basis of observable inequalities in face-to-face social interaction” (Berger, Rosenholtz, & Zelditch, 1980, p. 479). In this way, teams naturally develop an informal status hierarchy based on the rank ordering of individual team 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), there is general agreement among researchers that their consequences for team functioning deserve detailed attention in the field of management (e.g., Magee & Galinsky, 2008; Overbeck, Correll, & Park, 2005; Pearce, 2001; Ravlin & Thomas, 2005). A wide variety of scholarly disciplines, ranging from primate research (e.g., De Vries, Stevens, & Vervaecke, 2006) to research in social and organizational psychology (e.g., Halevy, Chou, Galinsky, & Murnighan, 2012; Leonard, 1990), has conceptualized a team's status hierarchy in terms of *hierarchy steepness*, which refers to the overall degree of asymmetry in members' social status within the team (Anderson & Brown, 2010). This is a meaningful and reliable way to consider status differentials in team settings (cf. Christie & Barling, 2010) because it gets directly at “the size of the absolute differences between adjacently ranked

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<sup>4</sup> In psychology and sociology, “status” generally refers to the prominence, respect, and influence one has in the eyes of others (see Anderson, John, Keltner, & Kring, 2001).

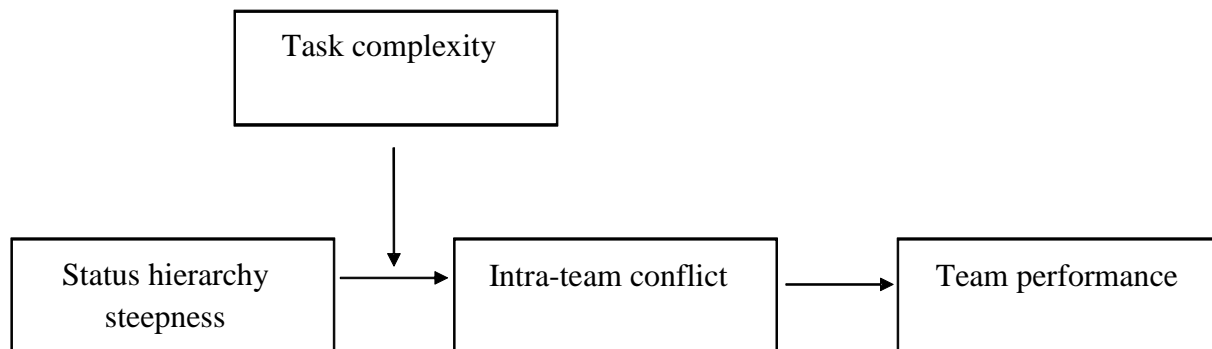
individuals” (De Vries et al., 2006, p. 585), and is commonly associated with important team outcomes (for a review, see Anderson & Brown, 2010). This conceptualization of status hierarchy is similar to what Harrison and Klein (2007) labeled “separation” with regard to vertical rather than horizontal differences within teams.

Functionalist theories of hierarchy propose that role clarity, a clear-cut division of labor, and the voluntary compliance mechanisms that emerge from steeper hierarchies should benefit team performance because they regulate coordination and conflict (e.g., Halevy, Chou, & Galinsky, 2011; Keltner, Van Kleef, Chen, & Kraus, 2008; Magee & Galinsky, 2008). However, past research on hierarchy steepness has produced mixed results on team performance so far, with studies reporting both negative effects (e.g., Bloom, 1999; Pfeffer & Langton, 1993) and positive effects (e.g., Halevy et al., 2012; Ronay, Greenaway, Anicich, & Galinsky, 2012, see also Greer, Schouten, De Jong, & Dannals, 2014). The studies that have found a positive relation between hierarchy steepness and team performance supported the notion that steeper hierarchies can facilitate coordination and cooperation (Halevy et al., 2012), and can reduce conflict between the members (Ronay et al., 2012). Yet these studies were all conducted in sport teams and experimental groups that operated under specific and fixed working conditions in relatively isolated settings. It therefore remains to be seen whether hierarchy steepness has the same conflict regulating function in work teams operating under various task conditions in broader organizational settings.

Given that findings of studies examining the relationship between hierarchy steepness and team performance are relatively indefinite, scholars have recently suggested that it may hinge on a team’s task characteristics (Anderson & Brown, 2010; Halevy et al., 2011). We therefore further examine whether task complexity determines when hierarchy steepness contributes to team performance. Task complexity is a critical factor in team performance research, and is

generally conceptualized as 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). Based on insights from the hierarchy literature, we propose 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. Moreover, we suggest that this moderated effect of hierarchy steepness on performance will be mediated by intra-team conflict. For a visual representation of the proposed model, see Figure 3.1.

Figure 3.1 *The conceptual model*



Finally, our research aims to contribute to knowledge on hierarchies in teams by handling two problems that are currently present within the status literature. First, extant research generally conceptualizes hierarchy steepness indirectly, basing it, for example, on pay differentials (e.g., Richards & Guell, 1998; Trevor, Reilly, & Gerhart, 2012), past performance differentials (e.g., Christie & Barling, 2010; Halevy et al., 2012), or on inequality in directors' board memberships (e.g., He & Huang, 2011). The use of indirect measures has occurred despite the long-recognized theoretical notion that status is a *relational* construct accorded to an individual by others

(Anderson, John, Keltner, & Kring, 2001; Washington & Zajac, 2005). Second, most research has regarded hierarchy steepness as a dichotomous construct that is either present (“steep”) or absent (“flat”) in teams, hereby ignoring different configurations of (status) differences that may exist among the members (e.g., Ronay et al., 2012). To solve these problems we measure status directly by using the status assessments of fellow team members, and operationalize hierarchy steepness as a continuous variable capturing variations in the steepness of status hierarchies. By means of these improvements, we can make more precise predictions of the strength of the relationships between hierarchy steepness, conflict, and team performance at different levels of task complexity.

