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From individual creativity to team creativity: A meta-analytic test of task moderators

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Research has advanced two perspectives on the fundamental issue of the relationship between member creativity and team creativity: the additive model (predicting with average member creativity) and the disjunctive model (predicting with highest member creativity). Inconsistent evidence raises the question of possible moderators. We address this question by developing moderating roles of task characteristics – task interdependence and task creativity requirement. In a meta-analytic review of team creativity (and innovation) research, we hypothesized and supported that the additive model is more predictive in tasks with high interdependence and with low creativity requirements, and that the disjunctive model is more predictive for less interdependent tasks. The effectiveness of the disjunctive model, however, did not differ as a function of task creativity requirements. Further, our supplementary analysis showed that the additive model is more effective in tasks requiring only generating creative ideas than in tasks involving both generation and implementation of creative ideas.

Practitioner points

- Because creative employees are in high demand, it is important to effectively select and assign creative individuals to teams for managing creativity.
- Managing team creativity by selecting creative individuals for the team can be done following two strategies: an additive strategy prioritizing high levels of average member creativity or a disjunctive strategy prioritizing one particularly creative member.
- Whether the additive or the disjunctive strategy is more effective is contingent on task characteristics: with high task interdependence, it is better to prioritize mean member creativity; with low task interdependence and with higher creativity requirements, it is better to prioritize one particularly creative team member.

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The rise of the creative economy in the past decades underscores that creativity – the generation of novel and useful outcomes – is a driving force in contemporary business (Florida, 2002; Howkins, 2001). Organizations that embrace creativity obtain higher growth rates and profitability. In acquiring and creating knowledge, organizations are increasingly recognizing teamwork as a key route (Edmondson, 2002; Gibson & Vermeulen, 2003). For creativity research and managerial practice, there is thus value in understanding the drivers of team creativity. One of the most fundamental questions in this respect is how the creativity of individual members impacts team creativity (Miron-Spektor, Erez, & Naveh, 2011; Taggar, 2002; Triandis, Bass, Ewen, & Mikesell, 1963). At first blush, the answer to this question seems obvious –more creative the teams are, the more creative their members are. Perhaps because the answer to this question seems so intuitive, team creativity research has only engaged with this question to a very modest degree (van Knippenberg, 2017). On closer consideration, however, the issue is decidedly more complex.

First, creativity scholars suggested that the combination of members with creative dispositions (creative personality, Goncalo & Duguid, 2012; cognitive styles, Mathisen, Martinsen, & Einarsen, 2008) or with individual creative performance (Gong, Kim, Lee, & Zhu, 2013) guarantees the success of team creative activities. This view sees creative members as a collective of creative assets – the more the better. Following this view, teams ought to combine and integrate such creative assets from different members (Taggar, 2002). Alternatively, a different perspective has grown in the past decades and stresses the inordinate influence of one or a few highly creative members on team creativity (Call, Nyberg, & Thatcher, 2015; Li et al., 2020). As creativity itself is about deviance and extreme, scholars have suggested that team creativity can be promoted by the most creative members alone (Girotra, Terwiesch, & Ulrich, 2010; Li et al., 2020; Yuan & van Knippenberg, 2020). This thus suggests two different ways to understand the individual-to-team creativity relationship. The *additive model* predicts team creativity with the sum (or in research practice: average) of member creativity and the *disjunctive model* with the creativity of the team's most creative member. Illustrating that the one is not obviously superior to the other, there is mixed evidence for both the additive perspective (Chen, Farh, Campbell-Bush, Wu, & Wu, 2013; Hanke, 2006; Kurtzberg, 2000; Mathisen et al., 2008; West & Anderson, 1996) and the disjunctive perspective (Bissola, Imperatori, & Colonel, 2014; Gong et al., 2013; Pirola-Merlo & Mann, 2004; Sacramento, Fay, & West, 2013; Triandis et al., 1963).

Such inconsistent evidence suggests there may be value in considering moderating influences in the individual-to-team creativity relationship. In this respect, a few studies proposed contextual impacts of creativity-relevant processes such as coordination and control (Bissola et al., 2014; Chiang & Hung, 2014; Taggar, 2002) and group norms and creative climate (Goncalo & Duguid, 2012; Somech & Drach-Zahavy, 2013). Steiner (1972) delineated the performance environment as an important context for different perspectives on member-to-team performance. Steiner's analysis sees the applicability of different member-to-team performance models (including the additive and the disjunctive models) as inherent to the task the team performs. Some tasks relying on synergy and coordination invite additive processes; other tasks striving for one best solution may fit better with disjunctive processes (Forsyth, 2010; Steiner, 1972). Drawing on the foundational work of Steiner (1972), in the present study, we move beyond this earlier work by developing an understanding of the moderating role of task characteristics in the additive and disjunctive perspectives of individual-to-team creativity.

Concerning team creative activities, we argue that task interdependence, creativity requirements, and idea implementation are key moderators of the extent to which the additive and disjunctive models hold. Steiner (1972) concluded that task interdependence, the extent to which members rely on each other for inputs or processes to achieve team performance (Courtright, Thurgood, Stewart, & Pierotti, 2015; Wageman, 1995), aligns with the conditions inviting additive processes (high task interdependence) or disjunctive processes (low task interdependence). For creativity, a key issue is the extent to which the task requires creativity (Chen et al., 2005). We propose that teams with a clear focus on creative performance are more prone to prioritize the higher levels of creativity that more creative members can provide. Thus, the stronger the focus on creativity, the more the disjunctive model holds. Conversely, with less creativity requirement, team creativity can be driven by any member's creative contribution and thus favours the additive perspective. Team tasks also vary in the extent to which they only focus on idea generation (hereafter referred to as ideation-only tasks) or also on the implementation of creative ideas (hereafter referred to as implementation tasks). As implementation is more about putting the best ideas into practice and ideation alone can be about developing as many ideas as possible, we suggest that the additive model has a better fit with ideation-only tasks and the disjunctive model more so with implementation tasks. In a broader scope, we also explored general contextual factors of team size and team longevity as moderators.

We adopted a meta-analytic approach to test this integrative set of hypotheses. This approach allows us to systematically review the two perspectives and draw on between-study differences in task characteristics (De Dreu & Weingart, 2003; Joshi & Roh, 2009; Wang, Cheng, Chen, & Leung, 2019). Importantly, we included both creativity and innovation research in this review. In research practice, team creativity and innovation overlap considerably in their operationalizations (van Knippenberg, 2017). In some innovation studies, innovation as the generation and implementation of novel and useful ideas is contrasted with creativity, understood as the generation of novel and useful ideas alone (Somech & Drach-Zahavy, 2013; West & Anderson, 1996). Many team creativity studies, however, have moved beyond the exclusive focus on ideation to include the implementation of generated ideas (Bissola et al., 2014; Fleming, Mingo, & Chen, 2007). Moreover, even when creativity is only understood as ideation, it is integral to team innovation. All else being equal, the individual-to-team creativity models should thus also hold for team innovation. The task perspective we present thus applies to both the team creativity and team innovation literature, and by including both in this meta-analysis we draw on a more homogeneous set of conceptualizations and operationalizations than the labeling difference suggests. This choice also aligns with decisions in earlier quantitative and qualitative reviews to group team creativity and team innovation together (Hülsheger, Anderson, & Salgado, 2009; van Dijk, van Engen, & van Knippenberg, 2012; van Knippenberg, 2017; Wang et al., 2019).

The individual-to-team creativity link is a fundamental issue in team creativity research. From the current focus on the main effects that has yielded inconsistent evidence, our meta-analytic review establishes the effectiveness of both the additive and disjunctive models. This in particular connects with the growing interest in key members' creative inputs (Aguinis & O'Boyle, 2014; Li et al., 2020) and calls for more attention to the disjunctive logic of team creativity. Moreover, the present study makes an important step forward by providing an integrative perspective of task moderators on the individual-to-team creativity relationship. It shows that the individual-to-team creativity relationship is not as obvious as it may appear at first and invites team creativity research to more systematically explore under what (task) circumstances team members' creative potential may, or may not, impact team creativity. Specifically, our exploration of both creativity-related moderators (i.e., task interdependence, creativity requirements, and idea implementation) and general contexts (i.e., team size, team longevity) in team tasks speaks to the importance of leveraging member creativity in line with the performance environment of team tasks. This task perspective also has implications for creativity researchers to carefully determine their sampling strategies and operationalizations for a better fit with the research focus. Moving beyond team creativity research, the perspective we provide also invites team performance research in general to consider the contingencies of individual-to-team models (Humphrey & Aime, 2014; Mathieu, Tannenbaum, Donsbach, & Alliger, 2014) and its provision of a theoretical base to build from in addressing this issue.

Theory and hypotheses

The question of how individual creativity affects team outcomes is associated more with team creativity research than with team innovation research, but it applies to both for several reasons. Team creativity refers to the generation of outcomes that are both novel and useful by a group of people who share the responsibility for these outcomes (Hargadon & Bechky, 2006; Paulus, 2000; Shalley & Zhou, 2008). Team innovation research often understands team creativity as idea generation (ideation only) and considers team innovation (as encompassing both ideation and idea implementation) to be a broader concept than team creativity (West & Anderson, 1996). Although it is possible to focus only on ideation when team tasks are defined as ideation only (Goncalo & Duguid, 2012; Sacramento et al., 2013), the boundary between ideation and implementation is fuzzy when teams are also charged with implementation. This is because implementation often requires new creative efforts. As new challenges emerge in efforts to implement the idea, teams often must invest in further creative idea development to meet those challenges. Thus, in innovation practice, teams often move back and forth between idea development and implementation efforts; ideation and implementation are more closely intertwined than the use of these separate labels may suggest (Alexander & van Knippenberg, 2014). Because of this, creative success extends beyond the development of creative ideas to include the usage of creative ideas (Bissola et al., 2014; Fleming et al., 2007; He, Hao, et al., 2020), and the impact of member creativity exists in both ideation and implementation processes. For these reasons, it is important to consider both team creativity research and team innovation research when studying the individual-to-team creativity issue. In the following, we rely on the team creativity label and understand this to refer to both ideation-only (i.e., generating new ideas) and the combination of ideation and implementation (i.e., putting ideas into action).

There is a strong tradition of viewing creativity as determined by individual differences (Staw, 2009; van Knippenberg & Hirst, 2015; Zhou & Hoever, 2014). A direct implication of this stream of research is that some teams will have more creative members than others. An obvious and fundamental question in team creativity research therefore concerns the impact of member creativity on team creativity. Such a focus on the individual-to-team creativity relationship is not to deny the role of team processes in team creativity; team processes may be an important driver in stimulating creative contributions and developing contributions for implementation by the team (Drazin, Glynn, & Kazanjian, 1999; Taggar, 2002; van Knippenberg, 2017). Rather, the focus on the individual-to-team creativity relationship complements the focus on team processes by recognizing that team creativity ultimately is also contingent on the creativity of member contributions.

The origin of this individual-to-team creativity link can be traced back to early team research (Forsyth, 2010; Steiner, 1972) and subsequent work on how individual contributions combine to form collective phenomena (Chan, 1998; Kozlowski & Klein, 2000). Team creativity is understood here as a particular form of team performance. Hence, the question of converting individual member creativity into team creativity fits in squarely with this tradition. In his influential analysis of team performance, Steiner (1972) proposed five individual-to-team performance models: the additive and disjunctive models, the compensatory model (which predicts team performance from the average contribution in for instance estimation tasks where the average may be most accurate), the conjunctive model (which predicts team performance from the performance of the least capable performer, for instance in mountain climbing), and the discretionary model in which team members can decide how to combine individual inputs according to any of the other models. The conjunctive model, which focuses on the contribution of the least capable member within a team, is misaligned with the nature of positive deviance in the understanding of team creativity and has been rejected in prior studies (Pirola-Merlo & Mann, 2004; Triandis et al., 1963). The discretionary model focusing on members' willingness in determining which model to follow is more about individual motives/preferences rather than individual creativity (i.e., the stable individual inputs of creative ideas/skills/expressions) in predicting team creativity and thus does not apply here.

