Consequences of Hierarchy for Creativity and Innovation in Teams

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Chapter 1: General Introduction

Hierarchy and Creativity in Teams

Creativity and innovation are widely recognized as essential drivers of organizational success, enabling companies to adapt and remain competitive in today's fast-evolving business landscape (Acar et al., 2019; Van Knippenberg, 2017). Given the increasing reliance on teamwork in organizations, both creative and innovative outputs often emerge from the collective efforts of diverse team members pooling their skills and perspectives (Anderson et al., 2014; Hülsheger et al., 2009; Jiang & Chen, 2018). A critical element in determining creative performance is team structures (Monechi et al., 2019; Stewart & Barrick, 2000). Of particular importance in this regard is the team's hierarchical structure—specifically, how socially valued resources, such as power, status, and influence, are distributed among team members (Bunderson et al., 2016; Greer et al., 2018). Hierarchy is a ubiquitous feature in teams, fundamentally shaping not only how individuals interact and make decisions (Anderson & Brown, 2010; Greer et al., 2018) but also influencing the climate for collaboration and creativity (Oedzes et al., 2019; Reitzig, 2022).

Organizational research has generally assumed that stronger hierarchies stifle creativity (e.g., Andriopoulos, 2001), and one study has similarly illustrated negative linkages between team hierarchy strength and collective team creativity (e.g., Oedzes et al., 2019). Nevertheless, several important issues remain unaddressed in this area. First, while numerous studies have examined the role of hierarchy in work teams, most of this research has focused on team performance rather than creativity (e.g., Greer et al., 2018). Much of the existing hierarchy–creativity research focuses on broader organizational contexts (e.g., Di Toma & Ghinoi, 2021; Riivari et al., 2023), leaving a limited understanding of how hierarchical structures shape creativity specifically within teams. Second, the linkage between hierarchy and creativity in teams may be more complex and context-dependent than commonly portrayed, yet prior research has often neglected this complexity. As outlined in the following,

hierarchy is not a singular construct; rather, it involves multiple dimensions that can shape team processes differently (Bunderson et al., 2016). Furthermore, these distinct hierarchy dimensions may interact with various contextual conditions to either foster or inhibit creativity, depending on how hierarchy operates within the team (Wellman et al., 2020). This ambiguity highlights the need for more research to clarify under what conditions, and through what mechanisms, different dimensions of team hierarchy either foster or impede creative processes.

Hierarchy as a Multi-dimensional Phenomenon

To fully understand team hierarchy–creativity relations, we believe it is critical to investigate team hierarchy through a multidimensional lens. Team hierarchy generally reflects member differences in socially valued characteristics, such as power (i.e., control over valued resources), status (i.e., the level of prestige and respect an individual holds), and influence (i.e., the capacity to shape team decisions; Greer, 2014; Magee & Galinsky, 2008; Oedzes et al., 2019). More specifically, hierarchy is a complex, multifaceted construct that encompasses both formal and informal aspects. Formally, hierarchy refers to differences in individuals' official organizational roles and responsibilities; informally, hierarchy manifests in emergent patterns of dominance and deference, where certain team members exert influence or gain respect based on their behaviors, skills, or status within the group (Diefenbach & Sillince, 2011).

Further, scholars have approached hierarchy through different lenses, describing its shape using concepts like centralization (the concentration of decision-making influence among a few members), differentiation (the overall extent of disparity between team members), hierarchical stratification (the number of formal ranks within the team), and steepness (the variance in influence between team members; Bunderson & Van der Vegt, 2018; Wellman et al., 2020). Together, these elements reflect distinct aspects of the overall strength of a team's hierarchy, indicating the degree to which there is a clear rank ordering

among members. An additional important aspect of hierarchy is mutability, describing the extent to which members' relative standing in the hierarchy is fixed or flexible (Gray et al., 2023).

Finally, hierarchy perceptions and their accuracy represent another key aspect, as perceptions reflect members' shared understanding of the team's structure. Recent studies have emphasized the significance of subjective hierarchy perceptions, noting that such perceptions not only encompass formal and informal dimensions but also profoundly shape members' psychological responses and behaviors (Yu & Kilduff, 2020; Yu et al., 2019b). Additionally, the accuracy of these perceptions (i.e., the extent to which an individual member's hierarchy perception aligns with the collective perception within the team; Yu et al., 2023) offers another important dimension of hierarchy to consider.

Team Hierarchy as a Double-edged Sword

It is crucial to note that research has depicted team hierarchy as a double-edged sword that has the potential to both advance and diminish team functioning (Anderson & Brown, 2010; Greer et al., 2018). On the one hand, the functionalist perspective suggests that hierarchies provide teams with clarity on how to coordinate and reduce conflict, which in turn may enhance team performance (Anderson & Brown, 2010; Halevy et al., 2011). This improved coordination includes clear resource allocation and expectations for norms, responsibilities, and behaviors according to each member's position in the hierarchy (Biggart & Hamilton, 1984; Keltner et al., 2008). Moreover, strong hierarchies streamline decision-making by prioritizing the input of key members, enabling teams to make more efficient decisions (Van Vugt et al., 2008). On this basis, one might anticipate that strong hierarchical structures could foster team creativity and innovation by providing a framework that guides roles and interactions within the team.

On the other hand, research adopting the conflict perspective has illustrated potential detriments of team hierarchy. Specifically, scholars argue that larger inequalities within teams

can foster conflicts that detract from performance and diminish overall team effectiveness (Bunderson & Van der Vegt, 2018; Siegel & Hambrick, 2005). Similarly, strong hierarchies often give differential benefits to higher-ranked members, such as privileged access to resources and greater authority, which may be perceived as unfair and illegitimate by lower-ranked members (Friesen et al., 2014; Gruenfeld & Tiedens, 2010). In addition, such hierarchies may suppress contributions from lower-ranked members, hindering knowledge sharing and collaboration, and promoting harmful political behaviors within the group (Berdahl & Martorana, 2006; Eisenhardt & Bourgeois, 1988). On this basis, one may anticipate negative consequences for team creativity and innovation arising from a strong team hierarchy, which may inhibit effective collaboration and communication (Bunderson & Reagans, 2011; De Wit et al., 2012).

Considering these two contrasting perspectives on hierarchy, it becomes essential to explore contingency factors that clarify when hierarchy is likely to benefit or harm team functioning. Based on Greer et al. (2018), factors related to the nature of team tasks, team structure, and the characteristics of the hierarchy itself can moderate the linkage between team hierarchy and performance. For example, hierarchy is expected to be most beneficial when teams engage in tasks that demand high levels of coordination, where members must integrate and align their individual actions, knowledge, and objectives toward common goals (Anderson & Brown, 2010; Halevy et al., 2011). Moreover, structural features of teams that often give rise to conflict, such as skill differentiation and membership instability, may also shape the effects of hierarchy (Greer et al., 2018). In certain team configurations, hierarchical differences can amplify underlying tensions, particularly when group members perceive disparities in resources. These tensions can escalate into conflicts, reducing the overall team effectiveness (De Jong et al., 2016). Finally, another critical contingency factor that determines whether hierarchy strength benefits or harms teams lies in the characteristics of the hierarchy itself, as hierarchies can vary considerably in their foundations and structure, with

certain types of hierarchy being more susceptible to challenges and disputes than others (Greer et al., 2018). For instance, when hierarchies either encourage or permit greater individual upward or downward mobility of the ranks, these environments tend to heighten individuals' focus on self-interest, increasing the chances of hierarchy undermining team performance through power struggles and conflicts (e.g., Bendersky & Hays, 2012; Greer & Van Kleef, 2010; Maner & Mead, 2010).

In the present dissertation, I aim to unravel the ambiguity underlying the team hierarchy–creativity linkage. To do so, I examine the consequences of different team hierarchy dimensions for team creativity and/or innovation across three empirical studies and, as outlined in the following, I investigate a number of distinct mechanisms and boundary conditions underlying these associations.

Overview of the Present Dissertation

In the first study (Chapter 2), I examine the role of team members' collective perceptions of their teams' hierarchical shape for team creativity. A key goal of this study is to scrutinize the common assumption that flatter hierarchies are generally beneficial for creativity. Hence, building on Yu et al. (2019b), I investigate the creativity consequences that arise when members perceive their team's hierarchy as more or less flat, pyramid-shaped (i.e., centralized), and ladder-shapes (i.e., stratified). Moreover, based on the notion that promoting creativity within teams requires deliberate behavior, such as sharing information, exchanging ideas, and collaborating (Men et al., 2019; Unsworth & Clegg, 2010), I cast support for innovation as a key mediating mechanism in the relation between such hierarchy shape perceptions and team creativity. Finally, drawing on sense-making model, which suggests that team members' creative efforts depend on how relevant they perceive creativity to be for the team's success (Ford, 1996; Unsworth et al., 2005), I propose creativity requirements as a key boundary condition for the hierarchy–creativity linkage. Hence, Study 1's overall model suggests a conditional indirect relationship, such that flat hierarchy perceptions only promote

team creativity (through members' support for innovation) under conditions of high, but not under conditions of low creativity requirements. This conceptual model is tested in survey data with a sample of 109 teams in Germany.

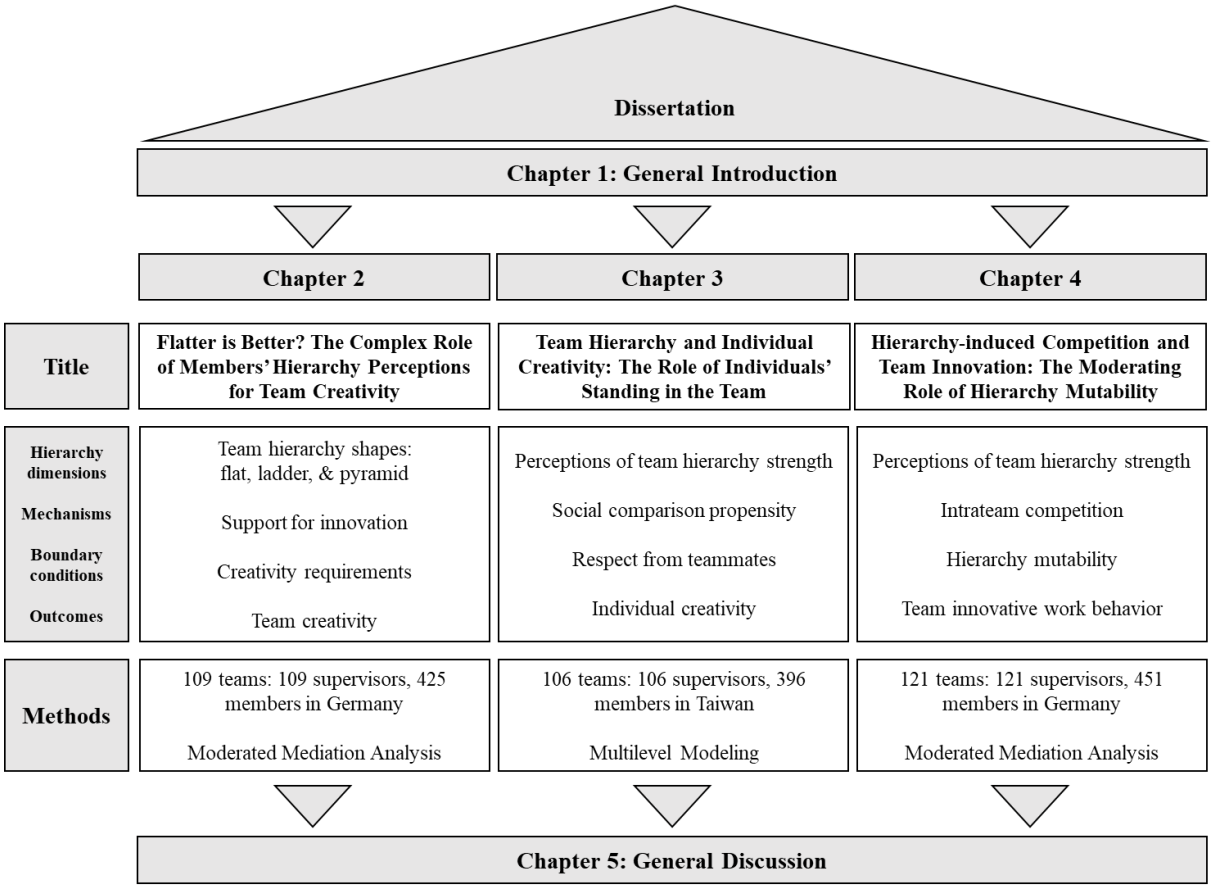
In the second study (Chapter 3), I investigate the creativity consequences of members' overall perceptions of the strength of their team's hierarchy (e.g., Yu & Kliduff, 2020; Yu et al., 2019a). In doing so, I shift the focus from team-level creativity toward individual creativity within teams. Hence, this study emphasizes the role of individual members' standing in the team hierarchy, and it examines the cross-level relationship between members' shared team hierarchy strength perceptions and individual creativity. Building on prior theory and research on hierarchy and creativity (e.g., Keum & See, 2017; Yu et al., 2019b), I propose intrateam social comparison propensity (i.e., members' shared tendency to compare their performance and status within the team; Garcia et al., 2013) as a key mechanism in the linkage between shared hierarchy perceptions and individual creativity. Moreover, I cast individual members' standing within the team hierarchy (i.e., the degree of respect they receive from teammates; Bunderson et al., 2016), as a key boundary condition, such that the effects of within-team social comparison may differ markedly between higher-ranked vs. lower ranked members (Baumeister et al., 2001; Van der Vegt et al., 2006). Consequently, Study 2's overall conceptual model casts an individual's standing in the team hierarchy as a key moderator for the indirect cross-level linkage between members' shared hierarchy strength perceptions and individual creativity, through a team's social comparison propensity. To examine this complex linkage, I collected survey data from 396 individuals across 106 work teams in Taiwan.

In the third study (Chapter 4), I move back to team level, examining the role of teams' overall hierarchy strength for their innovative work behavior. Building on hierarchy and innovation research (Beersma et al., 2003; Greer at al., 2018), this study casts teams' internal competition (i.e., members asserting their own opinions, challenging others' contributions,

and struggling for influence; Hays & Bendersky, 2015) as a key mechanism for the team-level hierarchy-innovation linkage. I also introduce a specific hierarchy dimension that the other two studies have neglected as a crucial contingency factor for the relationship between hierarchy-induced competition and team innovative work behavior, namely hierarchy mutability (i.e., the ease with which members can change their relative standing in the hierarchy; Hays & Bendersky, 2015). Thus, I suggest hierarchy mutability as a critical factor that determines whether internal competition may foster innovation (e.g., by encouraging team members to introduce new ideas that demonstrate their value to the team; Zhao et al., 2016; Zhu et al., 2018) or diminish innovation (e.g., by fostering harmful rivalries between members; Galvin et al., 2020; Loch et al., 2000). Hence, Study 3's overall conceptual model suggests that hierarchy mutability might alter the role of team hierarchy strength for a team's innovative work behavior, through the team's competition. I empirically test this model by using survey data from 121 work teams in Germany.

Taken together, this dissertation aims to contribute to the hierarchy and creativity/innovation literature by considering team hierarchy as a multi-dimensional phenomenon and developing a new, more context-specific view toward the implications of team hierarchy, offering practical insights for organizations looking to optimize team structures for the creativity of work teams and their individual members. Figure 1.1 provides a summary of the overall approach of this dissertation, offering a brief overview of the empirical chapters, their hierarchy perspectives, and methodologies.

Figure 1.1. *Overview of doctoral dissertation.*



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Chapter 2: Flatter is Better? The Complex Role of Members' Hierarchy Perceptions for Team Creativity

Abstract

Hierarchical structures are ubiquitous within teams. Scholars have generally assumed that flatter hierarchies are beneficial for team creativity, but empirical research has rarely tested this notion. Here, we argue that the "flatter is better" assumption is an oversimplification and only applies to teams with strong requirements to be creative. Specifically, the present study links members' perceptions of their team's hierarchical structure with team creativity and investigates key mechanisms and boundary conditions for this association. Results from a sample of 109 teams illustrate a positive indirect relationship between flat hierarchy perceptions and team creativity, through members' support for innovation—but only when members feel that creativity is crucial for their team's goal attainment. When members do not perceive strong team creativity requirements, by contrast, pyramid-shaped (i.e., centralized) hierarchy perceptions are positively related to their support for innovation and, thus, to team creativity. Finally, we do not find clear linkages between members' ladder-shaped (i.e., stratified) hierarchy perceptions and team creativity, regardless of a team's creativity requirements. These results provide new theoretical insights for team hierarchy–creativity research, illustrating that this linkage is more complex and context-dependent than previously believed.

Keywords: Team hierarchy; team creativity; support for innovation; creativity requirements

Creativity is crucial in today's organizations (Acar et al., 2019), and given the widespread use of teamwork, creative output in many cases represents a team's collective effort to introduce novel processes and products (Anderson et al., 2014; Hülsheger et al., 2009; Nijstad & De Dreu, 2012). It is generally assumed that team creativity requires different members' inputs and contributions, such that it can benefit from flat, egalitarian team structures. Indeed, the notion that hierarchical inequality (e.g., in individuals' power, prestige, and influence) stifles creativity is common in both team (Anderson & Brown, 2010; Oedzes et al., 2019) and organizational research (Andriopoulos, 2001; Reitzig, 2022). Similarly, although not directly examining hierarchical structures, the literature on team leadership suggests that members' equal sharing of leadership influence can stimulate a team's creative outputs (Ali et al., 2020). Overall, there seems to be a prevailing consensus, across different areas of research, that "flatter is better" when it comes to the role of hierarchy for collective creativity in general, and team creativity in particular.

We believe this assumption is problematic for at least two reasons. From an empirical perspective, there is hardly any research on the hierarchy–creativity relation in team contexts. As one exception, Oedzes et al. (2019) have illustrated a negative linkage between teams' informal hierarchy strength (defined as the degree of acyclicity in members' dyadic influence relations) and creativity, with supervisors' empowering leadership alleviating these consequences. Crucially, however, we are not aware of empirical studies that have directly tested the common "flatter is better" assumption, examining whether flatter hierarchical team structures (indicating members' relative equality) are indeed conducive to team creativity, whereas more differentiated hierarchical shapes are detrimental. This is a key omission, given the prevalence of hierarchy in teams (e.g., Greer et al., 2018) and the relevance of team creativity to organizations.

Moreover, from a theoretical perspective, the notion that flatter hierarchies promote team creativity likely represents an oversimplification. Flatter team hierarchies may create

opportunities for all members to voice their ideas and support others' creative inputs, rather than limiting such contributions to those at higher hierarchical levels (Anderson & Brown, 2010). It is not self-evident, however, that members will actually use these opportunities. Introducing creative ideas (e.g., new work procedures) challenges the status quo (Janssen et al., 2004), and such behavior is generally more effortful, demanding, and uncertain than resorting to familiar, established courses of action (Ford, 1996). Even members of teams with flat hierarchies may experience little motivation to do so – for example if they are satisfied with the current situation and do not perceive the necessity for change and innovation (Yuan & Woodman, 2010). Consequently, the creativity benefits of flatter team hierarchies may be more complex than the prevailing consensus would suggest, critically hinging on relevant boundary conditions related to members' motivation for providing and/or supporting creative inputs.

The present study addresses these issues. First, we aim to directly test the alleged creativity benefits associated with flatter team hierarchies. In doing so, we build on Yu et al.'s (2019) notion that members' mental representations of their team's hierarchical structure are crucial for team processes and outcomes. Specifically, Yu et al. have shown that lay perceptions of hierarchy often correspond to either of two structural forms that represent distinct types of hierarchical inequality (see also Bunderson & Van der Vegt, 2018). A *ladder* shape reflects hierarchical stratification (which is maximal when each member occupies a distinct vertical rank), whereas a *pyramid* shape reflects centralization (which is maximal when one member is at the top and all others at the bottom). To examine our research question, we extend this perspective by considering a third, *flat* hierarchical shape that explicitly captures the degree of equality in a team's structure and, thus, is maximized when all members are located on the same hierarchical level (akin to a "leaderless team;" Wellman et al., 2020, p. 1000). Hence, we examine the consequences for team creativity that ensue

when members perceive their teams' hierarchical structures as flatter, on the one hand, and as more ladder or pyramid shaped, on the other.[1]

Second, rather than assuming a general superiority of flatter hierarchies for team creativity, we examine distinct mechanisms and boundary conditions in this linkage. Scholars have emphasized that deliberate behavior aimed at promoting creativity is critical to achieving creative outcomes (Unsworth & Clegg, 2010). In team contexts, for example, it is clear that collective creativity requires members' willingness to share information, exchange ideas, and collaboratively support innovation efforts (Men et al., 2019). Hence, if a specific hierarchy shape is to influence team creativity, we believe it is likely through such processes. Combining insights from research on team hierarchy and creativity, in particular, we cast the *support for innovation* available in a team (i.e., the degree to which members expect, approve, and promote the introduction of new approaches and work procedures; Eisenbeiss et al., 2008) as a key mediating mechanism. We anticipate that members' construal of their team's overall hierarchy as relatively flat has the potential to advance their support for innovation in the team (e.g., by encouraging their openness to teammates' creative efforts and sharing of own ideas; Hülsheger et al., 2009). Members' ladder or pyramid shaped hierarchy perceptions, by contrast, may diminish such support (e.g., by creating internal conflicts and competition; Yu et al., 2019) – with crucial consequences for a team's creative outcomes.

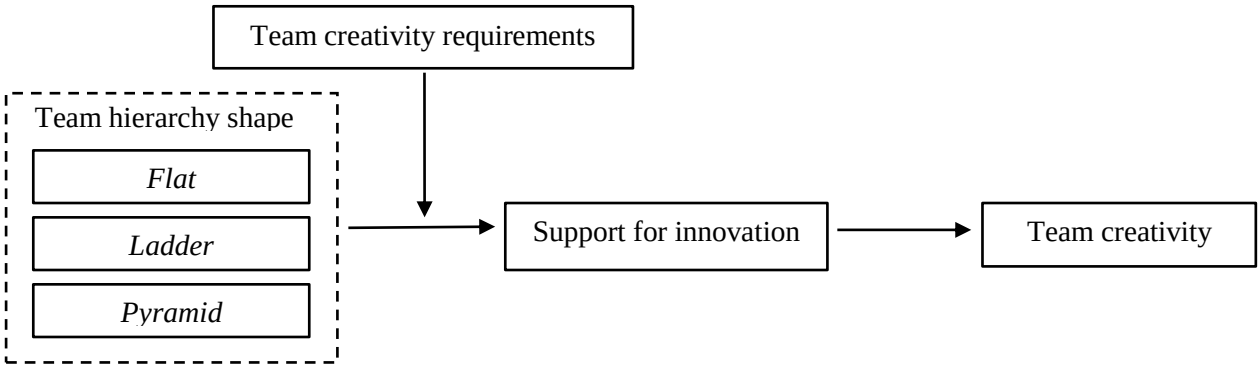
Finally, we emphasize that the role of a team's hierarchical structure for members' innovation support and team creativity is not self-evident. Creativity theory and research suggest that employees' creative efforts critically hinge on their view that such actions will yield favorable outcomes, for example because creativity is relevant for job-related

[1] Importantly, these shapes are theoretically distinct, because they reflect different dimensions of team hierarchy (i.e., stratification vs. centralization vs. equality). Accordingly, Yu et al. (2019) reported correlations between teams' ladder vs. pyramid shaped hierarchies that do not suggest convergent validity (r = -.23 to .60), and they found these variables to yield distinct consequences.

performance (Ford, 1996; Unsworth et al., 2005). On this basis, we cast members' shared perceptions of their team's creativity requirements (see also Unsworth & Clegg, 2010) as an important boundary condition for the consequences of team hierarchy. Members may see little reason to support innovation and promote team creativity, in particular, unless they view such creativity as crucial for their team's goal attainment (Yuan et al., 2022). Hence, we anticipate members' perceived team creativity requirements to enhance the potential benefits of flatter hierarchy perceptions for innovation support (and, thus, team creativity), while buffering the adverse role of ladder and pyramid shaped hierarchy perceptions.

Taken together, we cast creativity requirements as a key contingency factor for the indirect relationship between a team's hierarchical shape and creativity, as transferred by the degree of support for innovation in the team (see Figure 2.1). By examining this model, we aim to make a number of relevant contributions. First, this study directly examines the "flatter is better" assumption that has often been taken for granted (yet rarely tested) in the literature on hierarchy and creativity. Second, we investigate key mechanisms and boundary conditions, illustrating that team hierarchy–creativity linkages are more complex that commonly believed. Flatter (rather than more ladder or pyramid shaped) hierarchies may indeed offer the possibility for superior innovation support and, thus, team creativity. This possibility is only realized however, to the extent that members view creativity as crucial for their team's task accomplishment. Hence, our study shows that flat hierarchical structures are not a panacea; the associated creativity advantages critically hinge on how members perceive their team's task-related requirements.

Figure 2.1. *Research model of Chapter 2.*



Team Hierarchy Shape: Construct and Clarification

Hierarchy is a complex, multi-faceted phenomenon that entails both formal aspects (i.e., differences in individuals' official organizational roles) and informal elements (i.e., emergent patterns of dominance and deference; Diefenbach & Sillince, 2011). Similarly, team hierarchy may reflect member differences along diverse dimensions, including their power (i.e., control over valued resources), status (i.e., prestige and respect in the eyes of others), and influence (i.e., control over team decisions; Greer, 2014; Magee & Galinsky, 2008; Oedzes et al., 2019). Further, scholars have used diverse approaches toward describing the overall shape of a team's hierarchy, for example focusing on teams' hierarchical stratification (e.g., the number of formal ranks), steepness (e.g., influence variance between teammates), or centralization (e.g., the concentration of influence in a few members; Bunderson & Van der Vegt, 2018; Wellman et al., 2020).

In the present investigation, we are interested in members' overall perceptions of their team's hierarchical shape, largely irrespective of their specific origins (e.g., formal vs. informal). Such perceptions denote members' mental representations (or "lay perceptions") of the team hierarchy (Yu et al., 2019, p. 1718). Research has shown that subjective mental representations of the environment critically shape individuals' thoughts, feelings, and actions (Gallistel, 2001). More specifically, Yu et al. (2019) have found members' team hierarchy perceptions to influence intra-team relationships, processes, and team performance.