## **THEORY AND HYPOTHESES**

### **Hierarchy Steepness and Conflict Regulation**

Status hierarchy steepness represents the magnitude of the absolute differences between the adjacently ranked team members’ status levels (De Vries et al., 2006). From this definition, it follows that a team’s hierarchy steepness is minimized when all team members score the same on a specific status dimension, and is maximized when half of a team scores at the theoretical maximum on a status dimension and the other half scores at the minimum. In practice, teams’ status hierarchy steepness will lie somewhere between these two extremes. In more egalitarian work teams with a relatively flat hierarchy the status differences between the team members will be rather small or negligible, whereas in work teams with a steeper hierarchy the status differences among the members will be larger.

Although research has shown negative consequences of large status inequalities in groups (e.g., Bloom, 1999; Edmondson, 2002; see also Bunderson & Reagans, 2011), functional theories of status hierarchy posit that a steeper status hierarchy can increase the functioning of work teams because it enables members to identify each other’s status positions more clearly (Magee &

Galinsky, 2008). Knowing one's specific status ranking in a hierarchy allows individual members to avoid costly fights that harm the self and the team (Sirot, 2000; Sneddon, Hawkesworth, Braithwaite, & Yerbury, 2006). A clear pattern of deference is therefore seen as an evolutionary 'solution' to intra-team conflict that can ultimately improve a team's performance (Bunderson & Boumgarden, 2010; Halevy et al., 2011; Keltner et al., 2008). So, from a functional perspective, status hierarchy steepness may influence team performance because it has an important conflict regulation function.

Conflict in work teams is often categorized into three types. *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). *Task conflict* refers to disagreements about opinions, goals, and values in relation to the substantive content of the task (Jehn, 1995; Jehn & Bendersky, 2003). *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).

Given that status hierarchy steepness provides a clear deference order among team members, it is likely to be negatively related to all three types of conflict. For example, with respect to relationship conflict, Whyte (1943) observed that groups of young boys showed less interpersonal aggression when there was a steep hierarchy in the group. Relatedly, in a simulation study, Gould (2003) demonstrated that social conflicts between actors are less likely to occur when they clearly differ in rank. Consistent with these findings, Wilson and Sober (1994) propose that in teams with a steeper status hierarchy, where each member learns his or her interpersonal position relative to the others, members will adapt their behavior accordingly to minimize personal costs. As such, steeper hierarchies should be negatively related to relationship conflict.

Steeper status hierarchies may also reduce the likelihood of task conflicts in a work team. As status hierarchies become steeper, those at the top do not only exert more influence over team decisions (Bales, Strodtbeck, Mills, & Roseborough, 1951; Berger et al., 1980), they also receive substantially more support, recognition, and compensation for collective team performance than their lower status counterparts (Belliveau, O'Reilly, & Wade, 1996; Van der Vegt, Bunderson, & Oosterhof, 2006). So, in teams with steeper status hierarchies, most lower status members tend to rely on the opinions of the high status members during discussions about substantive task content and goals, thereby reducing the possibility that task conflicts will arise.

Finally, steeper hierarchies may result in less process conflict within a team because a deference order will provide teams with clear guidelines on who should be doing what, how and when (Leavitt, 2005; Magee & Galinsky, 2008; Simpson, Willer, & Ridgeway, 2012). As a result, it is less likely that steeper status hierarchies will elicit frustrations about process exchanges or the scheduling of activities in teams (De Kwaadsteniet & Van Dijk, 2010; Overbeck et al., 2005; Tiedens, Unzueta, & Young, 2007; Scott 1987), thereby decreasing process conflicts.

Notably, abundant empirical evidence suggests that relationship and process conflicts tend to hurt team performance (for a meta-analysis, see De Wit, Greer & Jehn, 2012). The performance effects for task conflict are less clear and less negative (De Church & Marks, 2001; Lovelace, Shapiro, & Weingart, 2001), but all three types of conflict tend to impose stress on team members (Thomas, 1992), evoke negative affect (Jehn & Bendersky, 2003), and lower their team satisfaction (Gladstein, 1984; Wall & Nolan, 1986). Research has shown that these negative responses can inhibit the cognitive functioning of team members (cf. Greer, Caruso, & Jehn, 2011), and can shift their attention away from executing team tasks (Blake & Mouton, 1984; Schwenk & Cosier, 1993). As such, there is reason to suggest that a reduction in all three types of conflict together may operate as an important mediating mechanism that can explain the



relationship between hierarchy steepness and team performance.

### **The Moderating Role of Task Complexity**

The above reasoning signifies the importance of status hierarchy steepness for team performance due to its conflict-reducing potential. Yet, in a literature review, Anderson and Brown (2010) concluded that the answer to the question of whether steeper hierarchies help teams to function better is: “it depends.” (p. 64). Indeed, past studies suggest that the performance effects of status hierarchy steepness may be strongly influenced by the task conditions under which teams operate. This work proposes that for a steeper hierarchy to translate into high team performance, it matters whether a team functions in a stable or changing environment (e.g., He & Huang, 2011; Roby, Nicol, & Farrell, 1963), 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 potential moderating factors can be clustered into one important overarching contingency variable, namely the *complexity* of the team task. Task complexity can be defined as the degree to which a task is unpredictable, high in variability and non-repetitive in nature (Van de Ven et al., 1976; Withey et al., 1983).