The team creativity literature has primarily focused on the aggregation of member creative contributions, corresponding to the additive model (Chen, Farh, Campbell-Bush, Wu, & Wu, 2013; Chiang & Hung, 2014; see Appendix A for a review table). This perspective emphasizes that team creativity benefits from the collective pool of individual creativity, suggesting that less creative members still contribute to team creativity in the face of more creative members' contributions. In that sense, for a given mean or sum of member creativity, differences in creativity between team members do not matter in the additive model. In Steiner's (1972) taxonomy, the additive model focuses on the aggregate of different members' contributions and the compensatory model on the complementary nature of different members' inputs – a subtle difference that is not reflected in research practice in which the additive model is often applied by taking the mean rather than the sum of member contributions to control for team size (i.e., in effect equating the additive and compensatory models, Gonzalez-Mulé, Cockburn, McCormick, & Zhao, 2020; Yuan & van Knippenberg, 2020). Given the highly overlapping use of both terms, we use the label additive model to indicate both additive and compensatory models.

The other perspective in understanding the individual-to-team creativity link focuses on the most creative members and their inordinate influence (i.e., the disjunctive model, Taggar, 2001; Yuan & van Knippenberg, 2020). Differences in creativity across team members do matter in the disjunctive view. In the disjunctive model, it is the creativity of the most creative member that counts, and the creativity of less creative members is of less relevance. Note that the disjunctive model is not at odds with the notion that a team creative product is the outcome of teamwork. It only suggests that the *creativity* of that product is driven by the creativity of the team's most creative member. Less creative members may facilitate team creative performance with contributions such as research, information, and insights, building and refining prototypes, etc. Also, even when the additive and disjunctive models as ideal-types may seem mutually exclusive, whether the additive or disjunctive model holds may be a matter of degree much more than a categorical difference, and the one need not exclude the other (i.e., team creativity may benefit both from additive and disjunctive processes; Gong et al., 2013; Taggar, 2002). We thus propose:

Hypothesis 1. Average individual creativity has a positive relationship with team creativity.

Hypothesis 2. Highest individual creativity has a positive relationship with team creativity.

The evidence for both the additive and disjunctive models as main effects is inconsistent, however, with some tests supporting the additive model (Goncalo & Duguid, 2012) whereas others do not (Hanke, 2006; Mathisen et al., 2008), and some tests supporting the disjunctive model (Triandis et al., 1963) and others not (Bissola et al., 2014; Sacramento et al., 2013). Such variance in findings invites the consideration of moderating influences. Some work addresses the moderating role of team process and climate for the additive model, showing that average member creativity is more predictive of team creativity with processes and climate more supportive of creativity (Chiang & Hung, 2014; Goncalo & Duguid, 2012; Taggar, 2002). What is needed to move this particular line of inquiry forward, however, is an integrative perspective that simultaneously addresses moderation in the additive and disjunctive models. We argue that such a perspective can be developed by building on Steiner's (1972) consideration of the link between task characteristics and the extent to which member contributions affect team performance according to the additive or the disjunctive model.

A task characteristics perspective on individual-to-team creativity

The origin of the two individual-to-team creativity models in Steiner (1972) is first and foremost an understanding of task characteristics. Team creativity may occur in the context of a variety of tasks such as creativity in generating decision alternatives for decision making, in finding solutions to problems, in improving processes, or in developing new products. Creativity need not be the main charge of the team. Such tasks also vary in their emphasis on implementing novel ideas. New product development teams and R&D teams are explicitly charged with delivering creative outcomes, just as teams in experimental research on team creativity, but team creativity may also be observed when the primary charge of the team is not creativity and innovation, such as in top management teams (West & Anderson, 1996), municipal teams (Vera, 2004), or healthcare teams (Somech & Drach-Zahavy, 2013). Considering that team creativity may be observed in such a variety of team tasks, it is an important question how task characteristics affect team creativity (Gilson & Shalley, 2004; Jia, Shaw, Tsui, & Park, 2014; Zhang, Hempel, Han, & Tjosvold, 2007). Yet, this task perspective has not been considered in individual-to-team creativity research. Following Steiner (1972), we propose three task characteristics affect the extent to which individual contributions affect team creativity in an additive or a disjunctive way: task interdependence, creativity requirements, and idea implementation. These elements reflect respectively how individual inputs are combined to yield a team product (task interdependence) and what teams strive for in their collective performance (creativity requirements, idea implementation). In the follow sections, we outline how the effectiveness of the additive and disjunctive models is contingent on these task characteristics.

The moderating role of task interdependence

As a core design feature of teams, task interdependence is defined as the extent to which members depend on each other's resources and effort to accomplish the team task (Wageman, 1995; Wageman & Gordon, 2005). High task interdependence reflects a situation in which the team task requires members to draw on each other's contributions and/or resources in performing the task. Low task interdependence in comparison reflects a situation in which members can contribute to team performance relatively independently from each other. Task interdependence is a key structural feature of work teams that may vary across teams operating in similar environments and aiming for similar objectives (Courtright et al., 2015; Wageman, 1995).

This feature fits with the distinction between the additive perspective that brings different members' ideas together and the disjunctive model that stresses one or a few members' inputs. Highly interdependent tasks are defined by the structural need for members to draw on and combine each other's contributions (Courtright et al., 2015; Wageman & Gordon, 2005). As a result of such structural features of teams, people working on interdependent tasks need to combine the contributions of members into an integrated product. For example, cross-functional teams must gather and utilize different expertise and insights of all members for optimal outcomes, implying the additive perspective. Moreover, the value of combining creative contributions from all members is more salient in teams with high task interdependence. In interdependent tasks, better team solutions emerge from the additive approach of all members sharing and synergizing distinctive information from each other (Mesmer-Magnus & DeChurch, 2009; van Ginkel & van Knippenberg, 2012). This speaks to the advantage of the additive perspective in team contexts of high interdependence. The disjunctive view of team creativity, in comparison, applies more to teams with low task interdependence. The focus on combining different members' ideas and solutions in interdependent teams tends to dilute the influence of any individual influence, including the member with the best creative contributions. Tasks with low interdependence, in contrast, allow the team to rely more on the best contributions of individual members. This makes it possible for teams to prioritize more creative contributions over less creative contributions from individual members, creating a situation in which the disjunctive model applies more. Thus, we propose:

Hypothesis 3. Task interdependence moderates the relationship between average individual creativity and team creativity, such that average individual creativity has a stronger relationship with team creativity when task interdependence is high rather than low.

Hypothesis 4. Task interdependence moderates the relationship between highest individual creativity and team creativity, such that highest individual creativity has a stronger relationship with team creativity when task interdependence is low rather than high.

The moderating role of creativity requirements in team tasks

Some tasks have a higher demand for creativity than others. For some teams, creativity is more or less definitional to task performance. A prototypical example of such teams is

R&D teams, for which the core task is to produce creative outcomes. In other teams, performance expectations do not revolve around creativity and creativity is more incidental in solving problems, improving operations, etc. We capture such differences between team tasks in the notion of *task creativity requirements,* which refers to the explicit requirement of creative outputs in team tasks. As a result of creative task requirements, team members not only invest more effort to generate and express creative ideas but are also more focused on identifying highly creative ideas. More than in teams with tasks with lower creativity requirements, the focus is on highly creative contributions as opposed to contributions that are sufficiently creative to address the issue at hand (e.g., solve a problem, improve a process).

High creativity requirements reflect a performance environment that is more creativity-demanding, both in terms of more explicit expectations for highly creative inputs and in terms of a higher bar for creative contributions to be valuable. High levels of creativity requirements push all members to express their creative ideas as much as possible (Rietzschel, Nijstad, & Stroebe, 2014). This gives rise to an environment in which the most creative members are more likely to express their ideas. Such task requirements for team creativity also encourage teams to prioritize more creative contributions over less creative contributions. The implication is that the most creative members tend to receive more attention and the team creative process is prone to select highly creative inputs for team products. This thus aligns with the disjunctive logic emphasizing the most creative contributions. For instance, in R&D teams that clearly require creativity, Gong et al. (2013) found that team creativity is highly associated with the highest member creativity. In contrast, in team tasks that do not explicitly require creativity (e.g., management teams, primary care teams, Somech & Drach-Zahavy, 2013; West & Anderson, 1996), ideas regardless of their creative quality could be potentially used in developing team products and services. For instance, routine ideas from members can be used for team tasks that require little creativity (e.g., payroll distributions) and lead to a less creative solution of the team. When creativity requirements are low, less creative contributions are more readily accepted. This implies a positive link between team creativity and average member creativity, matching the additive logic of individual-to-team creativity. Thus, we propose:

Hypothesis 5. Average individual creativity is more positively associated with team creativity when team tasks display lower levels of creativity requirements.

Hypothesis 6. Highest individual creativity is more positively associated with team creativity when team tasks display higher levels of creativity requirements.

The moderating role of idea implementation in team tasks

The combination of different lines of literature on ideation, creativity, and innovation also brings about another concern. Some researchers view creativity as ideation-only tasks – merely the generation of creative ideas and operationalize it as tasks of 'generating novel but operable work-related ideas' (Sacramento et al., 2013), such as brainstorming and alternate usage tasks (Nouri et al., 2013; Tadmor, Satterstrom, Jang, & Polzer, 2012). This perspective of team creativity focuses on the development of novel and useful ideas, without concerning how ideas would be implemented. In contrast, organizational behaviour scholars more typically see creativity as problem solving in organizations and thus include not just the development but also the implementation of novel ideas (Bissola et al., 2014; Eisenbeiss, van Knippenberg, & Boerner, 2008). Because novel ideas need to be put into practice to solve organizational problems and creativity is only observable through innovation. Such studies emphasize 'ideas that are then carried out (implemented) by the team' (Cerne, Jaklic, & Skerlavaj, 2013).

The distinction between ideation-only versus implementation tasks is important (Rosing et al., 2018) because the need to put creative ideas into action tends to shift the focus from 'as many creative ideas as possible' (as in ideation-only tasks) to 'one best idea to solve the problem'. Many ideas may be proposed in ideation, but to solve actual problems teams typically pursue only what is considered to be the best idea (Girotra et al., 2010). Research on idea receiving has pointed out that more creative individuals often receive higher ratings of creativity (Berg, 2016; Zhou, Wang, Bavato, Tasselli, & Wu, 2019) and are more likely to be sought for ideas (Goldsmith & Fitch, 1997). The implication is that teams with an implementation focus should be more likely to primarily direct their attention to input from highly creative members, whereas teams focused on ideation only can essentially embrace all contributions from all members. This influence of individual members' creative expertise (or history of creative performance) in implementation tasks is also supported by the social influence literature, which established a prestige effect in group decision making (Cheng, Tracy, Foulsham, Kingstone, & Henrich, 2013). Thus, we suggest that the disjunctive model is more effective in implementation tasks than in ideation-only tasks, and that the additive model fits better in ideation-only tasks than in implementation tasks.

Hypothesis 7. Average individual creativity is less positively associated with team creativity when team tasks require the implementation of creative ideas.

Hypothesis 8. Highest individual creativity is more positively associated with team creativity when team tasks require the implementation of creative ideas.

