

A NETWORK VIEW OF ADVICE-GIVING AND INDIVIDUAL CREATIVITY IN TEAMS: A BROKERAGE-DRIVEN, SOCIALLY PERPETUATED PHENOMENON

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One potential benefit of team contexts is that members can share knowledge and ideas to help one another solve problems (e.g., advice-giving), thereby enhancing members' creative potential. However, individuals' advice-giving actions do not guarantee increases in recipients' creativity and, in some cases, may even be a creative liability for the giver's own subsequent creativity. We argue that considering advice givers' brokerage in the team's advice-giving network (i.e., advice brokerage) may clarify this phenomenon. Specifically, we posit that advice given from a brokerage position contains more nonredundant content that boosts recipients' creativity. Further, we expect advice brokerage to positively influence a giver's own creativity, though this effect is at least partially explained via recipients' proximal creativity gains (e.g., recipients' creativity change mediates the relationship). Recipients' perceptions of psychological safety accentuate these relationships. Longitudinal field data support the main hypotheses, but also suggest that advice brokerage has more immediate proximal effects on givers' creativity; an additional qualitative study elucidates several mechanisms by which brokered advice boosts creativity, including two associated with generating diverse ideas (idea integration, perspective-taking), two associated with domain-specific knowledge accumulation (knowledge accumulation, reflection), collective creativity, and creative feedback. The study yields several important implications.

Creativity (i.e., the generation of novel and useful ideas) is in large part a social process influenced by the breadth and nature of one's network ties (Hirst, van Knippenberg, Zhou, Quintane, & Zhu, 2015; Perry-Smith & Mannucci, 2017; Perry-Smith &

Shalley, 2003; Zhou, Shin, Brass, Choi, & Zhang, 2009). In this regard, team-based structures, which can facilitate knowledge sharing and idea exchange between members, represent an enticing proposition for boosting individuals' creativity (Fleming, Mingo, & Chen, 2007; Hirst, van Knippenberg, & Zhou, 2009; Sosa, 2011). However, the conditions under which teams actually promote individuals' creativity are still largely unknown (Mueller & Kamdar, 2011).

The dissemination of creativity-enabling resources (e.g., knowledge, ideas) in teams can be explained, in part, by individuals' discretionary interactions, including advice-giving behaviors (i.e., optional and task-related efforts to help others

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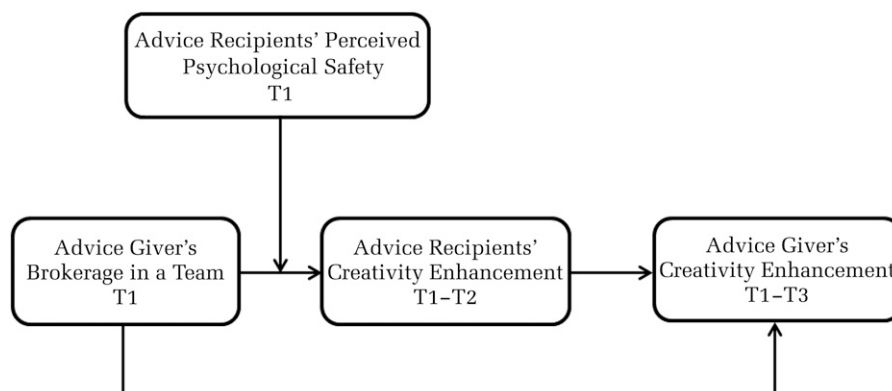
solve problems [Perry-Smith & Shalley, 2014; Zhou et al., 2009]). Advice-giving behaviors can affect both receivers' and givers' creativity, though research has suggested equivocal effects. For example, although receiving advice can be beneficial for enhancing knowledge and gaining perspective (Bolino & Grant, 2016; Bonaccio & Dalal, 2006; Yaniv, 2004), creative outcomes likely depend on whether the advice contains enough integrative, nonredundant information (Mueller & Kamdar, 2011; Zhou et al., 2009) to offset potential social costs for receivers (Bolino & Grant, 2016; Crocker, Canevello, & Brown, 2017). Similarly, giving advice affords learning and perspective-taking opportunities (Grant & Berry, 2011; Hargadon & Bechky, 2006), but can also require significant opportunity costs (e.g., time, energy) or reaffirm givers' existing views (Lingo & O'Mahony, 2010; Mueller & Kamdar, 2011).

We argue that an advice giver's brokerage in the team's advice-giving network (i.e., advice brokerage)—defined as the extent to which a member provides advice to teammates who do not share advice with one another (Venkataramani, Richter, & Clarke, 2014)—is a critical determinant of the creative utility of advice exchanges. Although brokerage has been linked to individuals' creative potential in general, nonteam settings (Burt, 2004; Burt, Kilduff, & Tasselli, 2013), most research has emphasized self-centric benefits that accrue to the broker without regard for potential spillover to others (Clement, Shipilov, & Galunic, 2018; Galunic, Ertug, & Gargiulo, 2012). Moreover, research has revealed very little about brokerage in *within*-team networks, where interactions are typically more constrained (Venkataramani et al., 2014).