We expect the relationship between status hierarchy steepness and intra-team conflict to be weak when teams have to carry out relatively complex tasks. Due to their nature, highly complex tasks are more uncertain, involve fewer pre-defined procedures, and require more information processing than tasks of lower complexity (Campbell, 1988; Daft & Macintosh, 1981; Van de Ven & Ferry, 1979). It is therefore necessary for team members to discuss and debate competing perspectives and to generate innovative ideas in order to reach team objectives (Hirokawa, 1990; Jehn, 1995; Jehn & Bendersky, 2003; Shah & Jehn, 1993). Some scholars argue that under such task conditions, teams will profit more from egalitarian status hierarchies

that allow all members to participate in the development of a collective task strategy (e.g., Anderson & Brown, 2010). Yet other research suggests that in egalitarian teams consisting of many high-status “stars”, members tend to compete with each other and engage in disruptive disputes that impede integrative team decisions (Groysberg, Polzer, & Elfenbein, 2011; see also Ronay et al., 2012).

At the same time, it is also unlikely that teams will profit from steeper status hierarchies under complex task conditions. Although clear guidelines from just a few high status members may reduce task uncertainties and, hence, conflict within those teams, steeper status hierarchies also make it more difficult for the lower status members to demonstrate their knowledge to the team (see Moreland, Argote, & Krishnan, 1996). This marginalization can cause frustrations among these members, and obstruct the integration of different task perspectives (Alexander, Chizhik, Chizhik, & Goodman, 2009; Greer et al., 2014). Taken together, existing literature and empirical evidence suggests that in teams working on complex tasks the conflict benefits and detriments of steeper hierarchies are likely to cancel each other out.

By contrast, we expect a strong negative relationship between status hierarchy steepness and intra-team conflict when teams carry out tasks of lower complexity. In teams working on less complex tasks, it is less important that all members offer a unique task contribution and challenge each other’s perspectives; teams have more straightforward outcome expectations and can execute the task successfully by using standard operating procedures (Gladstein, 1984; Lorsch & Morse, 1974; McDonough & Leifer, 1983; Tushman, 1979). Given that more egalitarian hierarchies offer team members the possibility to participate in decision making, they are likely to stimulate more time-consuming and even hazardous disagreements in teams that execute tasks of low complexity. Under such conditions, individual members are more likely to unnecessarily deviate from standard procedures (Dewar & Werbel, 1979; Jehn, 1995). Steeper status hierarchies

in which only one or a few members control collective decisions are more likely to be advantageous for those teams. Clear directives from high status members can prevent unnecessary task disagreements and procedural delays (see Hill, 1982). Accordingly, it is likely that steeper hierarchies reduce the amount of conflict within teams that execute tasks of lower complexity. Our first hypothesis therefore reads:

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

Proceeding from this first hypothesis, we also suggest that status hierarchy steepness will only be positively related to team performance when teams have to carry out tasks of lower complexity. A series of experimental studies on team network structures demonstrated that clear status differences among team members (on the basis of their network positions) influenced the performance of teams that worked on relatively simple tasks more positively than the performance of teams that worked on complex tasks (e.g., Cohen, Bennis, & Wolkon, 1961; Faucheux & Mackenzie, 1966; Guetzkow & Simon, 1955; Leavitt, 1951; Shaw, 1954). A large field study among 182 work teams replicated this finding (Cummings & Cross, 2003). These findings are consistent with our reasoning that a steeper status hierarchy will only prevent redundant task misinterpretations and time-consuming information processing in teams that carry out tasks of lower complexity (Galbraith, 1977; Gladstein, 1984; Guzzo, 1986). Our second 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.*

The empirical evidence on the relationships between task complexity, hierarchy steepness and team performance is also in line with conflict theory, suggesting that effective conflict regulation is particularly important when teams execute tasks of lower complexity that do not require a critical evaluation or discussion of task strategies and alternative task solutions (De Dreu & Weingart, 2003; Jehn, 1995). Indeed, under this task condition, not only relationship and process conflicts will harm team performance. The potential performance gain of task conflict is also less likely to occur because these teams do not benefit from a synthesis of diverse viewpoints (Hackman, Brousseau, & Weiss, 1976; Jehn, Northcraft, & Neale, 1999). Our final proposition is therefore that the absence of the three types of conflict altogether will explain the positive relationship between hierarchy steepness and team performance for teams carrying out tasks of lower complexity. Those teams should benefit from a steeper status hierarchy because the deference order resulting from a steeper hierarchy will forestall any possible disruptive form of conflict within a team. Given that the impact of steep hierarchies is less clear for teams performing complex tasks, we expect the mediating role of intra-team conflict to be less strong under this task condition. In conclusion, our third hypothesis is:

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

## **METHOD**

### **Sample and Procedures**

To test the above hypotheses, we collected data from 82 Dutch and German organizational ongoing, cross-functional work teams that consisted of a supervisor (i.e., senior-, middle-, or first-line manager) and two or more team members (i.e., these supervisors' direct subordinates). All teams shared common objectives, performed interdependent tasks, and were held accountable

for collective outcomes (Kozlowski & Bell, 2003).