The moderating role of team size

In addition to the above characteristics that closely relate to how creativity is pursued in teams, we also explored the possible influence of two general features of teams when carrying out such tasks – team size and team longevity. Team size indicates the scope of team resources such as expertise and personnel, but more importantly the growing complexity in team communication and coordination (Guzzo & Shea, 1992; Kerr, 1989). Large teams tend to experience more conflict (Amason & Sapienza, 1997) and to disperse into subgroups and cliques (Carton & Cummings, 2012), whereas it is easier to attend to individual members' ideas and to achieve collective decisions in smaller teams. Logically, teams with more members may find it more difficult to utilize the additive model, which requires widespread collection and integration of different members' creative inputs. In contrast, the disjunctive model may fit better with large teams, where star members (i.e., the most creative members) tend to stand out and are valued more (Kerr & Slocum, 2005). Besides, large teams tend to favour efficiency due to their communication barriers and process losses (Staats, Milkman, & Fox, 2012). Working on the most creative member's ideas presents a more efficient approach than gathering all members' inputs. Thus, we propose

Hypothesis 9. Team size negatively moderates the relationship between average individual creativity and team creativity, such that average individual creativity is more predictive in in smaller teams.

Hypothesis 10. Team size positively moderates the relationship between highest individual creativity and team creativity, such that highest individual creativity is more predictive in large teams.

The moderating role of team longevity

Team longevity, a significant variable affecting how people perform together (Eitzen & Yetman, 1972; Hirst, 2009), can also determine how teams rely on members' creative inputs. Both the additive and disjunctive perspectives require teams to recognize individuals' creative value. To fulfill the additive logic, teams have to understand how to coordinate and integrate each other's ideas. The pursuit of the disjunctive logic also requires teams to recognize the most creative member and then work on his/her inputs. In either case, teams benefit from shared understandings and common perspectives that develop in long-serving teams. Newly formed teams, however, still have to establish their communication norms and get to know different creative values of members' ideas. We therefore suggest that both the additive model and the disjunctive model grow more effective with greater team longevity.

Hypothesis 11. Average individual creativity has a more positive relationship with team creativity with higher team longevity.

Hypothesis 12. Highest individual creativity has a more positive relationship with team creativity with higher team longevity.

Method

Literature search and inclusion criteria

We searched all the common databases (i.e., Web of Science, PsycINFO, EBSCO, ABI/INFORM, and ProQuest Dissertation) for relevant empirical studies until July 2021. Considering that the two variables of interest (i.e., individual creativity and team creativity) were not always explicated but sometimes included as relevant (e.g., control) variables, we conducted our literature search in two steps. First, we identified studies on team creativity and team innovation. Team innovation was also included because team creativity in organizational context often includes the stage of idea implementation and thus does not substantively differ from team innovation (Hülsheger et al., 2009; van Dijk et al., 2012; van Knippenberg, 2017) We started with a keyword search based on the keywords of team/group/collective/collaborative and creativity/innovation/innovativeness to ensure a comprehensive coverage (Devine & Philips, 2001) and also scrutinized the reference lists of a prior meta-analysis on team creativity and team innovation (Hülsheger et al., 2009). This yielded more than 3000 journal articles, conference papers, and doctoral dissertations for the second-step screening. Below, we explain how we further identified studies that include both individual and team creativity/innovation for our analysis.

In the second step, we selected studies that included (1) a measure of team creativity/innovation; (2) a measure of individual creativity or creative differences such as creative personality (Somech & Drach-Zahavy, 2013), creative cognitive styles (Kirton, 1976), creative self-efficacy (Tierney & Farmer, 2002), creative identity (Farmer, Tierney, & Kung-Mcintyre, 2003), and openness to experience (Baer, Oldham, Jacobsohn, & Hollingshead, 2008); and (3) sufficient statistical information to compute effect sizes. Noticeably, in our operationalization of individual creativity, we included measures of both individual creative outcomes and creativity-related dispositions. This is because this study aims to examine individual creative differences in the individual-to-team creativity relationship. Member creativity in this research question reflects a stable capability of individuals in expressing their creative thinking and ideas (Staw, 2009). Team creativity research often considers individual creativity in the team creative process as stable individual inputs rather than outcomes (van Knippenberg, 2017; Yuan & van Knippenberg, 2020). From this perspective, creative dispositions such as creative personality and cognitive skills could act as proxies to capture the creative contributions that individual members could bring in. It therefore makes sense to combine individual creative outcomes and creativity-related dispositions for this particular research question.

Despite the large size of studies examining team creativity/innovation, only a handful of studies met the above criteria. Moreover, most studies only reported the correlation between average individual creativity and team creativity (i.e., the additive model). We emailed the authors of many studies for additional statistics (e.g., the disjunctive model or both). Eventually, we identified 65 studies for this meta-analysis. In particular, we obtained 71 effect sizes for the additive model and 54 for the disjunctive model. The slightly lower number of effect sizes for the disjunctive model was due to the fact that we were often dependent upon responses to our request for further information on the disjunctive model (i.e., which we were not always able to obtain).

Dataset and coding schemes

Initially, one author examined the studies twice to code sample size, correlations, and statistical artifacts such as reported reliability scores of measures. Then, another author independently coded a random sample (i.e., 10% of the studies) to examine the reliability and validity of the effect size coding. Interrater agreement was 96% for these articles. We resolved the discrepancies by checking against the original documents together to reach a consensus. We developed a coding scheme for relevant effect sizes and artifact information.

Team creativity

As outlined in the introduction, we followed earlier meta-analyses and reviews (Hülsheger et al., 2009; Van Dijk et al., 2012; van Knippenberg, 2017) to draw on both studies of team creativity and team innovation. Because all team innovation studies we sampled conceptualize team innovation as including team creativity, and many team creativity studies move beyond ideation alone in conceptualizing and operationalizing team creativity, this renders the labelling difference between team creativity and team innovation of less significance. That said, existing literature indeed reflects two distinct research foci. Our literature review of team creativity research showed that only 43% of empirical studies viewed team creativity as ideation-only. In our sample on individual-to-team creativity research, 68% of team creativity studies focused on ideation alone, whereas the rest focused on the combination of ideation and implementation. To further explore whether this distinction between ideation-only tasks and implementation tasks is consequential for the predictive value of the additive and the disjunctive model, we examined it as a potential moderator in a supplementary analysis.

For studies that include multiple ratings (e.g., team members vs. team leaders vs. external experts) and those that report measures on different dimensions of creativity/innovation (e.g., novelty and usefulness; quality and quantity; originality and fluency), we calculated the composite correlation scores with Hunter and Schmidt's (2004) formula to ensure the independence of effect sizes. Studies with independent samples were treated as multiple effect sizes and coded separately.

Task interdependence

Task interdependence was often not measured or reported in sampled studies. We developed our coding scheme based upon Courtright et al. (2015) conceptualization of structural task interdependence, which stresses the extent to which members *must* rely on each other's inputs or (process) engagement to accomplish the team task (i.e., a fixed property of task designs). We coded the extent to which there was such interdependence (high vs. low) from the descriptions of teamwork in the method sections. Studies that reported 'members rely on each other to use different tools and resources' (Bissola et al., 2014) and 'functionally diverse and interdependent members who worked together for a minimum of 10 weeks' (Chen et al., 2013), and 'the creativity of the R&D team depends on the coordination of the creative works of individual members' (Kurtzberg, 2000) were coded as high interdependence. In contrast, studies using the alternate usage task were coded as low interdependence (Nouri et al., 2013; Tadmor et al., 2012; Triandis et al., 1963), because this task is known to not require members to collaborate and rely on each other. Studies that examined (ideation and) implementation activities of retail teams, call center teams, sales teams, and marketing teams were also coded as low interdependence (Mathisen et al., 2008; Wang & Zhu, 2011; Yuan & van Knippenberg, 2020), because team tasks in such field teams are known for not requiring reliance and dependence among members. For a conservative coding, we coded studies with mixed types of team tasks (e.g., mixing manufacturing and service teams) as of low interdependence.

Creativity requirements in tasks

We coded sampled teams into two categories based on the extent to which team tasks required creativity (high vs. low), using reported descriptions about the nature of team tasks or concrete task descriptions. More specifically, we coded teams with high creativity requirements as the following: R&D teams (Gong et al., 2013), New Product Development teams (Bissola et al., 2014), the mixture of both (Mathisen et al., 2008), and student/laboratory teams that were explicitly instructed to design creative products or solutions (Fan et al., 2016; Nouri et al., 2013). We coded as low creativity requirements teams that did not specifically require creativity in operations (e.g., manufacturing teams, Cerne et al., 2013; primary care teams, Somech & Drach-Zahavy, 2013; municipal teams, Vera, 2004; or a mix of these teams, Wang & Zhu, 2011) and laboratory/student teams for which creativity were not required for accomplishing team tasks (e.g., negotiation tasks, Kurtzberg, 2000; general managerial tasks, Taggar, 2002).

Idea implementation in tasks

We coded this moderator with provided descriptions about team creative/innovative activities and employed measures. Ideation-only tasks refer to tasks that required teams to generate ideas and novel solutions. Thus, studies investigating idea-generation tasks (e.g., brainstorming ideas, Goncalo & Duguid, 2012, generating creative business proposals, Bogilović, Černe, & Škerlavaj, 2017) or operationalizing team creativity as 'generating novel but operable work-related ideas' (Sacramento et al., 2013) were coded as ideation-only tasks. Implementation tasks refer to those requiring teams to not only generate ideas but also put them into action. Thus, we coded studies that explicitly incorporate the implementation stage of generated ideas as implementation tasks, such as tasks in which teams must carry out creative designs in the development of new products (Bissola et al., 2014) and studies emphasizing that 'generate ideas that are then carried out (implemented) by the team' (Cerne et al., 2013).

Team size and longevity

We coded team size with provided statistics in each study (i.e., average team size) and team longevity with reported team tenure (i.e., average team tenure across members).

Methodological biases

As all meta-analytical reviews are subject to potential methodological biases, we also examined the moderating roles of publication bias, common source bias, and the measurement of team creativity (internal rating offered by team members or direct leaders vs. external rating by external judges or objective indicators). The measurement of team creativity was included in response to the longstanding debate about measurement methods of team creativity (i.e., self-ratings, independent ratings, and objective measures; Hülsheger et al., 2009).