Building on Yu et al.'s (2019) insights, we examine the creativity consequences that ensue when members perceive their team's hierarchical structure as more or less ladder shaped vs. hierarchy shaped. As Yu et al. have shown, these shapes are representative of the way people commonly think about hierarchy, and they are closely connected to the actual distribution of influence within a team. Moreover, these patterns reflect two crucial, theoretically distinct conceptualizations of hierarchy, with a ladder shape denoting hierarchical stratification and a pyramid shape denoting centralization (Bunderson & Van der Vegt, 2018; Yu et al., 2019). Importantly, Yu et al. have emphasized that it may be fruitful to also "consider other shapes that individuals use to mentally represent hierarchy" (p. 1730). As noted earlier, it is a prevalent assumption that team creativity benefits from flat, egalitarian hierarchies, and prior theory and research have distinguished such egalitarian structures from more unequal (e.g., stratified or centralized) hierarchies (Matusik et al., 2021; Wellman et al., 2020). Consequently, beyond ladder and pyramid shaped hierarchy perceptions, we consider the degree to which members' mental representations of their team's hierarchy corresponds with an explicitly flat, egalitarian structure in which all members share the same hierarchical standing.

Finally, we conceptualize members' mental representations of their team's hierarchy as a collective, team-level construct. Typically, members of the same team operate within a similar social context, frequently interact with each other, encounter similar work-related situations and experiences, and have ample opportunities to observe teammate interactions (Robbins & Judge, 2012; Rousseau et al., 2006). Consequently, it is likely that members develop similar perceptions of the hierarchical relations within their team and, thus, of the overall team's hierarchical structure. Hence, it seems viable to anticipate considerable agreement in members' mental representations of their team's hierarchy shape, and we therefore cast members' respective representations as a shared property of the team as a whole (see also Kozlowski & Klein, 2000).

Hypotheses Development

Team Hierarchy Shapes and Support for Innovation

Support for innovation denotes the degree to which members expect, approve, and promote new approaches and procedures in the team, aiming to facilitate the development and realization of novel ideas (Eisenbeiss et al., 2008). To do so, team members may introduce own creative inputs, provide constructive feedback for others' ideas, and proactively collaborate toward idea elaboration and refinement (Eisenbeiss et al., 2008; Madjar et al., 2002; West & Anderson, 1996). We anticipate that such efforts are more likely occur to the degree that members perceive their team's hierarchy as flatter, whereas ladder and pyramid shaped hierarchies may diminish support for innovation in the team.

Perceptions of a flat hierarchy shape, in particular, may motivate individual team members' creative contributions. In this situation, all members are viewed as having comparable status and power and, thus, as having similar influence over team decisions (Anderson & Brown, 2010). Hence, rather than being able (or forced) to rely on a few higher ranking individuals, members throughout the team share responsibility for joint decision-making (Bergman et al., 2012). In such contexts, team members are more likely to equally contribute to team discussions, to participate in collective decisions, and to exchange their ideas and opinions (Lee & Edmondson, 2017; Locke & Anderson, 2010). In fact, a flat and egalitarian hierarchy may distinctly motivate members' constructive contributions to the team as a whole by granting them with greater autonomy (Ghiselli & Siegel, 1972), fostering their perceptions of fairness (Greenberg, 1987), and strengthening their sense of psychological ownership (Slade Shantz et al., 2020).

Moreover, flat hierarchy perceptions may motivate members to constructively support their teammates' creative inputs and cooperate toward idea refinement. As noted before, members hold comparable resources (e.g., power, status, influence) in such teams, and there is little opportunity for hierarchical advancement (or demotion) at the cost (or benefit) of

other teammates (Greer & Van Kleef, 2010). Consequently, the potential for intra-team conflicts and power struggles is limited in teams with flatter hierarchies, and members are therefore more likely to collaboratively work toward the attainment of shared goals, to assist each other's task accomplishment, and to jointly explore new opportunities (Zhu et al., 2018). In other words, we anticipate that flatter hierarchies will yield a more collaborative team climate (Ali et al., 2021; Xu et al., 2022), increasing the likelihood that members favorably regard each other's inputs, provide constructive feedback, and strive to coordinate their efforts in working on novel ideas. Prior research has shown, accordingly, that flatter hierarchies can stimulate members' feedback provision (Esterhazy, 2018). Hence:

Hypothesis 1a: Members' shared perceptions of a flat team hierarchy are positively related to their support for innovation in the team.

By contrast, we expect perceptions of a ladder shaped team hierarchy to diminish members' support for innovation. Ladder shaped hierarchies are highly stratified, with each member occupying a distinct vertical rank (Yu et al., 2019). This may reduce individuals' creative contributions to the team, particularly among members on lower hierarchical levels. After all, a highly ladder shaped hierarchy clearly demarcates each member's roles and responsibilities, leaving less room for open, egalitarian exchanges between teammates (Cantimur et al., 2016) that could foster individuals' out-of-the-box thinking and stimulate their idea development. Moreover, members on higher ranks control decision-making in teams with a highly stratified hierarchy, whereas lower ranked members are expected to defer to instructions (Anderson & Brown, 2010; Keltner et al., 2003). It is clear that such settings discourage independent, creative thinking among individuals at lower hierarchical ranks and reduce the possibility for these members to speak up and share their knowledge, information, and insights (Islam & Zyphur, 2005).

Furthermore, when members perceive their team's hierarchy as more ladder-like, they are less likely to facilitate each other's creative inputs and aid teammates' idea development.

Each member occupies a well-defined, distinct hierarchical rank in this situation, with higher ranks offering pronounced advantages (e.g., superior status; Bunderson et al., 2016). Hence, it is likely that members at higher levels will strive to retain and defend their superior position, whereas members at lower ranks may compete to climb the hierarchical ladder, at the cost of other teammates' positioning (Greer & Van Kleef, 2010; Hays & Bendersky, 2015). In fact, research has shown that hierarchical conflicts and interpersonal clashes are prevalent in teams with ladder shaped hierarchies, whereas social support and intra-team relationship quality are diminished (Yu et al., 2019). Clearly, members in such conflict-laden, competitive teams are less likely to trust each other, to provide constructive feedback, and to support each other's ideas (Greer et al. 2018; Harbring & Irlenbusch, 2011). Overall, we therefore believe that a strong ladder shaped hierarchy will diminish the cooperative, mutually supportive behaviors that characterize strong support for innovation.

Hypothesis 1b: Members' shared perceptions of a ladder shaped team hierarchy are negatively related to their support for innovation in the team.

Similarly, we anticipate members' pyramid shaped hierarchy perceptions to relate negatively with their support for innovation. Pyramid-shaped hierarchies are highly centralized, with one or a few members occupying the top ranks and all others being located at the bottom (Yu et al., 2019). This may reduce individual members' creative contributions to the team – although these detrimental consequences may be less pronounced than for ladder shaped hierarchies. On the one hand, individuals' hierarchical roles are less clearly demarcated in pyramid (rather than ladder) shaped hierarchies, with the majority of teammates occupying comparable lower level positions (Bunderson et al., 2016). Hence, such hierarchies may grant more opportunities for the cross-fertilization of members' insights, potentially stimulating the development of novel ideas to a greater extent. On the other hand, decision-making within highly centralized hierarchies remains in the control of a few higher ranked members, and lower ranked members are expected to follow these individuals'

directions (Jansen et al., 2006). We believe the resulting dependencies are likely to subdue lower ranked members' creative thinking and to reduce their opportunities to voice their opinions and insights. Accordingly, research has shown centralized team structures to diminish members' open information sharing (Doyle et al., 2023; Hays et al., 2022).

Further, we expect that pyramid shaped hierarchy perceptions will reduce members' cooperative idea elaboration and refinement – although, again, these implications may be less pronounced than for ladder shaped hierarchies. On the one hand, hierarchical differences between members should be less prevalent in more pyramid (rather than ladder) shaped hierarchies, as most members are located on a similarly low rank. As Yu et al. (2019) have shown, this may de-emphasize internal divisions and allow for a more cooperative team atmosphere. On the other hand, pyramid shaped hierarchies denote, by definition, a concentration of valued resources within a few high-ranked team members (Bunderson et al., 2016). Hence, such structures may motivate those at the top to secure their advantageous roles, whereas those at the bottom may compete for the limited number of more favorable positions (Bunderson et al., 2016). Rather than supporting teammates' creative endeavors and collaboratively developing each other's ideas (e.g., by providing helpful feedback), members in teams with a more pyramid shaped hierarchy may therefore exhibit pronounced political behavior (e.g., coalition building, impression management; Eisenhardt & Bourgeois, 1988). Research has shown, accordingly, that centralized structures can increase members' conflicts (Bunderson et al., 2016) and value-claiming behaviors (Doyle et al., 2023). Hence:

Hypothesis 1c: Members' shared perceptions of a pyramid shaped team hierarchy are negatively related to their support for innovation in the team.

The Mediating Role of Support for Innovation

Scholars have argued that creative outcomes critically depend on individuals' deliberate efforts to contribute to the generation and development of novel ideas (Unsworth et al., 2005). In team settings, members' support for innovation may be particularly important in

this regard. As noted earlier, support for innovation entails members' willingness to provide own creative contributions (Anderson & West, 1998) – and it is clear that this is a fundamental prerequisite for the overall team's creative performance. After all, individual members' ideas, insights, and inputs often provide the raw material for new team processes and products (Harvey, 2014). Accordingly, research has illustrated positive relationships between individual members' creativity, on the one hand, and their overall team's creativity, on the other (e.g., Yuan et al., 2022).

Beyond providing own ideas, support for innovation entails members' willingness to encourage teammates' creative inputs, to openly consider others' ideas, and to provide constructive feedback towards idea improvement (West & Sacramento, 2006). Scholars have cast such behaviors as key prerequisites of team creativity, with members' exchanges and integration of diverse ideas enabling superior creative outcomes for the team as a whole (Van Knippenberg, 2017; Van Knippenberg & Hoever, 2021). More specifically, a sizable body of research suggests that team creativity and innovation are more likely to occur if teams encourage, value, and reward members' creative contributions and actively support the development and implementation of new ideas (e.g., Eisenbeiss et al., 2008; Hülsheger et al., 2009; Sung & Choi, 2021). Therefore:

Hypothesis 2: Support for innovation in the team is positively related to team creativity.

The previous rationale suggests linkages between members' shared perceptions of their team's hierarchy shape and support for innovation (H1). Moreover, we have proposed support for innovation to positively relate with team creativity (H2). Combining these arguments, we cast support for innovation as a key mediating mechanism in the indirect team hierarchy–creativity association. Specifically, our reasoning suggests that flat hierarchy perceptions facilitate support for innovation (H1a), whereas ladder shaped (H1b) and pyramid shaped (H1c) hierarchies diminish such support. We accordingly anticipate equivalent

indirect relations between these hierarchy perceptions and team creativity, through support for innovation.

Hypothesis 3: Support for innovation mediates (H3a) the positive indirect relationship between members' shared perceptions of a flat team hierarchy and team creativity, (H3b) the negative indirect relationship between members' shared perceptions of a ladder shaped team hierarchy and team creativity, and (H3c) the negative indirect relationship between members' shared perceptions of a pyramid shaped team hierarchy and team creativity.

The Moderating Role of Team Creativity Requirements

Beyond the main effects proposed in Hypotheses 1a-1c, we cast a team's creativity requirements as a key boundary condition for the linkage between the team's hierarchical shapes and support for innovation. Creativity requirements denote the degree to which individuals feel that creative action is needed to attain high job performance (Unsworth & Clegg, 2010). On the team level, we accordingly define this construct as members' shared perception of the degree to which team task accomplishment requires creative action (as developed, for example, through the team's overall task demands and objectives).

Prior research has positioned creativity requirements as a crucial factor that drives individuals to exhibit creative efforts and initiate innovations (Unsworth & Clegg, 2010). More specifically, the realization that creativity is a necessary part of an employee's job, upon which their performance is assessed, may motivate employees to adjust their job-related goals and felt responsibilities (Ford, 1996). Hence, perceived creativity requirements may induce employees to take charge, develop new ideas, and work towards creative outcomes (Robinson-Morral et al., 2013; Yuan & Woodman, 2010).

On this basis, we anticipate high team creativity requirements to strengthen the positive linkage between members' flat hierarchy perceptions and support for innovation. As outlined before, flat team hierarchies may encourage egalitarian, joint decision-making, thus offering opportunities for creative contributions from all members (Bergman et al., 2012).

Moreover, such hierarchies may facilitate a collaborative, constructive team climate, potentially inducing members to support each other's creative efforts (Ali et al., 2021). Importantly, these opportunities and potentials are most likely to be realized and, thus, to translate into support for innovation when team members perceive pronounced creativity requirements. In this situation, members should feel that their creative insights are valued and that their respective inputs can advance team performance (Shin et al., 2017; Yuan et al., 2022). Hence, they are likely to seize the participation opportunities presented by a flat team hierarchy and to deliberately voice their opinions and ideas. Similarly, high creativity requirements may strengthen members' appreciation of their teammates' creative inputs, as they perceive that the environment demands trying out new (and even potentially risky) approaches to meet work goals (Yuan & Woodman, 2010; Koseoglu et al., 2020). Hence, members may be highly motivated to work with others' ideas, channeling the potentials for cooperation promoted by a flat team hierarchy towards proactive innovation support (e.g., by providing constructive feedback on teammates' ideas).

Conversely, a lack of creativity requirements may attenuate the positive relationship between flat hierarchy perceptions and support for innovation. In this situation, members feel that team performance is unlikely to benefit from their creative inputs, as being highly innovative is not a priority for the team (McKay & Kaufman, 2019; Yuan et al., 2022). Hence, even if a flat hierarchy encourages joint decision-making, members may see little reason to use this opportunity for the introduction of novel, creative ideas. Similarly, despite the collaborative atmosphere that a flat hierarchy may create, a lack of creativity requirements may induce members to perceive limited value in their teammates' creative ideas (Yuan et al., 2022). Under these circumstances, members are less likely to proactively encourage and support each other's creative inputs, even if they perceive a flat hierarchical shape, because they should feel that such efforts provide little advantage. Hence, although a flat hierarchy

may advance a harmonious team climate, this is unlikely to translate into members' support for innovation when team creativity is not essential.

Hypothesis 4a: Team creativity requirements moderate the positive relationship between shared perceptions of a flat team hierarchy and support for innovation in the team. This relationship is stronger when creativity requirements are higher rather than lower.

Additionally, we anticipate creativity requirements to buffer the negative relationships of both ladder and pyramid shaped team hierarchies with members' support for innovation. As discussed earlier, these hierarchy types may limit creative contributions, particularly from lower-ranked team members, by clearly demarcating individuals' responsibilities and concentrating decision-making among those at the top (Cantimur et al., 2016; Wellman et al., 2020). Moreover, both ladder and pyramid shaped hierarchies may disincentivize members' proactive support for their teammates' creative efforts by creating a competitive team climate and aggravating members' interpersonal relationships (Bunderson et al., 2016).

Importantly, these mechanisms are most likely to hold when a team lacks strong creativity requirements. In this situation, new and creative ideas are perceived as largely irrelevant for team performance (Shin et al., 2017) and, thus, members who challenge the status quo through such ideas are likely to find low acceptance. Hence, rather than proposing new work processes or products, members at lower hierarchical levels may stick closely to their core responsibilities under these circumstances. Similarly, members may perceive that there is little to gain by encouraging teammates' creative contributions or aiding others' idea development if team performance does not require pronounced creativity (Koseoglu et al., 2020). Hence, the competitive, strained interpersonal relations fostered by a ladder or pyramid shaped hierarchy should prevail; even if some members come up with creative ideas despite these unfavorable conditions, their teammates are unlikely to assist such efforts through constructive feedback or proactive help.

By contrast, we anticipate that high creativity requirements enable teams to retain relatively high levels of innovation support even if their hierarchical structure is pronouncedly ladder or pyramid shaped. Such structures may induce members to focus on their specified responsibilities and rely on higher-ranked teammates for key decisions (Anderson & Brown, 2010). Crucially, however, even lower ranked members' responsibilities are likely to entail the provision of creative ideas when the team requires such inputs to be successful (i.e., high creativity requirements; Gilson & Shalley, 2004; Unsworth et al., 2005). Hence, even members at lower levels of a ladder or pyramid shaped hierarchy may then find it justified to voice creative suggestions. Under such conditions, they may indeed feel that doing so offers the possibility to make meaningful contributions to the team and, thus, to potentially improve their own hierarchical positioning (e.g., by enhancing their status; Loch et al., 2000). Similarly, pronounced creativity requirements may encourage members to actively support other teammates' creative efforts, despite the otherwise competitive climate that may result from a ladder or pyramid shaped hierarchy. After all, these requirements define creative outputs as a critical, overarching goal for team as a whole (Shalley, 1995). Research has shown that such joint, shared goals may facilitate member cooperation and encourage harmonious within-team relations even in otherwise competitive contexts (Chen & Tjosvold, 2008; Lam et al., 2011), as members realize that a collaborative approach can benefit the overall team. Hence, despite a pronounced ladder or pyramid shaped hierarchy, members of teams with high creativity requirements may be willing to encourage, facilitate, and support their teammates' creative efforts. In sum, we propose:

Hypothesis 4b-c: Team creativity requirements moderate the negative relationships between shared perceptions of a ladder shaped team hierarchy (H4b) as well as a pyramid shaped team hierarchy (H4c) and support for innovation in the team. These relationships are weaker when creativity requirements are higher rather than lower.

Our prior reasoning has positioned support for innovation as a mediating mechanism in the linkages between a team's hierarchical structures and team creativity. Moreover, we have cast creativity requirements as a key boundary condition that enhances the positive role of a flat hierarchy for members' innovation support while buffering the negative roles of ladder and pyramid shaped hierarchies. Combining these propositions, team creativity requirements are likely to also moderate the indirect associations between the different hierarchy shapes and team creativity, via support for innovation. Teams with a flatter hierarchy, in particular, may enjoy greater creativity benefits when also facing higher (rather than lower) creativity requirements, due to members' enhanced innovation support. Moreover, high team creativity requirements may ameliorate the creativity detriments associated with ladder or pyramid shaped hierarchies, facilitating collaborative and supportive member interactions despite these otherwise unfavorable conditions. We therefore propose the following condition indirect effects hypotheses:

Hypothesis 5: Team creativity requirements moderate the indirect relationships between members' team hierarchy perceptions and team creativity, through support for innovation. Specifically, higher (rather than lower) creativity requirements strengthen the positive indirect relationship between flat hierarchy perceptions and team creativity (H5a) and weaken the negative indirect relationships between ladder shaped (H5b) as well as pyramid shaped (H5c) hierarchy perceptions and team creativity.

Method

Procedure and Sample

We collected online survey data from team members and their direct supervisors from various organizations in Germany. We approached the potential participants through personal and university contact (for similar procedures, see Bunderson et al., 2016). Participants received an invitation email from the researchers, providing a link to their respective survey and offering general study information (without revealing the hypotheses). We matched

supervisor and member responses within teams through unique team codes. The invitation email emphasized that participation was voluntary and that the data was treated confidentially. To ameliorate common source concerns (Podsakoff et al., 2012), team members reported their perceptions of their team's hierarchical shapes, support for innovation, and creativity requirements, whereas supervisors' assessed their team's creativity (see also Farh et al., 2010; Gong et al., 2013).

The initial data set contained 136 supervisors and 488 team members. We excluded 15 supervisors and 32 members due to missing or incorrect team codes and/or excessive missing data. Moreover, final sample inclusion required that (a) a supervisor's data could be matched with at least two members (to enable meaningful aggregation of the member data to the team level; e.g., Jia et al., 2014) and (b) these members had worked in their current team for at least one month (so they could provide meaningful information about the team). On this basis, we excluded 12 additional supervisors and 31 members. Hence, the final sample included 109 teams (with 109 supervisors and 425 members), for a usable response rate of 80.1% among supervisors and 87.1% among members. Each team had 3.9 member responses on average (ranging from 2 to 12). 41.7% of the teams came from the service sector, 18.5% from finance, 15.7% from health care, 8.3% from manufacturing, 7.4% from public services, and 4.6% from sales.[2] Of the supervisors in our sample, 68.8% were male, with an average age of 46.1 years (SD = 10.59) and average organizational tenure of 12.4 years (SD = 9.24). Of the team members, 55.5% were female, with an average age of 37.0 years (SD = 11.85), average organizational tenure of 7.5 years (SD = 7.84), and average team tenure 3.4 years.

Measures

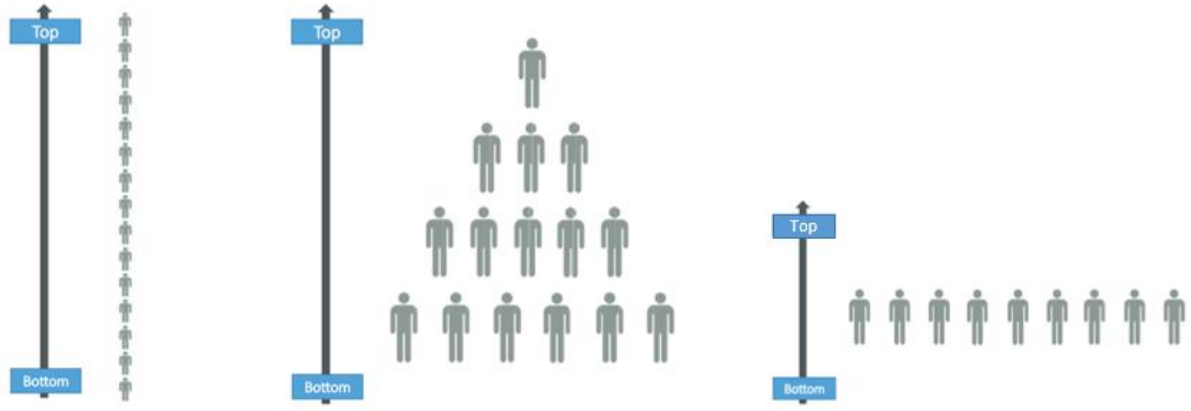
[2] One-way ANOVAs did not indicate significant between-industry differences in either of the present outcome variables (i.e., innovation support and team creativity; both $p > .79$). Similarly, we did not observe significant industry effects on either of the present predictor variables (all $p > .36$), with the exception of flat hierarchy perceptions ($p = .04$).

We followed a back-translation procedure to transfer all items from English to German. Unless otherwise noted, all variables were assessed on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Perceived team hierarchy shapes

We used the measures developed by Yu et al. (2019) to assess the degree to which members perceived their team's hierarchy as having a *ladder* or *pyramid* shape. For each of these shapes, members were presented with a graphical illustration of the respective hierarchical structure. They were then asked to indicate how similar the respective structure was to their own team's hierarchical shape, on a scale from 1 (not at all similar) to 7 (very similar). Moreover, we extended this instrument to also assess the degree to which members perceived their team's hierarchy as having a *flat* shape, using the same measurement approach. The respective illustrations for all three measures are depicted in Figure 2.2.

Figure 2.2. *Illustrations of ladder-shaped, pyramid-shaped and flat hierarchies.*



Before aggregating these variables to the team level, we calculated both interrater agreement statistics (r_{wg}) and intraclass correlation coefficients (ICC; Bliese, 2000). For the ladder shape, we obtained high interrater agreement within teams (median r_{wg} = .88, using a uniform reference distribution), although the respective intraclass correlations were relatively

low (ICC1 = .04, p = .14; ICC2 = .15). Moreover, we found moderate interrater agreement for the pyramid and flat hierarchy shapes (median r_{wg} = .50 for both variables; see LeBreton & Senter, 2008), while the intraclass correlations for these variables were substantive (pyramid: ICC1 = .15, p < .01; ICC2 = .42; flat: ICC1 = .20, p < .01; ICC2 = .50). Clearly, some of these statistics are lower than desirable. Importantly, however, small average group sizes (as in the present sample) can attenuate both r_{wg} and ICC2 estimates (Bliese, 1998). Moreover, scholars have argued that interrater agreement needs to be interpreted within the context of the specific constructs under examination (LeBreton & Senter, 2008). In this regard, research has illustrated considerable variance between individual members' team hierarchy perceptions (Kilduff et al., 2016; Yu & Kilduff, 2020), such that low-to-moderate within-team agreement is to be expected. On this basis, we believe the overall pattern of aggregation statistics justifies averaging individual members' ratings into overall team scores for flat, ladder, and pyramid hierarchy shapes. As outlined below, we nevertheless considered within-team dispersion effects as a possible source of bias, and we incorporated such effects in our robustness checks.

Support for innovation

We used Anderson and West's (1998) eight-item measure to assess a team's support for innovation (α = .92). Example items are "My team is open and responsive to change," and "Members in my team cooperate in order to help develop and apply new ideas." Interrater agreement (median $r_{wg(j)}$ = .94) and intraclass correlation statistics (ICC1 = .36, p < .01; ICC2 = .68) justified averaging multiple members' responses to the team level.

Creativity requirements

Members rated four items from Morgeson and Humphrey (2006) to assess their team's creativity requirements (α = .84). A sample item is "The job of my team requires unique ideas or solutions to problems," and "The job of my team involves solving problems that have no obvious correct answers." Both interrater agreement (median $r_{wg(j)}$ = .89) and intraclass

correlations (ICC1 = .30, $p < .01$; ICC2 = .62) supported the team-level aggregation of individual members' ratings.

Team creativity

Supervisors rated their team's creativity using a 13-item measure from Zhou and George (2001). We slightly adapted these items to refer to team (rather than individual) creativity. Sample items are "My team comes up with new and practical ideas to improve performance," and "My team is a good source of creative ideas." Cronbach's alpha was .95.

Control variables

We controlled for members' *average education* within teams because this factor may have substantive implications for team creativity (e.g., Hirst et al., 2009). Individual members' education level was assessed on a 6-point scale (from basic vocational education to doctoral degree), and we averaged this variable to the team level. Besides, we controlled for *team size* (i.e., overall number of members) as a critical factor known to influence team processes and outcomes (e.g., Staats et al., 2012; Sung & Choi, 2021). Moreover, as noted before, we aimed to account for potential *dispersion effects* with regard to individual members' hierarchy perceptions. Consistent with prior research (Briker et al., 2020; Homan et al., 2008), we therefore included the within-team standard deviation of members' flat, ladder, and pyramid hierarchy perceptions as possible covariates. Finally, to examine our findings' robustness, we followed common methodological recommendations and examined the hypotheses both with and without the controls (Becker, 2005).