Our conceptual model theorizes that givers' advice brokerage predicts the extent to which their advice helps receivers acquire knowledge and generate the ideas needed for creative solutions. Additionally, we argue that advice brokerage can positively affect the giver's own creativity, although at least some of this influence may be transmitted more distally via receivers' creativity changes. Specifically, when receivers exhibit more creativity (a by-product of brokered advice), they change the nature of social interactions in the team (Perry-Smith & Mannucci, 2017) and more generally contribute to a creative context (Hargadon & Bechky, 2006) that can, in turn, benefit the givers' own creativity. The benefits of a giver's advice brokerage on creativity, we argue, are accentuated as recipients' perceptions of psychological safety increase (Edmondson, 1999). We test and clarify these arguments using quantitative and qualitative methods. Figure 1 depicts the overall model.

Our research makes several important contributions. First, it adds to research that leverages social network features (e.g., brokerage) to explain how and why certain individuals exhibit disproportionate creative influence on others in teams (Cross, Rebele, & Grant, 2016; Li, Zhao, Walter, Zhang, & Yu, 2015). At a base level, demonstrating that meaningful brokerage roles can emerge within a team's network is an important advancement; it suggests that even relative closure on one network type (i.e., a workflow network) does not preclude important "hubs" from existing for other team networks (Clement et al., 2018; Galunic et al., 2012). In addition, in contrast to motives whereby brokers hoard information for personal gain (Rodan & Galunic, 2004; Rowley, 1997), we find that within-team brokers can act as

FIGURE 1
Research Model



catalysts who ultimately help others be more creative (Galunic et al., 2012; Hoeve, van Knippenberg, van Ginkel, & Barkema, 2012). Essentially, we clarify that advice brokerage, rather than just advice giving per se, can result in beneficial effects of other-oriented actions for both recipients and givers (Grant & Berry, 2011; Mueller & Kamdar, 2011).

Second, our study employs a longitudinal design to capture how the dynamic interplay between advice givers and receivers affects creative changes over time. In addition to finding that advice brokerage predicts proximal creativity gains for both the receiver and the giver, our results reveal that a significant part of a giver's distal creativity gains come via the recipient's creative changes, which suggests the importance of adopting a dynamic lens by which to understand creative contexts. Thus, the effect of advice giving on creativity appears to be in part a socially perpetuated phenomenon in teams. Furthermore, we integrate network and psychological safety theory (Schulte, Cohen, & Klein, 2012) to show that the effect of a giver's brokerage on creativity is accentuated when recipients perceive a safer context; this informs cross-level effects of diversity on individual creativity in team networks (Richter, Hirst, van Knippenberg, & Baer, 2012; Shin, Kim, Lee, & Bian, 2012).

Third, beyond establishing some temporal dynamics in the advice-creativity relationship, our qualitative study elucidates several micro-processes underlying this relationship. Whereas some processes lend notable support to prior arguments (e.g., divergent thinking, enhancing domain-specific knowledge [Perry-Smith, 2006; Perry-Smith & Shalley, 2003]), others are more novel. For instance, advice givers noted that helping others find creative solutions made them feel as if they were part of a more creative context overall, which in turn inspired their own creativity; they also noted benefits of seeing the outcome of their advice (i.e., creative feedback). Interestingly, these are both more distal processes since they can manifest only after recipients act (or do not act) on advice, thereby underscoring the importance of viewing the emergence of creativity in teams as a dynamic process.

THEORY DEVELOPMENT AND HYPOTHESES

Building from Amabile's (1983) componential model, Perry-Smith and Shalley's (2003) social framework of creativity posits that social interactions, and thus one's network, largely affect creativity by (1) providing access to domain-specific knowledge

and (2) facilitating processes relevant to divergent thinking. To better foster these interactions, organizations often use team-based arrangements whereby members can interact with and help one another solve problems, which should then boost creativity (Amabile, 1996). Indeed, extant research has suggested a general link between behaviors aimed at helping others and creativity (Hargadon & Bechky, 2006; Taggar, 2002), though this work has largely addressed team-level effects driven by *across*-team comparisons (for an exception, see Mueller & Kamdar, 2011). This, of course, limits the understanding of important *within*-team phenomena that are better captured at the individual level.

Individual creativity is likely affected both by a person's access to (receipt of) resources in a network and their contributions to a network (e.g., other-focused behaviors [Grant & Berry, 2011; Hargadon & Bechky, 2006; Hoeve, van Knippenberg, van Ginkel, & Barkema, 2012; Nebus, 2006]). Therefore, our study considers both givers' and receivers' role in creativity emergence. Importantly, we also incorporate the role of givers' advice brokerage to distinguish potentially important elements of the advice interaction, which is consistent with recent research suggesting that the effects of certain behaviors in teams may vary substantively based on an actor's network position (Li et al., 2015).

General network theory espouses that individuals who bridge unconnected individuals (i.e., brokers) (Burt, 2004; Freeman, 1979) will have access to more diverse information (Hirst et al., 2015; Perry-Smith & Shalley, 2003). Access to diverse information sources, in turn, increases the potential for brokers to obtain nonredundant domain-specific knowledge, adopt new schemas, and integrate concepts that may be otherwise seen as unrelated (i.e., remote association [Mumford & Gustafson, 1988; Perry-Smith & Shalley, 2014]). Yet, importantly, classic theories of brokerage were developed with general network operationalizations in mind, which are likely assumed to be larger and less densely connected than a *within*-team network. Moreover, traditional theories have tended to focus on self-centric views of the broker, without considering other actors in the broker's network (Galunic et al., 2012). As such, greater attention toward clarifying the concept of within-team brokerage is warranted.