Meta-analytic procedures

We adopted the Schmidt-Hunter psychometric meta-analysis method in the R environment using the metaphor package 3.0-2 (Hunter & Schmidt, 2004; Viechtbauer, 2010). This method is built on random model estimation and thus yields more conservative findings (Lipsey & Wilson, 2001). In line with prior meta-analytic reviews (Astill, van der Heijden, van IJzendoorn, & van Someren, 2012; van IJzendoorn, Juffer, & Poelhuis, 2005; Wang et al., 2019), we used nonoverlapping 95% confidence intervals (CIs) as a rule of statistical significance for main effects (Hypothesis 1-2) and nonoverlapping 84% confidence intervals (CIs) for our subgroup analysis (i.e., moderation effects, Hypothesis 3-12). Because methodological literature has suggested that the 84% rule best mimics 0.05 pairwise statistical tests for both symmetric and asymmetric confidence intervals (MacGregor-Fors & Payton, 2013). We extracted Pearson's r correlations between member creativity and team creativity and transformed them to Fisher's z statistics. For each study, we first corrected all effect sizes for sampling error, and then corrected the artifacts (measurement error and range restrictions) in independent variables and the dependent variable using Cronbach's

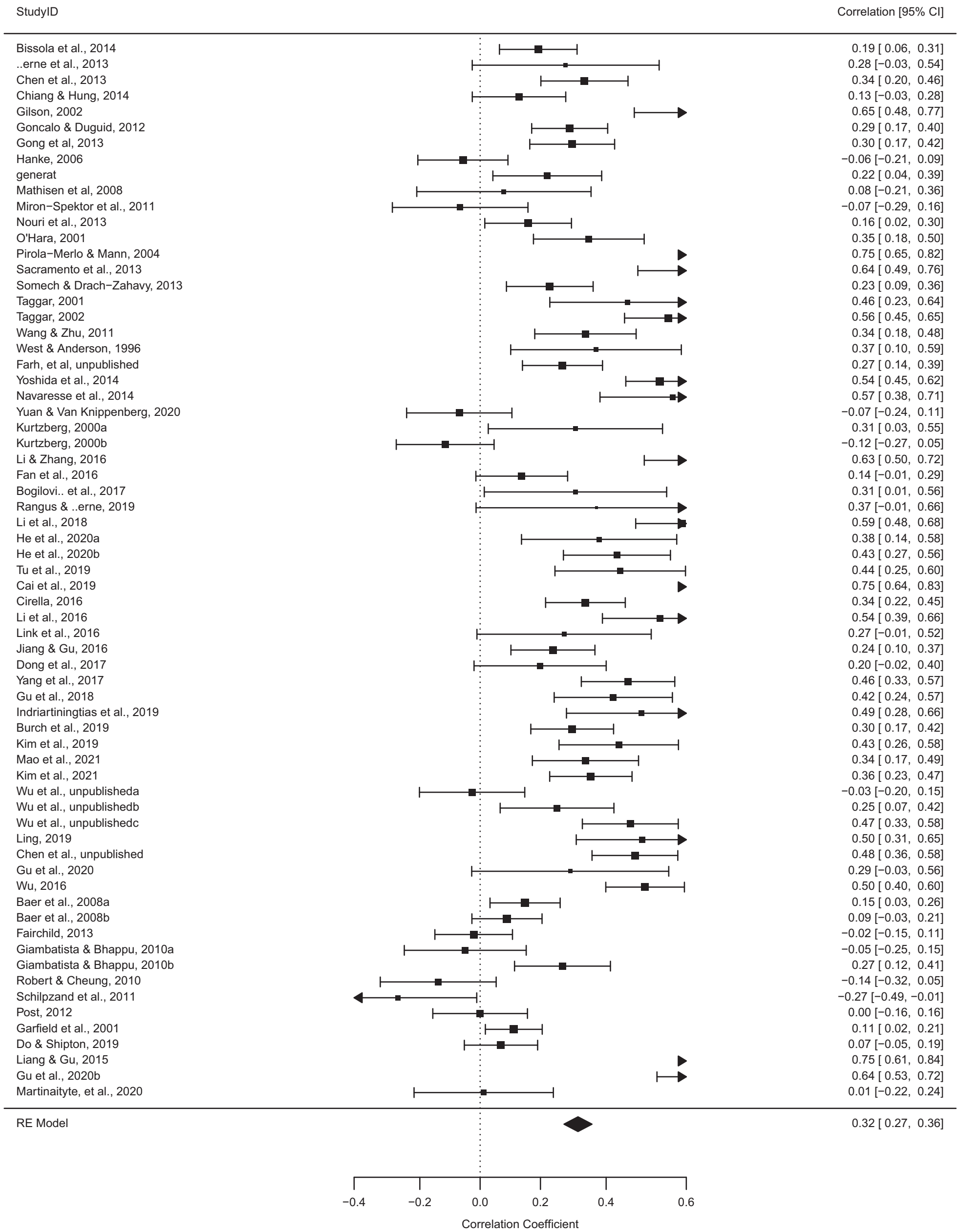

Figure 1. Forest plot of the additive model.

alpha coefficients provided in the studies. Studies that did not report Cronbach's alpha coefficients were assigned the average coefficient value from the other studies in our analysis (cf., Miron-Spektor et al., 2011). In addition, we assigned a reliability coefficient of 1.00 to objective measures (e.g., the number of patent applications), following prior meta-analytic research (de Wit, Greer, & Jehn, 2012; Riketta, 2008).

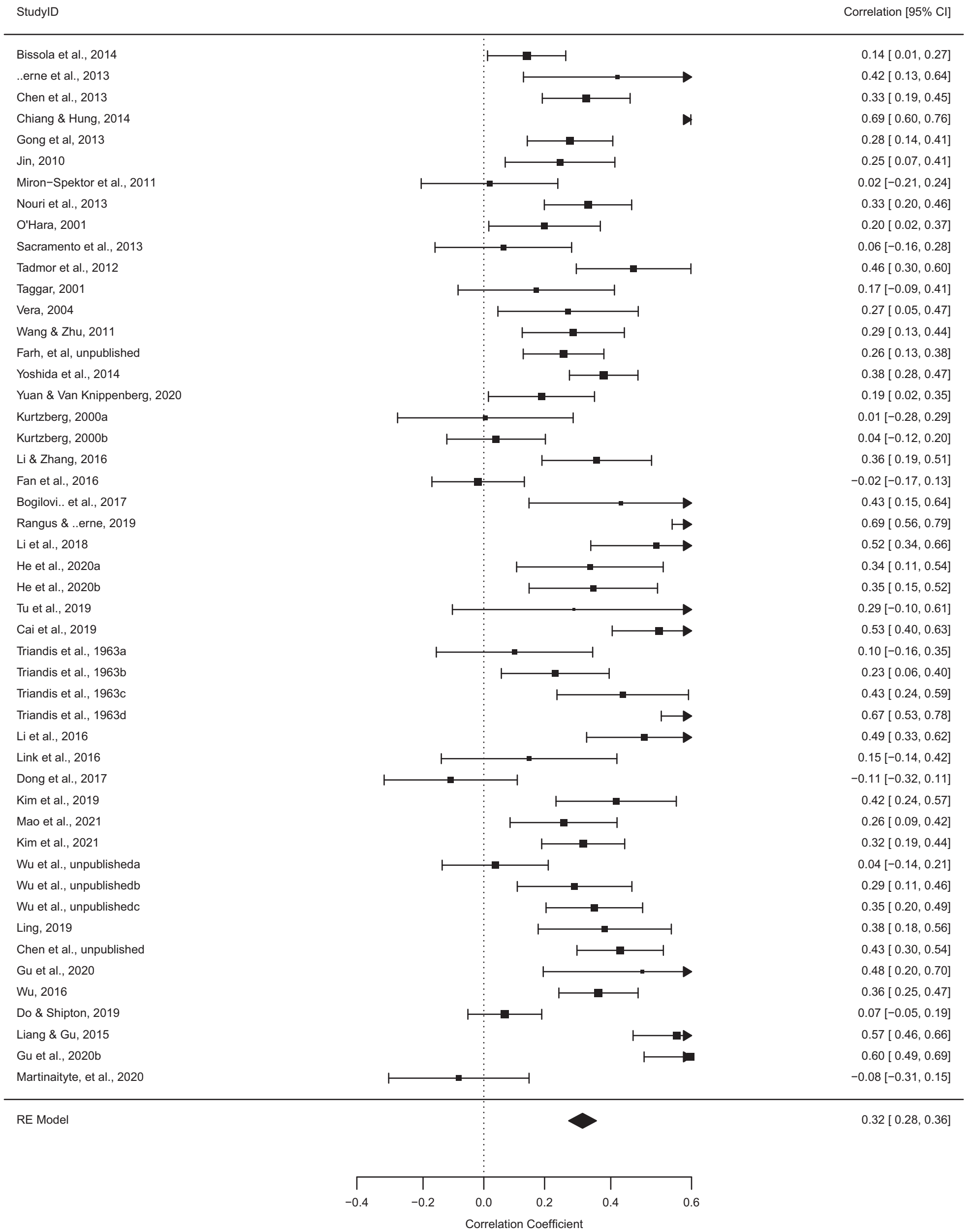

Figure 2. Forest plot of the disjunctive model.

Before testing our hypotheses, we examined outliers and influential cases in the samples of the additive and disjunctive models, respectively (Viechtbauer, 2010; Viechtbauer & Cheung, 2010). We found two influential cases for the additive model and one extreme observation for the disjunctive model. The visualization of Baujat plots showed consistent results (Baujat, Mahé, Pignon, & Hill, 2002). Following prior meta-

Table 1. Mixed-effects meta-regression results of the moderation effects

Predictors	The additive model			The disjunctive model		
	B (SE)	84% CIs	I^2	*B (SE)*	84% CIs	I^2
Moderator: Task interdependence (Hypothesis 3 & 4)						
Intercept	.40*** (.05)	[0.34, 0.47]		.28*** (.04)	[0.22, 0.34]	
Task interdependence	.17* (.07)	[0.08, 0.26]		.13* (.06)	[−0.22, −0.04]	
Moderation effect (QM)	6.55* (*N* = 61)		77.21%	3.91* (*N* = 45)		60.91%
Moderator: creativity requirements (Hypothesis 5 & 6)						
Intercept	.47*** (.06)	[0.39, 0.56]		.38*** (.06)	[0.30, 0.46]	
Creativity requirements	−.22** (.07)	[−0.32, −0.12]		−.08 (.07)	[−0.18, 0.03]	
Moderation effect (QM)	9.22** (*N* = 61)		77.11%	1.10 (*N* = 44)		65.55%
Moderator: Idea implementation (Hypothesis 7 & 8)						
Intercept	.39*** (.04)	[0.33, 0.45]		.37*** (.05)	[0.31, 0.44]	
Idea implementation	−.15* (.07)	[−0.25, −0.06]		−.08 (.07)	[−0.18, 0.01]	
Moderation effect (QM)	5.10* (*N* = 66)		78.40%	1.58 (*N* = 48)		66.53%
Moderator: Team size (Hypothesis 9 & 10)						
Intercept	.35*** (.05)	[0.28, 0.42]		.37*** (.05)	[0.31, 0.43]	
Team size	−.00 (.01)	[−0.01, 0.00]		−.01 (.00)	[−0.01, 0.00]	
Moderation effect (QM)	0.32 (*N* = 66)		79.78%	0.11 (*N* = 49)		65.97%
Moderator: Team tenure (Hypothesis 11 & 12)						
Intercept	.27*** (.05)	[0.20, 0.33]		.22*** (.05)	[0.16, 0.28]	
Team tenure	.00* (.00)	[0.00, 0.00]		.00** (.00)	[0.00, 0.00]	
Moderation effect (QM)	5.87* (*N* = 56)		76.70%	8.16** (*N* = 38)		56.56%
Methodological moderator: Common method bias						
Intercept	.43*** (.05)	[0.36, 0.49]		.37*** (.04)	[0.32, 0.43]	
Common method bias	−.18** (.06)	[−0.27, −0.09]		−.12* (.07)	[−0.22, −0.03]	
Moderation effect (QM)	7.92** (*N* = 67)		76.91%	3.39* (*N* = 49)		65.37%
Methodological moderator: Measurement of team creativity						
Intercept	.46*** (.04)	[0.40, 0.51]		.36*** (.04)	[0.30, 0.41]	
Measurement of team creativity	−.29*** (.06)	[−0.37, −0.21]		−.07 (.07)	[−0.17, 0.02]	
Moderation effect (QM)	26.33*** (*N* = 67)		70.35%	1.11 (*N* = 49)		66.83%

Notes. QM = test of the moderator; I^2 = between-study heterogeneity.
***$p < .001$; **$p < .01$; *$p < .05$; †$p < .10$.

analytic reviews (Astill et al., 2012; van Ijzendoorn et al., 2005), we winsorized these extreme values in further analysis.

