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THE BOON AND BANE OF CREATIVE "STARS": A SOCIAL NETWORK EXPLORATION OF HOW AND WHEN TEAM CREATIVITY IS (AND IS NOT) DRIVEN BY A STAR TEAMMATE

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Although previous research has highlighted the disproportional contributions of star employees to their teams, an emerging line of research has begun to examine the potentially negative consequences of team stars. Drawing on a social model of team creativity, we develop a dualistic model of the influences of team creative stars on team creativity. Specifically, we explore the roles of two types of team members—star and nonstar employees—in driving team creativity. Across two multiwave and multisource field samples, we find that a creative star who occupies a central position in the team workflow network has both a positive direct effect on team creativity and a negative indirect effect on team creativity via reducing nonstars' learning (i.e., exploratory and exploitative activities). Our study also reveals that team coordination can mitigate the detrimental effect of a star's centrality on nonstars' learning behavior, and subsequently buffer the indirect effect on team creativity.

In today's dynamic business environment, organizations increasingly rely on teams to perform complex tasks (Farh, Lee, & Farch, 2010) and generate the creative ideas and solutions needed to garner sustained competitive advantage (Amabile, 1996; Zhou & Shalley, 2008). Although numerous studies have explored the antecedents, processes, and consequences of individual creativity (Anderson, Potočnik, & Zhou, 2014; Shalley, Zhou, & Oldham, 2004; Zhou & Hoever, 2014), the mechanisms by which team creativity is developed have not been clearly elucidated (Gong, Kim, Lee, & Zhu, 2013). Rather, team creativity has often been treated as a product of team composition, whereby teams with more creative individuals exhibit more team-level creativity (Drazin, Glynn, & Kazanjian, 1999; Gong, Zhou, & Chang, 2013; Pirola-Merlo & Mann, 2004).

In reality, a team with many creative members that fails to develop novel and useful solutions as a whole is not uncommon, thereby suggesting that team creativity is more than just the sum of individual creativity. Indeed, simply having the basis for creative thinking at an individual level hardly ensures that a team will be able to integrate divergent ideas and perspectives in a manner that produces team-level creativity (Gong, Kim, et al., 2013). To this end, Perry-Smith and colleagues (Perry-Smith & Mannucci, 2017; Perry-Smith & Shalley, 2003, 2014) have extensively theorized that creative processes (e.g., integrating and combining ideas) are often social in nature, such that a team's

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social patterns—namely interpersonal interaction—are powerful drivers of creativity (Amabile, 1983; Li, Li, Guo, Li, & Harris, 2018; Perry-Smith, 2006; Perry-Smith & Shalley, 2003). Essentially, this perspective highlights that *all members* might interdependently contribute to the emergence of team creativity via the team's social interactions (Argote & Fahrenkopf, 2016; Coleman, 1988; Groysberg & Lee, 2008). Thus, team creativity is likely a product of the complex interaction patterns of creative stars and nonstars alike.

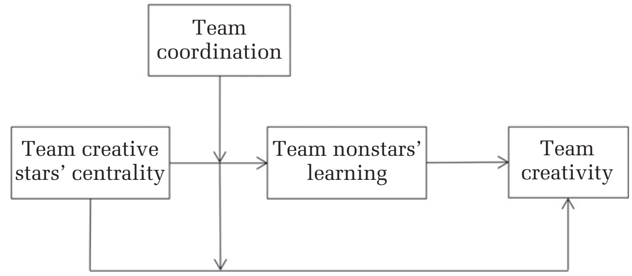
In an effort to advance team creativity research, we employ a team microdynamics perspective (Humphrey & Aime, 2014) to explore how team creativity emerges as a result of the unique social connections between teams' creative stars and other teammates in the context of overall team coordination. Consistent with the social model of creativity, our approach incorporates key interaction patterns at the individual (i.e., star centrality) and team (i.e., team coordination) levels. We define a team's creative star as the member who exhibits superior creativity relative to other team members.[1] A creative star is a key source of novel ideas, but the extent to which the star contributes to overall team creativity is also determined by how he or she communicates and interacts with others in the team (Oldroyd & Morris, 2012; Perry-Smith & Shalley, 2003). We conceptualize stars' work-related interactions with others by considering their network positions in the team workflow network, which reflects the extent to which members rely on one another for inputs to complete tasks (Brass, 1984).

We develop parallel arguments suggesting that creative stars can simultaneously exhibit direct positive and indirect negative effects on team creativity. Building from prior work on stars (e.g., Grigoriou & Rothaermel, 2014; Li, Zhao, Walter, Zhang, & Yu, 2015), we first posit that creative stars in central network positions can directly enhance team creativity because they are able to utilize diverse information from other teammates and more easily spread their ideas through the team's network. However, we also argue that when others are dependent on a star for key information or materials (i.e., the star occupies a central position in the team workflow network), they may not see a clear need for their own contributions and thus limit their engagement in the creativity-inducing learning activities (i.e., exploitative and exploratory learning [Baum, Li, & Usher, 2000; Gupta, Smith, & Shalley, 2006; Kehoe & Tzabbar, 2015; March, 1991; Oldroyd & Morris, 2012]). Finally, we theorize that the extent to which teams can effectively integrate individual efforts into collective outcomes (i.e., coordination [Kozlowski & Bell, 2003; Marks, Mathieu, & Zaccaro, 2001; Tesluk & Mathieu, 1999]) represents an important boundary condition, such that higher team coordination amplifies the direct positive relationship, and buffers against the detrimental negative relationship, between centrally located stars and team creativity. Figure 1 depicts our overall model.

Our research makes two important contributions. First, we extend the social model of creativity by showing the specific social interaction pathways through which stars impact team creativity, and thus shed light on the microdynamics (Humphrey & Aime, 2014) that affect overall team creativity. In doing so, our model challenges several common assumptions, including that team creativity is a product of individual creativity; that team creativity is heavily and unambiguously positively influenced by the most creative member in the team (Pirola-Merlo & Mann, 2004; Somech & Drach-Zahavy, 2013); and that stars in central positions invariably enhance team performance outcomes (Humphrey, Morgeson, & Mannor, 2009; Li et al., 2015). Namely, our arguments highlight that although creative stars can in some ways be a creative boon for teams, they may in other ways act as a bane by way of fostering a harmful overdependence in teammates (e.g., Oldroyd & Morris, 2012) that reduces the learning needed for creativity to emerge (Amabile, 1983).

Second, we examine the role of social interactions in driving creativity at both the individual and team levels by suggesting that team-level interactions, such as team coordination, act as a critical boundary

FIGURE 1
Research Model



Note: All variables are at the team level of analysis.

[1] Previous research has differentiated global stars from local stars: Global stars display superior performance in a larger collective, while local stars demonstrate superior performance in a smaller group, such as a department or team (Groysberg, Polzer, & Elfenbein, 2011). In the current research, we focus on local creative stars in teams.

condition of the microdynamics between creative stars and their teammates. Specifically, we posit that team coordination accentuates the positive effects of creative stars on team creativity and mitigates the detrimental effects of creative stars on nonstars' learning behavior. Our inclusion of team coordination enhances our understanding of how individual network positions and team-level interaction attributes jointly explain team creativity. Taken together, our study yields a more nuanced view of a creative star's influence within a team, and allows us to better understand when teams can benefit from a star member.

THEORY AND HYPOTHESIS DEVELOPMENT

Prior research on star performers has demonstrated their potential to exert disproportional, and generally positive, influences on team effectiveness outcomes (Aguinis & O'Boyle, 2014). In a recent conceptual review, Call, Nyberg, and Thatcher (2015) advanced a multidimensional typology indicating that stars have disproportionately high (a) performance, (b) visibility, and (c) relevant social capital. These star criteria can be applied to any number of work domains (e.g., top task performers as "productivity stars," those with exceptional social connections as "relational stars" [Grigoriou & Rothaermel, 2014]). Consistent with these views, we describe team creative stars as the most creative members in a team, and posit that they can exert significant influence on team creativity.

Over the last decade, team researchers have also begun to acknowledge the disproportional influences of individuals (Humphrey & Aime, 2014), especially elite members. For example, Li and colleagues (2015) found that a central "extra miler's" influence on team processes exceeds the average influence of all the other team members. Liu (2014) revealed that having star inventors on an inventing team increases the chances that those teams' patents will be favored in the patent renewal process and that the team's work will be considered more valuable by their firm.

Despite this initial evidence, the social model of creativity suggests that team creativity also heavily depends on interpersonal interactions among the majority of team members, and their involvement in the team's creative process (Perry-Smith & Mannucci, 2017). For example, Groysberg and Lee (2008) found that the ability of a star to perform at a top level on an ongoing basis is affected by the quality of nonstar team members. Groysberg, Lee, and Nanda (2008) further suggested that stars who switch employers, and thus give up the support of their preexisting coworkers, are likely to experience pronounced declines in performance. Essentially, this line of research has suggested that because of the interdependent nature of teamwork, the role of a team's star in driving team creativity is contingent on his or her teammates.