The teams 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, health care, 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.

The 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. The students first introduced the research project to the immediate team supervisors and informed them that participation was voluntary and confidentiality was guaranteed. Once the students established agreement of participation, they distributed separate survey versions among the team members and the team supervisors to minimize concerns over same-source bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The team member survey was distributed during organized meetings so that these members could fill out the surveys in a controlled setting where communication was minimized. In this survey, team members rated one another's status and indicated their perceptions of task complexity and intra-team conflict (i.e. relationship conflict, task conflict, and process conflict). The supervisor survey independently assessed the team's overall performance. All measures were translated to Dutch and German using a double-blind back-translation procedure and all respondents were blind to the objectives of the study.

There were 7 work teams with insufficient participation rates of team members (i.e., less than 50%) and 3 work teams for which no team supervisor responses were available. We

therefore tested our hypotheses using data from 72 work teams in 63 organizations, resulting in 438 team member responses and 72 immediate team supervisor responses. The overall response rate among the participating work teams was 91% and the average within-team response rate was 93%. The final sample primarily constituted Dutch work teams (93%). There was a small German subsample of 5 teams that was relatively similar to the Dutch sample in terms of size, industry, and demographic composition. So, this sample did not contain teams with unique characteristics that could potentially influence the results.

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 ( $SD = 6.55$ ).

## Measures

**Hierarchy steepness.** We examined the effects of status hierarchy steepness with a direct and continuous measure that takes into account that status is a relational construct that exists in the eyes of others (Ravlin & Thomas, 2005; Washington & Zajac, 2005), and that captures the fine-grained differences in hierarchy steepness that may exist in real-life work teams. By means of a peer-rating (i.e., round robin) design, individual team members were asked to evaluate the status of *each of the other* members of their work team on a 7-point scale (1 = *not at all*, 7 = *very much*). Status was defined as the extent to which a person is influential, respected, and prominent in the work team (Anderson et al., 2001). The interrater agreement index  $r_{wg}$  (James, Demaree, & Wolf, 1984) demonstrated that team members generally agreed on the status of their fellow team members, the median  $r_{wg}$  value using a uniform expected variance distribution was .77 ( $SD =$

.20). This finding is consistent with the conceptualization of status as a shared perception of a given team member (Berger et al., 1972). We also computed  $ICC_1$  and  $ICC_2$  values (James, 1982) and conducted one-way analyses of variance to ensure the statistical adequacy of aggregating the ratings for each team member to the individual-level ( $ICC_1 = .27$ ,  $ICC_2 = .70$ ,  $F(479,1988) = 3.31$ ,  $p < .001$ ). Having received support for this aggregation, we averaged the ratings for each member to form an overall measure of their status score within the work team. We subsequently calculated the standard deviation of all individual members' status scores within the same work team (for a similar operationalization, see Greer & Van Kleef, 2010). This procedure results in an appropriate measure of hierarchy steepness when modeling interaction effects (see Roberson, Sturman, & Simons, 2007). Higher values on the standard deviation indicated steeper status hierarchies in work teams.

**Task complexity.** Task complexity was measured with four items adapted from Morgeson and Humphrey's (2006) job complexity scale. Team members had to indicate whether the work in their team; (1) required them to do one task or activity at a time (reverse-coded), (2) was simple and uncomplicated (reverse-coded), (3) comprised relatively uncomplicated tasks (reverse-coded), and (4) involved performing relatively simple tasks (reverse-coded). The items were rated on a response scale from 1 (*strongly disagree*) to 7 (*strongly agree*) and, together, formed a reliable scale (i.e., Cronbach's alpha was .79). Further results warranted statistical adequacy for aggregating individual members' responses to the team-level ( $ICC_1 = .20$ ,  $ICC_2 = .62$ ,  $F(71,366) = 2.62$ ,  $p < .001$ ). The median  $r_{wg(j)}$  value using a uniform expected variance distribution was .87 ( $SD = .24$ ).

**Intra-team conflict.** Intra-team conflict was measured with six items from the intragroup

conflict scale by Jehn (1995) and three additional items from Shah and Jehn (1993)<sup>5</sup>. To assess relationship conflict, team members had to indicate how often there was; (1) emotional conflict, (2) friction, and (3) tension among the members in their work team. To assess task conflict, team members were asked to indicate how often they had; (1) disagreements about the (content of the) work being done (adapted), (2) conflicts about ideas, and (3) differences of opinion regarding the (best solution to the) work being done in their work team (adapted). To assess process conflict, team members had to indicate how often they had disagreements about; (1) who should do what, (2) task responsibilities, and (3) resource allocation in the work team. The items were again rated on a response scale from 1 (*never*) to 7 (*always*), and together, formed a reliable intra-team conflict scale (i.e., Cronbach's alpha was .90). This variable could be aggregated to the team-level as well ( $ICC_1 = .21$ ,  $ICC_2 = .63$ ,  $F(71,358) = 2.72$ ,  $p < .001$ ). The median  $r_{wg(j)}$  value using a uniform expected variance distribution was .95 ( $SD = .06$ ).

**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 the following criteria: productivity, effectiveness, work speed, meeting deadlines, and the continuity of the production process. Past research provides compelling evidence that these criteria are valid indicators of team performance (e.g., Van der Vegt & Bunderson, 2005). The supervisors provided their ratings on a response scale from 1 (*far below average*) to 7 (*far above average*). Cronbach's alpha was .85.