Clarifying Within-team Brokerage

In a larger network, it is quite easy to imagine how a focal actor might connect two other actors who are

entirely unknown to each other (i.e., absolute brokerage). Yet teams are often demarcated by relatively clear boundaries and a smaller set of interdependent actors—characteristics that make absolute brokerage positions unlikely to emerge. Even so, teams feature multiple concurrent network types that can exhibit notable variance (Kilduff & Brass, 2010). One particularly likely avenue for this variance to manifest is the team's advice-giving network, which captures the pattern of members' informal and discretionary participation in others' task-relevant (though not necessarily task-specific) problem-solving efforts (Brooks, Gino, & Schweitzer, 2015; Perry-Smith & Shalley, 2014). In this sense, advice-giving interactions may exhibit less uniformity across team actors relative to other interactions, such as those that are mandated (i.e., workflow ties) or otherwise generally hard to ignore (i.e., personal or friendship ties).

Related to this issue, teams often function using smaller within-team constellations of interactions based on myriad criteria (e.g., subgroups) (Carton & Cummings, 2012; Gibson & Vermeulen, 2003; Kirkman & Harris, 2017; Lau & Murnighan, 1998, 2005). As such, some members may give advice that spans subgroups and, therefore, enjoy informational advantages and control over how novel information spreads in a team. In this sense, members can fulfill important brokerage functions within the team (Venkataramani et al., 2014).

Another important issue to consider is whether brokers in teams actually provide advice that reflects their diverse stores of information and ideas. Some research, for instance, has suggested that brokers may exploit their position by hoarding information for maximum personal gain or political maneuverability (Rodan & Galunic, 2004; Rowley, 1997). This is a particularly salient concern when brokers have an opportunity to personally leverage information asymmetries against two parties (Brass, 2009; Galunic et al., 2012). However, because teams feature relatively high levels of interdependence (i.e., members must depend on one another to receive key information and materials, accomplish shared common goals, and receive rewards [Campion, Medsker, & Higgs, 1993]), brokers should be willing to share their diverse stores of information and ideas to help others work through problems; helping others is essentially helping one's self, in this regard (i.e., positive externalities [Clement et al., 2018; Galunic et al., 2012]). Finally, the relatively small and interconnected set of actors in teams makes hoarding information a somewhat risky proposition. In essence,

the possibility of being “found out” as an information hoarder could lead to ostracism.

Hypothesis Development

Receiving advice should, in general, enhance a recipient's creativity because it broadens the base of information and perspectives available for problem solving (Amabile, 1996). Yet this relationship is not assured and can vary based on a number of factors (Bolino & Grant, 2016; Crocker et al., 2017; Mueller & Kamdar, 2011; Perry-Smith & Shalley, 2003). From an information-sharing perspective, a giver's advice brokerage should be positively associated with the sharing of nonredundant information because the advice is gleaned, at least in part, from the giver's past efforts to help diverse sets of teammates solve their problems (Fleming et al., 2007; Lingo & O'Mahony, 2010). As such, the advice essentially grants recipients access to a wider array of domain-specific knowledge and provides receivers with the raw materials (i.e., different ideas) needed to make remote associations, both of which can promote creativity (Mumford & Gustafson, 1988; Perry-Smith & Shalley, 2003).

Brokerage may also allow advice givers to offer suggestions that convey more than just the sum of the giver's preexisting knowledge and ideas. Indeed, the act of giving advice is not just a simple recall task, but instead requires that givers first understand a recipient's problem (e.g., gather information, view the problem from the seekers' perspective), reflect on and synthesize their own relevant knowledge, and then provide an integrative solution (Lingo & O'Mahony, 2010; Soltis, Agneessens, Zuzana, & Giuseppe, 2013). As a result, the ultimate information shared by an advice giver—and especially by those givers with substantial brokerage—may have already undergone processes associated with creativity *within the giver* (e.g., perspective-taking, idea integration, remote association), thereby providing an even more direct pathway to recipients' creativity.

Related to these ideas, advice brokerage implies that an individual has had opportunities to give novel advice to diverse sets of individuals and, given the proximity of team actors, to observe the outcomes of the advice (i.e., evaluate success or failure). In this sense, advice brokerage not only provides access to a breadth of information, but also helps givers wield their advice more confidently and precisely. In sum, we posit that givers' advice brokerage enhances recipients' divergent thinking and domain-specific

knowledge, thereby boosting recipients' creativity (Amabile, 1996; Mascitelli, 2000).

Hypothesis 1. Givers' advice brokerage will be positively related to advice recipients' creativity enhancement.

Extant theories advance multiple possibilities for the general relationship between advice-giving behaviors and the giver's own creativity. Resource allocation perspectives and similar views suggest that there can be significant opportunity costs associated with helping others (e.g., time, energy) (Oldroyd & Morris, 2012; Soltis et al., 2013) that restrict an employee's own creative efforts (Bergeron, 2007; Bolino & Turnley, 2005; Mueller & Kamdar, 2011). In contrast, the process of giving advice may also help a focal employee gain access to and synthesize unique ideas that can boost their own creativity (Perry-Smith & Shalley, 2003). These perspectives are not mutually exclusive, as the costs and benefits associated with giving advice may depend on a number of factors (e.g., advice brokerage). Additionally, the effects of giving advice on the giver's own creativity may be transmitted through other factors, thereby obfuscating general main effect arguments.