Data Analysis

We used team-level (moderated) hierarchical regression analyses to test the main and moderation effects postulated in Hypotheses 1, 2, and 4 (Cohen et al., 2014). Moreover, we used recommended bootstrap procedures (e.g., Preacher et al., 2007) to the test the (moderated) mediation predictions in Hypotheses 3 and 5. These latter analyses employed the

PROCESS macro in SPSS 26, using 5000 bootstrap resamples (Hayes, 2013). We standardized all predictors prior to the analyses.

Results

Descriptive Statistics and Correlations

Table 2.1 presents means, standard deviations, and bivariate correlations. Consistent with the notion that ladder-shaped and pyramid-shaped hierarchies both reflect distinct forms of within-team inequality (i.e., stratification vs. centralization; Yu et al., 2019), we observed a moderate positive correlation between these variables (r = .25, p = .009). With flat hierarchies representing within-team equality (Hays et al., 2022), by contrast, this variable was negatively correlated with both ladder-shaped (r = -.22, p = .021) and pyramid-shaped hierarchy perceptions (r = -.74, p < .001).

Further, as expected, support for innovation was positively related with team members' flat hierarchy perceptions (r = .26, p = .007), yet negatively related with perceptions of a ladder-shaped hierarchy (r = -.22, p = .023). Perceptions of a pyramid-shaped team hierarchy, by contrast, were not significantly correlated with support for innovation (r = -.09, p = .355). Finally, consistent with expectations, support for innovation and team creativity were positively associated (r = .30, p = .002).

Corroborating the relevance of the respective control variables, team size was negatively correlated with team creativity (r = -.19, p = .044), and members' average education was significantly related with both support for innovation (r = .35, p < .001) and team creativity (r = .41, p < .001). By contrast, none of the within-team standard deviations of members' hierarchy perceptions were significantly correlated with either support for innovation or team creativity. Following Becker's (2005) recommendations regarding such "impotent" controls (p. 285), we therefore did not include these variables in our main analyses to avoid power problems and biased parameter estimates. For completeness, however, we conducted supplementary analyses that also included these covariates.

Table 2.1.
Descriptive statistics and correlations of Chapter 2 variables

Variables	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11
1. Perceptions of flat hierarchy (mean)	4.26	1.30	-										
2. Perceptions of ladder-shaped hierarchy (mean)	1.79	0.64	-.22*	-									
3. Perceptions of pyramid-shaped hierarchy (mean)	4.19	1.15	-.74**	.25**	-								
4. Support for innovation	3.40	0.62	.26**	-.22*	-.09	(.92)							
5. Creativity requirements	3.36	0.68	.23*	-.18	-.08	.66**	(.84)						
6. Team creativity	3.52	0.73	.07	-.04	.05	.30**	.24*	(.95)					
7. Team size	7.44	5.42	.18	-.18	-.04	-.07	-.02	-.19*	-				
8. Average education	3.57	0.97	.27**	-.19*	-.11	.35**	.47**	.41**	.06	-			
9. Perceptions of flat hierarchy (SD)	1.42	0.78	-.41**	.14	.35**	-.10	-.07	.05	.09	-.08	-		
10. Perceptions of ladder-shaped hierarchy (SD)	0.84	0.67	-.07	.71**	.08	-.11	-.01	.01	-.07	-.13	.12	-	
11. Perceptions of pyramid-shaped hierarchy (SD)	4.43	0.73	.07	.10	-.02	.05	.08	.02	.21*	.03	.47**	.34**	-

Note. Unit of analysis is team (N = 109). Cronbach's alpha in parentheses.
* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Hypotheses Tests

Hierarchy perceptions and support for innovation

Hypothesis 1 posited relationships between members' hierarchy perceptions and support for innovation. The respective findings are depicted in Table 2.2 (Model 1). Supporting Hypothesis 1a, flat hierarchy perceptions were positively related with support for innovation (b = .19, SE = .08, p = .024). As shown in the Appendix (Table A2.1), this relationship remained statistically significant when excluding all controls.

For Hypothesis 1b, there was a marginally significant, negative relationship between ladder shaped hierarchy perceptions and support for innovation (b = -.11, SE = .06, p = .077). Consistent with the significant bivariate correlation, this relationship reached conventional significance levels when omitting the controls (b = -.12, SE = .06, p = .046; see Table A2.1 in the Appendix). Hence, although these results should be regarded with caution, there is preliminary support for Hypothesis 1b.

Finally, regarding Hypothesis 1c, pyramid shaped hierarchy perceptions were not significantly related with support for innovation (i.e., b = .13, SE = .08, p = .120; see Table 2.2), although this relationship was marginally significant when excluding the controls (b = .16, SE = .09, p = .066; see Table A2.1 in the Appendix). Notably, this marginally positive (rather than negative) association contradicts our expectations. Hence, Hypothesis 1c is rejected.

Support for innovation and team creativity

Hypothesis 2 suggested that support for innovation is positively related with team creativity. Indeed, this relationship was significant both in our main analyses (b = .14, SE = .07, p = .050; Table 2.2, Model 6) and when excluding the controls (b = .22, SE = .07, p = .003). Thus, Hypothesis 2 was supported.

Table 2.2.
Regression results on support for innovation and team creativity (with control variables: team size and average education)

	Support for innovation										Team creativity	
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Variables	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Constant	3.39***	.06	3.36***	.04	3.39***	.05	3.38***	.04	3.36***	.05	3.53***	.06
Perceptions of flat hierarchy	.19*	.08	.10	.07	.12	.07	.12	.07	.10	.07	-.01	.10
Perceptions of ladder-shaped hierarchy	-.11	.06	-.08	.05	-.07	.05	-.07	.05	-.08	.05	.02	.07
Perceptions of pyramid-shaped hierarchy	.13	.08	.07	.07	.08	.07	.08	.07	.07	.07	.06	.10
Creativity requirements (CR)			.36***	.05	.37***	.05	.35***	.05	.36***	.05		
Flat hierarchy * CR			.15**	.05					.15*	.07		
Ladder-shaped hierarchy *CR					-.02	.04			-.002	.05		
Pyramid-shaped hierarchy * CR							-.12*	.05	.004	.08		
Support for innovation											.14*	.07
Control variables												
Team size	-.05	.06	-.04	.04	-.05	.05	-.04	.05	-.04	.04	-.11	.07
Average education	.16	.06	.03	.05	.01	.05	.02	.05	.03	.05	.25***	.07
R^2	.20		.52		.47		.50		.52		.23	
Adjusted R^2	.16		.49		.43		.46		.48		.18	
F	5.06***		15.49***		12.66***		14.13***		11.81***		5.01***	
ΔR^2 (compared with Model 1)			.32***		.27***		.30***		.32***			

Note. N = 109. Unstandardized coefficients are reported.
* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Indirect relationships

Hypothesis 3 proposed that support for innovation mediates the relationships between members' hierarchy perceptions and team creativity. Considering Hypothesis 3a, the confidence interval for the positive indirect relation between flat hierarchy perceptions and team creativity included zero in our main analyses (*indirect effect* = .04, 95% CI = [-.005, .127]), but it did not include zero when omitting the controls (*indirect effect* = .08, 95% CI = [.014, .192]). Hence, despite some ambiguity, there is preliminary support for Hypothesis 3a.

Regarding Hypothesis 3b, the confidence interval for the negative indirect linkage between ladder shaped hierarchy perceptions and team creativity contained zero both in our main analyses (*indirect effect* = -.02, 95% CI = [-.076, .003]) and when excluding the controls (*indirect effect* = -.04, 95% CI = [-.110, -.001]). Despite a trend in the predicted direction, we therefore conclude that there is no clear support for Hypothesis 3b.

Finally, considering Hypothesis 3c, the confidence interval for the indirect relationship between pyramid shaped hierarchy perceptions and team creativity did not include zero in our main analysis (*b* = .03, 95% CI = [-.004, .086]), although it included zero when omitting the controls (*b* = .05, 95% CI = [.003, .131]). In either case, the point estimate for the respective indirect effect was positive, rather than negative, refuting Hypothesis 3c.

The moderating role of creativity requirements

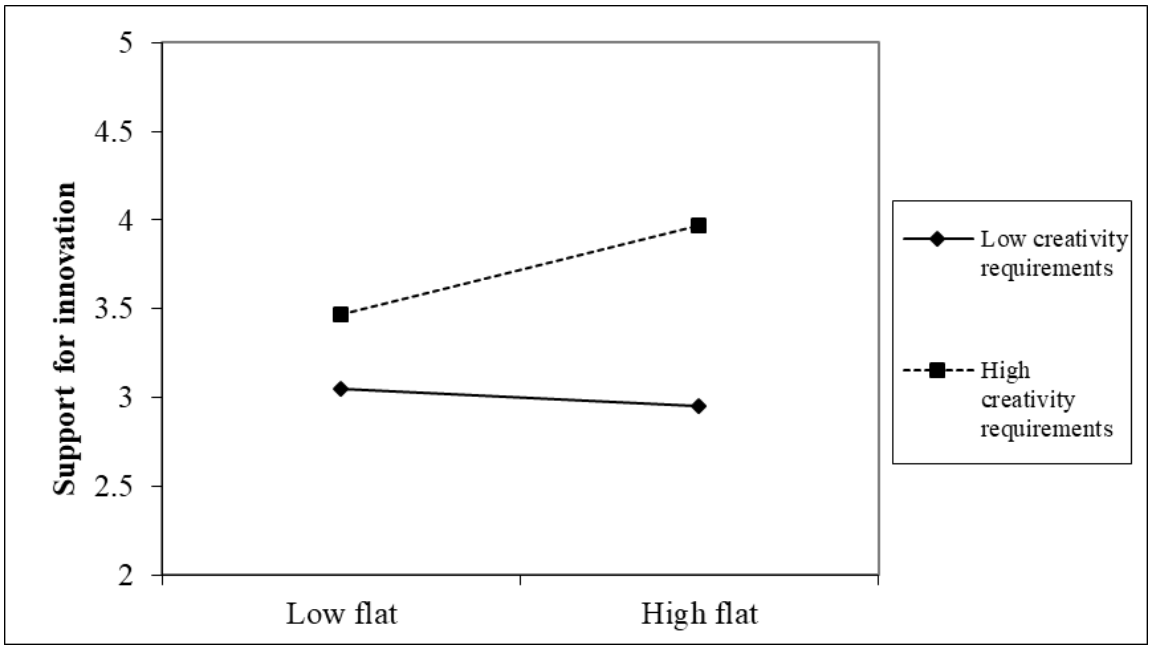
Hypothesis 4 suggested creativity requirements to moderate the relationships between the three hierarchy perceptions and support for innovation. We again tested these predictions both with (Table 2.2) and without controls (Table A2.1 in the Appendix), which yielded largely equivalent results. Hence, we only report results with controls in the following. Moreover, we first tested each of the three interaction coefficients in a separate equation

(Table 2.2, Models 2-4) before including all three coefficients in one common analysis (Table 2.2, Models 5).

Regarding Hypothesis 4a, the interaction coefficient for flat hierarchy perceptions and creativity requirements was significantly associated with support for innovation (Table 2.2, Model 2: b = .15, SE = .05, p = .002; see also Model 5). Simple slopes analyses, shown in Figure 2.3, illustrated that flat hierarchy perceptions were positively related with support for innovation when members perceived high creativity requirements (+1 SD: b = .25, SE = .08, p = .002). This relation was non-significant when members perceived lower creativity requirements (-1 SD: b = -.05, SE = .09, p = .545). Thus, Hypothesis 4a was supported.

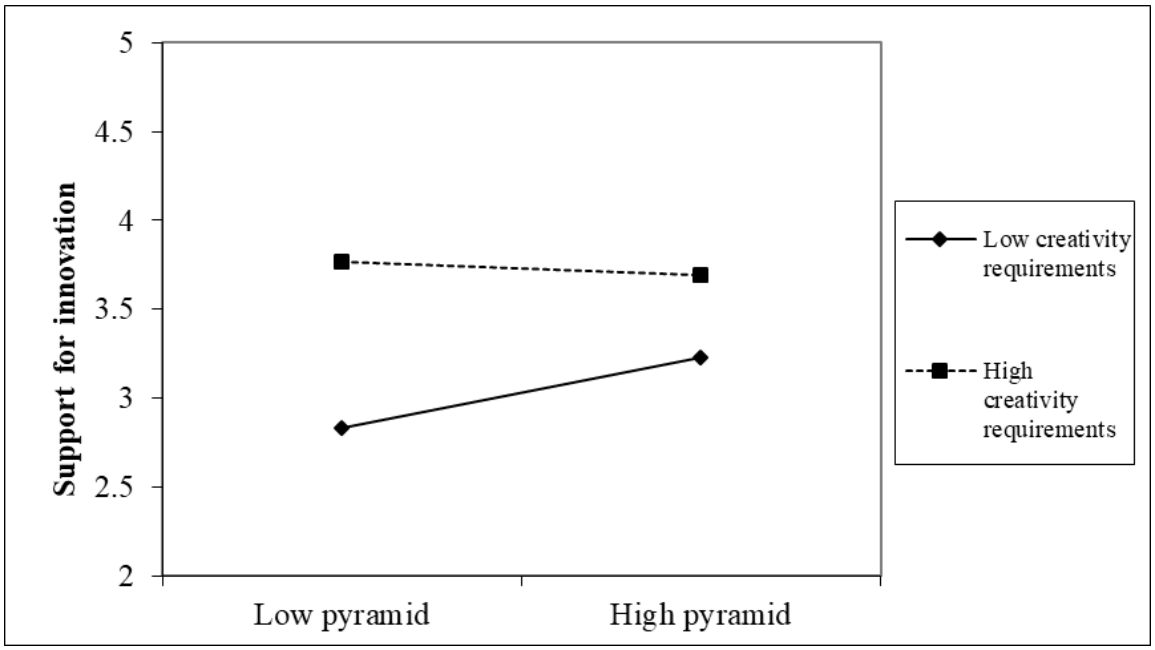
Refuting Hypothesis 4b, by contrast, the interaction coefficient of ladder shaped hierarchy perceptions and creativity requirements was not significantly related with support for innovation (Table 2.2, Model 3: b = -.02, SE = .04, p = .691; see also Model 5).

Figure 2.3. *Interactive relationship of flat hierarchy perceptions and creativity requirements with innovation support.*



Finally, we found a complex pattern for Hypothesis 4c. When separately analyzing the respective interaction, creativity requirements moderated the link between pyramid shaped hierarchy perceptions and support for innovation (Table 2.2, Model 4: b = -.12, SE = .05, p = .020). As shown in Figure 2.4, this interaction pattern was not consistent with expectations. Pyramid shaped hierarchy perceptions were positively related with support for innovation when team members perceived low creativity requirements (-1 SD: b = .19, SE = .08, p = .020), but not when members perceived higher creativity requirements (+1 SD: b = -.04, SE = .08, p = .660). Moreover, the respective interaction coefficient was not significantly related with support for innovation when simultaneously including the other two interaction terms (Table 2.2, Model 5: b = .004, SE = .08, p = .953). Overall, Hypothesis 4c was not supported.

Figure 2.4. *Interaction of pyramid-shaped hierarchy perceptions and creativity requirements with innovation support.*



Conditional indirect relationships

Hypothesis 5 suggested that creativity requirements moderate the indirect relationships between members' hierarchy perceptions and team creativity, through support

for innovation. Again, analyses with and without controls yielded largely equivalent results, and we therefore report results with controls in the following (based on the results reported in Models 2-4 and 6 in Table 2.2).

As predicted in Hypothesis 5a, the indirect relationship between flat hierarchy perceptions and team creativity, via support for innovation, was contingent on a team's creativity requirements (*index of moderated mediation* = .03, 95% CI = [.003, .080]). This indirect relation was significant when creativity requirements were higher (+1 *SD*: *indirect effect* = .06, 95% CI = [.005, .150]), but not when such requirements were lower (*indirect effect* = -.01, 95% CI = [-.061, .041]). Hence, Hypothesis 5a was supported.

Refuting Hypothesis 5b, by contrast, creativity requirements did not moderate the indirect relation between ladder shaped hierarchy perceptions and team creativity, through support for innovation (*index of moderated mediation* = -.004, 95% CI = [-.036, .017]). Finally, for Hypothesis 5c, creativity requirements moderated the indirect relationship between pyramid shaped hierarchy perceptions and team creativity, through support for innovation *(index of moderated mediation* = -.03, 95% CI = [-.070, -.001]. The pattern of this conditional indirect relation, however, was not as expected. The indirect relationship was significant when creativity requirements were lower (-1 *SD*: *indirect effect* = .04, 95% CI = [.001, .124]), but not when such requirements were higher (+1 *SD*: *indirect effect* = -.01, 95% CI = [-.054, .027]). Hence, Hypothesis 5c was rejected. We will return to the unexpected pattern of findings for pyramid-shaped hierarchy perceptions in the Discussion.

Robustness Checks: Controlling for Within-team Dispersion

We further examined our findings' robustness by also controlling for the within-team standard deviations of members' hierarchy perceptions (in addition to average education and team size, as reported before). These results are depicted in the Appendix. Notably, although the main effect relationships between hierarchy perceptions and support for innovation were

weaker in the supplementary analyses (Table A2.2, Model 1), the moderating role of creativity requirements in these relationships remained virtually identical (Table A2.2, Models 2-5). Similarly, although the linkage between support for innovation and team creativity became marginally significant (Table A2.2, Model 6) and, thus, the confidence intervals for the indirect linkages of hierarchy, innovation support and team creativity just contained zero, the overall pattern of conditional indirect relations remained unchanged. Akin to our main findings, creativity requirements continued to moderate the indirect relationships between both flat and pyramid-shaped (but not ladder-shaped) hierarchy perceptions and team creativity, through innovation support. Overall, we therefore conclude that controlling for possible dispersion effects did not meaningfully alter our substantive conclusions.

Discussion

This study illustrated a conditional indirect relationship between members' flat hierarchy perceptions and team creativity, through members' support for innovation in the team. Crucially, however, these creativity benefits of a flatter hierarchy only materialized if members felt that creative action was crucial for their team's task accomplishment. By contrast, there was no clear-cut linkage between ladder shaped hierarchy perceptions and team creativity, irrespective of a team's creativity requirements, despite some evidence for a negative relation between such hierarchy perceptions and members' innovation support. Finally, we unexpectedly found that members' pyramid shaped hierarchy perceptions were positively related with support for innovation and, thus, with team creativity if members perceived lower (but not higher) creativity requirements. Overall, these findings make important contributions to our theoretical understanding of team hierarchy–creativity relations.

Theoretical Implications

In trying to understand the origins of team creativity, various scholars have

emphasized the potential relevance of members' hierarchical relations (e.g., Anderson & Brown, 2010; Greer, 2014). Moreover, the literature on the creativity consequences associated with hierarchical structures in teams and organizations has often taken for granted the assumption that flatter hierarchies will benefit creative outcomes (e.g., Anderson & Brown, 2010; Andriopoulos, 2001; Reitzig, 2022). Notably, however, empirical research has rarely investigated the role of team hierarchy for team creativity (for an exception, see Oedzes et al., 2019). Hence, the viability of this assumption for explicating teams' creative performance remains unclear. The present study addresses this important omission, offering new empirical insights into the linkage between a team's hierarchical structure, on the one hand, and its creativity, on the other. In doing so, we move beyond a "black box" approach, highlighting key explanatory mechanisms and boundary conditions to scrutinize common assumptions and, thus, to advance our theoretical understanding of *why* and *when* a team's hierarchical shape may enhance or diminish its creativity. Our results show that a "flatter is better" perspective represents an oversimplification, illustrating that team hierarchy–creativity relations are more complex than prior theory and research would suggest.

Specifically, although our findings show that flat hierarchy perceptions offer the potential for superior team creativity, it is not self-evident that teams will actually utilize this potential. Such hierarchies may create opportunities for members' inputs and advance a collaborative team climate (e.g., Ali et al., 2021). Importantly, however, members are unlikely to build on these opportunities by proactively supporting innovation processes, unless they feel that creativity is critical for team task accomplishment. Hence, flatter hierarchies *can* promote team creativity (by stimulating innovation support)—but these benefits hinge on a team's task-related context. Our results highlight members' perceived team creativity requirements are a crucial, heretofore unexplored boundary condition for the creativity benefits of flatter team hierarchies.

Moreover, our findings for ladder and pyramid shaped hierarchy perceptions suggest that steeper (i.e., more stratified or centralized) hierarchies may be less harmful for team creativity than previously anticipated. Although ladder-like hierarchy perceptions may be a risk factor for members' innovation support, we did not find robust creativity detriments resulting from this hierarchical shape. Moreover, the role of pyramid shaped hierarchy perceptions differed from our expectations. Rather than being detrimental, such hierarchies may benefit innovation support and, thus, team creativity, particularly when members do not perceive strong creativity requirements. This pattern of findings may arise from the ambiguous nature of pyramid shaped hierarchies. Such centralized hierarchies establish clear differences between higher and lower level members (Yu et al., 2019). Thus, even if lower level teammates do not perceive high creativity requirements, more powerful members at higher hierarchical levels may be able to direct the team toward innovation support. At the same time, the majority of members in such hierarchies are located at comparable lower-level positions (Bunderson et al., 2016), and this equivalent positioning may motivate relatively egalitarian, cooperative team processes (Yu et al., 2019). Given the unexpected (and somewhat inconsistent) nature of the respective findings, it is clear that this interpretation is speculative. We will return to this issue in the section on future research directions.

Finally, our research has relevant implications for research on team hierarchy. As noted, scholars have used diverse operationalization of this construct, for example focusing on hierarchical steepness or centralization (Bunderson & Van der Vegt, 2018), on the acyclicity of members' influence relations (Oedzes et al., 2019), and on members' mental representations of the team's overall hierarchical shape (Yu et al., 2019). Our findings support and extend the latter approach. Beyond the ladder and pyramid shapes Yu et al. have examined, we illustrate that members' perception of their team's hierarchy as flat and egalitarian can critically shape team processes and outcomes. Hence, this study underscores

the utility of considering team members' subjective hierarchy perceptions and advances a more comprehensive perspective in this regard.

Limitations and Future Research Directions

A number of limitations should be considered when interpreting the present findings. First, our correlational design does not warrant causal conclusions. Although our predictions are based on a solid foundation of previous theory and research, for example, we cannot exclude possibilities of reverse causality (e.g., members of more creative teams may exhibit greater innovation support). Also, the aggregation statistics for members' hierarchy perceptions were lower than desirable, although we note that controlling for these variables' within-team dispersion did not change our conclusions. Future research could address these issues by constructively replicating the present findings, particularly using longitudinal or experimental study designs and/or data from larger teams (cf. LeBreton & Senter, 2008).

Moreover, we collected data from one country, Germany, limiting cross-cultural generalizability. For example, the German culture is characterized by relatively high uncertainty avoidance (Brodbeck et al., 2002), such that individuals may be more reluctant to venture towards creative, potentially risky ideas than in other cultural contexts. Similarly, the German culture is rather individualistic (Brodbeck et al., 2002), potentially making it more difficult to attain team members' support for joint innovation processes. Clearly, research could benefit from further examination of our model in alternative cultural settings.

Beyond addressing limitations, it may be worthwhile to expand the present theorizing. Our unexpected findings offer interesting opportunities in this regard. For instance, we did not find clear evidence for a negative indirect linkage between ladder shaped hierarchies and team creativity, through innovation support. It may be fruitful to examine alternative mediation mechanisms in this linkage – particularly pertaining to counterproductive team processes that may result from a team's hierarchical stratification. Yu et al. (2019) have

shown ladder-like structures to promote intra-team conflicts, for example, and such conflicts and power struggles might link this type of hierarchy with unfavorable creativity processes and outcomes (see also Greer & Chu, 2020).

Similarly, the unexpected creativity benefits we uncovered for pyramid-shaped hierarchy perceptions warrant further investigation. As noted in our theoretical argumentation, this type of hierarchy may promote both positive and negative team processes (e.g., high relationship quality between lower level members, yet clear differentiation between lower and higher level members; Yu et al., 2019). Hence, it may be interesting to examine boundary conditions that emphasize either the benefits or the detriments of a pyramid shaped hierarchy. Team members' goal interdependence may be an important factor in this regard (e.g., see Lam et al., 2011; Tu et al., 2020), with competitive goals potentially highlighting a pyramid shaped hierarchy's downsides and cooperative goals highlighting its positive implications.

Practical Implications

The current findings have several implications for organizations aiming to promote creativity in their teams. Contrary to common assumptions, our study suggests that cultivating flat, egalitarian team hierarchies is not sufficient (and not always beneficial) in this regard. Clearly, organizations are well advised to avoid exaggerated, highly stratified hierarchies in their teams, as this may undermine members' support for innovation (and generally induce counterproductive team processes; Yu et al., 2019). Beyond this, however, it seems important to thoroughly consider the degree to which members perceive that creativity is required for team task accomplishment. If members feel that creative action is important, then flat team hierarchies are likely to be helpful. In this case, organizations may be able to stimulate innovation support and advance creative team outcomes by assigning comparable

hierarchical ranks to teammates, deemphasizing status differences, and enabling participation, inputs, and shared leadership (see also Carson et al., 2007) from all team members.

If members do not appreciate the relevance of creativity for their team, by contrast, we believe there are two possible courses of action. On the one hand, organizations may strengthen members' perceived creativity requirements by highlighting the relevance of innovation for team performance, by incorporating creative outputs in a team's objectives, and by tying team-based rewards to the attainment of creative goals (Chen et al., 2012; Gilson & Shalley, 2004). If such measures are not viable, on the other hand, team creativity may benefit from moderate hierarchical differentiation – in the form of a pyramid shaped, centralized hierarchy. In this case, members' innovation support and team creativity may increase if organizations assign greater influence and authority to some key persons within the team, while assigning comparable lower level ranks towards the other members. Research has illustrated that the most creative individuals within a team can disproportionately impact overall team creativity (Pirola-Merlo & Mann, 2004). Hence, it may be useful to assign (formal or informal) leadership responsibility, in this situation, towards teammates that are particularly renowned for their creative approaches and contributions.

Conclusion

This study challenges common "flatter is better" assumptions regarding the role of team hierarchy for a team's creative performance. We illustrate that flat hierarchies may indeed aid members' innovation support and, thus, team creativity – but only if members perceive strong creativity requirements. If members do not perceive such requirements, more centralized, pyramid shaped hierarchies may be preferable to stimulate innovation support and creativity in the team. Overall, these results provide important new insights for theory and research on team hierarchy–creativity linkages and for organizations aiming to simulate their teams' creative outputs.