Results

Main effects of the additive and disjunctive models

Our findings supported the effectiveness of both the additive model (r = .33, SE = .03, 95% CI = [0.26, 0.39], see Figure 1 for the forest plot) and the disjunctive model (r = .33, SE = .03, 95% CI = [0.27, 0.39], see Figure 2 for the forest plot). In addition, the between-study heterogeneity was significant for the additive model (I^2 = 79.46%, 95% CI = [71.43%, 86.26%]) and for the disjunctive model (I^2 = 67.10%, 95% CI = [51.18%, 79.02%]), respectively, supporting our further investigations of moderators. Hypothesis 1 and 2 are thus supported

Analyses of task moderators

Table 1 presents the meta-regression results of all moderation effects. Table 2 presents the subgroup comparisons for all categorical moderators.

The moderating role of task interdependence

We found that the additive model was more predictive in teams with high task interdependence (b = .17, SE = .07, 84% CI = [0.08, 0.26], QM [1] = 6.55, p = .01), with a significant between-study heterogeneity (I^2 = 77.21%, 84% CI = [71.17%, 83.63%]). In particular, subgroup analysis suggested that the additive model is stronger in the condition of high interdependence (b = .40, SE = .05, 84% CI = [0.34, 0.47]) than in the condition of low interdependence (b = .23, SE = .05, 84% CI = [0.17, 0.30]). Task interdependence was found to moderate the disjunctive model negatively (b = −.13, SE = .06, 84% CI = [−0.22, −0.04], QM [1] = 3.91, p = .05), with a significant between-study heterogeneity (I^2 = 60.91%, 84% CI = [46.98%, 71.97%]). The disjunctive model was more effective in the condition of low interdependence (b = .40, SE = .05, 84% CI = [0.33, 0.47]) than in the condition of high interdependence (b = .28, SE = .04, 84% CI = [0.22, 0.34]). This supported Hypothesis 3 and 4.

The moderating role of creativity requirements in team tasks

Results revealed a negative moderation effect of creativity requirements on the additive model (b = −.22, SE = .07, 84% CI = [−0.32, −0.12], QM [1] = 9.22, p = .00), with a significant between-study heterogeneity (I^2 = 77.11%, 84% CI = [70.83%, 83.31%]). Subgroup analysis supported that the additive model is more predictive in team tasks with low creativity requirements (b = .47, SE = .06, 84% CI = [0.39, 0.56]) than in those with high creativity requirements (b = .26, SE = .04, 84% CI = [0.20, 0.31]). This supported Hypothesis 5. With respect to Hypothesis 6, we found no support for this moderation effect (b = −.08, SE = .07, 84% CI = [−0.18, 0.03], QM [1] = 1.10, p = .29), with a significant between-study heterogeneity (I^2 = 65.55%, 84% CI = [53.80%, 75.94%]). Subgroup analysis showed that the disjunctive model positively predicts team creativity in both teams with high creativity requirements (b = .30, SE = .04, 84% CI = [0.24, 0.36])

Table 2. Subgroup analyses of the main effects and moderation effects

	The additive model						The disjunctive model					
Predictors	k	n	r	SE	84% CIs	I^2	k	n	r	SE	84% CIs	I^2
Main effects: Individual creativity (Hypothesis 1 & 2)[a]												
	67	4,823	.33	.03	[0.26, 0.39]	79.46%	49	3,157	.33	.03	[0.27, 0.39]	67.10%
Moderator: Task interdependence (Hypothesis 3 & 4)												
High interdependence	34	2,111	.40	.05	[0.34, 0.47]	76.42%	26	1,531	.28	.04	[0.22, 0.34]	56.84%
Low interdependence	27	2,355	.23	.05	[0.17, 0.30]	77.33%	19	1,317	.40	.05	[0.33, 0.47]	65.41%
Moderator: Creativity requirements (Hypothesis 5 & 6)												
High requirements	41	3124	.26	.04	[0.20, 0.31]	77.98%	29	1,767	.30	.04	[0.24, 0.36]	65.86%
Low requirements	20	1,275	.47	.06	[0.39, 0.56]	74.94%	15	1,019	.38	.06	[0.30, 0.46]	64.61%
Moderator: Idea implementation (Hypothesis 7 & 8)												
Ideation-only	40	3002	.39	.04	[0.33, 0.45]	78.86%	25	1,523	.38	.04	[0.32, 0.43]	52.88%
Implementation	26	1,709	.24	.05	[0.16, 0.31]	77.56%	23	1,522	.29	.05	[0.21, 0.36]	74.48%
Methodological moderator: Common Method Bias												
Common sources	30	2,252	.42	.04	[0.37, 0.48]	69.06%	30	2,179	.37	.04	[0.31, 0.43]	70.95%
Different sources	37	2,571	.25	.05	[0.18, 0.32]	80.97%	19	978	.25	.05	[0.18, 0.32]	49.94%
Methodological moderator: Measurement of Team Creativity												
Internal rating	38	2,538	.46	.04	[0.40, 0.51]	71.59%	30	2,026	.36	.04	[0.30, 0.41]	62.00%
External rating	29	2,285	.16	.04	[0.11, 0.22]	68.00%	19	1,131	.29	.06	[0.20, 0.37]	71.39%

Note.. k = number of effect sizes; n = number of teams; QM = test of the moderator; I^2 = between-study heterogeneity.
[a]For main effects (Hypothesis 1–2), 95% CIs were used.

and those with low requirements (b = .38, SE = .06, 84% CI = [0.30, 0.46]). Thus, Hypothesis 6 is not supported.

The moderating role of idea implementation

Results revealed a negative influence of idea implementation for the additive model (b = −.15, SE = .07, 84% CI = [−0.25, −0.06], QM [1] = 5.10, p = .02), with a significant between-study heterogeneity (I^2 = 78.40%, 84% CI = [72.38%, 83.71%]). Specifically, the additive model is more predictive in ideation-only tasks (b = .39, SE = .04, 84% CI = [0.33, 0.45]) than in implementation tasks (b = .24, SE = .05, 84% CI = [0.16, 0.31]). This supported Hypothesis 7. No evidence was found for the influence of idea implementation on the disjunctive model (b = −.08, SE = .07, 84% CI = [−0.18, 0.01], QM [1] = 1.58, p = .21), with a significant between-study heterogeneity (I^2 = 66.53%, 84% CI = [55.35%, 76.07%]). The disjunctive model is similarly effective in ideation-only tasks (b = .38, SE = .04, 84% CI = [0.32, 0.43]) and in implementation tasks (b = .29, SE = .05, 84% CI = [0.21, 0.36]). Thus, Hypothesis 8 is not supported.

The moderating role of team size

In contrast to our prediction, we found no support for the moderating role of team size on the additive model (b = −.00, SE = .01, 84% CI = [−0.01, 0.00], QM [1] = 0.32, p = .57), with a significant between-study heterogeneity (I^2 = 79.78%, 84% CI = [74.34%, 84.92%]). Similarly, we found no support for the moderating role of team size the disjunctive model (b = −.01, SE = .00, 84% CI = [−0.01, 0.00], QM [1] = 1.76, p = .18), with a significant between-study heterogeneity (I^2 = 65.98%, 84% CI = [54.55%, 75.38%]).

The moderating role of team longevity

Team longevity positively moderates the relationship between the average individual creativity and team creativity (b = .002, SE = .001, 84% CI = [0.001, 0.003], QM [1] = 5.87, p = .02), with a significant between-study heterogeneity (I^2 = 76.70%, 84% CI = [69.83%, 83.14%]). The disjunctive model is also more effective in teams with higher longevity (b = .002, SE = .001, 84% CI = [0.001, 0.003], QM [1] = 8.16, p = .004), with a significant between-study heterogeneity (I^2 = 56.56%, 84% CI = [39.75%, 70.13%]). This supported Hypotheses 11 and 12.

Analyses of methodological influences

We examined the publication biases in all reported effects through Egger's tests and Begg's tests following the visualization of Funnel plots (Harbord, Egger, & Sterne, 2006; Sterne & Egger, 2001). As shown in Table 3, neither Egger's linear regression results nor Begg's rank tests showed any support for asymmetric distributions of tested relationships. This suggested no evidence for publication biases in all reported effects.

Testing the common source bias in both additive and disjunctive models, we found that multi-source studies reported significantly lower effect sizes than common-source studies for the additive model (b = −.18, SE = .06, 84% CI = [−0.27, −0.09], QM [1] = 7.92, p = .00), with a significant between-study heterogeneity (I^2 = 76.91%, 84% CI = [70.91%, 82.93%]). Specifically, as suggested by subgroup analysis, the additive

Table 3. Publication biases of main effects and moderation effects[a]

	Egger's regression tests		Begg's rank tests	
Funnel plot asymmetry	*Z*	*p*	*Kendall's Tau*	*p*
Main-effect models				
Additive model	1.18	0.24	0.11	0.21
Disjunctive model	−0.42	0.68	−0.01	0.93
Moderator: task interdependence				
Additive model	0.49	0.62	0.10	0.27
Disjunctive model	−0.03	0.97	−0.01	0.93
Moderator: creativity requirement				
Additive model	0.79	0.43	0.11	0.21
Disjunctive model	−0.58	0.56	−0.04	0.69
Moderator: idea implementation				
Additive model	1.46	0.15	0.10	0.23
Disjunctive model	−0.56	0.58	−0.02	0.84
Moderator: team size				
Additive model	1.07	0.28	0.10	0.23
Disjunctive model	−0.66	0.51	−0.01	0.93
Moderator: team tenure				
Additive model	1.27	0.20	0.16	0.09
Disjunctive model	−0.22	0.83	0.02	0.89
Methodological moderator: common method bias				
Additive model	1.60	0.11	0.11	0.21
Disjunctive model	0.16	0.87	−0.01	0.93
Methodological moderator: external DV ratings				
Additive model	0.89	0.37	0.11	0.21
Disjunctive model	−0.31	0.75	−0.01	0.93

model is more predictive in the subset of common-source studies ($b = .42$, $SE = .04$, 84% CI = [0.37, 0.48]) than in that of multi-source studies ($b = .25$, $SE = .05$, 84% CI = [0.18, 0.32]). This common source bias was found to moderate the disjunctive model negatively ($b = -.12$, $SE = .07$, 84% CI = [−0.22, −0.03], QM [1] = 3.39, $p = .07$), with a significant between-study heterogeneity ($I^2 = 65.37\%$, 84% CI = [53.59%, 74.78%]). The disjunctive model is less effective when both variables were sourced differently ($b = .25$, $SE = .05$, 84% CI = [0.18, 0.32]) than from common sources ($b = .37$, $SE = .04$, 84% CI = [0.31, 0.43]).

Lastly, we tested the measurement of team creativity (internal vs. external) as a moderator. It negatively moderates the additive model ($b = -.29$, $SE = .06$, 84% CI = [−0.37, −0.21], QM [1] = 26.33, $p < .0001$), with a significant between-study heterogeneity ($I^2 = 70.35\%$, 84% CI = [63.06%, 78.58%]). Subgroup analysis showed that the additive model is more predictive when team creativity is measured internally (i.e., rated by team members or team leaders; $b = .46$, $SE = .04$, 84% CI = [0.40, 0.51]) than measured externally (i.e., rated by external judges or objectively; $b = .16$, $SE = .04$, 84% CI = [0.11, 0.22]). No moderation effect was found for the disjunctive model ($b = -.07$, $SE = .07$, 84% CI = [−0.17, −0.02], QM [1] = 1.11, $p = .29$), with a significant between-study heterogeneity ($I^2 = 66.83\%$, 84% CI = [55.68%, 75.99%]). Subgroup analysis showed that the disjunctive model was more effective when team creativity was rated internally (b = .36, SE = .04, 84% CI = [0.30, 0.41]) than externally (b = .29, SE = .06, 84% CI = [0.20, 0.37]).