In addition to the notion that stars can benefit from the support of their teammates, research has suggested some reasons why star employees may detrimentally affect their nonstar colleagues (Call et al., 2015; Tzabbar & Vestal, 2015). Specifically, the resources and attention bestowed upon a star can restrict the opportunities for nonstars' development (Zucker, Darby, & Armstrong, 2002). Likewise, star members' exceptional contributions to the team may increase their teammates' dependence on them, reduce the initiative of those nonstars to engage in their own development through learning activities, and ultimately hurt organizational innovation as a whole (Kehoe & Tzabbar, 2015).

In March's (1991) pioneering article, exploration and exploitation were introduced as two key forms of organizational learning. Several scholars have explicitly argued that "learning, improvement, and acquisition of new knowledge are central to both exploitation and exploration" (Gupta et al., 2006: 694; see also Baum et al., 2000). This notion is also consistent with Amabile's (1983) componential model, and the social model of creativity (Perry-Smith & Shalley, 2003), which suggests that developing creative ideas requires individuals to leverage domain-relevant knowledge (exploitation) and access to diverse perspectives (exploration). Therefore, in line with the notion that star employees may adversely affect their nonstar teammates, we examine whether the presence of a central star can inhibit others from engaging in learning and innovation activities.

Taking the extant literature into account, and building on the social model of creativity (Perry-Smith & Shalley, 2003), we argue that the beneficial and detrimental effects on team creativity that are associated with star members can occur concurrently. Moreover, a star's influence on team creativity not only depends on his or her creative ideas, but also the way the star interacts with other teammates (Keum & See, 2017). Thus, creative stars can have dual effects on team creativity through direct and indirect ways, and their interaction patterns with others play key roles in determining these dual-effect processes.

Drawing from the teams literature, we also argue that team coordination (i.e., a team-level pattern of behavior relating to the integration and alignment of members' actions and objectives toward collective objectives [Marks et al., 2001]) can alter the relationships among stars' centrality, nonstars' learning behavior, and team creativity. Because team creativity is a social process that requires interdependent collaborations among members, the nature of a star's effect is likely to vary with the extent to which team members coordinate with one another as a team (versus just how they interact with a star) to accomplish their interdependent tasks. Thus, we seek to advance theory regarding the possible contingency effects of team coordination on the relationships between creative stars' centrality, nonstars' learning behavior, and team creativity.

The Direct Effect of Team Creative Stars' Centrality on Team Creativity

Perry-Smith and Shalley's (2003) social model of creativity explores the effect of interpersonal interactions on creativity from a social network perspective. Essentially, interpersonal interaction can be described as network connections among individuals. Employees who frequently interact with others are in central network positions and serve as the focal points of interaction (Klein, Lim, Saltz, & Mayer, 2004; Reinholt, Pedersen, & Foss, 2011). Among the various network types, we focus on the team workflow network, which captures the work-related processes by which people interact and communicate with one another to get things done (Mehra, Kilduff, & Brass, 2001).

According to social network theory (Borgatti, Mehra, Brass, & Labianca, 2009), team members share both direct and indirect network ties. Our theory primarily focuses on the interactions between creative stars and their teammates, which are captured by the direct network ties, as indicated by the stars' degree centrality. We acknowledge that the interactions among nonstars may impact team interactions to some extent; however, because of the stars' disproportional influence in the team, we argue that direct interactions with the stars are a more potent driving force of team creativity.

When a star frequently interacts with teammates, he or she is more likely to influence the team in a positive way (Brass & Burkhardt, 1993), such as by developing and promoting novel ideas, and is therefore more likely to make a direct contribution to team creativity. First, because of the interdependent nature of teamwork, the extent to which individual creativity is transformed into team creativity will depend on whether the focal individual has channels through which to present his or her ideas to the team and garner the other members' support (Paruchuri, 2010). Previous research has suggested that having high centrality within the workflow network accentuates the effects of individuals' behavior on the team's processes and outcomes (Li et al., 2015). Grigoriou and Rothaermel (2014) have also argued that a person who occupies a central position has a positive effect on the performance of the network as a whole, especially when that person is a star employee. Being in a central position allows the creative star to play the role of integrator in the team, which can benefit the team by advancing a solution from one member to address the problem of another member, and thus develops the star's capacity to promote his or her own ideas and drive team creativity (Balkundi & Harrison, 2006; Borgatti & Cross, 2003). Similarly, creative stars' relatively comprehensive views of team interaction patterns afford them opportunities to learn which team members know what and how they work together; as a consequence, they may be able to more effectively divide their labor so as to utilize the expertise available within the team to develop creative ideas (Reagans, Argote, & Brooks, 2005; Reagans, Miron-Spektor, & Argote, 2016; Venkataramani, Richter, & Clarke, 2014).

Second, team creativity requires members to develop novel and useful ideas for the team. The team's creative stars are likely to develop a large number of novel ideas, which can be an important source of team creativity. However, because not all novel ideas are relevant and useful for the team, the stars need to deeply understand the nature of teamwork and go through an evaluative process to decide which ideas can be further developed to drive team creativity (Taggar, 2002). Occupying a central position in the workflow network will allow the creative stars to clearly understand the structure of teamwork and, in turn, to integrate their novel ideas with the reality of the team's operation so as to advance original and useful solutions for the team. For example, Amabile (1983) and other researchers (Li et al., 2018; Perry-Smith & Shalley, 2003) have argued that domain-relevant knowledge is a key driver of creativity. Frequently interacting with others will allow the creative stars to increase their domain-relevant knowledge of the team. In contrast, stars who occupy a peripheral position in the workflow network may be able to produce novel ideas but, because they are relatively isolated from the team's ongoing processes, will be less familiar with the team's situation and less adept at generating novel and useful solutions for the team. Therefore, we predict:

Hypothesis 1. The centrality of a creative star has a positive and direct effect on team creativity.

The Indirect Effect of Team Creative Stars' Centrality on Team Creativity

Although a centrally located star in the workflow network can develop novel and useful ideas and promote those ideas to the team, team creativity also requires intellectual contributions from others (Perry-Smith & Shalley, 2003). However, when team members are inclined to rely on the star for resources and information, the high centrality of the creative star may lead to an overdependence on the star that ultimately inhibits the exploratory and exploitative learning of nonstar members (March, 1991; Oldroyd & Morris, 2012). Oldroyd and Morris (2012) argued that because of stars' exceptional performance, they are likely to be asked for help and advice. Stars can easily influence others to buy into their ideas and perspectives through work-related interactions. As more people come to depend on the stars for inputs (i.e., incoming ties toward the stars), nonstars will be less likely to reflect on the existing process or to try out alternative solutions that are not proposed by the stars. In other words, nonstars will grow to depend on the creative stars to share critical information and knowledge, which stifles their own creativity. In essence, centrally located stars increase other employees' reliance on them for direction and support (Brass, 1984), which can decrease the teammates' motivation to learn (Liden, Wayne, Jaworski, & Bennett, 2004).

Joshi and Knight (2015) found that people are inclined to defer to high-status individuals with relevant skills on important issues. Therefore, when the most creative member occupies a central position in the team, others are likely to develop team creative solutions based on the topics and ideas offered by the star, and to play supporting roles in the creative process (Anderson, Willer, Kilduff, & Brown, 2012). Although such deference may facilitate rapid decision making and efficiency, it can significantly constrain the team's ability to question whether the ideas offered by the star are relevant to the team problem, and to explore alternative perspectives. Centrally located stars can quickly disseminate their superior ideas to others (Schilling & Fang, 2013), increasing the probability that the nonstars will adopt and use the stars' knowledge, albeit without developing their own insights (Burke, Fournier, & Prasad, 2007). In the end, the result will be a failure to demonstrate learning behavior. Therefore, we suggest the following hypothesis:

Hypothesis 2. The centrality of a creative star is negatively related to learning activities of nonstars.

According to Amabile's (1983, 1996) componential model and Perry-Smith and Shalley's (2003) social model of creativity, developing creative ideas requires individuals to possess a sufficient level of domain-relevant knowledge and access to divergent perspectives. Individual learning activities such as experiential refinement, reuse of existing knowledge, and seeking out diverse perspectives are directly related to these two drivers. Therefore, nonstars' learning efforts will play a critical role in building a pool of relevant knowledge and divergent views in the team. Ultimately, the negative effect on other team members' learning associated with a centrally located star may indirectly hurt team creativity.

Research on creativity has long suggested the important role of organizational learning in facilitating creative ideas (Chen & Garg, 2015; Coff & Kryscynski, 2011; Gupta et al., 2006). For example, in a qualitative study, Li and colleagues (2018) found that team members' learning behaviors play a critical role in their ability to acquire domain-relevant knowledge and gain divergent perspectives. Specifically, they found that employees' learning-related activities fall into two broad categories: developing diverse ideas and integrating existing knowledge. At the team level, Taylor and Greve (2006: 724) argued that "team creativity relies on tapping into the diverse knowledge of team members." Therefore, despite creative stars' exceptional ability to generate ideas, their teammates' knowledge and ideas are still important in driving team creativity.