**Control variables.** Past research has shown the necessity to statistically control for the

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<sup>5</sup> Because our data collection took place before the status conflict scale by Bendersky and Hays (2012) became publicly available, it was not possible to include this scale in our analyses.



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)<sup>6</sup>. Given that team size and team tenure have been associated with team performance in past research (e.g., Ancona & Caldwell, 1992; Katz, 1982), we also controlled for these variables in our analyses.

## RESULTS

### Discriminant and Convergent Validity

Prior to testing our hypotheses, we examined the discriminant and convergent validity of the task complexity and intra-team conflict measures. We performed confirmatory factor analyses with the LISREL 8.80 computer package and computed the parameter estimates using the maximum-likelihood method. Our initial analysis included a model in which task complexity and intra-team conflict items loaded on two latent constructs (Model 1). The overall fit of this model to the data was sufficient ( $\chi^2 [64, 430] = 725.79, p < .001$ , the comparative fit index [CFI] = .89, the standardized root-mean-square of the residuals [SRMSR] = .07, and the goodness-of-fit index [GFI] = .79). These results suggest that loadings of all items on their intended constructs were significant at the .001 level or better.

We assessed two alternative models to further evaluate the discriminant validity of our scales. Model 2 tested the fit of a four-factor model in which task complexity items loaded on their corresponding latent construct and the intra-team conflict items loaded on three latent constructs (i.e., relationship, task, and process conflicts). This model showed better fit indices and

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<sup>6</sup> For exploratory reasons, we also measured how adding mean status to our conceptual model as an additional moderator (and hence not as a control variable) would affect our hypothesized relationships. OLS regression analyses revealed that the three-way interactions (status hierarchy steepness x task complexity x mean status) on intra-team conflict and team performance were not significant (lowest  $B = -.07, p = .17$  for the conflict types separately;  $B = -.05, p = .27$  for the general intra-team conflict scale, and  $B = .06, p = .37$  for team performance).

a significantly better fit of the measurement model to the data than Model 1 ( $\Delta\chi^2[5] = 596.66, p < .001, [CFI] = .99, [SRMSR] = .04, \text{ and } [GFI] = .96$ ). Model 3 extended Model 2 one step further and included an overarching second-order factor mapping the three latent constructs of relationship, task, and process conflict. Compared with Model 1, this model yielded superior goodness of fit statistics and a significantly better fit to the data ( $\Delta\chi^2[3] = 597.05, p < .001, [CFI] = .99, [SRMSR] = .04, \text{ and } [GFI] = .96$ ). However, Model 2 and Model 3 did not differ significantly from each other in terms of fit indices and fit to the data ( $\Delta\chi^2[2] = .39, n.s.$ ). Nonetheless, we observed that the inter-factor correlations for the distinctive types of intra-team conflict were quite high; .67 between relationship conflict and task conflict, .62 between task conflict and process conflict, and .72 between relationship conflict and process conflict. For that reason, we decided to test our hypotheses using a composite intra-team conflict scale. The separate results concerning relationship, task, and process conflicts are presented in a supplementary analyses section.

We conducted a separate confirmatory factor analysis for team performance as these ratings were provided by team supervisors. We tested a model in which all five team performance items loaded on a single factor (Model 4), and found that the overall fit to the data and the fit indices were satisfactory ( $\chi^2[5, 72] = 6.16, n.s., [CFI] = .99, [SRMSR] = .04, \text{ and } [GFI] = .97$ ). All factor loadings were found to be significant at the .001 level or better.

### **Descriptive Statistics**

Table 3.1 presents means, standard deviations, and Pearson zero-order correlations for all team-level variables. In line with our expectations, team performance was negatively related to intra-team conflict ( $r = -.36, p < .01$ ). Moreover, hierarchy steepness and task complexity were marginally negatively related ( $r = -.22, p < .10$ ). None of the control variables were significantly related to intra-team conflict and team performance. However, there is convincing reason (see

Harrison & Klein, 2007; Williams & O'Reilly, 1998) and prior evidence (e.g., Bunderson & Boumgarden, 2010; Christie & Barling, 2010; Greer & Van Kleef, 2010) to assume that these compositional variables are relevant and legitimate covariates. We therefore include them in our analyses.

Table 3.1

*Descriptive statistics and Pearson zero-order correlations among the study variables*

Variables	Mean	SD	1	2	3	4	5	6
1. Team size	6.67	2.18						
2. Team tenure	4.81	3.79	.22 <sup>~</sup>					
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 <sup>~</sup>	.31**	-.22 <sup>~</sup>		
6. Intra-team conflict	2.88	0.56	-.11	-.01	-.20 <sup>~</sup>	-.03	.06	
7. Team performance	5.40	0.73	.11	.13	.19	-.02	.18	-.36**

Note. N = 72. <sup>~</sup>  $p < .10$ , \*\*  $p < .01$ .

### Hypotheses Testing

**Analyzing techniques.** We tested our hypotheses at the team level of analysis using moderated ordinary least square (OLS) regression. As recommended by Aiken and West (1991), we standardized all predictor variables, and computed interaction effects by multiplying the respective standardized predictor variables. In a series of analyses, we regressed intra-team conflict and team performance on the control variables, hierarchy steepness, task complexity, and the interaction term of hierarchy steepness and task complexity.

Our mediation hypotheses specified a conditional indirect effects model (Preacher, Rucker, & Hayes, 2007) in which the strength of the indirect relationship between hierarchy steepness and team performance, through intra-team conflict, is contingent on the degree of task complexity. To test these hypotheses, we used an SPSS macro developed by Preacher et al.