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Appendices

Table A2.1.
Regression results on support for innovation and team creativity (without control variables)

	Support for innovation										Team creativity	
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Variables	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Constant	3.40***	.06	3.36***	.04	3.40***	.05	3.39***	.04	3.36***	05	3.52***	.07
Perceptions of flat hierarchy	.25**	.08	.10	.07	.07	.07	.11	.07	.10	.07	.08	.10
Perceptions of ladder-shaped hierarchy	-.12*	.06	.07	.05	-.06	.05	-.06	.05	-.07	.05	.01	.07
Perceptions of pyramid-shaped hierarchy	.16	.09	.06	.07	.11	.07	.07	.07	.06	.07	.11	.10
Creativity requirements (CR)			.37***	.05	.37***	.05	.36***	.05	.37***	.05		
Flat hierarchy * CR			.15**	.05					.15*	.07		
Ladder-shaped hierarchy *CR					-.01	.04			<.001	.04		
Pyramid-shaped hierarchy * CR							-.11*	.05	.004	.08		
Support for innovation											.22**	.07
R^2	.12		.50		.45		.48		.50		.10	
Adjusted R^2	.10		.48		.43		.46		.47		.07	
F	4.85**		20.96***		17.14***		19.14***		14.68***		2.89*	
ΔR^2 (compared with Model 1)			.38***		.33***		.36***		.38***			

Note. N = 109. Unstandardized coefficients are reported.
* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Table A2.2.
Regression results on support for innovation and team creativity (with control variables: time size, average education, and SD of hierarchies)

	Support for innovation										Team creativity	
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Variables	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Constant	3.39***	.06	3.36***	.05	3.39***	.05	3.38***	.05	3.36***	.05	3.53***	.06
Perceptions of flat hierarchy (mean)	.18	.09	.10	.07	.11	.08	.11	.07	.10	.07	.02	.11
Perceptions of ladder-shaped hierarchy (mean)	-.14	.09	-.06	.07	.05	.08	-.06	.07	-.06	.07	-.04	.10
Perceptions of pyramid-shaped hierarchy (mean)	.14	.08	.07	.07	.08	.07	.08	.07	.07	.07	.05	.10
Creativity requirements (CR)			.36***	.05	.37***	.05	.35***	.05	.36***	.05		
Flat hierarchy * CR			.15**	.05					.16*	.08		
Ladder-shaped hierarchy *CR					-.01	.05			.01	.05		
Pyramid-shaped hierarchy * CR							-.11*	.05	.01	.08		
Support for innovation											.14	.07
Control variables												
Team size	-.06	.06	-.04	.05	-.05	.05	-.04	.05	-.04	.05	.12	.07
Average education	.16**	.06	.02	.05	.01	.05	.02	.05	.02	.05	.25***	.07
Perceptions of flat hierarchy (SD)	-.03	.07	.01	.06	-.03	.06	-.03	.06	.01	.06	.10	.09
Perceptions of ladder-shaped hierarchy (SD)	.04	.09	-.02	.07	-.03	.08	-.02	.07	-.02	.08	.08	.10
Perceptions of pyramid-shaped hierarchy (SD)	.04	.07	.01	.06	.03	.06	.02	.06	.01	.06	-.04	.09
R^2	.21		.52		.47		.50		.52		.24	
Adjusted R^2	.14		.47		.42		.45		.46		.17	
F	3.19**		10.55***		8.67***		9.64***		8.61***		3.51***	
ΔR^2 (compared with Model 1)			.32***		.27***		.29***		.32***			

Note. N = 109. Unstandardized coefficients are reported.
* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Chapter 3: Team Hierarchy and Individual Creativity: The Role of Individuals' Standing in the Team

Abstract

We examine a cross-level model to explicate why team hierarchy may differentially relate with the creativity of individual team members. Using survey data from 396 individuals within 106 work teams from Taiwan, we illustrate that stronger team hierarchies can diminish individual members' creativity by promoting within-team social comparison tendencies. These negative impacts are limited, however, to individuals with relatively low standing in their teams (i.e., a lack of respect from teammates), whereas individuals with superior standing can maintain creativity even in highly hierarchical teams. Hence, this study provides important insights into the micro-foundations of team hierarchy–creativity linkages, explicating why hierarchy's respective consequences may differ markedly across different members of a team.

Keywords: Team hierarchy; creativity; social comparison; interpersonal respect

Creativity is a key driver of organizational success, and modern organizations often rely on individual employees' creative ideas to develop new products and services (Anderson et al., 2014). Importantly, these employees frequently operate within teams (Kozlowski & Ilgen, 2006), and research has shown that team structures crucially shape individuals' creative performance (Monechi et al., 2019; Stewart & Barrick, 2000). Of particularly relevance, in this regard, is teams' hierarchical structure (i.e., the distribution of socially valued resources, such as power, status, and influence, among members; Bunderson et al., 2016). Scholars have described hierarchy as a ubiquitous team feature that fundamentally shapes how individuals act and make decisions (Anderson & Brown, 2010; Greer et al., 2018). Further, organizational research has generally assumed that stronger hierarchies stifle creativity (e.g., Reitzig, 2022) and studies have similarly illustrated negative linkages between team hierarchy strength and collective team creativity (e.g., Oedzes et al., 2019a).

To fully understand team hierarchy–creativity relations, however, we believe it is critical to supplement this team-level research with a cross-level perspective. After all, collective team creativity is a result of individual members' creative contributions and interactions (e.g., Pirola-Merlo & Mann, 2004; Sung & Choi, 2021), and little is known about how team-level hierarchy affects the creative performance of a team's *individual* members. In this regard, it is unlikely that all individuals within a team are equally affected by their team's hierarchical structure. Although not examining hierarchy, prior research has accordingly illustrated that overall team characteristics (e.g., team reflexivity and knowledge sharing) have distinct cross-level implications for individual members' creative performance (Bai et al., 2016; Wang et al., 2021). More specifically, individuals are likely to hold different (i.e., higher or lower) positions within their team's hierarchy, with relevant implications for their psychological and behavioral reactions (e.g., Feenstra et al., 2017). Consequently, such positional differences may yield distinct individual creativity outcomes, even among members of the same team—and team-level approaches cannot uncover such differences. Therefore, the

present project adopts a cross-level perspective, aiming to uncover the micro-foundations of team hierarchy–creativity linkages. Our key goals are to understand (a) how and why members' collective team hierarchy perceptions shape individuals' creativity within the team and (b) how individuals' standing in the team alters this linkage.

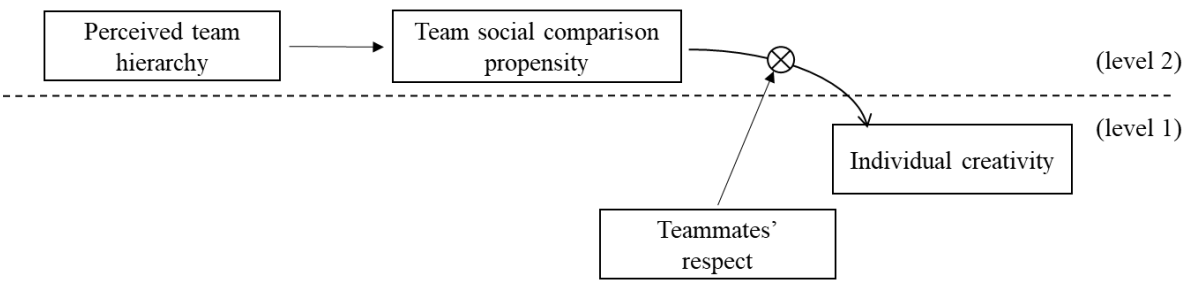
First, we draw from research on hierarchy and creativity to cast intrateam social comparison propensity (i.e., members' shared tendency to compare their own performance and position with that of others within the team; Garcia et al., 2013) as a key mechanism in the linkage between team hierarchy perceptions and individual creativity. Research suggests that strong hierarchical differentiation emphasizes between-member differences and draws members' attention to internal divisions, thus increasing the salience of others as comparison targets (Garcia & Tor, 2009). Moreover, intrateam social comparison propensity may diminish individuals' creativity. After all, social comparison processes require mental effort (Yu et al., 2019b) and often yield within-team conflicts (Bendersky & Hays, 2012), potentially distracting individuals from the development of creative ideas and impairing their ability and willingness to devise and share new ideas among each other.

Second, an adequate understanding of team hierarchy's individual creativity implications requires consideration of an individual's (informal) standing in the team. A key aspect, in this regard, is the degree to which other teammates respect a focal member (e.g., such that they acknowledge this member's expertise and allow him/her to exert influence; Bunderson et al., 2016). We cast such respect as a boundary condition in the linkage between team social comparison propensity and individual creativity. It is clear, for example, that intrateam social comparisons generally yield more favorable outcomes for members with a higher (rather than lower) position in the team's hierarchy (Wills, 1991). With research consistently illustrating that negative rather than positive information commands greater attention (Baumeister et al., 2001), social comparisons may therefore involve less mental effort and, thus, be less distracting for more highly respected individuals. Moreover, research

has shown that individuals receive more support from teammates if their expertise is more highly valued (Van der Vegt et al., 2006). Hence, members with greater respect may perceive their team's atmosphere as more collaborative, even if pronounced hierarchy perceptions trigger social comparison tendencies. Consequently, we anticipate the relationship between intrateam social comparison propensity and individual creativity to be less pronounced among members that are more (rather than less) respected by their teammates.

Together, we propose a conditional indirect effects model. As depicted in Figure 3.1, teammates' respect for a focal member should diminish the negative indirect relationship between team hierarchy perceptions and this member's creativity, as transferred by intrateam social comparison propensity. By examining this model, we aim to deepen our understanding of the creativity implications associated with the hierarchical structures that are ubiquitous within teams. Specifically, we seek to advance new theoretical knowledge on the complex cross-level relationship between team hierarchy and individual creativity. Our research sheds light on two pivotal aspects: First, we strive to clarify *why* shared perceptions of team hierarchy may shape the creative performance of individual members. Second, we highlight the potential for significant *variations* in individual creativity outcomes, even among members of the same team, due to individual differences in members' hierarchical standing. Hence, this study is among the first to explicate the cross-level foundations of the team hierarchy–creativity linkage. We strive to illustrate that relevant creativity detriments in highly hierarchical teams do not equally apply among all individual members, thus providing an important basis for further research on team hierarchy's creativity implications.

Figure 3.1. *Research model of Chapter 3.*



Hypotheses Development

Team Hierarchy Perceptions and Social Comparison Propensity

In general, a team's hierarchy denotes the degree to which there is a clear-cut (formal and/or informal) rank ordering among its members along socially valued dimensions such as power, status, and influence (Greer, 2014; Magee & Galinsky, 2008; Oedzes et al., 2019b). More specifically, despite considerable diversity in the literature (for a review, see Wellman et al., 2020), scholars have highlighted *centralization* (i.e., the degree to which one or a few members occupy top positions, while all others are located toward the bottom of the hierarchy) and *differentiation* (i.e., the overall degree of inequality between team members) as prominent approaches toward the conceptualization of team hierarchy (Anderson & Brown, 2010; Bunderson et al., 2016). Further, recent research has emphasized the importance of subjective elements in this regard, such that members' hierarchy *perceptions* (a) comprehensively capture both formal and informal aspects of a team's hierarchical rank ordering and (b) critically shape members' psychological and behavioral reactions (Yu & Kilfuff, 2020; Yu et al., 2019b). On this basis, the present study defines team hierarchy as members' shared, subjective perception of their team's hierarchical centralization and differentiation.

Teams are a frequent arena for social comparisons because their members typically pursue joint, overarching team goals and work on related, interdependent tasks (Kozlowski & Ilgen, 2006; Raveendran et al., 2020). As such, individual members' progress towards goal accomplishment and task attainment lends itself to relatively straightforward comparison (e.g., see Groenenboom et al., 2001; Tu et al., 2020). Also, team members often have ample opportunities to interact with and observe each other during daily work, meetings, and common events (Forsyth, 2000). These direct, shared interpersonal experiences enable members to directly compare their own abilities, performance, and overall standing in the team with that of other teammates (Darley, 2001; Festinger, 1954; Goodman & Haisley,

2007). Hence, work teams may develop distinct levels of social comparison propensity over time, reflecting members' collective tendency to compare themselves with each other on valued dimensions (Garcia et al., 2013). Crucially, this social comparison propensity may differ markedly across teams (Yu et al., 2019b)—and we draw from the literature on social comparison theory as well as team hierarchy to cast members' shared hierarchy perceptions as a key explanatory factor in this regard.

Social comparison theory posits that individuals engage in comparisons with others in the workplace, particularly within work teams, to satisfy their need for accurate self-evaluations of their own behaviors and outcomes, to gauge associated differences with teammates, and to accurately assess their relative standing (Festinger, 1954; Hu & Liden, 2013; Wood, 1989). With hierarchy representing, by definition, an indication of inequality and within-team differentiation (Bunderson et al., 2016), this theorizing suggests that strong, shared team hierarchy perceptions may serve as important cues that trigger teammates' tendencies toward mutual social comparisons. After all, strong hierarchical separation within a team emphasizes between-member differences, thus drawing individuals' attention to internal divisions and making other members more salient as social comparison targets (Garcia & Tor, 2009). A highly hierarchical team context may, in particular, propel members to continuously survey their own positioning in relation to others, aiming to correctly evaluate their position and to decipher possible reasons and consequences associated with the respective differences (Greer et al., 2018). For example, members may then be prompted to think about why they occupy lower or higher positions in the hierarchy relative to others, and they may ponder about the implications associated with these differences for their work interactions, rewards, and careers. As members seek validation and recognition within the team's hierarchy, such self-evaluative information plays an essential role for effective self-regulation and adaptation, aiding members to devise appropriate reactions (Ashford et al., 2003).

In less hierarchical teams, by contrast, members do not differ meaningfully on important, socially valued dimensions, and their overall standing within the team is rather similar to that of their teammates (Anderson & Brown, 2010). Hence, social comparison processes should be less relevant in the team as a whole, as it is less crucial for members to accurately gauge their relative positioning to alleviate associated uncertainty and devise useful courses of action (Gardner et al., 2002). Indeed, initial empirical research support this rationale, illustrating that more (rather than less) pronounced hierarchical stratification within a team emphasizes internal differences to a greater extent, thus strengthening members' propensity for social comparisons (Yu et al., 2019b). We therefore postulate:

Hypothesis 1: Team members' shared hierarchy perceptions are positively related to team social comparison propensity.

The Mediating Role of Team Social Comparison Propensity

Scholars have argued that creative outcomes critically depend on individuals' deliberate efforts to contribute to the generation of novel and useful ideas (Unsworth et al., 2005). For example, these creative efforts include problem identification and information gathering, as well as idea development, assessment, and selection (Amabile, 1996; Puente-Díaz et al., 2021). We argue that social comparison processes within teams have the potential to hinder individual members' respective actions.

A key intrapersonal reason, in this regard, is that social comparison involves complex cognitive processes that require considerable mental resources (Taylor & Lobel, 1989; Yu et al., 2019b) and, thus, may direct individuals' attention and efforts away from creative activities. For instance, social comparison implies that individuals spend time and effort to monitor others' attributes, behaviors, and outcomes and contrast these aspects with themselves (Suls et al., 2002). This monitoring process is cognitively challenging because it demands explicit attention and requires individuals to accurately analyze and interpret information about others. Indeed, research has shown that engaging in social comparison can

lead to cognitive overload (Yan et al., 2024). Moreover, such comparisons can evoke intense emotional responses (e.g., envy or pride; Matta & Van Dyne, 2020). To regulate these affective reactions, additional investment of cognitive resources is required, for example as individuals strive to suppress negative impulses and maintain emotional equilibrium (Richards & Gross, 2000; Smith, 2000). Consequently, pronounced social comparison tendencies within a team may drain important mental resources that individual members could otherwise use to effectively engage in creative efforts and achieve creative outcomes.

Furthermore, on an interpersonal level, members' preoccupation with social comparisons is likely to fuel competition in the team, potentially resulting in conflicts and power struggles and diminishing the quality of within-team relationships (Garcia et al., 2013; Van Bunderen et al., 2018; Yu et al., 2019b). This competitive atmosphere may arise because members are motivated to enhance their standing relative to their comparison targets, often at the expense of team cohesion and trust (Bendersky & Hays, 2012; Pai & Bendersky, 2020). Consequently, a strong emphasis on social comparisons may make teammates less willing to work with each other to advance creative contributions. Instead of aiding one another by sharing ideas, knowledge, and information (which are important drivers of creativity; Dong et al., 2017), members may then focus on securing and enhancing their own positions, for example by deliberately withholding own insights and undermining others' inputs (Kang, 2022; Reh et al., 2018). Thus, individual members are likely to receive less support and inspiration for their creative efforts from teammates in a team with high social comparison propensity.

Corroborating these general arguments, Koopman et al. (2020) demonstrated a link between social comparison processes and individuals' resource depletion, resulting for example in decreased helping behavior and increased incivility. Moreover, Yu et al. (2019b; Study 4) showed a negative linkage between a team's social comparison propensity and performance, through members' reduced relationship quality.

Taken together, our conceptual rationale therefore suggests (a) a positive linkage between members' team hierarchy perceptions and the team's social comparison propensity (i.e., Hypothesis 1) and (b) a negative linkage between such social comparison propensity and individual members' creativity. Combining these arguments, we cast intragroup social comparison propensity as a key mediating mechanism in the indirect team hierarchy perception–individual creativity association. Indeed, although not directly examining individual creativity, findings from Yu et al. (2019b; Study 3) underscore this overarching mediation logic. This study illustrated a negative indirect linkage, through team social comparison propensity, between a team's degree of hierarchical stratification on the one hand and team performance on the other. Hence:

Hypothesis 2: Team social comparison propensity mediates the negative relationship between team hierarchy perceptions and individual creativity.

The Moderating Role of Teammates' Respect for an Individual Member

Beyond the main effect of team social comparison propensity on individual creativity, we cast teammates' respect for a focal member as a key boundary condition that may alleviate this negative linkage. Indicating an individual's (informal) standing in the team, such respect denotes the degree to which other teammates value a focal member's expertise and contributions and, thus, allow him or her to yield influence within the team (Bunderson et al., 2016).

As outlined earlier, a key intrapersonal reason for the detrimental creativity consequences associated with a team's social comparison propensity is that it reduces individual members' mental resources and distracts their capacities for creative action. Crucially, this mechanism should be less pronounced for members with greater respect among their teammates. It is clear that more highly respected members enjoy considerable standing in the team, such that they hold a relatively high position in their team's (informal) hierarchy (Anderson & Kilduff, 2009). Consequently, highly respected members' within-team social

comparisons will generally be directed downward, favorably contrasting themselves with others who are worse off (Hu & Liden, 2013). Social comparison research has demonstrated that such downward comparisons are typically perceived rather positively, reaffirming an individual's status and boosting their confidence (Hakmiller, 1966; Major et al., 1991). Indeed, downward social comparisons have been shown to elicit positive feelings among individuals (e.g., increased self-esteem) and to advance a more favorable self-image, potentially even inducing a sense of superiority (Aspinwall & Taylor, 1993; Lyubomirsky & Ross, 1997). For members that lack their teammates' respect (and, thus, are located toward the bottom of the team hierarchy), by contrast, within-team social comparisons will generally be directed upward, contrasting themselves with others who are better off (Buunk et al., 2003; Muller & Fayant, 2010). Research has illustrated such unfavorable comparisons to exacerbate individuals' feelings of inadequacy, inferiority, and self-doubt (DeSteno et al., 2006; Van der Zee et al., 2000), often giving rise to intense negative emotions (e.g., envy and frustration; Smith, 2000).

In other words, within-team social comparisons should typically entail rather positive information and yield favorable conclusions among highly respected teammates, whereas such comparisons should be colored in a distinctly negative tone among members with little respect in the team. Importantly, research has consistently illustrated a "bad is stronger than good" effect (Baumeister et al., 2001), with negative rather than positive information commanding greater attention from individuals and demanding greater cognitive resource investment. Positive information, in particular, is often processed more superficially and rapidly, leading to less cognitive elaboration (Alves et al., 2017). Negative information, by contrast, is generally processed more thoroughly, because it may point towards potential threats that require careful consideration and detailed analysis (Smith et al., 2003). For example, studies have shown that negative (rather than positive) feedback is often remembered more accurately and more strongly impacts subsequent behavior (Vaish et al.,

2008). Hence, individuals tend to allocate more cognitive resources to negative information to mitigate potential risks and effectively address associated problems. Drawing from this rationale, we anticipate that within-team social comparisons are less mentally taxing for individual members with higher (rather than lower) respect, leaving them with greater resources for creative action.

Additionally, high team social comparison propensity may diminish individual members' creativity through interpersonal mechanisms, fueling within-team competition and conflicts (Liao et al., 2010) and, thus, diminishing members' willingness to support each other's creative efforts. Again, however, we expect these consequences to be less pronounced among individual members with higher (rather than lower) respect. Research has demonstrated that members with superior status and respect receive greater social support from teammates (Magee & Galinsky, 2008; Van der Vegt et al., 2006) and receive more recognition for their task contributions (Howell et al., 2015). This preferential treatment occurs because high-status individuals are viewed as more competent and credible, leading teammates to value their input and more willingly invest in their success (Wittenbaum, 2000). In other words, these respected members benefit from a more supportive and collaborative team environment. Hence, even in a team with pronounced social comparison propensity, highly respected members may still receive constructive feedback on their creative contributions and benefit from their teammates' support when developing new ideas. Moreover, research has shown that high-status individuals are afforded greater latitude to deviate from social constraints and, thus, to take risks (Phillips & Zuckerman, 2001). Consequently, these individuals may feel more secure in exploring unconventional ideas and approaches without fear of negative repercussions—which is crucial for creativity (Harada, 2020). Despite the competitive atmosphere in a team with high social comparison propensity, more highly respected individuals may therefore be less afraid to share new, potentially risky ideas, thus further encouraging their creative performance (Duguid & Goncalo, 2015).

Members with less respect among teammates, by contrast, may suffer from a distinct lack of support for their creative efforts in a team with strong social comparison propensity, and they may deliberately refrain from voicing new, risky ideas in this situation, for fear of experiencing backlash and further endangering their precarious position (Magee & Galinsky, 2008; Yuan & Zhou, 2015).

Taken together, we anticipate that even in a team with high social comparison propensity, individual members with higher (rather than lower) respect among teammates (a) will suffer less cognitive resource losses and distractions from creative efforts and (b) will receive greater social support and experience greater latitude for creative action. Hence, such individual respect should represent an important buffer for the otherwise detrimental creativity consequences associated with a team's social comparison propensity. We therefore propose the following moderation hypothesis:

H3: Teammates' respect for an individual member moderates the negative relationship between team social comparison propensity and individual creativity. This relationship is weaker among individual members with higher rather than lower respect.

Our prior reasoning has positioned team social comparison propensity as a mediating mechanism in the negative linkage between teammates' shared hierarchy perceptions and individual members' creativity. Moreover, we have cast an individual's respect from teammates as a key boundary condition that buffers the detrimental creativity consequences of team social comparison propensity. Combining these propositions, teammates' respect is likely to also moderate the indirect association between team hierarchy perceptions and individual creativity, via team social comparison propensity. We therefore propose the following conditional indirect effects hypothesis:

H4: Teammates' respect for an individual member moderates the negative indirect relationship between team hierarchy perceptions and individual creativity, through team

social comparison propensity. This indirect relationship is weaker among individual members with higher rather than lower respect.

Method

Data Collection

We gathered paper-and-pencil survey data from team members and their direct supervisors in various organizations in Taiwan. We approached the supervisors through personal contacts and, when they agreed to participate, we provided them with general study information (without revealing the hypotheses) and survey packages for both themselves and their team members. All participants returned their completed surveys directly to the researchers (either personally or by mail), and the survey's cover page emphasized that participation was voluntary and confidential. We used unique team codes to match supervisor and member responses. To address common source concerns (Podsakoff et al., 2012), we used three distinct measurement sources: Team members assessed their team's hierarchy and social comparison propensity, whereas others' respect for a focal member was assessed through peer-ratings, and supervisors evaluated each member's individual creativity. Individuals received a gift card worth 100 New Taiwan Dollars (roughly 3.30 US-Dollars) for their participation.

Participants

An individuals' inclusion in the final sample required that complete data on the focal study variables was available. Specifically, (a) individuals had to provide ratings of their team's hierarchy and social comparison propensity, (b) at least one teammate had to provide peer-ratings for an individual's respect in the team, and (c) the team supervisor had to rate the focal individual's creativity. Additionally, we only included participants who had worked with their current team for at least one month at the time of data collection, to ensure that they could provide meaningful information.

Initially, 115 supervisors had agreed on their team's participation. Based on our inclusion criteria, we were able to incorporate data from 106 of those teams, with 396 individual members (*mean* = 3.7 member responses per team; *range* = 2 to 10), for an average within-team response rate of 73.9%. The teams in our sample represented 66 organizations, with 46.5% from the service sector, 20.2% from public services, 10.9% from sales, 11.9% from manufacturing, 6.8% from finance, and 3.3% from health care. Of the supervisors, 49.1% were male, with an average age of 50.17 years (*SD* = 8.12) and average organizational tenure of 17.70 years (*SD* = 10.77). Of the team members, 62.1% were female, with an average age of 39.2 years (*SD* = 9.84), average organizational tenure of 9.35 years (*SD* = 8.67), and average team tenure 4.16 years (*SD* = 4.91).

Measures

We followed a back-translation procedure to transfer all items from English to Chinese. All variables were assessed on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Perceived team hierarchy

Team members rated their perceptions of their team's hierarchy using a seven-item measure developed by G. S. van der Vegt (personal communication, September 27, 2021). To comprehensively assess members' perceptions of the strength of the team hierarchy, this measure captures the degree to which members perceive that status, power, and influence within their team are differentiated (3 items; e.g., "There are big status differences in my team") and centralized (4 items; e.g., "A small number of team members determines what happens within my team;" see also Yu & Kilduff, 2020). Cronbach's alpha for the overall measure was .75. All items are depicted in the Appendix (Table A3.1), and we provide further evidence for the validity of this measure in the Results section.

Before aggregating this variable to the team level, we calculated both interrater agreement statistics and intraclass correlation coefficients (Bliese, 2000). We obtained high

interrater agreement within teams (median $r_{wg(j)}$ = .91, using a uniform reference distribution) and significant intraclass correlation statistics (ICC1 = .25, p < .01; ICC2 = .56). These indicators support the team-level aggregation of individual members' ratings.