Building from this premise, prior work has highlighted that creative stars need coworkers that can support their efforts in order to be effective (Groysberg et al., 2008). To this end, the organizational learning of nonstars boosts their input into the team's creative activities, which significantly affects a star's ability to propel his or her own creativity-related performance forward (Groysberg & Lee, 2008) and can improve team creativity as a whole. For example, nonstars' learning can help aid a creative star's ideas by providing more insight into whether a new method is compatible with the team's efforts.

Moreover, the learning activities of nonstars informs the heterogeneity and diversity of the team's knowledge base (Schilling & Fang, 2013). The ability to recombine the diverse knowledge possessed by and accessible to team members is essential if a team is to put forward new ideas (Taylor & Greve, 2006). Learning by nonstars improves these team members' ability to participate in independent exploration and creation, ultimately increasing the team's capacity to attain continuous creative productivity (Kehoe & Tzabbar, 2015). Thus, we predict:

Hypothesis 3. The centrality of a creative star has a negative and indirect effect on team creativity via the learning activities of nonstars.

The Moderating Role of Team Coordination

In line with the social model of creativity, team creativity requires interdependent collaborations among members. In this regard, the direct and positive effects of creative stars on team creativity are likely to depend on teams' ability to integrate those stars' ideas into the team's work. Team coordination—which refers to behavior patterns of integrating and aligning the actions and objectives of interdependent members to attain collective objectives (Li & Liao, 2014; Rico, Sánchez-Manzanares, Gil, & Gibson, 2008)—is an important team process that is closely related to team creativity (Reagans et al., 2016). Effective team coordination among members facilitates fluid team interactions and reduces friction in work flow (Kozlowski & Ilgen, 2006), thereby leading to a unified team function. Coordination also allows information, knowledge, resources, and ideas to smoothly flow within the team. In turn, the team as a whole becomes more responsive, integrated, adaptive, and innovative. We argue that team coordination will amplify the direct and positive effects of a star's centrality on team creativity. Specifically, we expect that a creative star's centrality will be more positively related to team creativity when the team is able to effectively coordinate its members' efforts.

Team coordination, which helps the team interactions proceed in clear and relatively smooth ways, enables the stars to easily gain elaborate and in-depth understanding of the team. As a result, these central stars can easily connect their ideas to the team's reality. Their centrality in the workflow network then helps the stars share their thoughts and thinking. Coordination can also help to eliminate fluctuations in the team's information flow, such that the teammates can readily access and apply the stars' knowledge in a compressed and easily digestible format (Morris & Oldroyd, 2009). Ultimately, efficient coordination helps the team members gain a better understanding of the stars' creative ideas, which then improves the relationship between the star's centrality and team creativity. In contrast, when a team is unable to integrate and coordinate different members' inputs (i.e., low coordination), even though the central creative star may present a large number of ideas to the team, other team members may find difficult to synchronize their efforts and convert the star's ideas into team creativity. However, when a star is located in a peripheral position, the star will lack channels and opportunities to offer the team creative ideas, even if the team can efficiently coordinate members' inputs. Thus, we predict:

Hypothesis 4. Team coordination accentuates the positive and direct effect of a creative star's centrality on team creativity, such that the relationship between the centrality of the star and team creativity will be more positive when team coordination is high.

In addition to amplifying the positive and direct effect of the star's centrality on team creativity, team coordination can mitigate the detrimental effect of a star's centrality on nonstars' learning, as well as the indirect effect on team creativity. To mitigate the negative effects of stars on nonstars' learning, organizations need to carefully coordinate actions and relations among stars and their teammates when these parties are performing interconnected subtasks (Edmondson, Bohmer, & Pisano, 2001). Research on learning within the team context has indicated that members' learning activities result from coordinated efforts to reflect on the team's existing knowledge and explore alternative perspectives (Salas, Nichols, & Driskell, 2007; Smith-Jentsch, Cannon-Bowers, Tannenbaum, & Salas, 2008). In the presence of a central creative star, other members are generally apt to rely on the star for inputs such as ideas and directions, but higher levels of team coordination can buffer this tendency and foster high levels of learning among all team members.

Specifically, team coordination helps teams develop a common language for describing tasks, assignments, roles, and locations of expertise (Faraj & Sproull, 2000). This shared understanding allows team members to more easily acquire team-relevant knowledge and a base of cross-understanding among members (Huber & Lewis, 2010; Srikanth & Puranam, 2011). Thus, in a team with a high level of coordination, nonstars can better integrate the tacit knowledge of the team's stars and other nonstar members with their own knowledge, which facilitates more individual learning for themselves and, separately, enables individual learning to spread more easily throughout the team. Further, when a team attains a high level of coordination, and thus all members understand how they contribute toward a collective goal, members' learning motivation should increase so that they can contribute even more to successful outcomes (e.g., finding creative solutions). Therefore, when team coordination is high, regardless of the star's centrality, nonstars are likely to maintain a relatively high level of learning activities (thereby subduing the star's influence).

In contrast, when a team is unable to integrate and align the actions and objectives of team members to attain collective objectives (Marks et al., 2001), the creative stars will play a more critical role in driving ideas and directions in terms of developing team creativity. Their influences will be particularly salient when they have opportunities to interact with their teammates. Over time, their strong presence in the team will persuade others to rely on them for information, guidance, and decisions. At the same time, low team coordination will amplify nonstars' dependency on the central stars. Ultimately, nonstars may simply adopt the stars' ideas and directions to develop team creativity, abandoning their own individual efforts to acquire team knowledge and explore different ideas.

By comparison, when the star is peripherally located in the team, other members will be less likely to depend on the star for decisions and will have more opportunities to independently reflect on team processes and engage in learning behaviors. Therefore, when team coordination is low, there will be an amplified negative association between star centrality and nonstars' learning behaviors. This leads to our next hypothesis:

Hypothesis 5. Team coordination mitigates the negative relationship between the centrality of a creative star and the learning activities of nonstars, such that the relationship will be less negative when team coordination is high.

As previously argued, nonstars' learning helps the team acquire necessary knowledge and explore alternative perspectives, which are critical for the team to develop creative solutions. Therefore, team coordination should buffer the negative and indirect effect of a star's centrality on team creativity via nonstars' learning. Thus, we predict:

Hypothesis 6. The indirect effect of the centrality of a creative star on team creativity via nonstars' learning is mitigated by team coordination, such that the indirect effect is less negative when team coordination is high.

METHODS

Research Setting and Participants

We tested our hypotheses in two independent settings to examine whether our findings were robust across different types of teams, including research and development (R&D) teams and sales teams. Additionally, because previous studies have employed a range of definitions and operationalizations of star employees, we used various approaches to identify stars (i.e., performance ratings in the R&D sample, a nomination approach in the sales sample) to further examine whether our findings are subject to different operationalizations of stars.

R&D sample. We employed a two-wave field survey of R&D teams in 23 firms across four provinces of China. The firms were from multiple industries, including aerospace, chemicals, hydropower, manufacturing, metallurgy, and transportation. The firms possessed self-owned intellectual property rights to their core technologies and relied on teams to produce novel solutions. With approval from the top executives of the firms, the human resources (HR) directors helped us invite the teams to participate in the study. We used a paper-and-pencil method to collect the data onsite. Teams of graduate students that were not directly affiliated with the research project distributed and collected the surveys. To encourage employee participation, we offered a gift valued at approximately $5 to all survey respondents when they finished their questionnaires.

In the first wave, we collected information from team members and team leaders. Our first-wave survey was given to 106 team leaders and 899 team members. Among them, a total of 97 team leaders and 787 employees completed the survey, leading to response rates of 91.51% and 87.54%, respectively.

We conducted the second-wave survey six months later. In this survey, we asked 23 R&D department executives to rate their teams' creativity. We received 88 evaluations, resulting in a response rate of 90.72%. Four teams were excluded from our final sample because the response rate for the team was less than 70%, which might lead to an inaccurate measure of network structure. The final sample included 676 employees from 84 teams. Team size was 8.05 members on average, ranging from three to 22.

Sales sample. We also surveyed 113 sales teams from two firms in the customer service industry. Each team represented an independent store where employees interdependently collaborated with one another to perform key tasks. In prestudy interviews with their top managers, we were informed that creativity was a key part of the firms' operations, namely in that employees are expected to develop new ideas to provide high-quality services to customers. Typical manifestations of employee creativity in this sample came in areas relating to advertising, customer relationship building, product demonstration, and sales promotion.

Because the sales teams were located in 36 different cities in China, we used an online survey platform to collect the responses. Specifically, we distributed our surveys to 36 regional sales managers, 113 team leaders, and 531 team members via the online data collection platform. The study authors created the survey and the link was administered by each company's HR department. In the first wave, we collected information from team members, team leaders, and regional sales managers. About two months later, we asked the regional sales managers to rate team creativity again.