Robustness tests

We conducted several supplementary analyses to assess the robustness of our findings. First, in understanding the individual-to-team creativity relationship, we included individual creative traits (e.g., creative personality and original cognitive thinking) as proxies for individual creativity, as they play homogenous roles in predicting individual creative contributions in team processes. Nevertheless, we acknowledge the distinction between individual creative traits and individual creative performance in creativity research (van Knippenberg & Hirst, 2015). It is therefore important to test whether our operationalization of combining creative traits and creativity biases our results. To test the robustness of our findings, we reinvestigated all hypotheses on the subset of only individual creativity as independent variable (N = 54 for the additive sample and N = 47 for the disjunctive sample). Results are largely consistent with our primary analysis. Specifically, the effectiveness of both the additive model (r = .40, SE = .03, 84% CI = [0.33, 0.46], Hypothesis 1) and the disjunctive model (r = .34, SE = .03, 84% CI = [0.28, 0.41], Hypothesis 2) remains moderately positive. Task interdependence positively moderates the additive model (b = .11, SE = .07, 84% CI = [0.01, 0.21], Hypothesis 3) and negatively moderates the disjunctive model (b = −.14, SE = .06, *84% CI* = [−0.23, −0.05], Hypothesis 4). Creativity requirements moderate the additive model negatively (b = −.19, SE = .07, 84% CI = [−0.29, −0.08], Hypothesis 5). In contrast to the non-significant result of Hypothesis 6 in our primary analysis, we found that creativity requirements negatively moderate the disjunctive model (b = −.12, SE = .07, 84% CI = [−0.22, −0.02], Hypothesis 6). Evidence also supported the moderating role of idea implementation on the additive model (b = −.20, SE = .07, 84% CI = [−0.29, −0.10], Hypothesis 7). Consistent with our primary analysis, no evidence was found for the moderating role of idea implementation on the disjunctive model (b = −.06, SE = .07, 84% CI = [−0.16, 0.03], Hypothesis 8). Similarly, we found no moderation effect of team size on either the additive model (b = −.01, SE = .01, 84% CI = [−0.02, 0.00], Hypothesis 9) or on the disjunctive model (b = −.01, SE = .01, 84% CI = [−0.02, 0.00], Hypothesis 10). Team longevity moderates the disjunctive model as predicted (b = .001, SE = .001, 84% CI = [0.001, 0.003]; Hypothesis 12). But the moderating role of team longevity for the additive model turned from significant (b = .002, SE = .001, 84% CI = [0.001, 0.003]) in our primary analysis to non-significant in this robustness test (b = .001, SE = .001, 84% CI = [−0.000, 0.002]; Hypothesis 11). Given this very small effect size, this change is of limited implication. To conclude, these supplementary tests yielded highly consistent findings as our primary analysis, supporting our operationalization of combining creativity-related traits and individual creativity as the robustness of our findings.

Second, a few studies (N = 13) reported task interdependence on different scales (Gong et al., 2013; Jin, 2010; O'Hara, 2001). This allowed us to create an alternative coding of task interdependence for this subset of studies to test the robustness of our primary coding. We thus coded interdependence scoring above the midpoint of adopted scales (e.g., 3 for 5-point scales and 4 for 7-point scales) as high task interdependence and the rest (equal to or lower than the midpoint) as low task interdependence. Consistent with our primary analysis, this new coding of task interdependence moderates the additive model negatively (N = 13, b = .37, SE = .14, 84% CI = [0.17, 0.56]). We did not find the moderation effect of task interdependence on the disjunctive ($N = 11$, $b = .05$, $SE = .23$, 84% CI = [−0.27, 0.37]), however. Despite the small sample size in this robustness test, it provides somewhat converging evidence for our operationalization of task interdependence as a moderator.

Discussion

Moving beyond the unspecified notion that individual creativity is good for team creativity, team creativity research has identified two models to understand the individual-to-team creativity link: the additive model and the disjunctive model. As our review of the literature indicated, however, support for both models is inconsistent. Team creativity research has only started to address moderation for the additive model, signalling a need for an integrative model that captures moderation for both the additive and the disjunctive model. To that end, we examined the effectiveness of these two models in a meta-analytic approach and also proposed a task characteristics perspective that the explanatory power of the additive and the disjunctive model is contingent on the task environment. Results revealed that both models are moderately predictive of team creativity (Hypothesis 1 and 2). In support of this integrative perspective, we found that the additive model is more predictive in highly interdependent tasks and the disjunctive model more in less interdependent tasks (Hypothesis 3 and 4). Evidence also showed that the additive model is more predictive in tasks with lower creativity requirements (Hypothesis 5). Contrary to Hypothesis 6, however, the (significant) effect of the disjunctive model does not differ between tasks with higher and lower creativity requirements. The distinction between ideation-only and implementation tasks also played a moderating role for the additive model (Hypothesis 7), but not for the disjunctive model (Hypothesis 8). As the broader context of team size and team longevity, we found no evidence for the moderating role of team size (Hypothesis 9 and 10), whereas team tenure positively moderates both the additive and disjunctive models (Hypothesis 11 and 12).

We did not find support for the moderating role of creativity requirements (Hypothesis 6) or idea implementation (Hypothesis 8) in the disjunctive model. With regard to the non-supported influence of creativity requirements, the issue may be that the superior value of the contributions of the most creative member(s) may still be recognized and valued when creativity requirements are lower. That is, even when there is no demand for creativity, teams may recognize and value more creative contributions over less creative contributions. This is consistent with the more general finding that high-performing individuals tend to be recognized as such and gain influence as a result (Cheng et al., 2013; Tost, Gino, & Larrick, 2012). Based on the current data, it is impossible to speak to this empirically, and this would be an obvious issue for future research to investigate the social influence of the most creative members in teams.

The lack of support for Hypothesis 8 suggests that the most creative member might indiscriminately contribute to team creativity in both ideation-only tasks and implementation tasks. In part, the issue may be that, as found by Girotra et al. (2010), the most creative member can generate not only highly creative ideas (quality) but also a large number of such ideas (quantity) in group brainstorming, thus also in ideation-only tasks contributing an inordinate share of the team production. By sharing such high production, the most creative member may also set a contribution standard for others to aspire to, thus motivating other members to increase their efforts. In effect, higher creativity of the most creative member may thus create a situation in which the higher creativity of the most creative member inspires higher creative production by other members.

Theoretical implications

A first important observation is that our findings show that overall both the additive model and the disjunctive model predict team creativity. This is a nontrivial observation because the empirical studies on team creativity have largely focused on the additive model and evidence for the disjunctive model is treated as in the periphery of study findings. We suspect that the intuitive notion that teams with more creative members are more creative has for many researchers been equated with the notion that it is the additive model that captures this relationship. That is, it seems that the additive model has largely been applied by default. This probably resulted in less attention to the disjunctive model than is warranted. Our results are important in this respect because they add two insights that should invite more attention to the individual-to-team creativity relationship in team creativity research. The first insight is that the disjunctive model is overall as predictive as the additive model; as a main effect, there is no reason to favour the additive model over the disjunctive model. This also links to the growing attention to the role of key individuals in collective performance (Aguinis & O'Boyle, 2014; Groysberg & Lee, 2009; Liu, Mihm, & Sosa, 2018) and supports this disjunctive logic in team creativity and innovation. The second insight is the contextual view of both models following Steiner's (1972) framework. We presented meta-analytic evidence for the impact of task characteristics on the extent to which individual creative contributions affect team creativity as per the additive model or as per the disjunctive model.

Whereas general team research points to the contextual impact of task factors (Steiner, 1972), the role of task characteristics in the team creativity literature has perhaps moved 'under the radar' because the variation has been between-study and not explicitly captured within-study. Maybe part of the issue is also that team creativity may have connotations of being a particular kind of task rather than an outcome that can obtain on a variety of team tasks. The current findings may thus not only invite a more deliberate consideration of individual-to-team creativity models but also a more careful consideration of team creativity and innovation from a task perspective. An important additional insight in this respect is that Steiner's (1972) typology including the additive and disjunctive model should not be understood as capturing categorical distinctions between tasks, but rather as ideal types such that in practice tasks can have additive and disjunctive elements to a greater or lesser degree. This would be an important insight to incorporate in further developments of the individual-to-team creativity analysis.

The evidence for the predictive power of the disjunctive model also suggests that it may be worthwhile to make a distinction between creative and noncreative contributions in team creativity. As we noted in the introduction, the disjunctive model does not imply that team creativity in the end is an individual task where the team is merely brought together to increase the chance of highly creative individual contributions emerging. Beyond the unique setting of pure idea generation tasks where the sole contribution expected is creative ideas, team creativity is a process that requires more than just creative contributions. Depending on the outcome a team is pursuing, creativity may require research, information sharing and integration, building and testing prototypes, etc. These are all important aspects of the team process leading to team creative outcomes (Alexander & van Knippenberg, 2014), but these are also processes that often revolve less around members' creativity and more around members' knowledge, skills, and abilities. A promising route for developing our understanding of team creativity may thus be to explore how creative contributions and other contributions combine to produce team creativity. It is altogether possible that even when members' creative contributions are best understood to contribute to team creativity following the disjunctive model, other elements of the team processes leading to team creativity are better understood following the additive model.

Divergent thinking has been linked to idea generation (Runco & Acar, 2012) and convergent thinking with the evaluation, selection, and implementation of creative ideas (Berg, 2016). Thus, the distinction we introduced between ideation-only and implementation tasks may to some extent speak to the issue of divergent versus convergent processes in team creativity. In some cases, we even observed that researchers operationalized team creativity as an ideation-only task in study 1 and then as an implementation task in study 2 (He et al., 2020a,2020b). Very few studies differentiated between these two processes in measurement (Harvey, 2013); however, and all implementation studies and most ideation-only studies (with brainstorming studies as the exception) require both divergence and convergence to select and develop creative ideas. We therefore cannot speak to this issue empirically in our analysis. That said, the current evidence that the additive model is more predictive for ideation-only tasks may be a valuable insight for future research applying the additive and disjunctive models to divergent and convergent processes in team creativity and innovation. Our findings may also provide a bridge to more temporal examinations of divergent (ideation) and convergent (implementation) processes. For instance, Rosing et al. (2018) suggested the advantage of more ideation activities at later stages of team innovation. It is worthwhile to explore how members switch between additive contributions and disjunctive contributions over time in the process of team creativity/innovation.

Another interesting avenue for future research may be to develop our understanding of the kind of creativity involved in team tasks. Creativity theories acknowledge the distinction between radical creativity and incremental creativity (Litchfield, 2008; Mumford & Gustafson, 1988), as does team innovation research (Alexander & van Knippenberg, 2014). A number of studies have investigated factors that facilitate and/or impair one type of creativity versus the other and have identified various individual and contextual characteristics (Gilson & Madjar, 2011; Madjar, Greenberg, & Chen, 2011). For instance, having creative coworkers, regardless of the absolute level of the coworkers' creativity, tends to benefit incremental creativity but not radical creativity (Madjar et al., 2011). Yet in the team contexts, how such inputs combine to form incremental and radical creativity differently has been rarely considered. Implied in our analysis is that the disjunctive model applies more for teams seeking radical creativity (i.e., stronger creativity requirements in the sense of the level of creativity required), whereas the additive model applies more in contexts of incremental creativity. To a certain extent our coding in terms of creativity requirements gets at this, but the overlap is not perfect and the coding was not intended to capture the radical versus incremental distinction. Meta-analysis can only test what is codable, and incremental versus radical creativity seems a bridge too far. Our conceptual analysis suggests, however, that focusing on this distinction may be a natural and consistent extension of the current moderator analysis.