Team social comparison propensity

We used three items from Yu et al. (2019b) to assess members' propensity to engage in social comparisons within their team. The items were "I compare the amount of influence I have in the team with the influence that others have in the team," "I determine my expertise in the team by comparing myself to my teammates," and "I evaluate how much respect I have in the team compared to that which others have." Cronbach's Alpha was .79.[3] Substantive interrater agreement (median $r_{wg(j)}$ = .85) and significant intraclass correlation statistics (ICC1 = .11, p < .01; ICC2 = .32) justified averaging multiple members' responses to the team level.

Teammates' respect for a focal member

Team members rated their respect for each of their individual teammates (identified by the last Chinese character of his/her name) using a three-item measure from Bunderson et al. (2016; α = .93). The items were "I am persuaded by this person's arguments and opinions," "I usually come around to this person's point of view," and "This person's position is usually the correct one." On average, each focal individual was rated by three teammates (*SD* = 1.79). When more than one peer-rating was available (as was the case for 342 individuals), we aggregated these ratings to the individual level, based on adequate interrater agreement (median $r_{wg(j)}$ = .84) and intraclass correlation statistics (ICC1 = .18, p < .01; ICC2 = .47).[4]

Individual creativity

[3] We omitted one item ("I think about whether I am better or worse than my teammates") from this measure because it was not significantly correlated with the other items in the present data (average r = .01, *n.s.*), and the overall measures' reliability was substantively reduced when including this item (α = .64). Notably, the results and conclusions from our hypotheses tests were virtually identical when including or excluding this item.

[4] Analyzing our hypotheses only for the 342 individuals with at least two peer-ratings of teammates' respect did not meaningfully change our results and conclusions.

Supervisors rated each of their individual team members' creativity using a six-item measure from Madjar et al. (2011). This measure includes three items assessing radical creativity (e.g., "This member of my team demonstrates originality in their work") and three items for incremental creativity (e.g., "…uses previously existing ideas or work in an appropriate new way"). Due to their high correlation (r = .83, p < .001) we combined these two dimensions into an overarching creativity measure (α = .93). For completeness, we repeated our hypotheses tests distinguishing radical (α = .90) from incremental creativity (α = .85). These supplementary analyses exhibited largely equivalent results patterns for either type of creativity (see Tables A3.2 and A3.3 in the Appendix).

Control variables

When examining the relationship between perceived team hierarchy and team social comparison propensity (Hypothesis 1), we controlled for team size (i.e., number of members) as well as team members' average age (in years) and gender composition (1 = male; 0 = female). Research has shown that these team characteristics may critically influence team processes and outcomes and shape members' experiences and reactions (e.g., Byron et al., 2023; Lau & Murnighan, 1998).

Additionally, when examining the linkages between team social comparison propensity, teammates' respect, and individual creativity (Hypotheses 2-4), we controlled for individual team members' gender, age, and education (on a 6-point scale, from elementary school to doctoral degree). Prior studies suggest that these demographic factors may shape both individual creativity (Baer & Kaufman, 2008; Chusmir & Koberg, 1986) and others' respect for a focal person (Bacharach et al., 1993). Further, following prior research (e.g., Chang et al., 2014; Hirst et al., 2009), we again considered team size as a control in these cross-level relationships, because it may critically shape individual members' creativity by altering relevant team processes.

To probe our findings' robustness, we (a) examined the hypotheses both with and without these controls (Becker, 2005), (b) we also considered industry as a possible covariate (using a dummy variable approach), and (c) we conducted additional multilevel analyses to account for individuals' nesting not only within teams, but also within organizations (i.e., a three-level model). Our substantive results and conclusions remained virtually unchanged in these auxiliary analyses.

Data Analysis

The individual members in our sample are nested within teams, and our focal variables are located at two conceptual levels. Team hierarchy perceptions and team social comparison propensity are located at the team level (Level-2), whereas team members' respect and creativity are located at the individual level (Level-1). Hence, we used multilevel path analysis to test our hypotheses, using Mplus 8 (Muthén & Muthén, 2017).

Specifically, all variables for Hypothesis 1 (i.e., the relationship between perceived team hierarchy and team social comparison propensity) are located at the team level. Further, Hypothesis 2 specified a cross-level mediation model, with the independent and mediator variables located at Level-2 and the outcome variable at Level-1. Following Zhang et al. (2009; see also Briker et al., 2021), we used the Level-2 estimate for the relationship between team hierarchy perceptions and social comparison propensity (as derived from testing Hypothesis 1) as the "a-path" in this mediation chain. Then, we estimated the cross-level relationship between team social comparison propensity and individual creativity to specify the "b-path". Based on these estimates, we used Selig and Preacher's (2008) Monte Carlo method to calculate confidence intervals for the hypothesized indirect relationship between perceived team hierarchy and individual creativity, through team social comparison propensity (i.e., "ab").

Hypothesis 3 postulated a cross-level interactive relationship between team social comparison propensity (Level-2) and teammates' respect (Level-1), on the one hand, and

individual creativity (Level-1), on the other. Such models have often been tested using a hierarchical linear modeling approach that specifies a cross-level interaction term between the Level-2 predictor and Level-1 moderator (e.g., Guillén et al., 2024; Shin et al., 2012). Notably, however, methodologist have pointed toward the risk of conflating within- and between-team level effects, therefore advocating an alternative procedure that decomposes the individual-level moderator into a within-team part and a between-team part (Preacher et al., 2016; Zhang et al., 2009). Consistent with recent research on cross-level predictors of individual creativity within teams (Liang et al., 2021), we followed this recommendation. Hence, we included the fixed effects of teammates' $respect_{within\text{-}team}$ on individual creativity at Level-1. Further, at Level-2, we included the effects of team hierarchy perceptions, team social comparison propensity, teammates' $respect_{between\text{-}team}$ and the fixed interaction term (i.e., team social comparison propensity × teammates' $respect_{between\text{-}team}$) on individual creativity.[5]

Lastly, to examine the conditional indirect cross-level relationship proposed in Hypothesis 4, we again used the "a-path" estimate for the Level-2 relationship between team hierarchy perceptions and team social comparison propensity. Moreover, we used the simple slope estimates for the relationship between team social comparison propensity and individual creativity, at different values of teammates' respect (as derived from testing Hypothesis 3) to represent the "b-path" at higher and lower moderator values. Using Selig and Preacher's (2008) Monte Carlo method, we then assessed the significance of the resulting conditional indirect relationships ("ab") at these higher and lower moderator values (for similar procedures, see Briker et al., 2021; Liang et al., 2021; Peng & Wei, 2018).

Results

Preliminary Validation Study

[5] As a robustness check, we also explored the cross-level interaction postulated in Hypothesis 3 using an alternative approach, following Shin et al. (2012). These analyses yielded equivalent conclusions to our main hypotheses tests (see Table A3.3).

Prior research has rarely used the present measure of perceived team hierarchy. Therefore, we aimed to validate this measure in a preliminary study (which was part of a larger project on the consequences of team hierarchy). Using procedures similar to the ones described before, this study collected survey data in a sample of 425 individuals from 109 teams across various industries in Germany (41.7% service sector, 18.5% finance, 15.7% health care, 8.3% manufacturing, 7.4% public services, 4.6% sales). Of these team members, 55.5% were female, with an average age of 37.0 years (*SD* = 11.85), average organizational tenure of 7.5 years (*SD* = 7.84), and average team tenure 3.4 years. Among other variables, this study included the present perceived hierarchy measure (translated to German following a back-translation procedure) as well as Yu et al.'s (2019b, pp. 1720-1721) single-item measures of a team's perceived hierarchical shape (i.e., assessing the degree to which participants perceived their team's hierarchy as ladder-shaped or pyramid-shaped).

To assess our perceived hierarchy measure's viability, we first used multilevel confirmatory factor analyses in Mplus 8 to assess the seven items' factor structure. A single factor model yielded adequate fit to the data (χ^2 = 97.39, *df* = 28, CFI = .96, SRMR-within = .03, SRMR-between = .03, RMSEA = .08, AIC = 9060.17). All item loadings were significant (average within standardized loading = .70; $p < .001$; average between standardized loading = .79; $p < .001$). Similarly, a two-factor model (with three items loading on a hierarchy differentiation factor and four items loading on a separate hierarchy centralization factor) provided good fit (χ^2 = 60.63, *df* = 26, CFI = .98, SRMR-within = .03, SRMR-between = .03, RMSEA = .06, AIC = 9030.42) and, in fact, its fit was superior to the one-factor model ($\Delta\chi^2$ = 36.76, Δdf= 16, $p < .01$). Importantly, however, the latent correlations between the two factors were substantive and significant (*latent* r_{within} = .87, $p < .001$; *latent* $r_{between}$ = .96, $p < .001$). In sum, these findings support the viability of our overall team hierarchy perception measure. Notably, this overall measure was positively and significantly correlated with the extent to which participants perceived their team's hierarchy

to be shaped like a pyramid (r = .42, p < .001) and a ladder (r = .34, p < .001). As Yu et al. (2019b) illustrated, these shapes are among the most common ways in which individuals mentally represent workplace hierarchies, thus underlining the present hierarchy measure's convergent validity.

Multilevel Confirmatory Factor Analysis

In the present sample, both team hierarchy perceptions and team social comparison propensity were assessed through team member ratings. We therefore conducted multilevel confirmatory factor analyses to (a) illustrate these construct's distinctiveness and (b) further scrutinize our hierarchy measure's viability. A two-factor model (with the items for perceived team hierarchy and team social comparison propensity loading on their respective, correlated factors) showed adequate fit (χ^2 = 234.19, df = 68, CFI = .89, SRMR-within = .06, SRMR-between = .07, RMSEA = .08, AIC = 12004.21). All item loadings were statistically significant both for perceived team hierarchy and team social comparison propensity (average within standardized loading = .63 and .75, respectively; p < .001; average between standardized loading = .61 and .76, respectively; p < .001). A single-factor model (with all items loading on one common factor), by contrast, did not provide acceptable fit (χ^2 = 640.93, df = 70, CFI = .61, SRMR-within = .11, SRMR-between = .11, RMSEA = .14, AIC = 2406.95), corroborating the hierarchy vs. social comparison measures' discriminant validity.[6]

Descriptive Statistics and Correlations

Table 3.1 presents means, standard deviations, and bivariate correlations for the team-level and individual-level variables, respectively. On the team level, as expected, perceived team hierarchy was positively related with team social comparison propensity (r = .37, p

[6] A three-factor model that distinguished hierarchy differentiation vs. centralization (in addition to social comparison propensity) provided adequate fit to the data as well (χ^2 =191.14, df = 64, CFI = .91, SRMR-within = .05, SRMR-between = .07, RMSEA = .07, AIC = 11969.16). Again, however, the latent correlations between the two hierarchy dimensions were substantive (*latent* r_{within} = .75; *latent* $r_{between}$ = .87; both p < .001). Exploratory analyses that repeated the hypotheses tests for the distinct hierarchy differentiation and centralization measures (rather than overall perceived hierarchy) yielded largely equivalent results and conclusions (see Appendix, Table A3.4-A3.5).

< .001). On the individual level, teammates' respect for a focal member was positively correlated with individual creativity (r = .21, p < .001). Further, examination of cross-level correlations showed that team social comparison propensity was not significantly related with individual creativity (r = -.08, p = .10). Given the hypothesized interaction pattern, we note that this does not contradict our expectations. Moreover, given the nested structure of the data, it is clear that bivariate individual-level and cross-level correlations should be interpreted with caution.

Corroborating the relevance of the respective control variables, team size was positively correlated with teammates' respect (r = .12, p = .02) and individual creativity (r = .15, p = .002), and individual members' age was negatively related with teammates' respect (r = -.12, p = .02). Moreover, the correlations for gender indicated slightly higher creativity values among men than women (r = -.16, p = .002), and education was positively related with individual creativity (r = .12, p = .02). By contrast, team average age and team gender composition were not related to perceived team hierarchy (r = .17, p = .09; r = .11, p = .25) and team social comparison propensity (r = -.05, p = .59; r = .17, p = .08).

Hypotheses Tests

Hypothesis 1 suggested a positive relationship between team hierarchy perceptions and team social comparison propensity. As shown in Table 3.2 (Model 1), our findings supported this notion (γ = .38, SE = .10, p < .001). Further, Hypothesis 2 proposed that team social comparison propensity mediates the relationship between team hierarchy perceptions and individual creativity. We observed a significant cross-level relation between team social comparison propensity and individual creativity (γ = -.14, SE = .07, p = .04; Table 3.2, Model 2). Moreover, the Monte Carlo confidence interval for the proposed indirect relationship did not include zero (*indirect effect* = -.05, 95% CI = [-.114, -.002]), supporting Hypothesis 2.

Hypothesis 3 predicted that an individual's respect among teammates moderates the cross-level relationship between team social comparison propensity and individual creativity.

Table 3.1.

Descriptive statistics and correlations of Chapter 3 variables

Variables		*M*	*SD*	1	2	3	4	5
	Team level							
1.	Perceived team hierarchy	3.05	0.44	(.75)				
2.	Social comparison propensity	2.71	0.52	.37***	(.79)			
3.	Team size	7.05	6.78	.07	.13	-		
4.	Team average age	39.30	7.08	.17	-.05	-.01	-	
5.	Team gender composition	0.35	0.35	.11	.17	.29**	.11	-
		M	*SD*	6	7	8	9	10
	Individual level							
6.	Teammates' respect	3.67	0.56	(.93)				
7.	Individual creativity	3.77	0.80	.21***	(.93)			
8.	Subordinate age	39.23	9.84	-.12*	.03	-		
9.	Subordinate gender	0.38	0.49	.02	.15**	.10*	-	
10.	Subordinate education	4.10	0.57	.09	.12*	-.22***	.02	-

Note. $N = 106$ for team level; $N = 396$ for individual level. Cronbach's alpha in parentheses. For gender, 1 = male and 0 = female. For education, 6-point scale, from elementary school (1) to doctoral degree (6).

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3.2

Hierarchical multilevel analyses results for team social comparison propensity and individual creativity

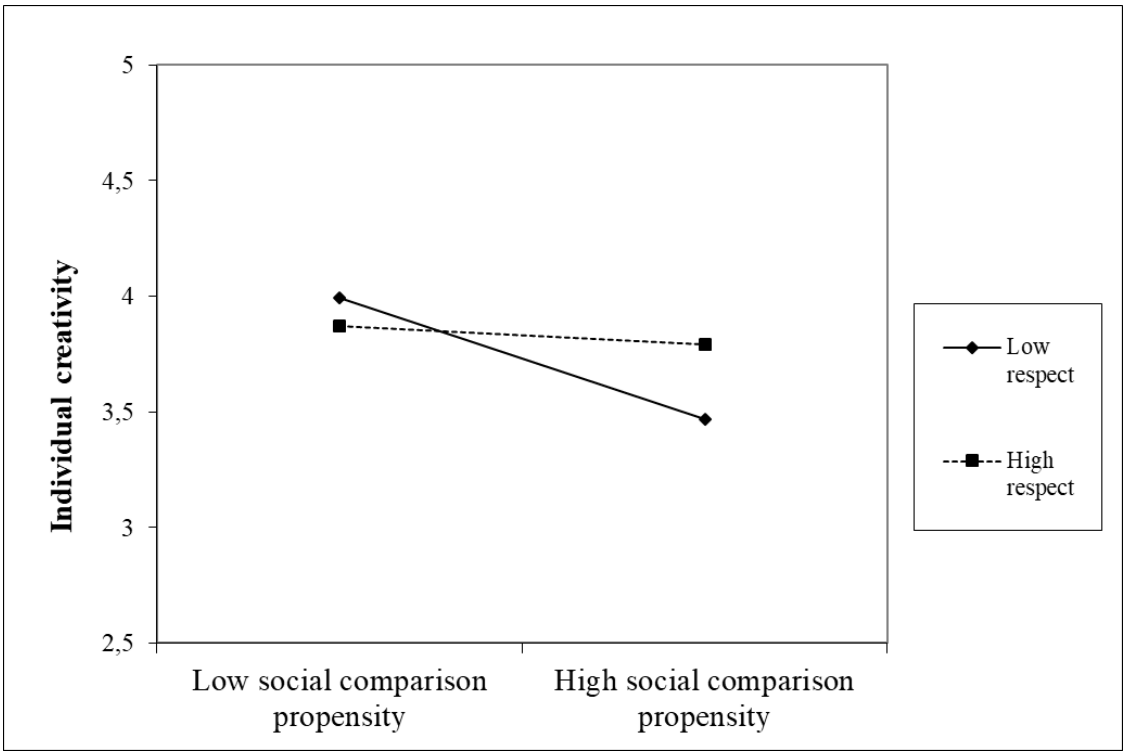
	Social comparison propensity		Individual creativity					
	Model 1		Model 2		Model 3		Model 4	
Predictors	*γ*	*SE*	*γ*	*SE*	*γ*	*SE*	*γ*	*SE*
Level 1								
Intercept	-.11	.14	3.78***	.07	3.77***	.07	3.78***	.07
Teammates' respect$_{within}$					.47***	.08	.47***	.09
Subordinate age			-.02	.04	-.04	.03	-.04	.03
Subordinate gender			.01	.08	.05	.08	.05	.08
Subordinate education			.04	.03	.002	.03	.004	.03
Level 2								
Perceived team hierarchy	.38***	.10	.10	.07	.11	.07	.09	.07
Social comparison propensity (SCP)			-.14*	.07	-.14*	.07	-.15*	.06
Teammates' respect$_{between}$ (TR)					.06	.06	.05	.06
Team size	.10	.14	.10	.06	.08	.06	.09	.06
Team average age	-.13	.09						
Team gender composition	.39	.28						
Interaction effect								
SCP*TR							.11*	.04

Note. N = 396 individuals, nested in 106 teams. Unstandardized coefficients are reported. Model 1 reports results for social comparison propensity, while Models 2-4 report results for individual creativity.

* $p < .05$. ** $p < .01$. *** $p < .001$.

As shown in Table 3.2, the interaction term for team social comparison propensity × respect was significantly related with individual creativity (γ = .11, *SE* = .04, *p* = .01; Table 3.2, Model 4). Further, as depicted in Figure 3.2, simple slopes analyses revealed that the relationship between team social comparison propensity and individual creativity was significant and negative for members with low respect in the team (-1 *SD*: γ = -.26, *SE* = .07, *p* < .001), whereas this relationship was not significant for members with higher respect (+1 *SD*: γ = -.04, *SE* = .08, *p* = .60). Thus, Hypothesis 3 was supported.

Figure 3.2. *Interactive relationship of team social comparison propensity and teammates' respect with individual creativity.*



Finally, Hypothesis 4 proposed a pattern of conditional indirect effects. Consistent with our prediction, the indirect cross-level relationship between perceived team hierarchy and individual creativity, through team social comparison propensity, was contingent on a member's respect in the team. This indirect linkage was negative and significant when

teammates' respect was relatively low (-1 *SD*: *conditional indirect effect* = -.10, 95% CI = [-.180, -.039]), but it was not significant for members with higher teammates' respect (+1 *SD*: *conditional indirect effect* = -.02, 95% CI = [-.075, .004]). Hence, Hypothesis 4 was supported.

Supplementary Analyses: Team Hierarchy and Team Creativity

As noted before, prior team-level research has generally shown that team hierarchy is negatively associated with overall team creativity (e.g., Keum & See, 2017; Oedzes et al., 2019a). Also, studies have illustrated the negative consequences of social comparisons within a team for the performance of the team as a whole (e.g., Du et al., 2022; Yu et al., 2019b). Notably, a team's overall creativity is more than just the sum of individual members' creative performance, as it critically depends on team processes such as information sharing, cooperation, and collaboration as well (Barczak et al., 2010; Reiter-Palmon et al., 2012). Moreover, individual members' potentially differing reactions toward their teams' social comparison propensity notwithstanding (as illustrated in our study), research has generally found that social comparison tendencies can create a competitive, conflict-laden atmosphere within teams that undermines cooperative efforts (Dunn et al., 2012; Garcia et al., 2013). On this basis, it seems plausible to anticipate a negative indirect team-level relationship between members' team hierarchy perceptions and overall team creativity, through a team's social comparison propensity.

Aiming to provide a more comprehensive picture of team hierarchy's consequences for both team and individual creativity, we explored this notion. To enable this, we had asked supervisors to rate their team's overall creativity, using a five-item measure from Alge et al. (2006; $\alpha = .89$). With all variables located at Level-2, we used the PROCESS macro in SPSS 28 to examine the team hierarchy–social comparison–team creativity mediation (see Hayes, 2022). As shown in Table 3.3, this indirect, negative team-level relationship was statistically significant (*indirect effect* = -.07, 95% CI = [-.132, -.015]).

Table 3.3
Regression results on team social comparison propensity and team creativity

	Social comparison propensity		Team creativity	
	Model 1		Model 2	
Predictors	*b*	*SE*	*b*	*SE*
Constant	2.72***	.05	3.65***	.06
Perceived team hierarchy	.19***	.05	.003	.07
Social comparison propensity (SCP)			-.18**	.07
Team size	.04	.05	-.11†	.06
Team average age	-.07	.05	.07	.06
Team gender composition	.07	.05	.18**	.06
			Bootstrapping	
	Indirect effect	*SE*	LL 95% CI	UL 95% CI
	-.07	.03	-.132	-.015

Note. N = 106 teams. Unstandardized coefficients are reported. Bootstrap sample size = 5000.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Discussion

Theoretical Implications

This study illustrated a conditional indirect, negative relationship between shared team hierarchy perceptions and individual members' creativity, through a team's social comparison propensity. Crucially, however, these creativity disadvantages of a strong team hierarchy only manifested among individuals who received little respect from their teammates. These findings make important contributions to our theoretical understanding of team hierarchy–creativity relations.

In trying to understand creativity in team contexts, scholars have emphasized the relevance of team structures and member interactions (e.g., Chang et al., 2014). Studies on the team-level creativity consequences associated with hierarchical team structures, in particular, have revealed that pronounced hierarchies can be detrimental (e.g., Oedzes et al., 2019a)—and our supplementary analyses have corroborated this conclusion. Moreover, initial cross-

level research has yielded similar findings, such that highly centralized and formalized team structures can constrain individuals' creative expression (Hirst et al., 2011). Importantly, however, our study suggests that this perspective paints an incomplete picture of team hierarchy–individual creativity linkages. After all, individuals' standing within their teams may differ (see also Feenstra et al., 2017), and a team's hierarchical structure may therefore affect individual members' creativity in markedly different ways. By examining this notion, the present study advances theoretical knowledge about the micro-foundations underlying the role of team hierarchy for creativity, illustrating *why* and *when* some individuals' creativity suffers from a pronounced team hierarchy whereas others' creative performance remains unharmed. Hence, our results illustrate that team hierarchy–creativity relations are more complex than prior theory and research would suggest.

Specifically, we highlight team social comparison propensity as a mediating mechanism that transfers the role of team hierarchy perceptions for individual creativity. Hierarchical structures are often introduced to coordinate team members' interactions and facilitate joint, cooperative task accomplishment (Bunderson & Boumgarden, 2010). Our findings suggest, however, that team hierarchy comes with relevant side effects (see also Greer et al., 2018; Yu et al., 2019b), emphasizing differences between members and encouraging a competitive, conflict-laden team atmosphere, characterized by interpersonal comparisons, that distracts members from the effective development of new ideas and, thus, may diminish their creative performance. To fully understand the implications of team hierarchy for creativity, it is therefore crucial to take into account hierarchy's unintended consequences for members' interpersonal relations, with team social comparison propensity, in particular, offering a relevant theoretical explanation for associated creativity detriments.

Critically, our findings further suggest that the negative creativity consequences of a strong team hierarchy (through team social comparison propensity) do not equally manifest among all members. Rather, we illustrate an individual's informal standing in the team as an

important boundary condition. Individuals with little respect from their teammates may be preoccupied with negative, unfavorable social comparisons in highly hierarchical teams and lack support for their ideas, thus diminishing their creativity. For more highly respected members, by contrast, social comparison outcomes are generally more favorable and teammates' support is more easily accessible (Van der Vegt et al., 2006), leaving these individuals with greater creativity potentials even in highly hierarchical settings. Hence, even though a team's overall creativity may suffer when its members perceive the team as highly hierarchical (Oedzes et al., 2019a), our findings illustrate that these creativity detriments disproportionately affect individual members with low respect. Hence, the present study advances a new understanding of individual creativity differences within teams, explicating why some members (i.e., with high respect) may be able to maintain high creativity levels even in otherwise difficult, hierarchical contexts.

Limitations and Future Research Directions

A number of limitations should be considered when interpreting the present findings. First, our correlational research design does not allow for causal conclusions. Although our conceptual model is grounded in prior theory and research, we cannot rule out the potential for alternative causal linkages. It is possible, for example, that more creative members may gain more respect within the team. At the same time, it seems less plausible to anticipate reverse causal relations between a single member's creativity on the one hand, and the overall team's hierarchical structure and/or social comparison propensity on the other. Clearly, however, future research could benefit from addressing possible causality concerns by using experimental or longitudinal research designs. Indeed, longitudinal designs could provide further insights into the temporal dynamics of the relationship between team hierarchy and creativity, enabling scholars to better understand how individuals' creative performance develops within more or less hierarchical teams over time.

We further acknowledge potential common method concerns, despite our multi-source study design, as we measured both team hierarchy perceptions and team social comparison propensity at the same time, using the same source. Notably, however, our CFA results corroborated the discriminant validity of these measures, and we used independent supervisor ratings to assess individual creativity. Moreover, although the aggregation statistics were generally acceptable for all of our measures, we note that some ICC2 values were lower than desirable, particularly for team social comparison propensity (despite considerable within-team agreement). In this regard, scholars have noted that small average group sizes (as in the present sample) can attenuate ICC2 estimates (Bliese, 1998).

Another notable limitation refers to our findings' cross-cultural generalizability, as our data collection was confined to one country, Taiwan. For instance, the Taiwanese culture is characterized by relatively high power distance, collectivism, and uncertainty avoidance (Huang & Van de Vliert, 2003; Kelley et al., 2006), which may shape individuals' reactions to team hierarchies as well as their communication of innovative, potentially risky ideas in the team (Ng, 2003; Zhang & Zhou, 2014). Research in other cultures or cross-cultural study designs would be useful to examine our findings' transferability to alternative contexts.