A total of 34 regional sales managers, 106 team leaders, and 496 team members completed the survey, leading to response rates of 94.4%, 93.8%, and 93.4%, respectively. We eliminated teams with only two members and those with less than a 70% team response rate from our analysis. This resulted in a final sample of 94 teams and 457 team members. Team size was 4.92 members on average, ranging from three to 10.

Measures

Because the original scales were developed in English, we used a back-translation process (Brislin, 1986) to ensure the equivalence of the English and Chinese versions. Unless otherwise noted, all study items used a five-point Likert-type scale ranging from 1 ("strongly disagree") to 5 ("strongly agree").

Team creative stars' centrality. To calculate the centrality of creative stars, we had to first identify "stars" and then calculate their centrality. To select *team creative stars* in the R&D sample, we identified the team member whose creativity score (as rated by team leaders) was the highest among all team members. Specifically, team leaders were asked to rate employee creativity in the first wave using a four-item scale developed in prior research (Farmer, Tierney, & Kung-Mcintyre, 2003; Hirst, Van Knippenberg, Chen, & Sacramento, 2011). Sample items include "Tries new ideas and approaches to problems" and "Seeks new ideas and ways to solve problems." The Cronbach's α value was 0.87. We identified 139 team creative stars from the 84 teams; 26 teams had more than one star, meaning that the team leaders gave the same evaluation score to more than one team member. Each team had, on average, 1.65 stars.

In the sales sample, we used a different method to identify team creative stars. In the first wave, consistent with previous conceptualizations of star performers (Aguinis & O'Boyle, 2014; Tzabbar & Kehoe, 2014), we provided team leaders with a clear definition of creative stars: "Creative stars are employees who display superior creativity relative to others and have a reputation of being creative." We then asked the leaders to nominate creative stars in their teams based on this definition. They were allowed to nominate up to 20% of their team members, or no one. In the end, the 90 team leaders nominated 96 creative stars; 84 teams only identified one star, four teams had no star, and six teams had two stars. Because team members often communicate their creative ideas to leaders, we felt like team leaders were well-positioned to rate and nominate creative stars (Venkataramani et al., 2014). In addition, compared with peer ratings or nominations, leaders are not directly involved in social comparisons with their followers, which may help them provide objective evaluations and nominations.

We then measured each team's workflow network. In the R&D sample, we provided respondents with a list of all team members' names attached to the questionnaire and asked the respondents, "To what degree do you rely on this teammate to provide you with inputs to your job?"; scores ranged from 1 ("never") to 5 ("frequently"). In the sales sample, participants were assigned a unique login ID linked with their team membership. They were also presented with a list of their teammates and asked to report whether they often relied on each of the listed teammates to provide them with inputs to perform jobs (0 = "not often," 1 = "often").

We calculated indegree centrality (Freeman, 1979), which indicates the extent to which others rely on the creative stars for inputs to perform tasks, using UCINET 6 (Borgatti, Everett, & Freeman, 2002). Centrality scores were calculated based on valued ties in the R&D sample and binary ties in the sales sample. When a team had more than one star, we averaged the stars' indegree centrality at the team level.

Team coordination. Team members rated team coordination using the five items from the scale developed by Hoegl, Weinkauf, and Gemuenden (2004) in the first wave across both samples (Cronbach's α: R&D sample = 0.83, sales sample = 0.92). Items were modified to reflect intrateam coordination. Items included "Connected processes and activities were well coordinated with other team members," "Duplicated and overlapping activities were avoided among team members," "Had no problems in coordinating with other team members," "Conflicts with other team members were settled quickly," and "Discussions with other team members were conducted constructively."

Team members' responses were aggregated at the team level. When we calculated the F values and intraclass correlation coefficients (ICCs); the results supported aggregation in both samples. For the R&D sample, $F(83, 592) = 2.76$, $p < .01$; ICC(1) = .18 and ICC(2) = .64; for the sales sample, $F(93, 363) = 2.07$, $p < .01$; ICC(1) = .18 and ICC(2) = .52. Moreover, using *rwg*(*j*) (James, Demaree, & Wolf, 1984), we found that the mean and median *rwg*(*j*) values were .93 and .94 for the R&D sample, respectively, and the mean and median *rwg*(*j*) values were .93 and .95 for the sales sample, respectively, suggesting acceptable levels of agreement for aggregation.

Nonstars' learning activities. We tried to capture employees' overall learning by capturing both exploratory and exploitative learning, which is in line with previous arguments that both exploitation and exploration dimensions can capture important learning, improvement, and knowledge acquisition components (Baum, et al., 2000; Benner & Tushman, 2003; He & Wong, 2004). To do so, we adopted a scale developed by Mom, Van den Bosch, and Volberda (2009) and modified the items to fit the context of our research (Cronbach's α: R&D sample = 0.81, sales sample = 0.89). Specifically, all original items were translated into Chinese; we changed the scale referent point to "I" instead of "We" (because we were interested in nonstars' individual learning behaviors rather than team learning), and then presented the items to a group of subject-matter experts (e.g., R&D employees). The subject-matter experts were asked to select items that capture typical activities related to an individual enhancing his or her existing domain knowledge, or behaviors that refer to an individual seeking out new ideas and perspectives in their teams. As a result of this process, we retained six items, including both employees' exploratory and exploitative learning activities. Items measuring exploration included, "I often participate in innovative research activities," "I often search for new possibilities with respect to developing new products or services," and "I often learn new skills or knowledge while finishing my tasks." Exploitative learning items included, "I am often concerned about promoting existing technologies," "I focus on how to serve existing (internal) customers with existing services or products," and "I often think about the use of existing knowledge to complete the work." Consistent with our conceptualization that both exploration and exploitation are critical learning components, these two dimensions were found to be highly correlated ($r = .60$ in the R&D sample and $r = .86$ in the sales sample). Therefore, we averaged all items to form an overall learning construct.

To support the aggregation of nonstars at the team level, we calculated the *F* values, ICCs, and *rwg* values. In the R&D sample, $F(83, 453) = 2.89$, $p < .01$, ICC(1) = .23 and ICC(2) = .65. The mean and median *rwg*(*j*) values were .87 and .93, respectively. In the sales sample, $F(93, 269) = 1.43$, $p < .05$, ICC(1) = .10, and ICC(2) = .30. These ICCs are considered acceptable for small groups ($k = 3.87$). The mean and median *rwg*(*j*) values were .94 and .96, respectively.

Team creativity. We measured team creativity using the three-item scale developed by Farh and colleagues (2010). A sample item was, "The team output is 'creative.'" In the R&D sample, in the second wave of data collection we asked the R&D department executives to rate team creativity (Cronbach's $\alpha = 0.75$). On average, each R&D executive rated 3.65 teams. In the sales sample, to further enhance the causal inference of the proposed relationships, we asked regional sales managers to evaluate team creativity in both the first wave of data collection (Cronbach's $\alpha = 0.88$) and the second wave (Cronbach's $\alpha = 0.80$). On average, each regional sales manager was in charge of 2.76 teams. As R&D executives and regional sales managers were directly responsible for supervising and evaluating the teams' outputs, they had sufficient opportunities to observe the teams' creative outcomes. Moreover, they were outside the team and hence could avoid common source variance and self-serving biases (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Control variables. Across the two samples, we controlled for stars' creativity to separate the effects of the stars' creativity and centrality on the nonstars' learning and team creativity. In line with the social model of creativity, which suggests that contextual variables that shape social interactions may affect team creative process, we controlled for team size and team network density. Supporting this concern, team size was significantly related to degree centrality, whereas density was significantly related to team coordination. Density was calculated as the proportion of actual ties among the total possible number of ties (Wasserman & Faust, 1994). Finally, we controlled for team demographics (i.e., members' age, education level, gender, and team tenure) as well as for leader demographics (i.e., age, education level, gender, and tenure). For the sales sample, we also included an organizational dummy variable and team creativity rated by regional sales managers in the first wave to establish a stronger causal inference.

RESULTS

Table 1 and Table 2 present the means, standard deviations, and correlations among the variables for the two samples.

TABLE 1
R&D Sample: Means, Standard Deviations, and Correlations

	Mean	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Team age	6.45	5.16														
2. Network size	8.05	4.39	−.07													
3. Density	0.75	0.19	−.06	−.28												
4. Leader's gender	0.23	0.42	−.14	.04	.10											
5. Leader's age	36.30	7.51	.25	.09	−.10	−.09										
6. Leader's education	3.98	0.79	−.06	.29	.00	−.06	.03									
7. Leader's tenure	9.75	6.18	.38	.20	−.02	−.02	.56	−.08								
8. Average gender	0.36	0.27	.03	−.03	−.09	.33	−.13	−.10	−.05							
9. Average age	28.78	4.44	.12	.10	−.08	−.00	.20	.05	.23	.13						
10. Average education	3.85	0.64	−.10	.27	.16	.00	.09	.62	.19	−.11	.11					
11. Stars' creativity	4.05	0.64	.01	.26	.17	−.09	.06	.03	.15	−.15	.16	.19				
12. Stars' centrality	25.61	18.52	−.20	.76	.33	.07	.06	.25	.16	−.11	−.01	.37	.32			
13. Team coordination	3.78	0.34	.03	.07	.25	.02	.05	.09	.14	.16	.21	.25	.25	.21		
14. Nonstars' learning	3.71	0.41	−.15	−.10	.16	−.12	.07	.09	−.08	−.21	.21	.27	.27	−.02	.30	
15. Team creativity	2.92	0.76	−.26	−.02	.02	−.03	−.09	−.12	−.06	.12	−.01	−.10	.17	.04	.14	.26

Notes: $n = 84$. All values greater than $|.25|$ are significant at $p < .05$. All values greater than $|.29|$ are significant at $p < .01$.