Our study concerns research on team creativity and innovation, and our findings thus only directly speak to this research domain. It is worth noting, though, that the additive and disjunctive models are not unique to team creative/innovative performance. Indeed, these models were developed with team performance more generally in mind (Steiner, 1972). Moving beyond the traditional focus on the sum/average of member dispositions (i.e., the additive view), team researchers in recent years have shifted towards exploring the disjunctive influence of key players, such as performance stars (Call et al., 2015; Kehoe, Lepak, & Bentley, 2018), the most voicing member (Li, Zhao, Walter, Zhang, & Yu, 2015), and key members with the greatest meta-knowledge (Mell, van Knippenberg, & van Ginkel, 2014). It has been long recognized in team research that the effectiveness of composition and compilation strategies is subject to the nature of teams and task characteristics (Kozlowski & Bell, 2003). It may thus also be worth exploring the extent to which the current insights generalize to the team performance domain more broadly (Humphrey & Aime, 2014; Mathieu et al., 2014).

Methodological implications for team creativity research

This meta-analysis also speaks to some potential methodological concerns in team creativity research, at least where the predictive validity of the additive and disjunctive models is concerned. No support was found for publication bias in relation to either model or moderation effects. But we found that multi-source data, although in general encouraged by methodologists to avoid measurement errors and thus inflated (deflated) relationship between constructs (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), only differs from single-source data for the disjunctive model but not for the additive model. The effectiveness of the disjunctive model seems to be inflated by common sources with a significant difference. This message is important for recent studies casting more attention to the role of creativity stars or most creative members in team creative processes (Li, Li, Li, & Li, 2020). Statistic remedies for such common source bias are thus particular important to gauge a true estimate of the relationship.

Our result points to a measurement concern that, average individual creativity is more predictive of team creativity when team creativity is rated internally (i.e., by team members or direct team leaders) rather than externally (i.e., by other corporate managers or external experts), with a significant difference between two conditions. No measurement bias was found in the effectiveness of the disjunctive model, however. To exclude the possibility of overrepresented internal/external ratings in certain tasks or team samples, we examined the correlation of this measurement variable with the creativity requirements of team tasks and found no significant association. This effect is in line with prior findings of ingroup favoritism in performance ratings, such that people tend to give more positive ratings to events and performance that evoke shared social identities and collectivism (Chen, Brockner, & Chen, 2002; Tajfel & Turner, 1986). A plausible explanation to this finding may be that, internal raters tend to refer to collective processes and effort when evaluating team creativity, and thus are more likely to reflect the additive effect of pooling and synergizing all members' inputs, whereas external raters who have little internal view or shared identities may rely more on the collective outputs to judge. Linking with the various conceptualizations of individual creativity in literature (e.g., as outcomes, Oldham & Cummings, 1996; as processes, Mumford, Mobley, Reiter-Palmon, Uhlman, & Doares, 1991), researchers may find it intriguing to explore different evaluation foci of team creativity and consequences – whether judges view team creativity more as a product of teamwork (i.e., an internal and additive focus) or the creative output in comparison to competitors on the market (i.e., an external focus).

Limitations and future directions

Like all studies, our study has its limitations. One concern might be its small sample size, which may be associated with second-order sampling error in meta-analytic moderation models (Hunter & Schmidt, 2004). Nevertheless, given a moderate level of heterogeneity, a meta-analysis on 40 studies has about 97% of power to detect an effect size of about 0.25 and about 100% to detect effects sizes around 0.35 (Valentine, Pigott, & Rothstein, 2010). Our sample features low to moderate levels of heterogeneity and effect sizes varying from 0.14 to 0.41. Thus, we could infer satisfactory levels of statistical power despite the modest sample size of 65. With the current rate of empirical tests on team creativity and individual creativity-relevant dispositions, it will take at least a decade of research to overturn our findings here.

Our coding of two moderators as categorical rather than continuous is also not ideal. Due to the lack of sufficient information – a common limitation of all meta-analytic reviews – we used both direct measures and proxy measures via reported task information in sampled studies. Though the additional analysis corroborated our coding scheme of task interdependence with different robustness tests, our current operationalization does not allow more nuanced examinations of different types of interdependence in teams (Saavedra, Earley, & Van Dyne, 1993). But it is also the merit of meta-analytic reviews to present converging evidence across various teams and task contexts. With this task perspective of individual-to-team creativity, we would welcome empirical studies providing more detailed descriptions and measures of task objectives, structure, and other relevant factors to advance our understanding of the contextual impacts on individual-to-team creativity.

Practical implications

It seems obvious that getting more creative members on a team would increase team creativity. An important implication for practice from the current analysis is that there are two different strategies to achieve this – an additive strategy in which they aim for teams with members that are on average as creative as possible or a disjunctive strategy in which they aim to staff teams with one member who is as creative as possible. Which of the two strategies is more effective in practice depends on task contingencies. This is a nontrivial observation because creative employees are in high demand. The observation that organizations in pursuit of creativity may either pursue an additive or a disjunctive strategy is thus important in allowing organizations to focus their efforts more effectively. For teams with high task interdependence, organizations are better off prioritizing high mean member creativity over the search for one particularly creative individual. For teams with low task interdependence teams, it is advisable to prioritize one particularly creative team member over higher mean member creativity. In a related vein, for tasks with higher creative requirements, prioritizing one particularly creative member should have a higher payoff, whereas for tasks with lower creative requirements this makes less of a difference (i.e., member creativity more generally has a stronger payoff in ideation tasks). These are potentially important observations because all organizations face time and budget constraints in the competition for creative talent; insights that help focus one's efforts more effectively thus can be important in building towards creative success.

Conclusion

Translating individual creativity into team creativity is a fundamental issue. As the present meta-analysis shows, it is more complex than one might imagine at first blush. It seems obvious that teams are more creative with more creative members. Drawing insights from Steiner's (1972) understandings of team tasks, we show in the current findings that the issue is more complicated in that both the additive model and the disjunctive model may capture this individual-to-team creativity relationship. Moreover, the extent to which these models hold is contingent on both task interdependence and creativity requirements in team tasks. These conclusions underscore that these are relationships of greater complexity worthier of study than our first blush intuitions may suggest.

Conflict of interest

All authors declare no conflict of interest.

Author Contribution

Yingjie Yuan: Conceptualization (equal); Data curation (equal); Formal analysis (equal); Investigation (equal); Methodology (equal); Project administration (equal); Resources (equal); Software (equal); Visualization (equal); Writing – original draft (equal); Writing – review & editing (equal). **Stephen E. Humphrey:** Methodology (equal); Resources (equal); Supervision (equal); Validation (equal); Writing – review & editing (equal). **Daan van Knippenberg:** Conceptualization (equal); Supervision (equal); Validation (equal); Writing – review & editing (equal).

Data Availability Statement

The data that support the findings of this study will be openly available in a public repository after acceptance.

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Appendix A:
Overview of empirical studies on individual-to-team creativity and codings

References	Sample	Measurement of individual creativity/ innovation	Measurement of team creativity/ innovation	Hypothesis of the additive model	Hypothesis of the disjunctive model	Member-to-team creativity findings	Task interdependence	Creativity requirements	Idea implementation
Baer et al. (2008)	145 student teams	Goldberg (1999)	Independent expert ratings	Yes	No	Positive link between average individual openness and team creativity	Low	Yes	Ideation-only
Bissola et al. (2014)	119 student teams	Williams (1993)	O'Quin and Besemer (2006)	No	No	Non-significant correlation between average individual creativity and team creativity	High	Yes	Implementation
Bogilović et al. (2017)	104 student teams	Independent expert ratings	Independent expert ratings	No	No	Positive correlation between average individual creativity and team innovation	Low	Yes	Ideation-only
Burch, Burch, and Batchelor (2019)	105 student teams	Gough (1979)	Besemer and Treffinger (1981)	Yes	No	Positive link between average individual originality and group creativity	Low	Yes	Ideation-only
Cai, Lysova, Bossink, Khapova, and Wang (2019)	43 work teams from various companies	Farmer et al. (2003)	Shin and Zhou (2007)	No	No	Did not examine any relations	High	No	Ideation-only
Cerne et al. (2013)	23 work teams in a manufacturing company	Zhou and George (2001)	Lovelace, Shapiro, and Weingart (2001)	No	No	Positive correlation between average individual	High	No	Implementation

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Appendix A. (Continued)

References	Sample	Measurement of individual creativity/ innovation	Measurement of team creativity/ innovation	Hypothesis of the additive model	Hypothesis of the disjunctive model	Member-to-team creativity findings	Task interdependence	Creativity requirements	Idea implementation
						creativity and team innovation			
Chen et al. (2013)	95 R&D teams from various industries	Janssen (2000)	De Dreu (2002)	Yes	No	Positive link between average individual creativity and team innovation	High	Yes	Implementation
Chen et al. (unpublished)	98 work teams from various industries	Farmer et al. (2003)	Shin and Zhou (2007)	No	No	Did not examine any relations	Low	Yes	Ideation-only
Chiang and Hung (2014)	83 teams from manufacturers	Farmer et al. (2003)	Moorman and Miner (1997)	Yes	No	Positive link between average individual creativity and team innovation	Low	Yes	Implementation
Cirella (2016)	113 project teams	Pirola-Merlo and Mann (2004)	Hargadon and Bechky (2006), Chaharbaghi and Cripps (2007)	Yes	No	Positive relationship between average individual creativity and team creativity	High	Yes	Ideation-only
Do and Shipton (2019)	133 work units from creative small firms	Gong et al. (2009)	Chen and Huang (2009)	Yes	No	Positive link between average employee creativity and group creativity	NA	NA	Implementation
Dong, Bartol, Zhang, and Li (2017)	43 R&D teams from 8 companies	Farmer et al. (2003)	Shin and Zhou (2007)	No	No	Did not examine any relations	High	Yes	Ideation-only
Fairchild (2013)	119 student teams	Goldberg (2006)		No	No	Did not examine any relations	Low	Yes	Ideation-only

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Appendix A. (Continued)

References	Sample	Measurement of individual creativity/ innovation	Measurement of team creativity/ innovation	Hypothesis of the additive model	Hypothesis of the disjunctive model	Member-to-team creativity findings	Task interdependence	Creativity requirements	Idea implementation
			Besemer and O'Quin (1999)						
Fan et al. (2016)	86 teams from an Intelligent Ironman Creativity Contest	Scott and Bruce (1994)	External expert ratings	No	No	Did not examine any relations	High	Yes	Implementation
Garfield, Taylor, Dennis, and Satzinger (2001)	219 pseudo student teams	Kirton (1976)	Independent expert ratings	Yes	No	Positive link between average creative thinking and team creativity	Low	Yes	Ideation-only
Giambatista and Bhappu (2010)	50 student teams (study 1), 79 student teams (study 2)	Goldberg (1992)	Independent expert ratings	No	No	Did not examine any relations	Low	Yes	Ideation-only
Gilson (2002)	47 work teams from a regional bank and a graphic design company	West (1987), Burningham and West (1995)	West and Anderson (1996)	No	No	Positive correlation between average individual innovativeness and team innovation	High	No	Implementation
Goncalo and Duguid (2012)	124 student teams	Gough (1979)	External expert ratings	Yes	No	Positive link between the proportion of high creative individuals and team creativity	Low	Yes	Ideation-only
Gong et al. (2013)	100 R&D teams across industries	Zhou and George (2001)	Shin and Zhou (2007)	Yes	No	Positive link between average	High	Yes	Ideation-only