Looking beyond these limitations, there are several promising avenues for future research that could expand the current theoretical framework. It may be fruitful, for example, to investigate moderating factors that can alleviate the linkage between a team's hierarchy and social comparison propensity. For example, team hierarchy stability might play a crucial role (e.g., Gray at al., 2023). In general, research suggests that more stable hierarchies provide fewer opportunities for status gains and fewer risks of status losses, potentially reducing members' competitive behavior within the team (Hays & Bendersky, 2015; Mead & Maner, 2012). Hence, it seems plausible to assume that a highly stable team hierarchy might limit members' social comparison tendencies even if they perceive their team as highly hierarchical. Further, a formal supervisor's supportive or empowering leadership may be

relevant in this regard (see also Oedzes et al., 2019a), potentially mitigating the detrimental effects of team hierarchy by promoting a sense of autonomy and competence among members and ensuring that they feel valued for their unique contributions (rather than relative rank; Hill & Bartol, 2016; Seibert et al., 2011). Along the same lines, it may be possible to reduce members' focus on hierarchical differences by fostering a team culture that emphasizes collective, collaborative goals and by promoting inclusivity and equitable participation (Wong et al., 2018). In doing so, members may come to emphasize shared group success over individual accomplishments, potentially reducing social comparison tendencies and promoting a more creative environment largely irrespective of a team's hierarchical structure.

Additionally, exploring alternative moderators for the linkage between team social comparison propensity and individual creativity may provide valuable insights. Beyond teammates' respect for a focal member, in particular, individual characteristics such as learning goal orientation (Peng et al., 2019) and creative self-efficacy (Malik et al., 2015) may be critical. Individuals with a strong learning goal orientation, for example, may retain a focus on new ideas and on opportunities for personal growth and development (Liu et al., 2019) even in a team with high social comparison propensity, potentially buffering detrimental creativity impacts. Similarly, individuals with high creative self-efficacy may be more resilient to the adverse effects of social comparisons, as their confidence in their creative abilities may help them persevere in their creative efforts despite an unfavorable, competitive team environment (Mittal & Dhar, 2015). By delving deeper into these individual characteristics, future research may advance a broader, more differentiated picture of individual creativity differences within team settings.

Practical Implications

The current findings have relevant implications for organizations aiming to promote individual creativity in their teams. Organizations are well advised, in particular, to avoid employees' perceptions of highly hierarchical team structures, as such perceptions may

trigger social comparison processes (see also Yu et al., 2019b) that have the potential to diminish members' creativity. To do so, organizations may try to avoid exaggerated differences between individual members' power and influence within their teams, for example by ensuring equitable distribution of resources, responsibilities, and recognition (Yu et al., 2019a). Similarly, it may be fruitful to encourage shared leadership processes within teams that enable all members' participation and influence, for example through appropriate coaching efforts (Carson et al., 2007; Pearce, 2004). In addition, organizations may counter a detrimental propensity toward social comparisons in their teams by promoting a culture of cooperation and support rather than competition and conflict (Shin et al., 2016). To achieve this, organizations may for instance use structured team-building activities that promote mutual respect and understanding among members (Fapohunda, 2013), and they may set shared, collective goals for the team as a whole to direct members' efforts towards common objectives rather than individual achievements (Leung et al., 2015). Similarly, explicitly encouraging team members to collaborate and openly share ideas may switch their attention away from interpersonal comparisons and toward the work itself (Paulus & Yang, 2000).

Moreover, our research has demonstrated that strong team hierarchy perceptions (through a team's social comparison propensity) are particularly detrimental for members that receive little respect from their teammates. Thus, organizations may ameliorate adverse creativity effects, even in highly hierarchical teams, by fostering a climate of mutual respect, appreciation, and inclusivity among team members (e.g., through training programs focused on equity and inclusion; Nguyen, et al., 2024; Stephens & Carmeli, 2017). Moreover, leaders may deliberately model respectful behavior by recognizing contributions from all team members and encouraging open feedback through regular team meetings and one-on-one check-ins (Van Quaquebeke & Eckloff, 2010). And finally, organizations may provide targeted support and resources to employees in precarious positions, aiming to boost these individuals' respect among teammates. This could include human resource development

efforts focused on enhancing employees' problem-solving abilities, technical and communication skills, and self-confidence (Bunderson, & Barton, 2010), as well as mentorship programs to provide less experienced and respected members with guidance and encouragement (Eby & Robertson, 2020).

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Appendices

Table A3.1
Items of the perceived team hierarchy measure (Van der Vegt, personal communication, September 27, 2021)

Hierarchy differentiation
1. There are big status differences in my team.
2. In my team, everybody has the same level of influence. (reverse-coded)
3. Power differences between the members of my team are large.
Hierarchy centralization
4. A small number of team members determines what happens within my team.
5. In my team, everybody participates in decision-making. (reverse-coded)
6. One or a few members determine how things are done in the team.
7. There is a clear pecking order in this team.

Table A3.2
Hierarchical multilevel analyses results, distinguishing radical vs. incremental creativity

	Radical creativity						Incremental creativity					
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Predictors	*γ*	*SE*	*γ*	*SE*	*γ*	*SE*	*γ*	*SE*	*γ*	*SE*	*γ*	*SE*
Level 1												
Intercept	3.71***	.07	3.69***	.07	3.71***	.07	3.85***	.08	3.84***	.08	3.86***	.08
Teammates' respect$_{within}$			.50***	.09	.50***	.09			.42***	.09	.42***	.09
Subordinate age	-.03	.04	-.05	.09	-.05	.04	-.01	.04	-.03	.03	-.03	.03
Subordinate gender	.05	.08	.09	.08	.09	.08	-.03	.08	.01	.08	.01	.08
Subordinate education	.03	.04	-.01	.03	-.01	.03	.05†	.03	.02	.03	.02	.03
Level 2												
Perceived team hierarchy	.10	.06	.11	.07	.10	.07	.10	.07	.11	.08	.09	.07
Social comparison propensity (SCP)	-.16*	.07	-.17*	.07	-.17**	.06	-.11	.07	-.11	.07	-.13*	.06
Teammates' respect$_{between}$ (TR)			.07	.06	.07	.06			.05	.06	.04	.06
Team size	.11*	.05	.09†	.05	.09†	.05	.09	.07	.07	.08	.08	.08
Interaction effect												
SCP*TR					.08†	.05					.14**	.05

Note. N = 396 individuals, nested in 106 teams. Unstandardized coefficients are reported.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table A3.3
Alternative test of the cross-level moderation hypothesis (following Shin et al., 2012)

	Individual creativity			
	Model 1		Model 2	
Predictors	*B*	*SE*	*B*	*SE*
Level 1				
Intercept	3.78***	.07	3.79***	.07
Teammates' respect (TR)	.24***	.03	.24***	.03
Subordinate age	.04	.03	.04	.03
Subordinate gender	-.02	.03	-.02	.03
Subordinate education	.01	.03	.01	.03
Level 2				
Perceived team hierarchy	.13	.07	.12	.07
Social comparison propensity (SCP)	-.13	.07	-.13*	.07
Team size	.05	.08	.06	.08
Cross-level interaction effect				
SCP*TR			.07*	.03

Note. N = 396 individuals, nested in 106 teams. Unstandardized coefficients from a multilevel mixed-effects model are reported. In contrast to our main analysis, the present approach does not decompose the individual-level moderator into a within-team part and a between-team part.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table A3.4

Hierarchical multilevel analyses results, with hierarchy differentiation as predictor

	Social comparison propensity		Individual creativity					
	Model 1		Model 2		Model 3		Model 4	
Predictors	*γ*	*SE*	*γ*	*SE*	*γ*	*SE*	*γ*	*SE*
Level 1								
Intercept	-.14	.14	3.78***	.07	3.77***	.07	3.78***	.07
Teammates' respect$_{within}$					.47***	.08	.47***	.08
Subordinate age			-.02	.04	-.04	.03	-.04	.03
Subordinate gender			.01	.08	.05	.08	.05	.08
Subordinate education			.04	.03	.001	.03	.003	.03
Level 2								
Team hierarchy differentiation	.34***	.10	.12*	.06	.14*	.06	.12*	.06
Social comparison propensity (SCP)			-.14*	.06	-.15*	.06	-.16**	.06
Teammates' respect$_{between}$ (TR)					.07	.06	.06	.06
Team size	.11	.14	.10†	.06	.08	.06	.09	.06
Team average age	-.12	.09						
Team gender composition	.45	.28						
Interaction effects								
SCP*TR							.11*	.04

Note. N = 396 individuals, nested in 106 teams. Unstandardized coefficients are reported. Model 1 reports results for social comparison propensity, while Models 2-4 report results for individual creativity.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table A3.5
Hierarchical multilevel analyses results, with hierarchy centralization as predictor

	Social comparison propensity		Individual creativity					
	Model 1		Model 2		Model 3		Model 4	
Predictors	*γ*	*SE*	*γ*	*SE*	*γ*	*SE*	*γ*	*SE*
Level 1								
Intercept	-.11	.14	3.78***	.07	3.77***	.07	3.79***	.07
Teammates' respect$_{within}$					.47***	.08	.47***	.08
Subordinate age			-.02	.04	-.04	.03	-.04	.03
Subordinate gender			.01	.08	.04	.08	.05	.08
Subordinate education			.04	.03	.002	.03	.004	.03
Level 2								
Team hierarchy centralization	.34***	.10	.06	.07	.06	.07	.05	.07
Social comparison propensity (SCP)			-.12†	.07	-.12†	.07	-.14*	.06
Teammates' respect$_{between}$ (TR)					.05	.06	.05	.06
Team size	.10	.13	.10†	.06	.08	.06	.09	.06
Team average age	-.12	.10						
Team gender composition	.37	.28						
Interaction effects								
SCP*TR							.12**	.04

Note. N = 396 individuals, nested in 106 teams. Unstandardized coefficients are reported. Model 1 reports results for social comparison propensity, while Models 2-4 report results for individual creativity.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Chapter 4: Hierarchy-induced Competition and Team Innovation: The Moderating Role of Hierarchy Mutability

Abstract

This study investigates the moderating role of hierarchy mutability in the indirect relationship between teams' hierarchy strength, competitive climate, and innovative behavior. Drawing on data from 121 work teams in Germany, our findings reveal that in teams with low hierarchy mutability, the competitive climate induced by a strong hierarchy is positively related with innovative work behavior. In teams with high hierarchy mutability, by contrast, the indirect team hierarchy strength–competitive climate–innovation linkage was not significant. These results provide important theoretical insights into the role of hierarchy for innovation in work teams, explicating why and when strong team hierarchies can be beneficial to teams' innovative behavior. We highlight the significance of viewing team hierarchy as a multi-dimensional construct and emphasize the complexity of hierarchy's role in shaping team innovation.

Keywords: Team hierarchy; innovation; competitive climate

Innovation is a critical driver of organizational success in today's rapidly changing business environment (Van Knippenberg, 2017). It enables organizations to adapt, compete, and thrive by fostering new ideas, products, and processes (Damanpour & Aravind, 2012). Central to the innovation process is the role of teamwork, as innovation often emerges from collaborative efforts where team members' diverse skills and perspectives are pooled together (Jiang & Chen, 2018). The concept of team innovative work behavior captures this phenomenon, highlighting how collective creativity and problem-solving within teams lead to the development and implementation of novel solutions (Widmann et al., 2016). Importantly, however, the effectiveness of teamwork in promoting innovative behavior critically hinges on a team's structure (Hülsheger et al., 2009)—and we believe the strength of a team's hierarchy is particularly important in this regard. Team hierarchy strength refers to the distribution of power, status, and influence among members, reflecting how concentrated or dispersed these resources are, and scholars have described such hierarchy as a ubiquitous, fundamental feature of a team's structure (Bunderson et al., 2016; Greer et al., 2018; Magee & Galinsky, 2008). Indeed, research has shown that strong hierarchical differences within teams can create power and status disparities that foster a competitive climate among team members, such that members try to assert their opinions over each other, challenge each other's contributions, and struggle for influence over decisions (Greer at al., 2018; Hays & Bendersky, 2015), with key implications for members' innovative efforts (e.g., Beersma et al., 2003; Loch et al., 2000).

Crucially, however, a close reading of the respective literature suggests that the role of intra-team competition for members' innovative behavior is complex and ambiguous, such that competition might be both a driver and a hindrance of innovation (Dietz et al., 2015). On the one hand, competition may promote innovative behavior, motivating members to put in greater effort, seek recognition, and differentiate themselves by generating novel ideas and solutions that enhance their standing in the team (Kilduff, 2014; Kilduff et al., 2010; Sutton & Hargadon, 1996). On the other hand, competition may induce destructive rivalries among

team members as they prioritize individual gains over collective innovation, thereby hindering collaborative efforts (Bendersky & Hays, 2012; Groysberg et al., 2011; Loch et al., 2000).

On this basis, a team's hierarchical strength is likely to critically shape its members' innovative behavior by promoting a competitive climate in the team—but it is unclear whether these hierarchical consequences are ultimately harmful or helpful. Given both the prevalence of hierarchical structures in teams (Magee & Galinsky, 2008) and the importance of team innovation for organizational success (Van Knippenberg, 2017), it is crucial to address this ambiguity. Hence, this study aims to promote a new theoretical understanding of team hierarchy's complex innovation consequences by investigating *when* hierarchy-induced competition may promote or hinder members' innovative behavior.

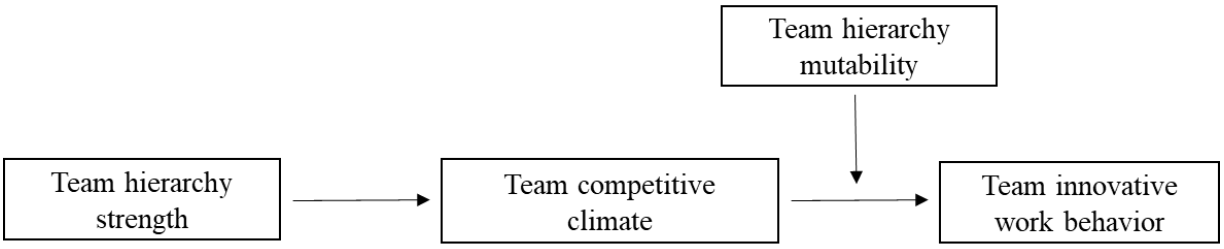
To do so, we build on theory and research that has depicted team hierarchy as a multi-dimensional phenomenon (Bunderson et al., 2016; Wellman et al., 2020). A team's hierarchy can be described not only by the *strength* of the hierarchical differences between its members, as noted before, but also by the *mutability* of this differentiated structure (i.e., the extent to which members' relative standing in the hierarchy is fixed or flexible; Gray et al., 2023). Indeed, research has described hierarchy mutability as a critical moderator of the consequences associated with hierarchy strength (Knight & Mehta, 2017; Scheepers, 2009). In teams with relatively stable hierarchies, the benefits of hierarchy strength for team functioning may be more pronounced, as members may draw from the coordination benefits associated with clear hierarchical structures (Greer & Van Kleef, 2010; Greer et al., 2018) while avoiding destructive struggles for positional gains (Bendersky & Pai, 2018; Hays & Bendersky, 2015). With higher mutability, by contrast, the possibility of positional advancements (and risk of positional losses) may emphasize the downsides of a strong team hierarchy, inducing power struggles and discouraging members' cooperative actions (Case & Maner, 2014; Maner & Mead, 2010).

Integrating these arguments, we believe that a full understanding of the innovation consequences of team hierarchy, through a team's competitive climate, requires consideration of both the strength and the mutability of a team's hierarchy. On the one hand, we anticipate that strong hierarches will generally trigger a competitive atmosphere within teams, because they emphasize members' inequality and separation and evoke struggles for limited and unevenly distributed resources (Anderson & Brown, 2010; Magee & Galinsky, 2008). On the other hand, we hold that the consequences of such intra-team competition hinge on the respective hierarchy's mutability. Highly mutable hierarchies, in particular, are likely to emphasize destructive aspects of team competition that diminish team innovation, as members jockey for the advancement or preservation of their hierarchical positions and, thus, exhibit destructive rivalries, restrict their cooperation, and avoid the introduction of new, potentially risky ideas (Greer et al., 2018). Conversely, more stable team hierarchies may emphasize competition's constructive aspects that benefit team innovation, potentially motivating members to assert their unique value through innovative, productive, and cooperative behaviors that benefit the team as a whole (Bendersky & Pai, 2018; Knight & Mehta, 2017). Overall, we therefore propose a conditional indirect effects model, as depicted in Figure 1, such that hierarchy mutability is suggested to alter the role of team hierarchy strength for a team's innovative work behavior, through the team's competitive climate.

By empirically examining this model, we aim to illustrate *why* and *when* team hierarchy strength can shape team innovation, contributing new theoretical insights into this complex relationship. As noted, existing research has presented conflicting views on whether strong hierarchies may help or hinder team functioning (e.g., Bunderson et al., 2016; Greer et al., 2018; Halevy et al., 2012). To address this apparent inconsistency, our research highlights a key mechanism underlying the team hierarchy strength–innovation linkage, illustrating a team's internal competitive climate as a critical factor. On this basis, we are able to identify hierarchy mutability as a crucial boundary condition that may alter the consequences of

hierarchy-induced competition. Our research therefore emphasizes that a unidimensional perspective on team hierarchy is insufficient: Beyond hierarchy strength, it is critical to also consider the mutability of a team's hierarchy to fully grasp the innovation consequences of a team's hierarchical structure. Hence, this study points towards important new directions for team hierarchy–innovation research, emphasizing that studies on this issue need to consider the complex interplay between different hierarchy dimensions.

Figure 4.1. *Research model of Chapter 4.*



Hypotheses Development

Team Hierarchy Strength: Construct Clarification

A team's hierarchy strength reflects the degree of rank ordering among its members, based on socially valued characteristics like power, status, and influence (e.g., Greer et al., 2018; Magee & Galinsky, 2008). Hierarchies can be based on both formal (e.g., members' officially assigned roles) and informal aspects (e.g., status attributions from peers; Diefenbach & Sillince, 2011). Also, scholars have used diverse approaches toward describing the overall strength of a team's hierarchy. For example, centralization refers to the degree to which decision-making power is concentrated among a few individuals (Bunderson et al., 2016), whereas differentiation highlights the overall degree of disparity across team members (Anderson & Brown, 2010). Moreover, recent studies emphasize that members' hierarchy *perceptions* are key to understanding their psychological and behavioral reactions (Wellman et al., 2020; Yu et al., 2019). This perspective highlights the importance of subjective

experiences, such that members' interpretations of the hierarchical relations within their team shape how they navigate and respond to the hierarchy (Gallistel, 2001; Greer et al., 2018; Yu et al., 2019). In this regard, research has further shown that members of the same team often come to share similar perceptions of their team's hierarchical structure, as they are exposed to the same events, experiences, relationships, and conditions that shape their respective views (Forsyth, 2000; Yu et al., 2019). Consequently, this study conceptualizes team hierarchy strength as members' collective, shared perception of their team's hierarchical centralization and differentiation.

Teams' Hierarchy Strength and Competitive Climate

Building on prior theory and research on hierarchy's consequences, we argue that strong, shared hierarchy perceptions among a team's members promote a competitive climate within the team. After all, a strong hierarchy denotes pronounced differences among team members along valued dimensions (Greer et al., 2018). In other words, it indicates a social divide that emphasizes members' inequality, such that some members are perceived as superior and others as inferior (Anderson & Brown, 2010; Magee & Galinsky, 2008). This is likely to create an atmosphere of rivalry in the team, with members carefully comparing their positions against one another to gauge their relative standing (Garcia et al., 2013). Indeed, research has shown that perceptions of inequality often lead individuals to view others in a more negative light (Bunderson et al., 2016). Higher-ranking members, for example, are likely to perceive lower-ranked individuals as less valuable in a strongly hierarchical team, whereas those at lower ranks may perceive their higher-ranking counterparts as unduly privileged, disconnected, and aloof (Greer et al., 2017). Hence, members at different hierarchical levels may view each other with suspicion and try to assert their own views (Greer et al., 2011; Hays & Bendersky, 2015).

Moreover, a strong hierarchy may promote a team's competitive atmosphere because it signals that resources are limited and unevenly distributed between members (Anderson &

Brown, 2010). Research has shown, accordingly, that individuals are highly sensitive to differences in hierarchical standing and unequal resource distributions, prompting their competitive behaviors (possibly even in an unconscious manner) to secure adequate resources for themselves and ensure their personal success (Halbesleben et al., 2014; Piff et al., 2018; Su et al., 2024). More specifically, members may strive to positively distinguish themselves from their teammates in such situations, for example by deliberately showcasing their own contributions and value for the team (e.g., through self-enhancement behavior; Hohmann & Walter, 2019). Alternatively, members may try to gain personal resource advantages by disparaging others' contributions and/or emphasizing the superiority of their own views and efforts (Boone, 2017; Hays et al., 2022; Piff et al., 2018). Consistent with these notions, prior empirical studies have associated strong team hierarchies with a tendency toward social comparisons (Garcia et al., 2006; Yu et al., 2019), conflicts (Bunderson et al., 2016; Greer, 2014), and competition among a team's members (Greer et al., 2017). Hence, we propose:

Hypothesis 1: Team hierarchy strength is positively related to team competitive climate.

Team Competition and Innovation: The Moderating Role of Hierarchy Mutability

As noted earlier, we hold that a team's competitive climate has the potential to both fuel and obstruct member's innovative work behavior, depending on how such competition unfolds within the team. Team competition may enhance innovation by motivating members to contribute new ideas that showcase their value for the team (Zhao et al., 2016; Zhu et al., 2018b), but it may also trigger destructive rivalries that inhibit collaborative efforts required for a team's innovative performance (Galvin et al., 2020; Loch et al., 2000). To address these ambiguous consequences, we cast the mutability of a team's hierarchy (i.e., the ease with which members can change their relative hierarchical standing; Hays & Bendersky, 2015) as a moderating factor that critically alters how a team's competitive climate is expressed in members' behaviors.

On the one hand, research has shown that highly mutable hierarchies may stifle team creativity by restricting members' information sharing and contributions to the team, as members strive to protect or improve their position in the hierarchy—even at the expense of the team as a whole (Bendersky & Hays, 2012; Hon & Lui, 2016). Consistent with these insights, we anticipate that high hierarchy mutability will direct a team's competitive dynamics towards detrimental innovation consequences, shifting members' focus away from collaboration and innovation, towards the preservation and/or advancement of their individual positions (Hays & Bendersky, 2015; Maner & Mead, 2010). This shift toward destructive competition may manifest in subtle forms of dominance and exclusionary behaviors, creating a toxic atmosphere that undermines cooperative efforts and innovative potential (Cheng et al., 2013; Van Kleef et al., 2011). Members may withhold required information or even sabotage others' efforts, for example, to solidify or improve their relative standing in the hierarchy (Maner & Mead, 2010; Mead & Maner, 2012). As a result, intragroup conflicts may increase, diverting attention and resources away from the development and implementation of new ideas (Bendersky & Shah, 2012; Greer et al., 2011).

More specifically, those at the top of a highly mutable team hierarchy may perceive internal competition as a direct threat to their privileged standing (Feenstra et al., 2020; Ridgeway, 2014). As a result, they may resort to defensive and potentially destructive means of dealing with such competition (Tost et al., 2012), for instance by refusing to support—or actively blocking—others' development and implementation of innovative ideas (Anderson & Brion, 2014; Maner & Mead, 2010). After all, higher-standing members may perceive such ideas as a challenge to their authority in such contexts, representing a competitive attempt to alter the existing hierarchy. Similarly, strong internal competition may induce members lower in a mutable team hierarchy to seek upward mobility by competing for scarce resources (Cheng et al., 2013; Maner & Case, 2016). Rather than cooperating with others in the development and implementation of novel ideas, teammates may appear as direct rivals that

can undermine one's own hierarchical advancement (Kilduff et al., 2016). It may appear worthwhile, then, to withhold support and maybe even (covertly) sabotage other members' innovation attempts, aiming to utilize others' setbacks as an opportunity to improve one's own position (Bendersky & Hays, 2012). For similar reasons, both higher- and lower-ranked members may deliberately avoid introducing novel ideas in highly competitive and hierarchically mutable teams. Such ideas inherently entail a high risk of failure (March, 1991), and competing teammates may exploit such failures to undermine one's own standing and advance their relative position (Duguid & Goncalo, 2015; Jordan et al., 2011).

On the other hand, relatively stable (i.e., less mutable) hierarchies provide clearer structures, such that higher-ranking members' positions are relatively secure and lower-ranking members' upward mobility is limited (Scheepers et al., 2015). Research has shown that individuals (even at lower ranks) often appreciate such stability, because it structures interactions, reduces conflicts, and satisfies the need for order and predictability (Halevy et al., 2011; Ronay et al., 2012). Moreover, given their well-defined authority relations and decision-making roles, stable hierarchies can foster cooperation and coordination (Greer & Van Kleef, 2010; Woolley et al., 2023). Accordingly, we anticipate that low hierarchy mutability will steer a team's competitive dynamics towards beneficial innovation consequences. The introduction of creative ideas, in particular, should be less risky in such team contexts, as errors and failures are less likely to damage an individual's standing in the hierarchy (Bendersky & Pai, 2018; Knight & Mehta, 2017). Hence, despite a competitive team atmosphere, members may feel greater freedom to experiment with novel ideas (Duguid & Goncalo, 2015). In fact, internal competition may motivate team members to distinguish themselves through creative efforts in this situation (Kilduff et al., 2010), highlighting their expertise and earning others' recognition without fear of endangering their own position.

Moreover, internal competition is less likely to manifest in destructive power struggles and, thus, to undermine members' support for others' innovative efforts in hierarchically

stable teams. Rather, such innovation support may represent a viable means to gain a competitive edge in such contexts (Rousseau et al., 2013; Somech & Drach-Zahavy, 2013). Specifically, although a competitive team climate may induce those at the top of the hierarchy to assert their own views and opinions (Greer & Van Kleef, 2010), they are more likely to utilize constructive means for reaching these goals if the team's hierarchy is stable. Team competition does not constitute an immediate challenge to higher-ranking members' privileged standing in this situation, such they may perceive little need to obstruct lower-ranking members' creative efforts to fend off hierarchical threats. In fact, internal competition within a stable hierarchy may even encourage higher-ranking members to support such efforts. After all, aiding others' idea development and implementation may enable higher-ranking members to showcase their engagement for the team as a whole, thus reinforcing their recognition, respect, and influence (Anderson & Kilduff, 2009). Similarly, internal competition is less likely to aggravate lower-ranking members' cooperation in the development of innovative solutions if the team hierarchy is stable. Members have little to gain, then, from obstructing their peers' creative efforts, because others' failures are unlikely to benefit one's own hierarchical position (Deng et al, 2021). Indeed, a competitive team atmosphere may even encourage lower-level peers' strategic collaboration in this context. With little incentive for mutual exploitation (i.e., because hierarchical gains are unlikely), such collaboration may enable teammates to collectively push towards the implementation of novel ideas even against others' objections (Van Knippenberg, 2017).