We used Mplus 7.0 (Muthén & Muthén, 2007) to examine our hypotheses. Because our teams were nested under specific firms or regions, we used the sandwich estimator to account for additional non-independence associated with multiple cluster sampling and to correct for potential estimation bias (Liu, Wang, Chang, Shi, Zhou, & Shao, 2015; Muthén & Muthén, 2007). To facilitate the interpretation of results, we standardized centrality scores of creative stars. Table 3 and Table 4 present the regression results.

Hypothesis 1 posited that creative stars' centrality would be positively related to team creativity. For the R&D sample, as shown in Model 4 in Table 3, we found that the relationship between stars' centrality and team creativity was significantly positive (b = .42, $p < .05$). For the sales sample, as shown in Model 4 in Table 4, stars' centrality was significantly positively related to team creativity (b = .29, $p < .05$), which showed that stars' centrality had a significant and positive direct effect on team creativity. Thus, Hypothesis 1 was supported.

Hypothesis 2 posited that stars' centrality would be negatively related to nonstars' learning. As shown in Model 2 in Table 3, the effect of stars' centrality on nonstars' learning in the R&D sample was significantly negative (b = −.20, $p < .05$). Similarly, for the sales sample, it was significantly negative (b = −.18, $p < .001$; Model 2 in Table 4). These findings suggest that stars' centrality significantly and negatively influences nonstars' learning. Thus, Hypothesis 2 was supported.

Hypothesis 3 posited that the stars' centrality would have a negative indirect effect on team creativity via learning of nonstars. For the R&D sample, as shown in Model 4 in Table 3, we found that after controlling for stars' centrality, nonstars' learning was positively related to team creativity (b = .65, $p <$ .01). We then tested the indirect effect of stars' centrality on team creativity. As shown in Table 5, the coefficient for the indirect effect via nonstars' learning was significant and negative (b = −.13, $p <$ .05). Next, we used a Monte Carlo simulation with 20,000 replications to build a confidence interval around the estimated indirect effect—a technique that can provide accurate estimates for the nested data (Preacher & Selig, 2012). The results showed that the indirect relationship between stars' centrality and team creativity via nonstars' learning was negative and statistically significant (95% confidence interval = [−.29, −.01]).

For the sales sample, as shown in Model 4 in Table 4, nonstars' learning was positively related to team creativity (b = .96, $p < .01$). As shown in Table 6, the coefficient for the indirect effect via nonstars' learning was significantly negative (b = −.17, $p < .05$). A Monte Carlo simulation with 20,000 replications showed that the confidence interval

TABLE 2
Sales Sample: Means, Standard Deviations, and Correlations

	Mean	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Organization dummy	0.31	0.46																
2. Team age	3.91	3.10	–.10															
3. Team size	4.93	1.59	.19	.04														
4. Density	0.63	0.27	–.22	.06	.12													
5. Leader's gender	0.30	0.46	–.23	–.08	–.15	.08												
6. Leader's age	28.48	3.64	.19	.01	.09	–.11	.12											
7. Leader's education	2.06	0.65	–.03	.12	.07	.08	.19	.10										
8. Leader's tenure	4.37	2.31	.08	.23	.15	.00	.16	.46	.26									
9. Average gender	0.33	0.21	.05	–.12	–.01	–.10	–.08	–.21	–.07	–.02								
10. Average age	25.78	2.17	.35	–.02	.18	.21	–.12	.29	–.05	.24	–.09							
11. Average education	1.88	0.38	.02	.03	–.04	.05	.24	.22	.36	.28	–.10	.08						
12. Stars' creativity	4.18	0.78	–.01	.06	–.08	.24	–.09	–.14	–.04	–.06	–.17	–.08	–.05					
13. Stars' centrality	2.84	1.61	.10	.02	.77	.55	–.06	.06	.09	.08	–.06	.24	–.03	.08				
14. Nonstars' learning	4.14	0.35	.24	.11	.10	.34	–.08	.03	–.02	.18	–.09	.36	.11	.24	.12			
15. Team coordination	4.25	0.38	.37	.05	.23	.35	–.02	.09	–.05	.14	.03	.29	.05	.14	.30	.67		
16. Team creativity (*T*1)	3.47	0.69	.08	–.12	.10	.17	.11	.11	–.11	.06	–.10	.24	–.16	.06	.22	.31	.17	
17. Team creativity (*T*2)	3.42	0.67	–.01	–.02	–.09	.14	–.00	–.02	.03	.06	–.07	.22	.01	.03	.05	.43	.26	.34

Notes: $n = 94$. All values greater than $|.23|$ are significant at $p < .05$. All values greater than $|.27|$ are significant at $p < .01$.

TABLE 3
R&D Sample: Regression Results

	Nonstars' Learning			Team Creativity	
	Model 1	**Model 2**	**Model3**	**Model 4**	**Model 5**
Intercept	2.10***(.48)	1.37** (.51)	1.99** (.59)	3.24** (1.16)	2.83* (1.25)
Team age	–.01 (.01)	–.01 (.01)	–.01 (.01)	–.04** (.01)	–.03** (.01)
Network size	–.02* (.01)	.02 (.02)	.02 (.02)	–.09 (.05)	–.08 (.05)
Density	.05 (.18)	.66 (.36)	.56 (.41)	−1.41 (1.04)	−1.45 (.85)
Leader's gender	–.06 (.11)	–.07 (.11)	–.07 (.11)	–.13 (.21)	–.11 (.22)
Leader's age	.01 (.01)	.01 (.01)	.01 (.01)	–.02 (.01)	–.01 (.01)
Leader's education	–.07 (.07)	–.09 (.06)	–.11* (.06)	.06 (.11)	.11 (.11)
Leader's tenure	–.02 (.01)	–.02 (.01)	–.02* (.01)	.03 (.02)	.03 (.02)
Average gender	–.24 (.23)	–.24 (.23)	–.29 (.22)	.68* (.28)	.64** (.24)
Average age	.02* (.01)	.02 (.01)	.02 (.01)	–.01 (.01)	–.02 (.01)
Average education	.22* (.10)	.24** (.09)	.17* (.09)	–.34 (.21)	–.32 (.20)
Star's creativity	.14* (.07)	.13* (.07)	.12 (.06)	.20 (.11)	.17 (.12)
Star's centrality		–.20* (.09)	–.20* (.09)	.42* (.21)	.41* (.20)
Team coordination			.43*** (.10)		–.14 (.24)
Star's centrality × team coordination			.40* (.17)		–.61* (.30)
Nonstars' learning				.65** (.23)	.73*** (.21)
R-squared	.29	.31	.41	.27	.29

Notes. $n = 84$. Standard errors are included in parentheses.
* $p < .05$
** $p < .01$
*** $p < .001$

around the estimated indirect effects between stars' centrality and team creativity via nonstars' learning was negative and statistically significant (95% confidence interval = [–.36, –.03]). Therefore, Hypothesis 3 was supported.

Hypothesis 4 posited that team coordination would positively moderate the relationship between stars' centrality and team creativity, such that team coordination would amplify the direct and positive effect of stars' centrality on team creativity. For the R&D sample, in contrast to our prediction, the interaction between stars' centrality and team coordination was significant but negatively related to team creativity ($b = –.61$, $p < .05$); this result is shown in Model 5 in Table 3. Simple slope analyses showed that when team coordination was lower (one standard deviation below the mean), the slope of a star's centrality on team creativity was positive and significant ($b = .62$, $p < .01$); when it was higher (one standard deviation above the mean), the slope was not significant ($b = .21$, n.s.). The effect of the difference between these two conditions was significant ($b = –.41$, $p < .05$). As shown in Figure 2, the relationship between stars' centrality and team creativity was more positive when team coordination was lower rather than higher.

For the sales sample, as shown in Model 5 in Table 4, the effect of the interaction between stars' centrality and team coordination on team creativity was not significant ($b = .07$, n.s.). Taken together, the results from the two samples did not support Hypothesis 4.