(2007) to obtain the bias-corrected and accelerated bootstrap confidence intervals for these effects.

**Main analyses.** Table 3.2 represents the OLS regression results for intra-team conflict and team performance. Consistent with Hypothesis 1, the cross-product of hierarchy steepness and task complexity was indeed positively related to intra-team conflict after the control variables and the main effects had been taken into account ( $B = .13, p < .05$ ). Simple slope analyses (Aiken & West, 1991) confirmed that the relationship between hierarchy steepness and intra-team conflict was significant and negative when task complexity was low (simple slope at  $-1 SD: B = -.19, \beta = -.33, SE = .09, p < .05$ ), but remained non-significant and neutral when task complexity was high (simple slope at  $+1 SD: B = .07, \beta = .12, SE = .09, n.s.$ ). This pattern of results is graphically depicted in Figure 3.2.

Consistent with Hypothesis 2, the coefficient of the cross-product of hierarchy steepness and task complexity predicting team performance was also significant ( $B = -.15, p < .05$ ). The simple slope analyses revealed that the relationship between hierarchy steepness and team performance was positive at low levels of task complexity (simple slope at  $-1 SD: B = .21, \beta = .29, SE = .12, p = .079$ ), but non-significant at high levels of task complexity (simple slope at  $+1 SD: B = -.09, \beta = -.13, SE = .12, n.s.$ ). For a graphical depiction of this finding, see Figure 3.3.

We also found that intra-team conflict was significantly and negatively related to team performance ( $B = -.24, p < .01$ ), offering initial support for our proposition that intra-team conflict could explain the relationship with regard to the interactive effect of hierarchy steepness and task complexity on team performance. The moderated mediation macro of Preacher et al. (2007) further showed that the significant interaction between hierarchy steepness and task complexity on team performance indeed became non-significant when intra-team conflict was inserted as the mediating variable ( $B = -.10, n.s.$ ). Table 3.2 reports the bootstrap confidence

intervals at three values of task complexity. The indirect and positive effect of hierarchy steepness on team performance through intra-team conflict was observed at low levels of task complexity with a bootstrapped 95% confidence interval around the indirect effect not containing zero (.011 to .219). However, the same relationship was not observed at moderate and high levels of task complexity. Together, these results confirm Hypothesis 3.

Table 3.2

*Regression analyses results and conditional indirect relationships*

<i>Predictor</i>	<i>Intra-team conflict</i>		<i>Team performance</i>			
	Model 1		Model 1		Model 2	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
<i>Controls</i>						
Team size	-.09	.07	.07	.09	.04	.09
Team tenure	-.01	.07	.07	.09	.06	.09
Mean status	-.17*	.07	.15	.10	.09	.10
<i>Main Effects</i>						
Hierarchy steepness	-.06	.07	.06	.09	.04	.09
Task complexity	.01	.08	.16	.10	.17	.10
<i>Two-Way Interactions</i>						
Hierarchy steepness *						
Task complexity	.13*	.06	-.15*	.08	-.10	.08
<i>Mediator</i>						
Intra-team conflict					-.22*	.09
$\Delta R^2$	.07		.05		.07	
$R^2$ (Adjusted $R^2$ )	.15 (.08)		.13 (.05)		.21 (.12)	
<i>Conditional indirect relationship</i>						
Moderator Value	95 % Confidence Interval (BCA)					
-1 SD	.011, .219					
<i>M</i>	-.020, .112					
+1 SD	-.139, .034					

*Note.* N = 72. Unstandardized regression coefficients are presented. Bootstrap sample size = 5,000. BCA = Bias Corrected and Accelerated. \*  $p < .05$ .

Figure 3.2 *Interactive relationship of status hierarchy steepness and task complexity with intra-team conflict*