Taken together, we anticipate that hierarchy mutability is critical in determining how internal competition influences a team's innovative work behavior. Specifically, we propose the following moderation hypothesis:

Hypothesis 2: Team hierarchy mutability moderates the relationship between team competitive climate and team innovative work behavior. This relationship is negative when team hierarchy mutability is high, but it is positive when hierarchy mutability is low.

Our prior reasoning has posited a positive relationship between team hierarchy strength and a team's competitive climate (Hypothesis 1). Moreover, we have cast team hierarchy mutability as a boundary condition that critically shapes the (detrimental or beneficial) innovation consequences of team competition (Hypothesis 2). Combining these propositions, team hierarchy mutability is likely to also moderate the indirect association between team hierarchy strength and team innovative work behavior, via team competition. We therefore propose the following conditional indirect effects hypothesis:

Hypothesis 3: Team hierarchy mutability moderates the indirect relationship between team hierarchy strength and team innovative work behavior, through team competitive climate. This indirect relationship is negative when team hierarchy mutability is high, but positive when team hierarchy mutability is low.

Method

Data Collection

We gathered online survey data from team members and their direct supervisors across various organizations in Germany. Potential participants were contacted via personal and university networks, following procedures similar to those used by Bunderson et al. (2016). The researchers sent invitation emails to potential participants, which included a link to their respective surveys and general information about the study, without disclosing the hypotheses. We used unique team codes to match responses from supervisors and team members. The invitation email stressed that participation was voluntary and that all data was kept confidential. To address common source concerns (Podsakoff et al., 2012), team members reported their perceptions of their team's hierarchy strength, competitive climate, and hierarchy mutability, whereas supervisors evaluated their team's innovative work behavior.

Participants

Initially, we received responses from 161 supervisors and 558 team members. We excluded 23 supervisors and 32 members due to missing or incorrect team codes and/or excessive missing data. Moreover, inclusion in the final sample required that (a) a supervisor's data could be matched with at least two members (to enable meaningful aggregation of the member data to the team level; e.g., Rousseau et al., 2013) and (b) these members had worked in their current team for at least one month (so they could provide meaningful information about the team). On this basis, we excluded 17 additional supervisors and 75 members. Hence, the final sample included 121 teams (with 121 supervisors and 451 members), for a usable response rate of 75.2% among supervisors and 80.8% among members. Each team had 3.7 member responses on average (ranging from 2 to 9). Of the participating teams, 39.7% came from the service sector, 19.0% from health care, 14.0% from manufacturing, 10.7% from finance, and 9.9% from sales.[7] Of the supervisors in our sample, 57.0% were male, with an average age of 46.2 years (*SD* = 10.60) and average organizational tenure of 14.3 years (*SD* = 9.11). Of the team members, 53.7% were female, with an average age of 38.5 years (*SD* = 21.63), average organizational tenure of 8.2 years (*SD* = 9.14), and average team tenure of 3.7 years (*SD* = 5.36).

Measures

We followed a back-translation procedure to transfer all items from English to German. All variables were assessed on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Team hierarchy strength

Team members rated their perceptions of their team's hierarchy strength using a seven-item measure developed by G. S. van der Vegt (personal communication, September 27, 2021). This measure captures the degree to which members perceive that status, power,

[7] One-way ANOVAs did not indicate significant between-industry differences in any of the substantive study variables (all $p \geq .27$).

and influence within their team are differentiated (3 items; e.g., "There are big status differences in my team") and centralized (4 items; e.g., "A small number of team members determines what happens within my team;" see also Yu & Kilduff, 2020). These two dimensions were highly correlated $r = .75$ ($p < .001$), and Cronbach's alpha for the overall measure was .85. For completeness, we further explored our hypotheses by distinguishing hierarchical differentiation ($\alpha = .78$) from centralization ($\alpha = .78$).

Before aggregating members' team hierarchy perceptions to the team level, we calculated both interrater agreement statistics ($r_{wg(j)}$) and intraclass correlation coefficients (ICC; Bliese, 2000). We obtained high interrater agreement within teams (median $r_{wg(j)} = .89$, using a uniform reference distribution) and significant intraclass correlation statistics (ICC1 = .28, $p < .01$; ICC2 = .59), supporting the team-level aggregation of individual members' ratings.

Team competitive climate

Members rated a three-item measure from Hays and Bendersky (2015) to assess their team's competitive climate. We slightly adapted these items to refer to the competitive behavior of a focal team's members (rather than their initial self-referent). The items are "Members of my team attempt to assert their opinions over other team members," "Members of my team challenge the contributions of other team members," and "Members compete within the team for influence over team tasks and decisions." Cronbach's Alpha was .75. Substantive interrater agreement (median $r_{wg(j)} = .86$) and significant intraclass correlation statistics (ICC1 = .16, $p < .01$; ICC2 = .41) justified averaging multiple members' responses to the team level.

Team hierarchy mutability

Members rated a six-item measure from Hays and Bendersky (2015) to assess their team's hierarchy mutability ($\alpha = .84$). A sample item is "Members' relative positions in the hierarchy of my team can be altered," and "The hierarchy in my team is flexible and members

can move up or down based on how hard they work." We obtained high interrater agreement within teams (median $r_{wg(j)}$ = .84) for this variable, although the intraclass correlations were lower than desirable (ICC1 = .06, p = .06; ICC2 = .20). In this regard, we note that small average group sizes (as in the present sample) are known to often result in lower ICC values (Bliese, 1998). Moreover, despite this issue, the high interrater agreement suggests consistent perceptions of hierarchy mutability among members of the same team. On this basis, we believe the overall pattern of aggregation statistics justifies averaging individual members' ratings into overall team scores for hierarchy mutability. Importantly, however, we nevertheless considered within-team differences in individual members' ratings as a possible source of bias and, as outlined below, we therefore incorporated such differences as a potential control variable.

Team innovative work behavior

Supervisors rated their team's innovative work behavior using a 9-item measure from Janssen (2000). We slightly adapted these items to refer to team (rather than individual) innovative behavior. Sample items are "Members of my team create new ideas for difficult issues," "Members of my team mobilize support for innovative ideas," and "Members of my team transform innovative ideas into useful applications." Cronbach's alpha was .93.

Control variables

We considered several controls. First, members' *average education* within teams may have substantive implications for team innovative work behavior (e.g., Bell et al., 2011). Individual members' education level was assessed on a 6-point scale (from basic vocational education to doctoral degree), and we averaged this variable to the team level. Besides, *team size* (i.e., overall number of members) is known to influence team processes and outcomes (including team innovation; e.g., Ghosh et al., 2019; Hülsheger et al., 2009; Stewart, 2006) and to shape members' experiences and reactions (e.g., Byron et al., 2023; Lau & Murnighan, 1998). Moreover, as noted before, we aimed to account for potential dispersion effects with

regard to individual members' hierarchy mutability ratings. Consistent with prior research (Briker et al., 2020; Homan et al., 2008), we therefore included the *within-team standard deviation of members' team hierarchy mutability ratings* as a possible covariate.

Data Analysis

We used team-level (moderated) hierarchical regression analyses to test the main and moderation effects postulated in Hypotheses 1 and 2 (Cohen et al., 2014). Moreover, we used recommended bootstrap procedures (Preacher et al., 2007) to the test the moderated mediation predictions in Hypotheses 3. These latter analyses employed the PROCESS macro in SPSS 28, using 5000 bootstrap resamples (Hayes, 2022). We standardized all predictors prior to the analyses.

Results

Multilevel Confirmatory Factor Analysis

In the present sample, teams' hierarchy strength, competitive climate, and hierarchy mutability were assessed through member ratings. We therefore conducted multilevel confirmatory factor analyses in Mplus 8 to examine these constructs' distinctiveness. A three-factor model (with the items for hierarchy strength, competitive climate, and hierarchy mutability loading on their respective, correlated factors) showed largely adequate fit (χ^2 = 626.63, *df* = 202, CFI = .89, SRMR-within = .06, SRMR-between = .10, RMSEA = .07, AIC = 22280.92). All item loadings were statistically significant for all constructs (average within standardized loading = .70; $p < .001$; average between standardized loading = .74; $p < .001$). Moreover, a four-factor model that distinguished hierarchy differentiation vs. centralization provided adequate fit to the data as well (χ^2 =524.85, *df* = 196, CFI = .91, SRMR-within = .06, SRMR-between = .10, RMSEA = .06, AIC = 22191.14) and, if fact, its fit was superior to the three-factor model ($\Delta\chi2 = 101.78$, $\Delta df = 6$; $p < .001$)—although we note that the latent correlation between the two hierarchy dimensions was very high (i.e., .81, both at the within and the between level; $p < .001$). We therefore tested our hypotheses both for the overall

hierarchy strength measure and, as supplementary analyses, for the distinct hierarchy differentiation and centralization measures. Notably, a single-factor model (with the items for all variables loading on one common factor) did not provide acceptable fit (χ^2 = 2088.23, *df* = 208, CFI = .51, SRMR-within = .15, SRMR-between = .18, RMSEA = .14, AIC = 23730.51), corroborating our measures' discriminant validity.

Descriptive Statistics and Correlations

Table 4.1 presents means, standard deviations, and bivariate correlations. As expected, team hierarchy strength was positively related with competitive climate (r = .51, p < .001). Team competitive climate also revealed a positive relationship with innovative work behavior (r = .20, p = .03). Considering the control variables, team average education was negatively related with hierarchy strength (r = -.21, p = .02) and positively related with innovative work behavior (r = .24, p = .008). Team size and the within-team standard deviation of hierarchy mutability, by contrast, were not significantly related with any of the focal study variables. Following Becker (2005), we therefore decided to retain only team average education as a control variable in our main analyses to preserve statistical power and avoid biased parameter estimates. Importantly, however, we further repeated our hypotheses tests (a) with all control variables and (b) without any control variables, which yielded largely equivalent results and conclusions (see Table 4.2, Models 2-3).

Hypotheses Tests

Hypothesis 1 posited a positive relationship between team hierarchy strength and team competitive climate. Supporting this notion, Table 4.2 (Model 1a) shows that these variables were indeed positively related (b = .26, SE = .04, p < .001).

Further, Hypothesis 2 suggested hierarchy mutability to moderate the relationship between teams' competitive climate and innovative work behavior. As shown in Table 4.2 (Model 1b), the interaction coefficient of team competitive climate and hierarchy mutability was significantly associated with team innovative work behavior (b = -.15, SE = .07, p

Table 4.1
Descriptive statistics and correlations of Chapter 4 variables

Variables	*M*	*SD*	1	2	3	4	5	6	7	8
1. Team hierarchy strength	2.54	0.56	(.85)							
2. Hierarchy differentiation	2.46	0.58	.84***	(.78)						
3. Hierarchy centralization	2.60	0.60	.90***	.75***	(.78)					
4. Competitive climate	2.40	0.51	.51***	.48***	.35***	(.75)				
5. Hierarchy mutability	2.94	0.52	-.14	.10	-.09	-.05	(.84)			
6. Innovative work behavior	3.43	0.75	-.06	-.15	-.16	.20*	.12	(.93)		
7. Team average education	3.18	0.93	-.21*	.15	-.28**	-.06	.13	.24**	-	
8. Team size	7.60	5.19	.10	.09	.08	.12	-.02	-.14	.05	-
9. SD of hierarchy mutability	0.73	0.39	-.10	-.04	-.10	.05	-.15	-.02	.04	.04

Note. Unit of analysis is team (N = 121). Cronbach's alpha in parentheses. For education, 6-point scale, from elementary school (1) to doctoral degree (6). *M* = mean. *SD* = standard deviation.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4.2

Regression results on team competitive climate and innovative work behavior

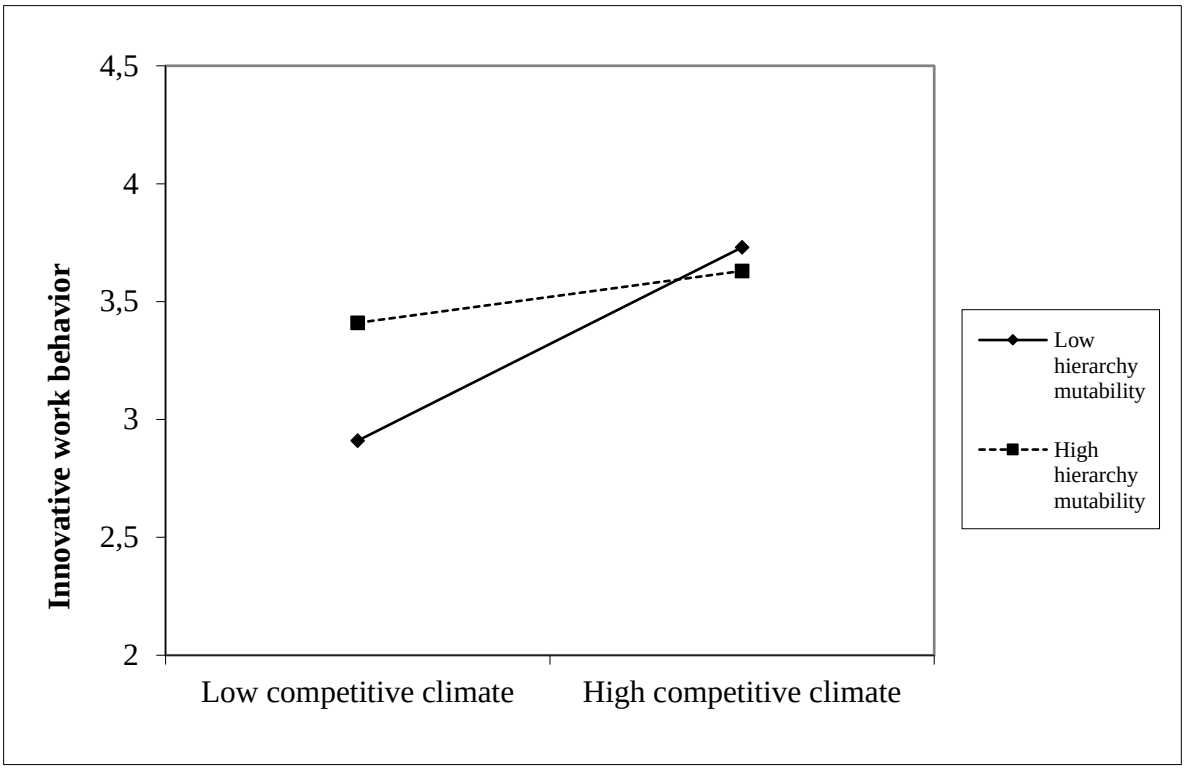
	Competitive climate		Innovative work behavior		Competitive climate		Innovative work behavior		Competitive climate		Innovative work behavior	
	Model 1a		Model 1b		Model 2a		Model 2b		Model 3a		Model 3b	
Variables	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Constant	2.40***	.04	3.42***	.07	2.40***	.04	3.42***	.06	2.40***	.04	3.42***	.07
Team hierarchy strength	.26***	.04	-.20*	.08	.26***	.04	-.14†	.08	.26***	.04	-.19*	.08
Competitive climate			.26***	.08			.25***	.08			.25***	.08
Hierarchy mutability			.10	.07			.07	.07			.09	.07
Competitive climate*hierarchy mutability			-.15*	.07			-.12†	.07			-.14*	.07
Team average education	.001	.04	-.08	.07	.02	.04	.16*	.07				
Team size					.03	.04	-.12†	.06				
SD of hierarchy mutability							-.003	.07				
R^2	.26		.13		.27		.18		.26		.12	
Adjusted R^2	.25		.10		.25		.13		.25		.09	
F	20.66***		3.53**		14.13***		3.60**		41.68***		3.98**	

Note. $N = 121$. Unstandardized coefficients are reported. Model 1 control for team average education, Model 2 include all control variables, and Model 3 without control variables.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

= .03). As anticipated, simple slopes analyses illustrated that a team's competitive climate was positively related with innovative work behavior when members perceived low hierarchy mutability (-1 *SD*: *b* = .40, *SE* = .11, *p* < .001; see Figure 4.2). Contrary to our expectations, however, this relation was non-significant (rather than negative) when members perceived higher hierarchy mutability (+1 *SD*: *b* = .11, *SE* = .09, *p* = .24). Thus, Hypothesis 2 was only partially supported.

Figure 4.2. *Interactive relationship of team competitive climate and team hierarchy mutability with team innovative work behavior.*



Finally, Hypothesis 3 suggested that hierarchy mutability moderates the indirect relationship between team hierarchy strength and team innovative work behavior, through competitive climate. Indeed, our results show that this indirect relationship was contingent on a team's hierarchy mutability (*index of moderated mediation* = -.07, 95% CI = [-.147, -.011]; Hayes, 2022). As expected, this indirect relation was significant and positive when hierarchy mutability was lower (-1 *SD*: *indirect effect* = .10, 95% CI = [.083, .333]). Contrary to our

expectations, however, the indirect relation was not significant (rather than negative) when mutability was higher (*indirect effect* = .03, 95% CI = [-.026, .130]). Hence, Hypothesis 3 was partially supported.

Supplementary Analyses

As noted earlier, we conducted supplementary analyses of the distinct hierarchy strength dimensions (i.e., differentiation vs. centralization; Bunderson et al., 2016) to enable a finer-grained understanding of our results. As shown in Appendix (Table A4.1), our respective findings revealed that hierarchical differentiation was positively correlated with competitive team climate (b = .26, SE = .06, p < .001), whereas hierarchical centralization was not (b = -.02, SE = .06, p = .74). Consequently, the overall conditional indirect effects model proposed in our research (i.e., hierarchy mutability moderating the indirect team hierarchy strength-competition-innovation linkage) was supported for hierarchical differentiation as well (*index of moderated mediation* = -.08, 95% CI = [-.152, -.009], but not for hierarchical centralization (*index of moderated mediation* = .01, 95% CI = [-.034, .048]). We will return to these supplementary findings in the Discussion.

Moreover, besides moderating the linkage between competitive team climate and innovative work behavior (as argued and illustrated above), it seems possible that hierarchy mutability might moderate the relationship between a team's hierarchy strength and competitive climate. A stronger hierarchy may be particularly likely, for example, to induce competition within the team if individuals' positions are unstable, such that hierarchical gains and losses are a distinct possibility (Greer & Van Kleef, 2010; Hays & Bendersky, 2015). To examine this notion, we tested an alternative model that placed team hierarchy mutability as a moderator of the team hierarchy strength–competition linkage. As shown in the Appendix (Table A4.2), however, the interaction coefficient of team hierarchy strength and mutability was not significantly related with a team's competitive climate (b = -.04, SE = .04, p = .39). Hence, our initial theorizing appears more empirically tenable than this alternative model.

Discussion

This study showed that team hierarchy mutability moderates the indirect role of hierarchy strength for team innovation, through teams' competitive climate. In teams with relatively stable hierarchies (i.e., low mutability), the competitive climate resulting from a strong hierarchy was positively associated with teams' innovative work behavior. Somewhat unexpectedly, by contrast, the competitive climate induced by a strong hierarchy was unrelated (rather than negatively related) with innovative work behavior in teams with more flexible hierarchies (i.e., high mutability). These findings provide important theoretical insights for team hierarchy–innovation research.

Theoretical Implications

As noted before, prior research suggests that strong hierarchies may critically influence innovation in work teams by evoking a competitive atmosphere—but it is unclear whether such competition is beneficial or detrimental to a team's innovative performance (e.g., see Dietz et al., 2015; Sofyan et al., 2023; Zhao et al., 2016). Beyond reiterating the role of team competition for understanding the hierarchy–innovation linkage, our findings address this ambiguity and, thus, advance a better theoretical understanding of how the competitive dynamics set in motion by a teams' hierarchical structure relate with members' innovative work behavior. Whereas prior studies have often treated hierarchy as a unidimensional construct (e.g., Cantimur et al., 2016; Knight & Mehta, 2017), we illustrate that it is crucial to consider both hierarchy strength and mutability as distinct, largely independent dimensions that *jointly* shape a team's innovation behavior, through its competitive climate. Hence, our results emphasize that the role of hierarchy for team innovation is more complex than often assumed; the consequences of a strong team hierarchy critically hinge on the degree to which team members perceive this hierarchy as stable vs. mutable.

More specifically, we note that strong (team) hierarchies are often regarded with considerable reservation, with authors emphasizing the advantages of flat, egalitarian

structures (Burton et al., 2017; Lee, 2024). Our findings challenge this negative view and, indeed, they intimate an even more favorable perspective on the innovation consequences associated with strong team hierarchies than we had initially anticipated. In teams with relatively stable hierarchies, our study illustrates that the competitive climate induced by pronounced hierarchy strength may yield distinct innovation benefits. In teams with more mutable hierarchies, however, the indirect role of hierarchy strength for innovation, through team competition, was not negative (as we had expected), but rather was non-significant. As illustrated in Figure 4.2, these teams exhibited relatively strong innovation behavior, largely irrespective of the degree of hierarchy-induced competition. Overall, our findings therefore suggest that teams' innovative efforts may benefit both from their hierarchy strength (through the associated internal competition) *and* from their hierarchy mutability. Of course, due to the partially unexpected nature of these results, further empirical scrutiny is warranted. At the same time, a number of recent studies have similarly found that stronger hierarchies may not consistently damage team innovation or creativity and, in some cases, may even prove beneficial (e.g., Lou & Tong, 2024; Oedzes et al., 2019). Hence, this study contributes to a growing body of research that may advocate a more favorable assessment of the role of hierarchies in work teams.

Finally, our supplementary results illustrate that, beyond distinguishing hierarchy strength and mutability, hierarchy strength itself may be a multi-faceted construct, with its various facets potentially exerting inconsistent effects on team processes and outcomes (see also Greer & Van Kleef, 2010; Wellman et al., 2020). Our findings suggest, specifically, that hierarchical differentiation may be more relevant than centralization when it comes to shaping team competition and innovation. Potentially, hierarchical differentiation may create a particularly competitive environment by highlighting salient rank distinctions across all members of the team (Yu et al., 2019). Centralization's competitive consequences may be less pronounced, by contrast, as it minimizes opportunities for the majority of team members (i.e.,

those at the bottom of the hierarchy) to effectively shape team decisions (Jansen et al., 2006). Although these findings are exploratory (and, given the high correlation between hierarchy differentiation and centralization, they should be regarded with caution), we believe they further reiterate the relevance of adopting a fine-grained, multidimensional perspective on team hierarchy and its implications for team functioning.

Limitations and Future Research Directions

Interpretation of our findings should consider a number of limitations. We cannot draw causal conclusions from our correlational research design. Although our conceptual model is grounded in prior theory and research, we cannot rule out the potential for alternative causal linkages. It is possible, for instance, that more innovative teams reshape their hierarchical structures over time. Specifically, teams that engage in successful innovative behaviors may become more mutable in their hierarchy, as the collaborative nature of innovation might flatten hierarchical distinctions (Zhu et al., 2018a). Longitudinal and experimental research designs are needed to better establish causal directions and to examine how hierarchies may evolve as teams innovate over time (cf. LeBreton & Senter, 2008).

We also recognize potential concerns related to common method bias, despite the multi-source design of our study, as teams' hierarchy strength and competitive climate were measured simultaneously and from the same source. However, our CFA results supported the discriminant validity of these measures, and we used independent supervisor ratings to assess teams' innovative work behavior. Additionally, while the aggregation statistics were generally acceptable, we acknowledge that the ICC values for team hierarchy mutability were lower than desirable, despite strong within-team agreement. As noted earlier, scholars have pointed out that small average group sizes, like those in our sample, can lower ICC estimates (Bliese, 1998). Moreover, low ICC values indicate relatively low reliability of the group means (Bliese, 2000), which is likely to attenuate relationships between group-level variables and, thus, render our results more conservative (e.g., see Bliese et al., 2018; Burke et al., 2017).

Another limitation of this study is that all data were collected from a single country, Germany, which restricts the generalizability of our findings towards different cultural contexts. For example, the German culture is characterized by relatively low power distance and high individualism (Hofstede, 2001; House et al., 2004), such that team members may be less likely to accept strong hierarchies and more inclined to assert their own perspectives, particularly in competitive situations. Moreover, the German culture has been characterized by relatively high uncertainty avoidance (Brodbeck et al., 2002), potentially making individuals more reluctant to exhibit innovative behaviors that often entail risks and ambiguities. Future research could benefit from exploring our conceptual model in different cultural settings, particularly in cultures with higher power distance and collectivism (e.g., many Asian or Latin American countries; Basabe & Ros, 2005) and/or lower uncertainty avoidance (e.g., the US; Ayoun & Moreo, 2008).

Beyond addressing limitations, our investigation opens up several promising avenues for future research that could extend and build upon our findings. First, as noted earlier, our unexpected results on the moderating role of hierarchy mutability invite further inquiry. Prior research suggests, for example, that relatively powerless individuals at the bottom of the hierarchy may perceive an unstable, highly mutable hierarchy as beneficial (i.e., because it enables upward mobility), whereas more powerful individuals at the top may perceive such mutability as detrimental (i.e., because it threatens their superiority; Feenstra et al., 2020; Scheepers et al., 2015). Akin to this dissertation's Study 2 (see Chapter 3), future studies could therefore adopt a cross-level perspective, exploring how hierarchy mutability may differentially shape the innovation consequences of hierarchy-induced competition among individual team members in lower vs. higher positions.

Second, following prior research (e.g., Bednall et al., 2014; Widmann & Mulder, 2018), our study has conceptualized and measured team innovative work behavior as a broad construct that comprises both the generation and implementation of novel ideas. This may

have obscured more specific patterns, and future research could benefit from a more detailed approach that distinguishes different stages of the innovation processes (e.g., idea generation, refinement, selection, and implementation; Amabile & Pratt, 2016; Perry-Smith & Mannucci, 2017). Whereas strong hierarchies may inhibit the free flow of creative ideas during the generation and refinement phases, for example, they may facilitate the selection and implementation of useful ideas by providing clear-cut, efficient processes for decision-making and resource allocation (e.g., Keum & See, 2017). Examining this notion could reveal new theoretical insights that advance a more specific depiction of the impacts associated with hierarchical structures for innovation within work teams.