Hypothesis 5 posited that team coordination would mitigate the negative relationship between stars' centrality and nonstars' learning. For the R&D sample, as shown in Model 3 in Table 3, the effect of the interaction between stars' centrality and team coordination on learning was significantly positive ($b = .40$, $p < .05$). Furthermore, simple slope analysis showed that when team coordination was lower (one standard deviation below the mean), the slope of a star's centrality on team creativity was negative and significant ($b = –.33$, $p < .01$); when it was higher (one standard deviation above the mean), the slope was not significant ($b = –.06$, n.s.). The effect of the difference between these two conditions was significant ($b = .27$, $p < .05$).

We observed similar interaction patterns in the sales sample. As shown in Model 3 in Table 4, the effect of the interaction between stars' centrality and team coordination on nonstars' learning was significantly positive ($b = .21$, $p < .05$). Simple slope analysis showed that the slope was less negative ($b_{diff} = .17$, $p < .05$) when team coordination was higher ($b = –.12$, $p < .01$) than when team coordination was lower ($b = –.29$, $p < .001$).

TABLE 4
Sales Sample: Regression Results

	Nonstars' Learning			Team Creativity	
	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	2.31*** (.42)	1.49** (.46)	2.21*** (.40)	.70 (1.12)	.99 (1.23)
Organization dummy	.11 (.07)	.08 (.07)	–.12* (.05)	–.16 (.16)	–.20 (.17)
Team creativity (*T*1)	.12* (.05)	.14** (.05)	.12** (.04)	.19 (.16)	.20 (.16)
Team age	.01† (.01)	.01 (.01)	.01 (.01)	–.01 (.02)	–.01 (.02)
Team size	–.00 (.02)	.07* (.03)	.06** (.02)	–.19** (.07)	–.19** (.07)
Density	.23* (.11)	.52** (.15)	.33** (.01)	–.54† (.28)	–.53† (.29)
Leader's gender	–.03 (.06)	–.03 (.07)	–.06 (.05)	–.07 (.14)	–.08 (.14)
Leader's age	–.01 (.01)	–.01 (.01)	–.02† (.01)	–.02 (.02)	–.02 (.02)
Leader's education	–.03 (.05)	–.02 (.05)	–.01 (.03)	.09 (.12)	.09 (.12)
Leader's tenure	.01 (.01)	.01 (.01)	.01 (.01)	.00 (.03)	.00 (.03)
Average gender	–.01 (.14)	.03 (.13)	–.05 (.10)	–.17 (.25)	–.18 (.26)
Average age	.04* (.02)	.04* (.02)	.04** (.01)	.02 (.03)	.02 (.03)
Average education	.13 (.11)	.11 (.09)	.13† (.07)	–.02 (.19)	.00 (.19)
Stars' creativity	.08* (.03)	.09** (.03)	.06* (.03)	–.12 (.08)	–.12 (.09)
Stars' centrality		–.18*** (.05)	–.21*** (.04)	.29* (.13)	.26† (.15)
Team coordination			.63*** (.09)		.14 (.25)
Star's centrality × team coordination			.21* (.08)		.07 (.23)
Nonstars' learning				.96** (.36)	.87* (.38)
R-squared	.35	.40	.66	.34	.34

Notes: $n = 94$. Standard errors are included in parentheses.
† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

As shown in Figure 3, across both samples the relationship between stars' centrality and nonstars' learning was more strongly negative when team coordination was lower, whereas it became less negative when team coordination was higher. Thus, Hypothesis 5 was supported.

Hypothesis 6 proposed that the indirect effect of the stars' centrality on team creativity via nonstars' learning would also be moderated by team coordination. Following the recommendation of Cohen, Cohen, West, and Aiken (1983), we tested our moderated mediation hypotheses by examining the conditional indirect effects at different levels of team coordination. For the R&D sample, the results are shown in Table 7. When team coordination was higher, the negative indirect relationship was weaker ($b = -.05$, n.s.) than when team coordination was lower ($b = -.24$, $p < .001$), and the difference between the two effects was significant ($b = .20$, $p < .05$). For the sales sample, the results of conditional indirect effects are shown in Table 8. Simple slope analyses showed that when coordination was higher, the effects of stars' centrality on team creativity was not significant ($b = -.11$, n.s.); when coordination was lower, the effects of stars' centrality on team creativity was significantly negative ($b = -.25$, $p < .05$). However, the effect of the differences between the conditions was marginally significant ($b = .15$, $p < .10$). Thus, Hypothesis 6 was supported in the R&D sample and weakly supported in the sales sample.

TABLE 5
R&D Sample: Total, Indirect, and Direct Effects from Stars' Centrality to Team Creativity

Effects	Estimate	*SE*
Total	.30	.22
Indirect	–.13*	.06
Direct	.42*	.21

Note: $n = 84$.
* $p < .05$

Supplementary Analysis

In the R&D sample, we identified team members with the highest creativity ratings as the team creative stars. However, it is possible that some stars may not display superior creativity relative to others.

TABLE 6
Sales Sample: Total, Indirect, and Direct Effects from Stars' Centrality to Team Creativity

Effects	Estimates	*SE*
Total	.12	.11
Indirect	−.17*	.08
Direct	.29*	.13

Note: $n = 94$.
* $p < .05$

Therefore, in line with Beck, Beatty, and Sackett's (2014) approach of using a one standard deviation difference to distinguish between stars and nonstars, we created a subsample consisting of those teams with stars whose creativity score was greater than one standard deviation above the mean. This subsample included 63 teams (i.e., 75% of the full sample of teams). When we analyzed the data using just this subsample, we found that stars' centrality was significantly and positively related to team creativity ($b = .46$, $p < .05$), but significantly and negatively related to nonstars' learning ($b = -.28$, $p < .01$); the effect of the interaction between stars' centrality and coordination on team creativity was negative but not significant ($b = -.33$, n.s.); and the effect of the interaction on nonstars' learning was significantly positive ($b = .34$, $p < .01$). All of these findings were consistent in terms of direction and statistical significance, with the exception of the direct moderating effect between stars' centrality and team coordination on team creativity.

As described earlier, we employed various methods to operationalize team creativity stars across the two samples (i.e., creativity rating versus leader nomination). We subsequently conducted additional analyses to examine whether our findings were consistent across these different star-selection methods. Specifically, when designing the second survey (sales sample), we asked team leaders to rate employee creativity and identified the employees with the highest creativity rating as the team creative stars. When this method was used, 115 stars were defined; 73 teams identified only one star and 21 teams identified two stars. We compared the stars selected by the highest score with the stars nominated by leaders. The results showed that the stars identified by the two methods were highly correlated (the correlation between stars identified by these two methods was .79).

Moreover, our regression results showed that the direct effect of centrality of the stars selected by highest score on team creativity was significantly positive ($b = .31$, $p < .05$). The effect of those stars' centrality on nonstars' learning was significantly negative ($b = -.20$, $p < .01$), and coordination positively moderated the effects of those stars' centrality on nonstars' learning ($b = .19$, $p < .05$). Taken together, these supplementary analyses indicate that our findings are quite robust across the different star identification methods.

Finally, we conceptualized nonstars' learning as including both exploration and exploitation. We thus decided to conduct finer-grained analyses to

FIGURE 2
Interactive Effect of Creative Stars' Centrality and Team Coordination on Team Creativity

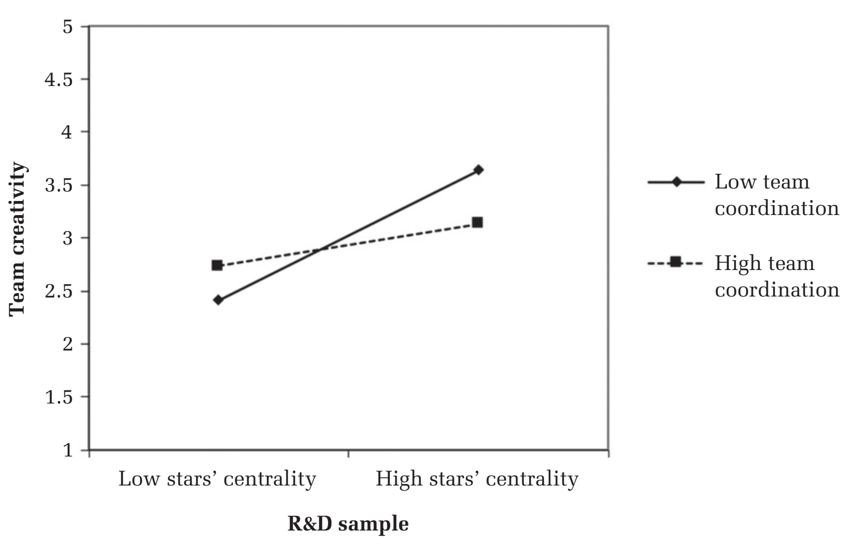
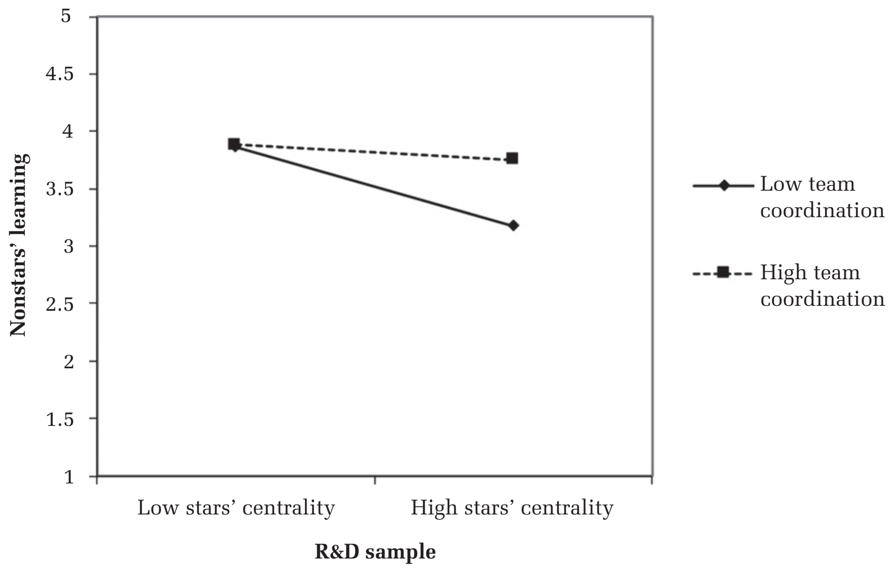