We argue that one especially important factor for understanding how advice giving affects one's own creativity is the proximal outcome of the advice giver's efforts to help recipients. Specifically, we posit that recipients' creativity gains (losses) following advice will positively (negatively) influence the giver's own creativity at a subsequent time period. General support for this logic can be traced to classic social cognitive views (Bandura, 2001), which imply that an individual's creativity is significantly impacted by the complex social system (i.e., the team) whereby actors rely on, and iteratively interact with, one another to adopt behavioral approaches and perform tasks (Grosser, Venkataramani, & Labianca, 2017). In essence, when recipients exhibit enhancements to their own creativity, the giver's own social cognitions regarding creativity are affected, thereby driving change.

Creativity research also lends general support to this premise, noting that changes in the nature of social interactions can influence individuals' creativity (Perry-Smith & Mannucci, 2017) and, relatedly, that creative coworkers can positively affect an individual's creativity (Bloom & Sosniak, 1981; Shalley & Perry-Smith, 2001). An advice recipient's creativity enhancement can influence givers through multiple pathways. For example, a teammate's

creative success contributes to a more general creative context (Hargadon & Bechky, 2006), which reflects a more supportive attitude for creative action, as well as interactive processes whereby ideas and knowledge spread to promote creativity among individuals within the team, including the focal advice giver. Recipients' creativity can also have unique and more narrowly focused effects on the giver through their ongoing interactions and idea exchanges with the advice giver. For example, interacting with recipients who have significantly improved their ideas can inspire the original giver to synthesize the recipients' novel perspectives with the giver's own to develop creative ideas.

Hypothesis 2. Advice recipients' creativity enhancement will be positively related to advice givers' creativity enhancement.

Because givers' advice brokerage is presumed to positively affect recipients' creativity enhancement (Hypothesis 1), and, subsequently, recipients' creativity enhancement is presumed to positively affect advice givers' creativity enhancement (Hypothesis 2), we propose a causal mediating effect. Specifically, we expect advice recipients' creativity enhancement to mediate the relationship between a giver's advice brokerage and the giver's subsequent creativity gains. Therefore:

Hypothesis 3. Advice recipients' creativity enhancement will mediate the relationship between a giver's advice brokerage and the giver's creativity enhancement.

Although a giver's advice brokerage should be generally viewed as a positive antecedent of recipient creativity, recipients may nonetheless view advice as risky and, in turn, temper their creative action (Mueller & Kamdar, 2011; Nickerson, 1998). In this regard, the extent to which recipients feel safe to try out new ideas is likely to accentuate the positive effect of exposure to unique and diverse information on recipients' creativity (Li, Lin, Tien, & Chen, 2017). Accordingly, we argue that recipients' perceptions of psychological safety (i.e., a "belief that the team is safe for interpersonal risk taking" [Edmondson, 1999: 354]) play a key role in how a giver's advice brokerage affects recipient creativity.

Psychological safety was initially established as a team-level construct capturing members' shared perceptions (Edmondson, 1999), but some recent studies have indicated that individuals' perceptions may vary due to their unique interactional experiences (Detert & Burris, 2007; Tröster & van

Knippenberg, 2012). Thus, we focus on recipients' individual psychological safety perceptions. When recipients perceive that they are in a psychologically safe environment, they are likely to increase their willingness to consider alternative viewpoints (Bradley, Postlethwaite, Klotz, Hamdani, & Brown, 2012) and incorporate them into their own idea development processes (Choo, Linderman, & Schroeder, 2007; Lee, Swink, & Pandejpong, 2011). By contrast, recipients' motivation to maintain the status quo (and suppress creativity) should be more salient if the perceived environment is unsafe. Therefore:

Hypothesis 4. Recipients' psychological safety perceptions will moderate the relationship between givers' advice brokerage and recipients' creativity enhancement, such that the relationship is more positive when psychological safety perceptions are higher (versus lower).

Beyond accentuating the beneficial effect of givers' advice brokerage on recipient creativity, psychological safety should augment the indirect effects on the givers' own creativity. Specifically, the enhanced creativity of recipients stemming from the cross-product of a giver's brokerage and recipient psychological safety contributes to the development of a stronger creative atmosphere, which in turn benefits the giver's creativity. Therefore:

Hypothesis 5. Recipients' psychological safety perceptions will moderate the positive indirect effect of the giver's advice brokerage on her or his own creativity enhancement via recipients' creativity enhancement, such that the indirect effect is more positive when psychological safety perceptions are higher (versus lower).

STUDY 1

Sample and Procedures

We conducted a three-wave field survey in China. We sampled research and development (R&D) teams from 17 manufacturing firms that valued employee creativity. The teams developed products for application in several industries, including manufacturing, transportation, hydropower, metallurgy, chemicals, and aerospace. Participation was voluntary and respondents received a small university souvenir upon completion.

In the first survey (Time 1), team members assessed demographic information, perceived psychological safety, and within-team advice-giving interactions. We also asked team leaders (one per team) to evaluate employees' creativity. The Time 1

survey included 278 employees from 43 teams; there were 247 useable responses from 40 teams. The overall response rate was 88.8%; average within-team response rate was 90.1%.

We asked the 40 responding team leaders from Time 1 to evaluate their team members' creativity six months later (Time 2), as this matched the approximate length of R&D projects in our sample and aligned with semi-annual performance rating intervals. We received 233 creativity ratings, resulting in a response rate of 94.3%. Six months later (Time 3), we again solicited member creativity ratings from leaders. We received 207 ratings from 38 team leaders (overall response rate of 88.8%).