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Appendix A. (Continued)

References	Sample	Measurement of individual creativity/ innovation	Measurement of team creativity/ innovation	Hypothesis of the additive model	Hypothesis of the disjunctive model	Member-to-team creativity findings	Task interdependence	Creativity requirements	Idea implementation
						individual creativity team creativity			
Gu, Chen, Huang, Liu, and Huang, (2018)	68 work teams from various industries	Dul et al. (2011)	Shin and Zhou (2007)	No	No	Positive correlation between average individual creativity and team creativity	Low	NA	Ideation-only
Gu, Liang, and Cooke (2020)	21 work teams from various industries	Zhou and George (2001)	NA	No	No	Did not examine any relations	Low	NA	Implementation
Hanke (2006)	89 student teams	Taggar (2002)	External expert ratings	No	No	Non-significant correlation between average individual creativity and team creativity	Low	yes	Implementation
He, Hao, et al. (2020)	32 student teams (study 1) and 64 R&D teams (study 2)	Zhou and George (2001)	External expert ratings	Yes	No	Positive link between average individual creativity team creativity	High	Yes	Ideation-only (study 1), implementation (study 2)
Indriartiningtias, Subagyo, and Hartono (2019)	34 work teams from creative firms	Woodman et al. (1993), Amabile (1988), Amabile et al. (1996), Zhou and George (2001), and Sarooghi et al. (2013)	Woodman et al. (1993), Amabile (1988), Borghini (2005), Sternberg (2006), and Mishra and Singh (2010)	No	No	Positive correlation between average individual creativity and team creativity	NA	Yes	Ideation-only
Jiang and Gu, (2016)	102 sales teams	Baer et al. (2006)	Shin and Zhou (2007)	No	No	Positive correlation	Low	No	Ideation-only

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Appendix A. (Continued)

References	Sample	Measurement of individual creativity/ innovation	Measurement of team creativity/ innovation	Hypothesis of the additive model	Hypothesis of the disjunctive model	Member-to-team creativity findings	Task interdependence	Creativity requirements	Idea implementation
						between average individual creativity and team creativity			
Jin (2010)	52 R&D teams from telecommunication companies	Shalley, Gilson, and Blum (2009)	Shin and Zhou (2007)	No	No	Non-significant correlation between average individual creativity and team creativity	High	Yes	Ideation-only
Kim, Park, and Kim (2019)	52 work teams from various industries	Tierney, Farmer, and Graen (1999)	Shin and Zhou (2007)	Yes	No	Positive link between average individual creativity and team creativity	NA	Yes	Ideation-only
Kim, David, and Liu (2021)	106 work teams from various industries	Zhou and George (2001)	Shin and Zhou (2007)	No	No	Did not examine any relations	Low	NA	Ideation-only
Kurtzberg (2000)	26 teams from various industries (sample 1) and 76 student teams (sample 2)	Kirton (1976)	Member ratings and external manager ratings	Yes	No	Non-significant link between average individual creative styles and team creativity	High (study 1); low (study 2)	No	Implementation
Li and Zhang (2016)	80 R&D teams from high-tech companies	Scott and Bruce (1994)	Shin and Zhou (2007)	No	No	Did not examine any relations	High	Yes	Ideation-only
Li, Fu, Sun, and Yang, (2016)	56 work teams from a university	Burningham and West (1995)	West and Anderson (1996)	No	No	Did not examine any relations	Low	Yes	Implementation
Li, Wang, and Huang (2018)	84 work teams from various companies	Farmer et al. (2003)	Farh, Lee, and Farh (2010)	No	No	Did not examine any relations	High	No	Implementation
Liang and Gu (2015)	92 work teams from various industries	NA	Shin and Zhou (2007)	No	No	Did not examine any relations	Low	No	Ideation-only
Ling (unpublished)		NA	NA	No	No		High	No	Ideation-only

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Appendix A. (Continued)

References	Sample	Measurement of individual creativity/ innovation	Measurement of team creativity/ innovation	Hypothesis of the additive model	Hypothesis of the disjunctive model	Member-to-team creativity findings	Task interdependence	Creativity requirements	Idea implementation
	43 teams from a power station					Did not examine any relations			
Link, Siemon, de Vreede and Robra-Bissantz, (2015)	26 student groups	Independent expert ratings	Independent expert ratings	Yes	No	Non-significant link between average individual creative styles and team creativity	High	NA	Ideation-only
Mao, Chang, Gong, and Xie (2021)	65 R &D teams at a publicly listed high-technology firm	Madjar et al. (2011)	Oldham and Cummings (1996)	No	No	Did not examine any relations	High	Yes	Implementation
Martinaityte, Unsworth, and Sacramento (2020)	39 work teams	Jabri (1991)	Farh, Lee, and Farh (2010)	No	No	Did not examine any relations	NA	Yes	Implementation
Mathisen et al. (2008)	29 work teams from a television production company	Martinsen (2004)	Scott and Bruce (1994)	No	No	Non-significant correlation between average individual originality capability and team innovation	Low	Yes	Ideation-only
Miron-Spektor et al. (2011)	41 work teams in defense industry	Kirton (1976)	Darel, Bonen, and Myersdorf (1993)	Yes	No	Positive link between proportion of creative individuals and team innovation	High	Yes	Implementation
Navaresse, Yauch, Goff, and Fonseca (2014)	36 student teams	Taggar (2002) and Amabile (1996)	External expert ratings	Yes	No	Positive link between average individual	High	No	Ideation-only

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Appendix A. (Continued)

References	Sample	Measurement of individual creativity/ innovation	Measurement of team creativity/ innovation	Hypothesis of the additive model	Hypothesis of the disjunctive model	Member-to-team creativity findings	Task interdependence	Creativity requirements	Idea implementation
						creativity and team creativity			
Nouri et al. (2013)	96 student teams	Torrance (1974)	Torrance (1974), and Silvia et al. (2008)	No	No	Positive correlation between average individual creativity and team creative performance	Low	Yes	Ideation-only
O'Hara (2001)	60 student teams	External judges	Amabile (1982)	No	No	Non-significant correlation between individual creativity and team creativity	High	No	Ideation-only
Pirola-Merlo and Mann (2004)	56 project teams from R&D organizations	Single-item scale	A customized scale	No	No	Positive correlation between average individual creativity and team creativity	High	Yes	Ideation-only
Post (2012)	81 work teams from various industries	Jabri (1991), Kirton (1976)	Janssen (2000)	Yes	No	Positive link between average connective thinking and team creativity	High	Yes	Implementation
Rangus and Černe (2019)	10 work teams from a manufactural firm	George and Zhou (2001)	Anderson and West (1998)	No	No	Did not examine any relations	High	No	Implementation
Robert and Cheung (2010)	55 student teams	Goldberg (1999)	Corporate KPI scores	No	No	Did not examine any relations	Low	Yes	Ideation-only
				No	No		High	Yes	Ideation-only

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Appendix A. (Continued)

References	Sample	Measurement of individual creativity/ innovation	Measurement of team creativity/ innovation	Hypothesis of the additive model	Hypothesis of the disjunctive model	Member-to-team creativity findings	Task interdependence	Creativity requirements	Idea implementation
Sacramento et al. (2013)	41 work teams from various organizations	George and Zhou (2001), and Tierney, Farmer, and Graen (1999)	George and Zhou (2001) and Tierney, Farmer, and Graen (1999)			Positive correlation between average individual creativity and team creativity			
Schilpzand, Herold, and Shalley (2011)	31 student teams	Costa and McCrae (1992)	Oldham and Cummings (1996), Tierney and Farmer (2002)	No	No	Non-significant correlation between average individual openness and team creativity	High	Yes	Implementation
Somech and Drach-Zahavy (2013)	96 primary care teams from a health maintenance organization	Gough (1979)	External expert ratings	Yes	No	Positive link between average creative personality and team creativity	High	No	Ideation-only
Tadmor et al. (2012)	57 student teams (dyads)	Expert ratings	External expert ratings	Yes	No	Positive link between average individual creativity and team creativity	Low	Yes	Ideation-only
Taggar (2001)	31 student teams	Evan (1991)	External expert ratings	Yes	Yes	Positive link between the number of creative individuals and team creativity and between highest individual creativity and team creativity	High	No	Ideation-only
Taggar (2002)	94 student teams	A global measure	External expert ratings	Yes	No	Positive correlation	High	No	Ideation-only

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Appendix A. (Continued)

References	Sample	Measurement of individual creativity/ innovation	Measurement of team creativity/ innovation	Hypothesis of the additive model	Hypothesis of the disjunctive model	Member-to-team creativity findings	Task interdependence	Creativity requirements	Idea implementation
						between average individual creativity and team creativity			
Triandis et al. (1963)	42 student teams (study 1) and 41 student teams (study 2)	Student judge ratings	Student judge ratings	No	Yes	Positive link between highest individual creativity and team creativity	Low	Yes	Ideation-only (study 1,3,4), implementation (study 2)
Tu, Lu, Choi, and Guo (2019)	44 work teams from various organizations	Farmer et al. (2003)	Oldham and Cummings (1996)	No	No	Positive correlation between average individual creativity and team creativity	High	Yes	Ideation-only
Vera (2004)	43 teams from municipal departments	Tierney, Farmer, and Graen (1999)	Roth (1993)	No	No	Did not examine any relations	High	No	Implementation
Wang and Zhu, (2011)	71 work teams from a wide range of organizations	Tierney, Farmer, and Graen (1999)	Tierney, Farmer, and Graen (1999)	No	No	Non-significant correlation between average individual creativity and team creativity	Low	No	Ideation-only
West and Anderson, 1996	27 top management teams from major hospitals	Burningham and West (1995)	West (1987)	Yes	No	Positive link between the proportion of innovative individuals and team innovation	High	No	Implementation
Wu et al. **(unpublisheda)**	66 student teams	Independent expert ratings	Independent expert ratings	No	No	Did not examine any relations	High	Yes	Implementation

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Appendix A. (Continued)

References	Sample	Measurement of individual creativity/ innovation	Measurement of team creativity/ innovation	Hypothesis of the additive model	Hypothesis of the disjunctive model	Member-to-team creativity findings	Task interdependence	Creativity requirements	Idea implementation
Wu et al. **(unpublishedb)**	57 work teams from various industries	Madjar et al. (2011)	Farh, Lee, and Farh (2010)	No	No	Did not examine any relations	Low	Yes	Implementation
Wu et al. **(unpublishedc)**	79 work teams from engineering and construction industries	Madjar et al. (2011)	Farh, Lee, and Farh (2010)	No	No	Did not examine any relations	High	Yes	Implementation
Wu (unpublished)	116 teams from various departments of a TV station	NA	NA	No	No	Did not examine any relations	Low	No	Ideation-only
Yang, Liu, and Gu, (2017)	84 teams in 28 banking offices	Baer and Oldham (2006)	Gong et al. (2013)	No	No	Positive correlation between average individual creativity and team creativity	Low	Yes	Ideation-only
Yoshida, Sendjaya, Hirst, and Cooper (2014)	154 work teams from various industries	Baer and Oldham (2006)	De Dreu (2006)	No	No	Positive correlation between average individual creativity and team innovation	High	No	Implementation
Yuan and van Knippenberg (2020)	61 sales teams	Farmer et al. (2003)	Corporate KPI scores	Yes	Yes	Positive link between highest individual creativity and team creativity	Low	Yes	Implementation