FIGURE 3A
Interactive Effect of Creative Stars' Centrality and Team Coordination on Nonstars' Learning: R&D Sample



examine whether exploration and exploitation play different roles in our model. Specifically, we explored the effects of exploration and exploitation on team creativity simultaneously. The results suggested that stars' centrality can reduce nonstars' exploratory and exploitative learning activities in the R&D sample ($b = -.13$, $p < .10$ and $b = -.27$, $p < .10$, respectively) and the sales sample ($b = -.14$, $p < .001$ and $b = -.28$, $p < .001$, respectively). However, only nonstars' exploration significantly predicted team creativity ($b = .66$, $p < .05$ for the R&D sample and $b = 1.31$, $p < .001$ for the sales sample), whereas nonstars' exploitation did not predict team creativity in either sample ($b = .21$, n.s. for the R&D sample and $b = -.37$, n.s. for the sales sample).[2]

DISCUSSION

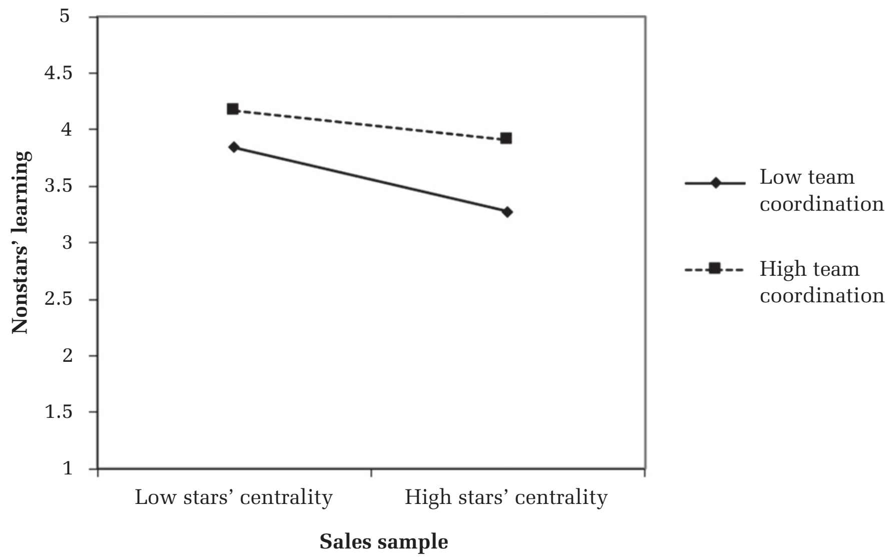
Drawing on the social model of creativity and research on star performers, our study sought to understand the mechanisms by which different team members contribute to team creativity. Specifically, we demonstrated the dual effects of centrally located creative stars on team creativity and nonstars' learning. Our findings, which are based on two multisource and multiwave samples, highlight the important role of team creative stars' interaction patterns with teammates in influencing team creativity and others' learning behavior. In the R&D sample, we found that stars who occupy central network positions can benefit team creativity directly. However, their presence can also restrict nonstars' learning behaviors and, therefore, dampen team creativity indirectly. Team coordination serves as a critical boundary condition that simultaneously weakens both the positive and negative effects that a creative star's centrality can exert on team creativity and teammates' learning.

Theoretical Contributions

Our results have several important theoretical implications. First, although previous research has distinguished between individual and team creativity (Taggar, 2002; Woodman, Sawyer, Griffin, 1993), our understanding of the underlying processes by which individual team members contribute to team creativity remains severely limited, with only a few exceptions that have examined the relationship between aggregated individual and team creative outcomes. Our findings demonstrate that different individuals, namely creative stars and their teammates, play

[2] We also analyzed the coefficients of exploration or exploitation as independent predictors in separate models (versus including them concurrently). When analyzed separately, results showed that the effects of exploration on team creativity were significantly positive in both samples ($b = .88$, $p < .01$ for the R&D sample, and $b = 1.01$, $p < .01$ for the sales sample), whereas the effects of exploitation on team creativity were significantly positive for the R&D sample ($b = .43$, $p < .01$) but insignificant for the sales sample ($b = .54$, n.s.).

FIGURE 3B
Interactive Effect of Creative Stars' Centrality and Team Coordination on Nonstars' Learning: Sales Sample



unique roles in driving team creativity. Although previous research has assumed that the most creative member tends to disproportionally influence team creativity, we found that this relationship is modest at best. This result is also consistent with the modest correlation previously identified between individual average creativity and team creativity (Gong, Zhou, et al., 2013), suggesting that a straightforward relationship between individual and team creativity cannot be assumed. Thus, our research helps to clarify the complex process by which how creative stars and their teammates jointly contribute to team creativity.

Second, a prevailing perspective has suggested that star employees can create disproportional value for their organizations (Aguinis & O'Boyle, 2014; Rothaermel & Hess, 2007), and that the positive effect of stars on teams is most significant when they are centrally located in the team (Grigoriou & Rothaermel, 2014; Humphrey et al., 2009; Li et al., 2015). However, the extant literature has been largely silent on stars' potential to have negative effects on other colleagues. Such "ripples" that affect other individuals are particularly critical in team contexts, where tasks are completed through the collective efforts of all team members. Indeed, the interdependent nature of teamwork requires a nuanced understanding of how team stars make contributions to their teams.

Our findings suggest that centrally located stars can be both a boon and a bane for team creativity and,

TABLE 7
R&D Sample: Results of the Moderated Path Analysis

	Stars' centrality (X) → Nonstars' learning (M) → Team creativity (Y)			
	Stage	Effect		
Moderator variable: Team coordination	First P_{MX}	Direct (P_{YX})	Indirect ($P_{MX} \times P_{YM}$)	Total ($P_{YX} + P_{MX} \times P_{YM}$)
High coordination (+1 *SD*)	–.06 (.12)	.21 (.24)	–.05 (.07)	.16 (.26)
Low coordination (–1 *SD*)	–.33** (.12)	.62** (.21)	–.24*** (.07)	.38 (.21)
Differences between low and high	.27* (.11)	–.41* (.20)	.20* (.09)	–.21 (.19)

Notes: P_{MX}: path from X (stars' centrality) to M (nonstars' learning); P_{YM}: path from M (nonstars' learning) to Y (team creativity); P_{YX}: path from X (stars' centrality) to Y (team creativity); $n = 84$. Standard errors are included in parentheses.

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

TABLE 8
Sales Sample: Results of the Moderated Path Analysis

	Star's centrality (X) → Nonstars' learning (M) → Team creativity (Y)			
	Stage	Effect		
Moderator variable: Coordination	First P_{MX}	Direct (P_{YX})	Indirect ($P_{MX} \times P_{YM}$)	Total ($P_{YX} + P_{MX} \times P_{YM}$)
High coordination (+1 *SD*)	−.12** (.04)	.29* (.14)	−.11 (.07)	.19 (.13)
Low coordination (−1 *SD*)	−.29*** (.06)	.23 (.21)	−.25* (.12)	−.02 (.17)
Differences between low and high	.172 (.07)	.06 (.19)	.15† (.08)	.21 (.19)

Notes: P_{MX}: path from X (star's centrality) to M (nonstars' learning); P_{YM}: path from M (nonstars' learning) to Y (team creativity); P_{YX}: path from X (star's centrality) to Y (team creativity). $n = 94$. Standard errors are included in parentheses.

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

problematically, that these dual effects may exist concurrently. Specifically, our study demonstrates that centrally located stars can make significant positive contributions to team creativity, but at the cost of inhibiting nonstar teammates' learning behavior; in this way, stars also have a negative indirect effect on team creativity. Our study highlights that the influence of team stars depends not only on their high levels of performance, but also on their positions in the team social network. We believe a key implication for scholars is that they should be more mindful of considering the interaction patterns between high-performing employees and their teammates in order to more fully understand these parties' influences in the team context. Our findings also extend Zhou's (2003) research on the positive influences that creative coworkers exert on individual creativity. Specifically, we demonstrate that frequently interacting with a creative star can actually inhibit teammates' knowledge acquisition in some cases.