The team members' average age was 30.26 years ($SD = 7.44$), organizational tenure was 6.70 years ($SD = 6.75$), 62.8% were male, and 62.8% had a college degree or higher. The team leaders' average age was 34.39 years ($SD = 8.74$), organizational tenure was 9.21 years ($SD = 5.96$), 82% were male, and 73.7% had a college degree or higher.

Measures

Survey items were originally developed in English and translated to Chinese using a common back-translation process (Brislin, 1986). Unless otherwise noted, responses were given using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Givers' advice brokerage. We used betweenness centrality to measure givers' advice brokerage. Betweenness centrality examines the extent to which an individual falls between pairs of unconnected individuals in a network (Borgatti, 2005; Freeman, 1979) and suggests exposure to diverse information (Burt et al., 2013). We calculated betweenness centrality at Time 1 by providing participants with a roster of all members and asking them to respond to the question "Do you give work-related advice to this team member?" for each member, using a five-point Likert scale ranging from 1 (never) to 5 (frequently). Because binary data are required to calculate betweenness scores, we dichotomized the responses such that responses of 1 on the Likert scale were coded as "0" and responses of 2–5 were coded as "1" (Venkataramani et al., 2014). Using the resulting matrix, betweenness for actor p was calculated as the proportion of all paths linking two other actors (i.e., i and j , which pass through p) summed across all pairs of i and j in the advice network (where $i \neq j \neq p$).

Creativity. Team leaders rated individual team members' creative performance in all three waves

using three items developed by Baer (2012). A sample item is "This employee developed ideas that imply substantial departures from existing product and service lines." The Cronbach's alpha (α) values for Times 1–3 were 0.76, 0.81, and 0.87, respectively. We calculated Intraclass correlation (ICC1) values to assess the proportion of variance related to a common rater; these values were .47, .60, and .50, for Times 1–3, respectively.

Because our hypotheses required creativity change to be nested within advice givers, the average score of creativity for recipients was calculated as:

$$\text{Advice recipients' creativity} = \frac{\sum_{j \neq i} AT_{ij} \times \text{Creativity}_j}{\sum_{j \neq i} AT_{ij}}$$

In this formula, a focal actor (broker) is represented by i ; j represents the recipient of the focal actor's advice (who works in the same team). It presumes that $AT_{ij} = 1$ if the focal actor i says that he or she has given advice to the receiver j ; otherwise, $AT_{ij} = 0$. Creativity_j represents the rating that recipient j 's supervisor assigned to his or her creativity performance.

We used latent change score modeling (McArdle, 2009), which overcomes many of the limitations associated with basic difference scores, to capture the true difference in the same variable over two time points (Huang, Zhao, Niu, Ashford, & Lee, 2013). To better establish the temporal ordering between recipients' and brokers' creativity improvement, recipients' creativity change was derived from Time 1 and 2 ratings, whereas advice givers' creativity change was derived from Time 1 and 3 ratings.

Advice recipients' perceived psychological safety.

Team members rated their perceived psychological safety at Time 1 using seven items developed by Edmondson (1999). Sample items include "If you make a mistake on this team, it is often held against you" and "Members of this team are able to bring up problems and tough issues" ($\alpha = 0.76$).

As previously noted, members' perceptions of psychological safety may not always be uniform in teams (Detert & Burris, 2007; Tröster & van Knippenberg, 2012). Based on this assumption, and because team members are clustered within teams *and* givers in our model, we determined that our focal tests should reflect not *necessarily* overall team perceptions of psychological safety, but rather the combined assessments from individuals who received advice from a focal giver (i.e., additive composition model [Chan, 1998]). To achieve this, we took the average of the perceptions of a giver's advice

recipients ($rwg = .86$, $ICC(1) = .10$, and $ICC(2) = .30$). The low ICC values further suggest that this approach was appropriate.

Control variables. We controlled for employees' demographic variables, including gender, age, education, and organizational tenure. We also sought to control for several alternative explanations that might affect the nature of informational exchange relevant to creativity (Zhou et al., 2009), including network density, knowledge acquisition (four items from Tortoriello, Reagans, & McEvily [2012]; $\alpha = 0.79$), team coordination (five items from Hoegl, Weinkauff, & Gemuenden [2004]; $\alpha = 0.78$), and trust (five items from De Jong & Elfring [2010]; $\alpha = .92$).

Results

Table 1 presents the descriptive statistics, correlations, and reliabilities of our study variables. Before testing our hypotheses, we conducted a latent mean structure analysis using Mplus 7.0 (Muthén & Muthén, 1998–2012) to determine whether there were meaningful changes in creativity. Consistent with expectations, the results showed positive changes in advice recipients' creativity ($\Delta M = .19$, $SD = .07$, $p < .01$) from Time 1 to Time 2, and givers' creativity ($\Delta M = .23$, $SD = .08$, $p < .01$) from Time 1 to Time 3.

Latent change scores for creativity were entered into regression models using Mplus 7.0 (Muthén & Muthén, 1998–2012). Data were first structured to account for the nonindependence associated with team membership. Then, because advice recipients were also nested under specific givers, we used the sandwich estimator to account for additional nonindependence associated with multiple cluster sampling and to correct potential estimation bias (Liu, Wang, Chang, Shi, Zhou, & Shao, 2015; Muthén & Muthén, 2012).

Table 2 shows the results of our tests of Hypotheses 1–4. Hypothesis 1 posited that a giver's brokerage in the advice-giving network would positively predict advice recipients' creativity improvement. Supporting this argument, a giver's advice brokerage was positively and significantly associated with recipients' creativity change ($b = .02$, $p < .01$, Model 1).