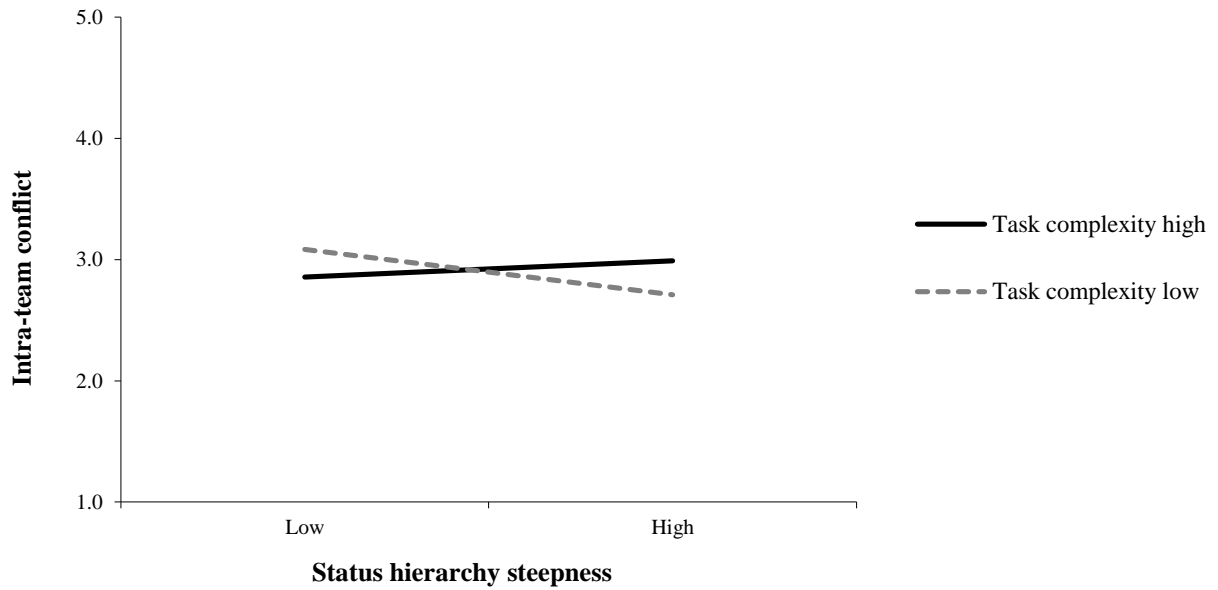
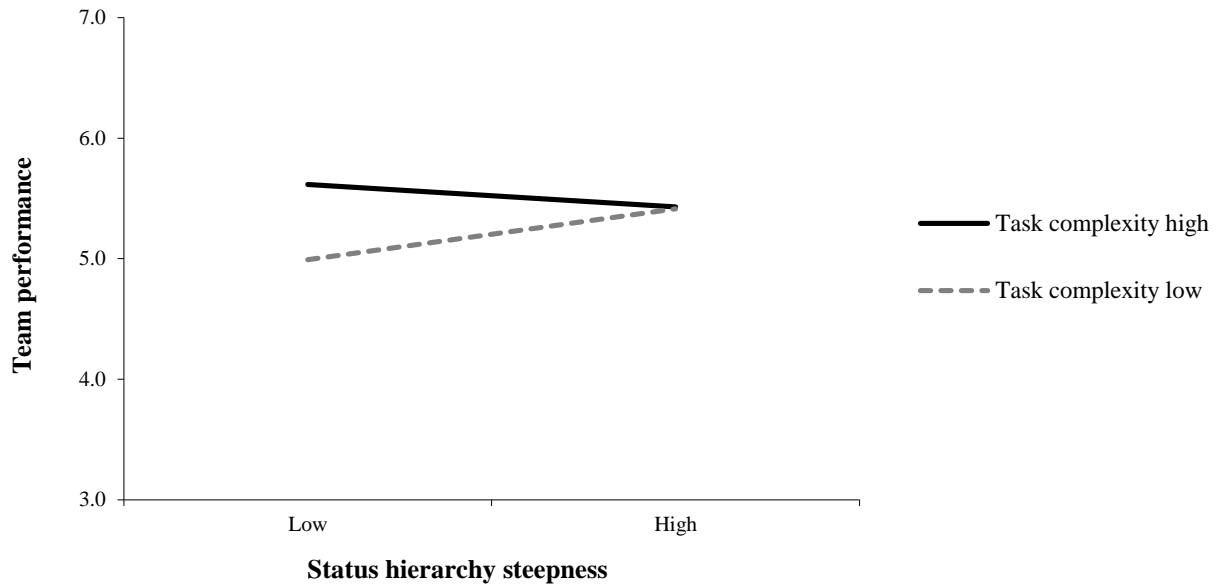


Figure 3.3 *Interactive relationship of status hierarchy steepness and task complexity with team performance*



**Supplementary analyses.** We tested the same hypotheses using the distinctive types of intra-team conflict instead of the composite intra-team conflict construct. The Appendix contains the table presenting the OLS regression and the moderated mediation macro results for relationship, task, and process conflicts separately. Hypothesis 1 was refuted for relationship conflict ( $B = .10, n.s.$ ), but was confirmed for task and process conflicts ( $B = .14, p < .05$  in both cases). These two types of conflict were also significantly and negatively related to team performance ( $B = -.20, p < .05$  and  $B = -.23, p < .01$  for task and process conflicts respectively). Furthermore, the interaction effect of hierarchy steepness and task complexity on team performance dropped to non-significance when we added either task or process conflict to the equation ( $B = -.11, n.s.$  in both cases). Subsequent bootstrap analyses revealed that the indirect and positive effect of hierarchy steepness on team performance through either task conflict or process conflict was observed only at low levels of task complexity with a bootstrapped 95% confidence interval around the indirect effect not containing zero (.003 to .169 for task conflict; .007 to .248 for process conflict). We therefore conclude that our hypotheses are confirmed for task and process conflicts, but not for relationship conflict.

## DISCUSSION

In this paper, we articulated a contingency theory of the relationships between status hierarchy steepness, intra-team conflict, and team performance in organizational settings. Across 72 work teams, we found that status hierarchy steepness was unrelated to conflict and team performance when teams carry out complex tasks. Hierarchy steepness was, however, negatively related to conflict, and hence, positively associated with team performance when teams worked on tasks of lower complexity. Follow-up analyses revealed that hierarchy steepness particularly reduced task and process conflicts under this task condition.

### **Theoretical Implications**

The results of this study have several important implications for status research. First, status hierarchies are ubiquitous in groups and have far-reaching implications for their functioning (Berger et al., 1980). Nevertheless, research examining the role of status differences has been mainly restricted to highly specific group samples (e.g., sports teams, Christie & Barling, 2010; Halevy et al., 2012; or experimental groups, Ronay et al., 2012). In this paper, we provide insight into the team-level effects of hierarchy steepness on the performance of organizational work teams and identify the task conditions under which such effects are most likely to occur.