Finally, further research could consider how aspects of team hierarchy interact with other team characteristics to shape a team's innovative performance. Given the increasing diversity of the workforce observed in many countries (Won et al., 2021), examining the role of teams' (surface-level and/or deep-level) diversity may be particularly interesting. On the one hand, strong and clear-cut hierarchical structures may simplify decision-making processes and reduce the need for consensus-building (Hollenbeck et al., 2011), thus aiding teams to overcome the coordination difficulties often associated with high diversity (Halevy et al., 2011). On the other hand, such structures may emphasize between-member differences, potentially aggravating existing reservations between diverse members and stifling their innovative contributions to the team as a whole (Doyle et al., 2023; Park et al., 2018). Research on team faultlines may be informative in addressing this ambiguity (for a recent overview, see Thatcher et al., 2024), such that the benefits associated with strong hierarchies may be reduced (and their detriments enhanced) if a team's hierarchical structuring is closely aligned with relevant diversity dimensions, thus promoting counterproductive subgroup formation.

Practical Implications

This study has important implications for organizations aiming to enhance their teams' innovative work behavior. Contrary to claims about the detrimental innovation consequences associated with hierarchical structures (e.g., Dearden et al., 1990; Hirst et al., 2011), our findings show that strong team hierarchies are not necessarily problematic. In fact, our investigation suggests that team innovation is most likely to suffer in weak hierarchies that, at the same time, are highly stable.

On this basis, the present study suggests two distinct ways through which organizations may reap innovation benefits from their teams' hierarchical structures. If the hierarchical relations within their teams are relatively fixed and immutable, organizations may emphasize hierarchical differences, thus facilitating competitive within-team dynamics that advance members' innovative efforts. They could do so, for example, by assigning clear-cut roles with differentiated decision-making responsibilities towards individual members, thus establishing a salient rank order within the team (Anderson & Brown, 2010; Oedzes, 2020). Alternatively, organizations may strive towards creating more flexible, mutable team hierarchies. For example, they could encourage role rotation within teams and/or define clear career paths that facilitate individuals' hierarchical upward mobility (Gerstberger, 2021; Kumar et al., 2021; Laud & Johnson, 2012).

Conclusion

This study highlights the important, yet complex role of team hierarchy for team innovation. In teams with stable hierarchies, on the one hand, innovative work behavior may benefit from pronounced hierarchical differences that foster a competitive internal climate. Teams with more mutable hierarchies, on the other hand, may be able to achieve such innovative behavior even without strong hierarchy-induced competition. These findings underscore the theoretical importance of conceptualizing team hierarchy as a multi-dimensional construct, and they offer relevant insights for organizations aiming to stimulate their teams' innovative performance.

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Appendices

Table A4.1
Regression results on team competitive climate and innovative work behavior, distinguishing hierarchy differentiation and centralization

	Competitive climate		Innovative work behavior	
	Model 1		Model 2	
Variables	*b*	*SE*	*b*	*SE*
Constant	2.40***	.04	3.42***	.06
Hierarchy differentiation	.26***	.06	-.19†	.11
Hierarchy centralization	-.02	.06	-.10	.10
Competitive climate			.28***	.07
Hierarchy mutability			.09	.07
Competitive climate*hierarchy mutability			-.15*	.06
Team average education	.01	.04	-.09	.06
R^2	.23		.19	
Adjusted R^2	.21		.14	
F	11.90***		4.36***	

Note. $N = 121$. Unstandardized coefficients are reported.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table A4.2

Alternative model exploration: Interaction of hierarchy strength and mutability on team competitive climate

	Competitive climate			
	Model 1		Model 2	
Variables	*b*	*SE*	*b*	*SE*
Constant	2.40***	.04	2.39***	.04
Team hierarchy strength	.26***	.04	.25***	.04
Hierarchy mutability	.01	.04	.00	.04
Hierarchy strength*mutability			-.04	.04
Team average education	.00	.04	-.01	.04
R^2	.26		.26	
Adjusted R^2	.24		.24	
F	13.68***		10.42***	

Note. *N* = 121. Unstandardized coefficients are reported.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Chapter 5: General Discussion

Summary of Findings

Hierarchical structures are ubiquitous within teams, and recent research has revealed their influence on team creativity to be more complex than traditionally assumed (e.g., Bunderson et al., 2016; Greer et al., 2018; Oedzes, 2020). This dissertation examines different dimensions of team hierarchy and their varying effects on team creativity, individual creativity, and team innovative behavior, while also considering mediating team processes as well as contingency factors.

First, Chapter 2 reveals that flat team hierarchies can foster support for innovation, and thus, may aid team creativity, but only when members perceive that creativity is crucial for task accomplishment. Interestingly, pyramid-shaped, highly centralized hierarchies can also promote innovation, but only in contexts where lower creativity demands exist. These findings challenge the conventional wisdom that flatter hierarchies are universally better for creativity, suggesting instead that the creativity consequences of specific hierarchical shapes depend on the specific creativity requirements of the team.

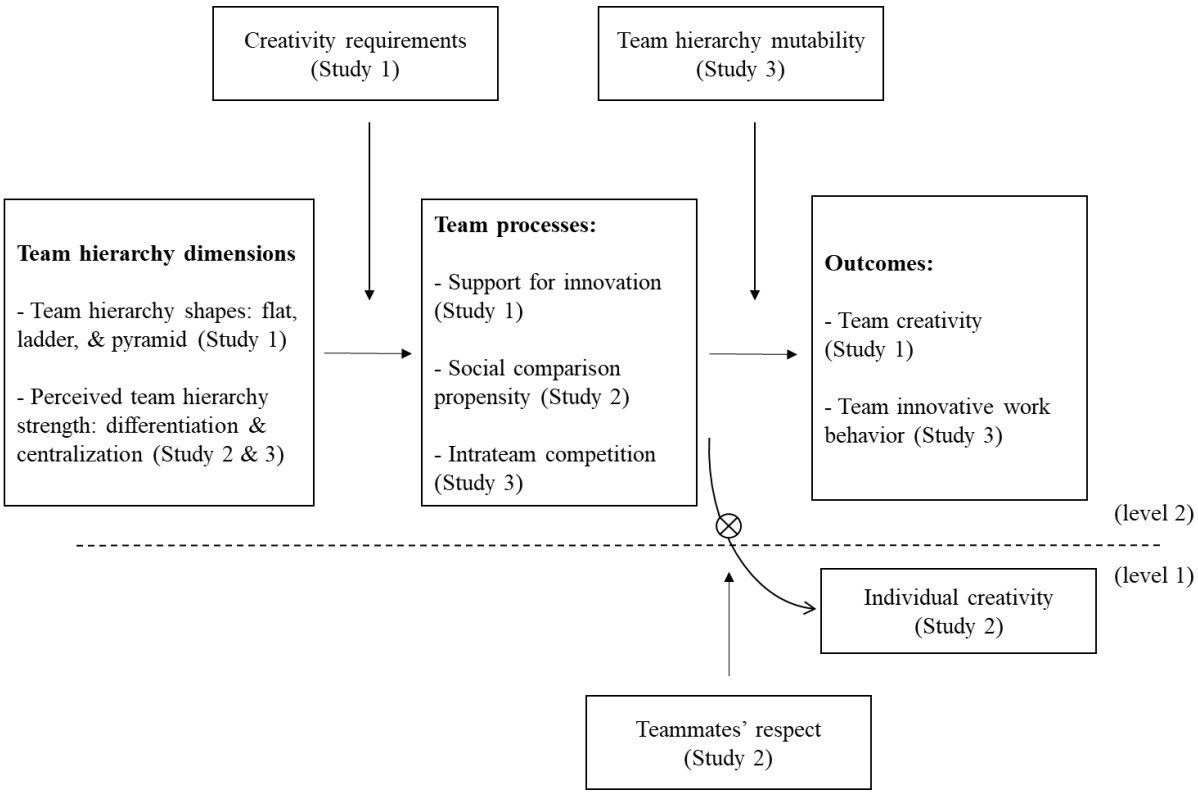
Adopting a cross-level perspective, Chapter 3 shows that strong hierarchical structures within teams can diminish individual members' creativity, primarily due to increased intrateam social comparison propensity. However, this negative linkage is not uniform across all team members; individuals who lack respect or standing in the team are more adversely affected by strong hierarchical structures, while those with higher standing are relatively insulated from these negative consequences.

Finally, Chapter 4 shows that hierarchy mutability plays a crucial moderating role in the relationship between team hierarchy strength, intrateam competition, and team innovation. In teams with stable hierarchies, strong hierarchical differences foster a competitive climate that is positively linked to team innovative work behavior. In contrast, in teams where

hierarchy is more mutable, innovation remains relatively high, irrespective of hierarchy-induced competition.

Taken together, these findings suggest that the effects of hierarchy on team creativity and innovation are far from straightforward. As summarized in Figure 5.1, the respective consequences of team hierarchy depend on its structure (i.e., different shapes), its flexibility (i.e., mutability), and the social interactions between team members on different levels of the hierarchy. Key team processes, such as support for innovation, social comparison propensity, and intrateam competition, play critical roles in shaping these outcomes. These results offer important theoretical insights, highlighting the complex and contingent nature of the team hierarchy–creativity relationship.

Figure 5.1. *Summary of findings.*



Theoretical Implications

Overall, the findings from this dissertation provide significant contributions to theory advancement. First, this dissertation contributes to the hierarchy literature by emphasizing team hierarchy as a multi-dimensional construct. The common assumption in many organizational studies is that flatter hierarchies are inherently better for fostering creativity and innovation, while more hierarchical structures are often viewed as stifling or detrimental (Amabile, 1997; Hirst et al., 2011). However, this dissertation reveals that these assumptions are not always true and oversimplify the complex role of hierarchy. The findings show that hierarchical flatness, differentiation, and centralization differently shape both team and individual creativity. For example, flat hierarchies can promote team creativity, but only when creativity is explicitly required (Study 1). In contrast, highly centralized hierarchies can be beneficial to team creativity when creativity requirements are low (Study 1) although, at the same time, they may diminish team and individual creativity, particularly for lower-ranked members (Study 2). Study 3 examined both centralization and differentiation simultaneously and found that, when controlling for differentiation, centralization was not significantly associated with team competition and innovation. Similarly, highly differentiated hierarchies may undermine individual creativity for lower-ranked members (Study 2), while promoting overall team innovation through intrateam competition when the hierarchy is stable (Study 3). Together, a key takeaway is that hierarchy is a multi-faced construct whose specific dimensions have the potential to both help and hinder important aspects of creativity and innovation in team settings.

Second, this dissertation contributes to the ongoing debate between conflict and functional perspectives on hierarchy (e.g., Anderson & Brown, 2010; Greer et al., 2018) by demonstrating how diverse team processes mediate the relationship between hierarchical structures and creativity/innovation. From a functional perspective, on the one hand, hierarchies may enhance team coordination by clearly defining team members' roles and

responsibilities (Anderson & Brown, 2010; Halevy et al., 2011). Accordingly, Study 1 highlights team support for innovation as a functional mediator for the creativity benefits of flat and centralized hierarchies. On the other hand, the conflict perspective suggests that strong hierarchies can activate conflict-enabling processes, thus diminishing team functioning (Bunderson & Van der Vegt, 2018; Siegel & Hambrick, 2005). Accordingly, Study 2 found that strong hierarches may promote intrateam social comparison propensity, which can undermine individual creativity. Interestingly, Study 3's findings may appear somewhat counterintuitive in this regard, as internal competition could be construed as a form of dysfunctional team conflict (Boz Semerci, 2019; Tjosvold, 1998). The findings of Study 3 reveal, however, that hierarchy-induced competition may actually foster innovation in teams with low hierarchy mutability. Importantly, this finding aligns with Milstein et al. (2022), who suggested that rivalry and competition can enhance performance by motivating individuals to invest extra effort and strive for success. Therefore, when occurring within stable rank structures, competition may serve as a catalyst for improved creative outcomes, rather than a destructive source of conflict.

Third, this dissertation advances the understanding of hierarchy's effects on team outcomes by introducing important boundary conditions that clarify *when* team hierarchy influences creativity and innovation. Its findings show that the relationship between hierarchy and team creativity/innovation is not universal; rather, it is contingent on several key factors that shape how team members respond to hierarchical structures. Specifically, I identify three critical moderators: creativity requirements (Study 1), individual standing in the team (Study 2), and hierarchy mutability (Study 3). These moderators can direct the consequences of team hierarchy to be functional or detrimental. Creativity requirements, for instance, influence whether hierarchical structures function to support team creativity (Study 1). Similarly, an individual's standing in the hierarchy moderates the effects of hierarchy-induced social comparisons on individual creativity. For lower-ranked members, the association turns

negative, consistent with the conflict perspective (Study 2). Finally, hierarchy mutability shapes whether team hierarchy functions in a productive way. When hierarchy is stable, it can help channel competition among members into innovative work behavior (Study 3).

Strengths, Limitations and Future Research Directions

This dissertation has several strengths, including its multidimensional approach to studying hierarchy, offering a nuanced understanding of how different dimensions of hierarchy are linked to creativity. The use of multi-source data across the dissertation's studies further enhances the robustness of the findings (e.g., by reducing common method concerns; Podsakoff et al., 2003). Also, the relatively large sample sizes (i.e., more than 100 teams in each study) add statistical power, which is particularly valuable in team research (Maynard et al., 2021).

Further, the empirical studies were conducted in two distinct cultural settings—Germany and Taiwan—both offering unique perspectives on the relationship between hierarchy and creativity. Germany, characterized by relatively low power distance and high individualism (Brodbeck et al., 2002; Hofstede, 2001; House et al., 2004), offers a context where individuals are less likely to accept strong hierarchical structures and more inclined to assert their own viewpoints. In Taiwan's culture with high power distance and collectivism (Huang & Van de Vliert, 2003; Kelley et al., 2006), by contrast, individuals are more likely to accept hierarchical differentiation in team environments, while emphasizing effective communication and collaboration. Clearly, future studies could further extend this cultural diversity by examining team hierarchy–creativity relations in traditionally under-examined regions in organizational behavior research (e.g., Africa or South America; Cooke et al., 2017).

At the same time, there are broader limitations related to this dissertation as a whole (beyond the specific constraints of each individual study, which were previously discussed) that should be taken into account when interpreting its conclusions and findings. Correlational

research designs, as used across the dissertation's three studies, do not allow for causal conclusions. Although the conceptual models and hypotheses of all studies are grounded in strong theoretical foundations and prior research, I cannot rule out the potential for reverse causality or alternative causal pathways. For instance, it is possible that teams engaging in more creative behaviors over time may reshape their hierarchical structures, potentially becoming more mutable or flatter as collaboration and innovation progress (Zhu et al., 2018). Additionally, despite using multi-source data, common method concerns remain in some instances. For example, in all three studies, team hierarchy and team process variables (e.g., support for innovation in Study 1, social comparison propensity in Study 2, and intrateam competition in Study 3) were measured from the same source (i.e., team members) at the same time. Future research could address these concerns through longitudinal or experimental designs to establish clearer causal mechanisms and further explore the temporal dynamics of hierarchy and creativity in teams.

Also, while this dissertation examines team hierarchy using aggregated team-level constructs, an important limitation concerns the potential loss of meaningful individual-level variance. Although team-level aggregation mostly assumes sufficient within-team agreement to justify a shared perception of hierarchy, the ICCs for hierarchy measures in Study 1 and hierarchy mutability in Study 3 were less than ideal. This raises concerns that aggregation may obscure important differences in individual perceptions of hierarchy. Prior research has noted that such perceptual divergence is not uncommon and may meaningfully shape individuals' experiences within teams (Kilduff et al., 2016). Future research could employ more refined measurement approaches, incorporating individual-level analyses within teams for a deeper understanding of individual (rather than aggregated) hierarchy perceptions and their consequences.

Beyond addressing the limitations, this dissertation opens up several promising avenues for future research that could deepen and expand the theoretical framework and

enhance our understanding of hierarchy and team creativity. First, future studies could examine different shapes of hierarchy, expanding the distinction between centralization and differentiation. Drawing on Wellman et al. (2020), researchers could investigate alternative hierarchy forms, such as inverse-pyramid shape (where the majority of team members hold higher formal authority, while only a small number occupies lower-ranking, in advisory or support teams; Kaufman & Seidman, 1970), and diamond-like structures (where most members have moderate formal authority, accompanied by a few individuals at the top and bottom of the hierarchy, such as seen in hospital nursing shifts; Duffield et al., 2007). Exploring how these various configurations influence team processes and outcomes could provide further insight into the optimal design of hierarchical structures for fostering innovation.

Along similar lines, future research could consider the degree of acyclicity in the dyadic influence relations within a team to more fully capture how hierarchical structures shape team creativity and innovation. In a fully acyclical hierarchy, influence flows in one direction only, such that a member who influences others is not subject to these others' influence in return (Bunderson et al., 2016). This creates a clear, cascading chain of influence, helping team members understand who leads and who defers in decision-making or conflict situations (Bunderson et al., 2016; Krackhardt, 1994). Acyclicity may be particularly relevant for team functioning because it reduces ambiguity in interpersonal interactions. Research suggests that clear influence structures can enhance coordination and task performance, as members are better able to anticipate each other's behavior and avoid unnecessary consultation (Anderson & Brown, 2010; De Kwaadsteniet & Van Dijk, 2010). However, this same clarity may come at a cost for creativity. In strongly acyclical teams, lower-ranked members may feel less empowered to challenge ideas or introduce novel perspectives, which can limit divergent thinking and constructive controversy (Camacho & Paulus, 1995; Choi, 2007). Conversely, less acyclical (i.e., more reciprocal) structures, where members mutually

influence each other, may foster more open exchange, enhance information sharing, and ultimately promote creative outcomes (Oedzes, 2020). Thus, focusing on acyclicity offers a promising extension to current hierarchy research and could enrich the understanding of how influence structures shape creative collaboration within teams.

Second, future studies could examine additional mediating mechanisms to more fully understand the theoretical reasons underlying hierarchy's creativity consequences. Team processes, such as status conflict, warrant more attention in future research. For example, in strongly differentiated hierarchies, status conflicts (i.e., disputes over individuals' rank within the team; Bendersky & Hays, 2012) may intensify as lower-ranking members, feeling marginalized or restricted, might challenge the authority of higher-ranking individuals (Greer et al., 2018). These vertical conflicts may create significant tension across hierarchical levels (Cummins, 2005; Slade Shantz et al., 2020), as they can undermine established authority, thus limiting psychological safety, detering open communication, and ultimately stifling creativity in the team (Bienefeld & Grote, 2014). In contrast, in flatter hierarchies, status conflicts are more likely to arise horizontally between similarly ranked members who are vying for informal leadership or influence (Lee, 2022). While these lateral conflicts may create rivalry and diminish team cohesion, they can also stimulate creative outputs by encouraging individuals to differentiate themselves through novel ideas and contributions (Bendersky & Hays, 2012). Hence, investigating how different hierarchy shapes affect the emergence, escalation, and resolution of status conflicts could offer deeper insights into how these conflicts, in turn, shape team creativity.

Third, future studies could examine other moderators that might shape the effects of hierarchy on team processes and outcomes. For instance, in teams where members are highly interdependent (e.g., due to shared goals or collective tasks and/or rewards; Hertel et al., 2004; Raveendran et al.,2020), hierarchical structures may be less likely to generate negative outcomes like diminished creativity (Havely et al., 2011). For example, when team members'

rewards are tied to collective performance rather than individual achievements, hierarchy-induced competition or social comparison might be reframed in a more cooperative ways, thus encouraging collaboration across hierarchical levels (Zhang et al., 2020). Similarly, task interdependence could push team members to rely on each other's inputs, regardless of hierarchical differences, fostering a more inclusive environment for idea generation and selection (Fong et al., 2018). Furthermore, members' perspective taking, defined as the cognitive process of considering others' viewpoints and understanding their thoughts and feeling (Hoever et al., 2012), might play an important moderating role. In hierarchically differentiated teams, in particular, perspective taking may help mitigate power imbalances by encouraging higher-ranking members to consider the input of lower-ranking teammates, while also allowing lower-ranking members to understand the challenges and strategic perspectives of higher-ranking individuals (Wellman et al., 2020). This mutual understanding can lead to greater alignment in team objectives and smoother collaboration, reducing potential tensions and encouraging joint creative performance. Exploring these and other moderators could help to further clarify the conditions under which hierarchical structures either hinder or promote creative outputs, offering a more comprehensive understanding of the contextual factors that shape the hierarchy–creativity relationship.

Finally, Rouse and Harrison (2022) suggested that the most creative team outcomes often arise within contexts with strong "creative centralization" (i.e., with creative contributions and decisions converging on one or a few team members). Such creative centralization may facilitate more efficient knowledge sharing and decision-making, ensuring that diverse inputs are synthesized into cohesive, innovative solutions. However, this centrality might also lead to an over-reliance on central members' ideas, discouraging others from contributing their own creative inputs (Li et al., 2020). Building on this, future research could explore the degree of alignment between a team's hierarchical centralization and its creative centralization (for similar notions, see Oedzes, 2020, Chapter 3). Team creativity

may be most pronounced when individuals who hold central creative roles also occupy high hierarchical positions, as their influence can help legitimize and implement creative ideas (Tarakci et al., 2016). In contrast, when creative centralization resides in lower-ranked members, misalignment may arise that creates tensions, reduces psychological safety, and ultimately discourages broader team contributions, as higher-ranked members may resist influence from lower-ranked peers, and lower-ranked individuals may feel less secure in voicing ideas without influence authority (Edmondson, 2003; Islam & Zyphur, 2005; Tost et al., 2013).

Practical Implications

The findings from this dissertation offer several actionable insights for managers and leaders in the workplace to foster creativity and innovation within teams. While team hierarchy is often viewed with skepticism when it comes to promoting creativity (Anderson & Brown, 2010), this research demonstrates that the relationship between hierarchy and innovation is more complex and contingent on how the hierarchy is designed and managed. Leaders can apply these insights to optimize team creativity and innovation by strategically adjusting hierarchy and team processes.

First, the findings of this dissertation emphasize that team hierarchy is a multidimensional construct, indicating that there are no absolute benefits or detriments associated with any single dimension of hierarchy. For example, while flatter hierarchies may generally promote creativity, their benefits are not automatic. Team members may not perceive the necessity to take creative actions and contribute to innovative ideas without a clear impetus (Study 1; Unsworth & Clegg, 2010). Therefore, managers should take deliberate steps to invite creative inputs from all team members, creating a culture of support where members feel free to express their ideas and take creative risks to fully leverage the advantages of a flat structure. Similarly, in highly differentiated hierarchies, where clear distinctions in rank trigger competition, it is essential to maintain a stable hierarchy (Study 3).

Stability allows team members to adapt to their roles and expectations within the hierarchy (Greer et al., 2018), minimizing uncertainty and fostering a structured environment that channels competitive dynamics into productive, innovation-driven efforts.

Further, our findings suggest that in centralized hierarchies, where decision-making authority is concentrated in one or a few individuals (Yu et al., 2019), creativity depends on how this centralization is leveraged (Study 1 & 2). On the one hand, centralization can support creativity by offering clear direction and reducing ambiguity, thereby facilitating efficient coordination and idea generation within teams. On the other hand, centralized teams may trigger increased social comparisons among members, which can undermine team and individual creativity, especially among lower-ranked members. To balance these effects, leaders in centralized teams should provide clear guidance while being mindful of the potential for negative team processes, ensuring that centralization enhances rather than hinders creativity across all team members.

Moreover, while hierarchy-induced team processes such as social comparison and intra-team competition are often seen in a negative light (Greer et al., 2018; Yu et al., 2019), the findings of this dissertation suggest that such processes are not necessarily detrimental. In fact, leaders and managers might deliberately use these processes to benefit the team's creative outcomes. For example, social comparison, which often occurs in hierarchies, can distract (lower-ranking) team members from their tasks, reducing the mental effort they dedicate to work (Study 2; see also Garcia et al, 2018; Yu et al., 2019). Leaders can mitigate these effects by providing support and fostering a sense of inclusion (Shore & Chung, 2022). Ensuring that all team members have opportunities to contribute and that their efforts are appreciated may create an environment where members feel valued, regardless of their hierarchical position. Intra-team competition, similarly, can have both positive and negative effects on team creativity, as shown by previous research (Dietz et al., 2015). More specifically, however, Study 3 of this dissertation shows that in teams with strong hierarchical

differences, competition can be channeled into innovation if the hierarchy remains stable. Thus, leaders can strengthen the potential positive impact of competition by channeling its energy towards the team's overall success rather than individual rivalries (Schouten et al., 2024).

In summary, this dissertation shows that hierarchical team designs are not necessarily a burden for team creativity. By creating suitable environments and effectively utilizing hierarchy-induced team processes, leaders may even be able to utilize such hierarchical structures as catalysts for innovation.

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Affidavit

Ich erkläre hiermit, dass ich die vorgelegten und nachfolgend aufgelisteten Aufsätze selbstständig und nur mit den Hilfen angefertigt habe, die im jeweiligen Aufsatz angegeben sind. In der Zusammenarbeit mit den aufgeführten Koautoren war ich mindestens anteilig beteiligt. Bei den von mir durchgeführten und in den Aufsätzen erwähnten Untersuchungen habe ich die Grundsätze guter wissenschaftlicher Praxis, wie sie in der Satzung der Justus-Liebig-Universität Giessen zur Sicherung guter wissenschaftlicher Praxis niedergelegt sind, eingehalten.

I hereby declare that I completed the papers submitted and listed hereafter independently and with only those forms of support mentioned in the relevant paper. When working with the authors listed, I contributed no less than a proportionate share of the work. In the analyses that I have conducted and to which I refer in the papers, I have followed the principles of good academic practice, as stated in the Statute of Justus Liebig University Giessen for Ensuring Good Scientific Practice.

Giessen, 23.04.2025

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Huang, S. & Walter, F. (working paper). Team hierarchy and individual creativity: The role of individuals' standing in the team.

Huang, S. & Walter, F. (working paper). Hierarchy-induced competition and team innovation: The moderating role of hierarchy mutability.