Hypothesis 2 predicted that advice recipients' creativity improvement would be positively related to the giver's creativity improvement. Consistent with the hypothesis, recipients' creativity improvement significantly and positively predicted the giver's creativity improvement ($b = .15$, $p < .05$, Model 3).

Hypothesis 3 predicted that advice recipients' creativity improvements would mediate the relationship

TABLE 1
Descriptive Statistics and Correlations of Variables (Study 1)

Variable	Mean	SD	<i>n</i>	1	2	3	4	5
1. Gender	1.37	0.48	207					
2. Age	30.26	7.44	207	0.13				
3. Education	3.60	0.70	207	−0.12	−0.02			
4. Tenure	6.70	6.75	207	0.21**	0.86**	−0.08		
5. Network density	0.72	0.32	207	−0.07	−0.29**	0.08	−0.40**	
6. Coordination	3.97	0.60	207	0.04	0.12	−0.03	0.09	0.03
7. Knowledge acquisition	3.78	0.59	207	−0.17*	0.19**	0.16*	0.15*	−0.03
8. Intrateam trust	3.66	0.78	207	−0.04	−0.04	0.01	−0.14*	0.28**
9. Giver's centrality	4.08	1.79	207	0.26**	−0.10	0.09	−0.12	0.31**
10. Giver's advice brokerage, Time 1	2.21	9.23	207	−0.03	0.07	−0.04	0.07	−0.44**
11. Advice recipients' perceived psychological safety, Time 1	3.57	0.41	200	−0.05	−0.05	0.17*	−0.07	−0.08
12. Advice recipients' creativity, Time 1	3.23	0.64	200	−0.20**	0.02	0.08	−0.01	0.10
13. Advice recipients' creativity, Time 2	3.48	0.76	200	−0.05	0.16*	−0.06	0.20**	0.02
14. Advice recipients' creativity, Time 3	3.40	0.63	200	0.08	−0.11	0.07	−0.22**	0.23**
15. Giver's creativity, Time 1	3.23	0.78	207	−0.21**	0.12	0.08	0.06	0.10
16. Giver's creativity, Time 2	3.50	0.90	207	−0.06	0.19**	0.02	0.17*	0.01
17. Giver's creativity, Time 3	3.39	0.81	207	0.01	−0.06	0.14*	−0.12	0.19**

between a giver's advice brokerage and his or her own creativity improvement. To test the indirect effect, we first multiplied the independent variable–mediator regression coefficient and the mediator–dependent variable–regression coefficient in Mplus 7.0 (Muthén & Muthén, 1998–2012; Preacher & Hayes, 2004). As shown in Model 3, the coefficient for the indirect effect was significant and positive ($b = .003, p < .05$), supporting Hypothesis 3.

Hypothesis 4 posited that recipients' perceived psychological safety would accentuate the relationship between a giver's advice brokerage and recipients' creativity improvement. As shown in Table 2, the interaction between a giver's brokerage and psychological safety on recipients' creativity improvement was significant ($b = .02, p < .001$, Model 2).¹ In support of Hypothesis 4, Figure 2 shows that the relationship between a giver's brokerage and recipients' creativity improvement is more strongly positive in psychologically safer conditions.

Hypothesis 5 proposed that the indirect effect of the giver's advice brokerage on his or her own creativity improvement (via recipients' improvements) would be accentuated by recipients' perceived psychological safety. Results from a moderated path analysis (Edwards & Lambert,

2007) show that the indirect effect of the giver's brokerage on his or her own creativity improvement via recipients' creativity improvement was significant ($P_{MX} \times P_{YM(\text{high})} = .004, p < .05$) at higher levels of recipients' psychological safety, but insignificant ($P_{MX} \times P_{YM(\text{low})} = .002$, n.s.) at lower levels. The difference in the indirect effect was significant ($P_{MX} \times P_{YM}$ (differences between low and high) = .002, $p < .05$), supporting Hypothesis 5.

Robustness Checks and Supplementary Analyses

We conducted a number of additional tests to probe the robustness of our conclusions and evaluate potentially meaningful relationships that were not formally hypothesized but may inform future research (Gardner, Harris, Li, Kirkman, & Mathieu, 2017; Hollenbeck & Wright, 2017). First, following recent suggestions (Bernierth & Aguinis, 2016), we analyzed our models excluding control variables. Results were significant and in the direction expected, suggesting that our results were not unduly driven by control variables.

Second, to probe the implicit assumption that the effects of advice given from a brokerage position are distinct from a sheer volume of advice given, we conducted a test whereby an advice giver's centrality in the advice-giving network was added as a predictor of recipients' creativity improvement. When both advice centrality and brokerage were included, results indicated that brokerage positively predicted

¹ Additional tests indicated that team-level psychological safety did not moderate the relationship ($b = -0.061$, n.s.); this supports our logic that recipients' perceptions may be more relevant in the current conceptualization.