Third, our findings also contribute to the social model of creativity, which highlights the critical role of interpersonal interaction in driving creativity. Specifically, we discovered that when others rely on the creative stars for input (as indicated by the stars' high indegree centrality in the workflow network), those team members are less likely to proactively acquire team-relevant knowledge and explore alternative perspectives, which subsequently harms team creativity. Because we focused on the direct interaction between stars and nonstars, some may argue that team members' indirect interactions with the star and the interactions among themselves (e.g., team overall workflow patterns, such as density and centralization) may also affect team creativity. However, in line with other star-related research, we argue that because of creative stars' unique influences within the team, their direct interactions with others will be more influential than other types of interactions. For example, relying on creative stars could make team members more apt to defer to the stars on creativity-related issues, whereas interactions among nonstars would be less likely to produce dominant views. Supporting our speculation, our supplementary analyses suggested that a team's overall workflow patterns do not significantly affect nonstars' learning or moderate the stars' centrality–nonstars' learning relationship. Similarly, alternative measures capturing both the direct and indirect interactions between stars and nonstars (e.g., closeness centrality) did not significantly predict team creativity.

Finally, given the interdependent nature of teamwork and the creative process (Hoever, Zhou, & Van Knippenberg, 2018; Li & Liao, 2014), we view team coordination as an important boundary condition, such that team coordination shows a trend toward weakening *both* the positive direct effects of stars who occupy central network positions on team creativity *and* those stars' detrimental effects on nonstars' learning behavior. Across the two samples (albeit only weakly supported in the sales sample), our findings consistently reveal that coordination can buffer the negative effects of the stars on nonstars' learning behavior. We caution, however, that the significant moderated indirect effect on team creativity was only observed in the R&D sample. Interestingly, the findings from the R&D teams (but not the sales teams) indicate that team coordination weakens the positive direct relationship between centrally located stars and team creativity, suggesting that efficient team coordination may also reduce teams' reliance on stars who fill central positions in the workflow network. Essentially, our results show that high-quality team coordination can weaken the effects of team creative stars' influence in the team, in either a positive or a negative direction.

The finding that team coordination weakens the positive and direct effect of team stars on team creativity is contrary to our initial prediction, which argued that teams may benefit more from stars' contributions when the level of team coordination is high. As a *post hoc* explanation, we note that team coordination ensures that all team members collaborate to finish interdependent work and contribute to common goals (Rico et al., 2008). Under an efficient coordinative context, team creativity highlights the collective contributions of all team members rather than the utilization of stars' expertise and intelligence (Reagans et al., 2016). By contrast, in the absence of efficient team coordination (e.g., "bad management"), organizations may heavily rely on star employees to make a positive impact. However, because this finding emerged in only one sample, our interpretations need to be more extensively tested in future work. Indeed, we may have observed a context-specific phenomenon.

Practical Implications

Our research has important implications for practice. First, managers should be wary of the dual effects of centrally located stars. Our study suggests that stars who occupy central network roles have a stronger positive direct effect on team creativity than do team members who occupy peripheral network roles. Thus, consistent with prior research, we find a positive direct effect of centrally located stars on team creativity (Grigoriou & Rothaermel, 2014). Beyond this intuitive conclusion, our study reveals that the existence of centrally located stars restricts the learning behavior of nonstars, thereby indirectly stifling team creativity. In contrast to prior research, which has suggested the managers should enhance the positions of stars in the team (Kehoe & Tzabbar, 2015; Li et al., 2015), we recommend that to take full advantage of star employees managers should focus on fostering a balance between the beneficial and detrimental aspects of the stars' position in the team network.

Second, to sustain team creativity, managers need to acknowledge and support the work of nonstars. Because of stars' extraordinary performance (Aguinis & O'Boyle, 2014), many organizations view it as imperative to attract such talent (Groysberg et al., 2008). Unfortunately, some organizations that participate in the "war for talent" generate underwhelming results from their engagement (Pfeffer, 2001). Our study highlights that the role of nonstars may be ignored in such cases. Thus, solely focusing on the most talented individuals over still valuable nonstars is likely an unwise practice when trying to promote creative processes (Fonti & Maoret, 2016).

Finally, managers should strive to promote efficient team coordination, thereby relieving some of the burden placed on centrally located stars. Previous studies have implied that power or resource asymmetries may stifle learning in highly interdependent units (Bunderson & Reagans, 2011). Our study highlights that team coordination—which sets a common goal, creates a shared language, and fosters a collaborative climate among team members—can reduce the divides that dampen effective learning and encourage nonstars' participation in their team's creative process.

Limitations and Directions for Future Research

Our study is not without potentially important limitations. First, as pointed out by Call and colleagues (2015), previous studies have employed various definitions and operationalizations of star employees. Often, measures of star employees have been study-specific. In our R&D sample, the selection of team creative stars, which was based on the highest creativity rating, did not account for the creativity difference between the star and other team members. It is possible, then, that the selected member might not actually demonstrate meaningfully superior creativity. To partially address this concern, we conducted additional analyses to examine whether the creativity difference between the identified stars and others would change our results. Though this was not a perfect test, our results were unchanged. Further, in our second sample we asked team leaders to nominate creative stars based on the definition of a "star"; this study yielded findings consistent with those in the first sample. Although the combination of analyses and their consistent results are promising for our theoretical conclusions, it is nevertheless important for future research to consider different measures to capture the notion of a creative star. For example, researchers might consider using objective indicators, such as patents or awards, to identify stars.

Second, we conducted our study in China, which may limit the generalization of our findings. Western cultures are often considered to be individualistic and characterized by low power distance, whereas Eastern cultures are considered to be collectivist, interdependent, and characterized by high power distance (Hofstede, 1991). In Chinese culture, individuals emphasize collective contributions, which may discourage individual contributions. As a result, this cultural background may accentuate the detrimental effect of the stars' centrality on the nonstars' learning and weaken the positive effects of centrally located stars on team creativity. Moreover, in a high-power-distance culture, people are more sensitive to unbalanced power distribution and are more likely to defer to high-status individuals. Therefore, when power distance is high, nonstars may rely on the central creative stars to a greater extent, which then exacerbates the negative effect of stars' centrality on their learning. Some studies have suggested that the differences between Western culture and Eastern culture are decreasing (Ralston, Egri, Stewart, Terpstra, & Yu, 1999), and consistent findings across collectivist and individualistic contexts have been observed in several studies (Kirkman, Chen, Farh, Chen, & Lowe, 2009). Nevertheless, it remains important to constructively replicate these results in other cultural contexts.

Third, our study explored the effects of creative stars' network position on nonstars' learning. However, it is possible, and even likely, that nonstar teammates can also affect team creative stars. Supporting this idea, Groysberg and Lee (2008) found that star employees' performance is significantly influenced by their teammates' quality, such that star employees tend to experience significant performance decline when they lose the support of their teammates (as evidenced by performance across job changes). Therefore, future research can explore how the network connections between stars and nonstars affect the stars' performance and contributions in the organization.

Fourth, in line with the social model of creativity, we included several theoretically relevant controls, including team size and network density. Although most of our findings remained the same after removing these controls, team size and density did appear to influence the direct effect of creative stars' centrality on team creativity in both samples. Therefore, the direct beneficial effects of creative stars on team creativity may depend on other contextual factors that shape team interactions. Future research should further explicate the contextual factors that influence team creative processes.

Finally, extant literature has found that stars have distinct effects on exploration and exploitation as part of the team creative process (Groysberg & Lee, 2009; Tzabbar & Kehoe, 2014). Extending this line of reasoning, future research might explore when teams can achieve a balance between exploration and exploitation in terms of having members who excel at adapting innovations to a given context versus those who excel at innovating (Miron-Spektor, Erez, & Naveh, 2011). As a consequence of these proclivities, stars and nonstars may differentially impact various types of team creativity (e.g., radical creativity versus incremental creativity). Similarly, distinct needs may arise in the phases spanning from creativity to innovation (Perry-Smith & Mannucci, 2017), and stars and nonstars may play different roles across these stages. Thus, we encourage future research to explore how team members uniquely contribute to different types of creativity across different phases in a team's lifecycle.

CONCLUSION

Drawing on the social model of team creativity, we developed a dualistic model of how the centrality of team creative stars affects team creativity. Our study demonstrates that stars who occupy central positions in a team's network have both a positive direct effect and a negative indirect effect on team creativity via inhibiting nonstars' learning. The disproportionate effects of creative stars in central roles, however, can be mitigated by means of increased team coordination. Overall, our research offers a more nuanced view of the effects of team creative stars on team creativity, and highlights the important interplay between centrally located stars, nonstars, team coordination, and team creativity.

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