Second, the findings provide support for a functionalist perspective on the role of status hierarchies in work teams. Researchers had already suggested that steeper hierarchies facilitate team success by reducing destructive conflict among the team members (e.g., Halevy et al., 2011), but our study is the first to show empirically that intra-team conflict is indeed an important mediating mechanism that may explain why steeper status hierarchies in organizational work teams can positively impact performance. At the same time, however, our research clearly demonstrates that these processes only take place in teams performing less complex tasks. Task circumstances thus have a substantial impact on the extent to which teams experience the merits of a steeper status hierarchy.

### **Strengths, Limitations, and Directions for Future Research**

A few important strengths of our study are that we collected team-level data from real-life organizations operating in diverse business sectors. We therefore feel confident that our findings may extend to a broader range of work teams that are characterized by either egalitarian or steeper status hierarchies. We further used different measurement methods to assess our constructs; our independent variable (i.e., status hierarchy steepness) was measured with a round-



robin design, our moderator and mediator (i.e., task complexity and intra-team conflict respectively) were measured by means of a self-report design, and our key dependent measure (i.e., team performance) was measured with independent leader ratings. As such, we could avoid issues of same-source bias (Podsakoff et al., 2003).

Despite the strengths of our study, there are some limitations as well. For example, we acknowledge that it would be important to further examine the causality of the relationships between our study variables in future research, for example, by means of longitudinal designs. Additionally, some scholars have argued that complex tasks consist of different components on the basis of coordination or team dynamics (see Wood, 1986). Although status literature does not suggest unique relationships between hierarchy steepness and team performance for each of these task complexity components, it is possible that the multidimensional nature of complex tasks partially explains why the effects of steeper status hierarchies are less clear under this task condition. A more detailed examination of the different components of the team task may thus provide additional insight into the relationship between status hierarchy steepness and team performance.

Another limitation of our work is that we only examined the mediating role of task, process, and relationship conflicts in explaining the relationship between status hierarchy steepness and work team performance. Just recently, researchers have identified a fourth type of conflict that may be relevant when studying the effects of hierarchy steepness on work teams (i.e., status conflict; Bendersky & Hays, 2012; Groysberg et al., 2011). Status conflicts commonly co-occur and highly correlate with task, process, and relationship conflicts, but particularly cover “disputes over people’s relative status positions in their group’s social hierarchy” (Bendersky & Hays, 2012, p. 323). It can therefore be expected that hierarchy steepness may also reduce this type of conflict when teams execute tasks of lower complexity. It

may be worthwhile to examine the role of status conflict in the relationship between hierarchy steepness and team performance in future research.

Relatedly, future research might integrate measures of conflict *management* into this line of inquiry. 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 toward conflict rather than a destructive approach. As we found that steeper status hierarchies reduce intra-team conflict when teams perform tasks of low complexity, we expect that such constructive strategies may be less relevant under these circumstances. However, the performance effects of hierarchy steepness are rather mixed (or neutral) when teams perform complex tasks. So, under this task condition, it may be valuable to examine whether constructive conflict management strategies mitigate the negative effects and help to accentuate the positive effects of status hierarchy steepness.

In the current investigation, we specifically focused on hierarchy steepness, but we recognize that it is important to also study how other conceptualizations of a status hierarchy relate to team conflict and team performance. For example, Carton and Cummings (2012) recently proposed that the presence of status-based subgroups (i.e., the presence of subsets of team members that are each characterized by a unique degree of interdependence due to having similar status levels) may also have important implications for team functioning (see also Kameda & Sugimori, 1995; Sachdev & Bourhis, 1991). Indeed, it may be that teams with two or more homogeneous status-based subgroups operate quite differently than teams in which there are no status subgroups because the former comprise a clear deference order in status. Interestingly, these scholars also emphasize that the nature of a team's task is likely to be an important moderating factor in explicating how different status-based subgroup configurations

affect team performance. We therefore strongly encourage researchers to examine the role of task complexity in this relationship.

Another important feature of a team's status hierarchy is whether team members perceive the intra-team status distribution to be legitimate and fair (Magee & Galinsky, 2008; Tyler, 2006). It is known that team members who perceive the status hierarchy within their team 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 and feed conflict over higher-status positions (Berger et al., 1998; Walker, Thomas, & Zelditch, 1986). An interesting question is whether teams that carry out tasks of lower complexity will still benefit from a steeper status hierarchy when some of the members perceive this hierarchy to be illegitimate. Future research could therefore also examine how hierarchy steepness and hierarchy legitimacy jointly influence team performance under different task conditions.

### **Conclusion and Practical Implication**

In this paper, we show *when* and *why* status hierarchy steepness conduces to optimal team performance in organizational settings. Based on our findings, we conclude that steeper hierarchies, through their reduction of intra-team conflict, can be beneficial for team performance, but only when teams perform less complex tasks. These findings suggest that managers of teams performing less complex tasks should be aware of their teams' status hierarchies and the consequences for intra-team conflict and performance. Especially in egalitarian teams performing less complex tasks, it may be important to closely monitor interpersonal interactions and manage latent conflicts, thereby mitigating hierarchy's potentially negative effects on team performance.

WHEN AND WHY HIERARCHY STEEPNESS IS RELATED TO TEAM PERFORMANCE

Appendix: Regression analyses results and conditional indirect relationships

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

Note. N = 72. Unstandardized regression coefficients are presented. \*  $p < .05$ . Bootstrap sample size = 5,000. BCA = Bias Corrected and Accelerated. Model 1 for team performance is not included in this table; corresponding results can be seen from Table 3.2.