TABLE 1
(Continued)

6	7	8	9	10	11	12	13	14	15	16
0.50**										
0.05	-0.07									
0.10	-0.06	0.04								
0.03	0.01	-0.10	-0.11							
0.07	0.10	-0.08	0.00	-0.05						
0.13	0.28**	-0.19**	-0.09	-0.01	0.44**					
-0.04	0.08	0.20**	-0.06	0.14	-0.22**	-0.06				
-0.08	-0.12	0.51**	0.06	-0.04	-0.04	-0.19**	0.30**			
0.11	0.25**	-0.16*	-0.08	-0.04	0.35**	0.62**	-0.07	-0.14*		
-0.02	0.14*	0.17*	-0.06	0.14*	-0.26**	-0.07	0.68**	0.22**	-0.05	
0.01	0.01	0.56**	0.06	-0.03	-0.00	-0.15*	0.23**	0.56**	-0.12	0.26**

Notes: Education: 1 = middle school or below, 2 = technical secondary school, 3 = community college, 4 = bachelor's degree, 5 = master's degree, 6 = doctorate.

* $p < .05$

** $p < .01$

creativity improvement ($b_{\text{recipients}} = .02, p < .01$) while centrality showed negative but nonsignificant effects on creativity ($b_{\text{recipients}} = -.02, p = .75$). Thus, advice brokerage, which captures how givers

disseminate diverse information to different recipients, rather than centrality, which emphasizes the volume of advice, was a more salient factor driving creativity in our study.

TABLE 2
Regression Results (Study 1)

Variables	Advice Recipients' Creativity Enhancement		Advice Giver's Creativity Enhancement
	Model 1	Model 2	Model 3
Gender	-0.092 (0.153)	-0.081 (0.144)	0.108 (0.110)
Age	-0.014 (0.012)	-0.014 (0.013)	-0.001 (0.016)
Education	-0.086 (0.088)	-0.049 (0.081)	0.161* (0.081)
Tenure	0.046* (0.018)	0.044* (0.018)	-0.004 (0.021)
Network density	0.485 (0.506)	0.361 (0.464)	0.183 (0.218)
Coordination	-0.219* (0.091)	-0.201* (0.090)	-0.020 (0.093)
Knowledge acquisition	0.241** (0.082)	0.228** (0.088)	0.124 (0.079)
Intrateam trust	0.228* (0.106)	0.233* (0.101)	0.530*** (0.073)
Giver's advice brokerage (GB)	0.019** (0.007)	0.018** (0.006)	0.004 (0.002)
Advice recipients' perceived psychological safety (RPPS)		-0.332 (0.242)	0.195 (0.132)
Advice recipients' creativity enhancement (RCE)			0.145* (0.065)
GB \times RPPS		0.016*** (0.004)	-0.001 (0.003)
GB via RCE (indirect effect)			0.003* (0.001)
Pseudo R^2	0.085	0.149	—
Pseudo R^2 change	0.012*	0.065***	—

Notes: $n = 200$. Standard errors are included in parentheses.

* $p < .05$

** $p < .01$

*** $p < .001$

TABLE 3
Results of the Moderated Path Analysis (Study 1)

Moderator Variable: Advice Recipients' Perceived Psychological Safety (RPPS)	GB (X) → RCE (M) → Advice Giver's Creativity Enhancement (Y)				
	P_{MX}	P_{YM}	Direct Effects (P_{YX})	Indirect Effects ($P_{MX} \times P_{YM}$)	Total Effects ($P_{YX} + P_{MX} \times P_{YM}$)
Low RPPS (−1 SD)	0.012 [†] (0.007)	0.145* (0.065)	0.004 (0.003)	0.002 (0.001)	0.006 [†] (0.003)
High RPPS (+1 SD)	0.025*** (0.006)	0.145* (0.065)	0.003 (0.003)	0.004* (0.002)	0.007* (0.003)
Differences between low and high	0.013*** (0.003)	0.000 (0.000)	−0.001 (0.003)	0.002* (0.001)	0.001 (0.002)

Notes: P_{MX} : path from X (giver's advice brokerage) to M (advice recipients' creativity enhancement); P_{YM} : path from M (advice recipients' creativity enhancement) to Y (advice giver's creativity enhancement); P_{YX} : path from X (giver's advice brokerage) to Y (advice giver's creativity enhancement). Standard errors are included in parentheses.

[†] $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

Third, we tested the potential interaction effect of givers' advice brokerage and centrality on recipients' creativity improvement to see whether there was evidence of possible synergies between advice givers' information heterogeneity and volume. We did not find significant interactive effects between centrality and brokerage for creativity improvement.

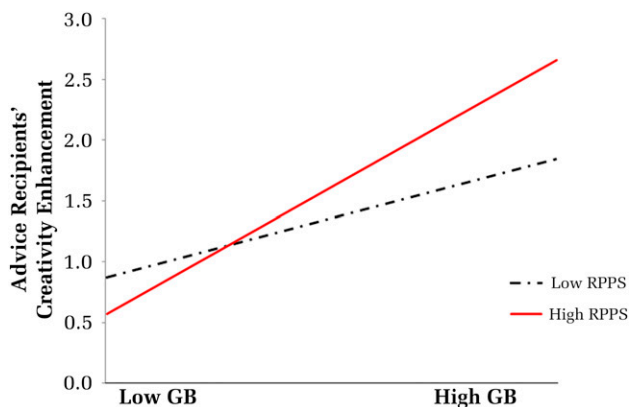
Finally, we explored whether givers' advice brokerage had a proximal impact on their own creativity improvement from Time 1 to Time 2. Results indicated that givers' brokerage positively predicted their proximal creativity improvement ($b = .02, p < .05$), suggesting more immediate positive effects of advice brokerage than we theorized (see Study 2). Extending this inquiry, we further tested an integrated model whereby the proximal effects (Time 1–2 creativity change) on the giver and recipients were allowed to simultaneously mediate the relationship between givers' advice brokerage and their more distal (T1–T3) creativity change. The results suggested that a giver's brokerage concurrently generates significant proximal (T1–T2) and distal (T1–T3) effects on his or her own creativity improvement; the 95% confidence interval of the indirect effect via recipients' creativity enhancement (Monte Carlo mediation estimate) was [.0002, .007] after including the proximal effect on the giver's creativity.

Study 1 Discussion

In an attempt to extend and clarify social models of creativity, we theorized that an advice giver's brokerage in the team's advice-giving network would play a key role in explaining when advice leads to more creativity for both advice recipients and givers. Consistent with our expectations, a giver's advice

brokerage had a positive effect on recipients' proximal creativity improvement and, in turn, recipients' creative improvements were positively associated with advice givers' more distal creativity improvements; recipients' creativity improvements mediated the relationship between givers' advice brokerage and givers' distal creativity improvements. These effects were further enhanced by recipients' perceptions of psychological safety, suggesting that how individuals view their team environment is an important consideration for individual creativity in teams. Interestingly, we found that givers' advice brokerage also directly influenced their own proximal creativity, suggesting rather immediate benefits of advice brokerage.

FIGURE 2
Interactive Effect of Advice Givers' Brokerage and Advice Recipients' Perceived Psychological Safety on Advice Recipients' Creativity Enhancement



Notes: GB = giver's brokerage; RPPS = advice recipients' perceived psychological safety.

A key limitation of our quantitative study is that it was unable to capture the specific underlying processes associated with brokers' advice giving and creativity. This is especially critical given that our supplementary analyses suggested some alternative causal pathways (i.e., the relationship between advice brokerage and giver's proximal creativity gains) beyond the ones we theorized in our model. To address this gap, we conducted an additional qualitative study whereby we solicited thoughtful self-reflections on the most salient creativity-related processes that emerge from brokers' advice-giving interactions.

STUDY 2

Sample and Procedures

We recruited and interviewed 92 employees working in 21 teams from eight manufacturing firms in China that relied heavily on employee creativity. The teams engaged in designing and developing products used in many industries, including manufacturing, electric power, and chemicals. The average age was 29.49 years, average organizational tenure was 5.75 years, and 17.39% of participants were female.

Because the primary goal of Study 2 was to elucidate the processes associated with brokers' advice giving and creativity (rather than to replicate Study 1) we sought to interview only brokers who provided advice to others, and recipients of brokers' advice. Human resources representatives connected us with team leaders and, after a brief description of our study, those leaders nominated individuals who best reflected our conceptualization of brokers in the advice-giving network, as well as individuals who were common recipients of advice. This process resulted in 51 advice recipients and 41 advice givers (givers and receivers were not matched). All participants received an explanation of voluntary participation and confidentiality, and a small gift upon completion (a business card holder).

We developed unique interview questions for recipients and givers. The recipient interview protocol sought to understand the impact that receiving brokers' advice had on recipients' creativity, as well as the concerns they most commonly felt when deciding whether to use advice. The giver interview protocol focused on motives for providing advice, as well as the different impacts that giving advice had on the giver's own and others' creativity. We intentionally sought to phrase questions in ways that did not lead to any *a priori* expectations.

Two study authors conducted face-to-face interviews with the participants in on-site conference rooms. Interviews were audio-recorded and transcribed. The transcripts featured a total of 170,026 decipherable words (recipients = 92,229, givers = 77,797). Interviews with recipients and givers lasted about 30 minutes and 60 minutes, respectively.

Data Analysis

Across both sets of interview transcripts, we employed a thematic analysis in which two authors inductively created conceptual categories of recurring themes related to the research goals (Glaser & Strauss, 1967; Miles & Huberman, 1994). They iteratively worked back and forth between transcripts to ensure that theme generation was complete and devoid of redundancies (i.e., "theoretical saturation" [Glaser & Strauss, 1967: 61]). In line with studies using a similar methodology, we retained themes for subsequent discussion if they surfaced at least three times (e.g., Colquitt, Long, Rodell, & Halvorsen-Ganepola, 2015; Hollensbe, Khazanchi, & Masterson, 2008). Two independent raters then categorized all interview quotes into their thematic classification to evaluate frequency. Cohen's κ ($\kappa = 0.83$) indicated adequate interrater agreement. Discrepancies were resolved through discussion.

Results

To first confirm that leaders identified appropriate participants, we directly asked respondents whether they fit our descriptions of advice-giving brokers, and recipients of brokered advice. Among the participants, 93% of givers and 98% of receivers agreed that they had been correctly identified. Misidentified employees' responses did not affect thematic emergence.

Advice recipients. Two main themes emerged for how receiving advice benefits receivers' creativity ("How does the advice from other colleagues influence your creativity at work?"). The first theme, exposure to new ideas and perspectives (21 mentions, 41% of recipients), is consistent with prior work on creativity (e.g., divergent thinking [Perry-Smith & Shalley, 2003]). As an example, one interviewee (#F3T2A1)² noted: "When I was stuck with a problem, others providing me advice helped me view things from a different angle." The second theme, enhancing domain-specific knowledge (14 mentions; 28% of recipients), is also consistent with prior work

² F3 indicates firm ID, T2 indicates team ID and A1 indicates individual ID.

(Perry-Smith & Shalley, 2003). For instance, one informant (#F2T1A4) stated: “When I drew up plans, I often did not have the experience needed to do so correctly. In this case, I needed advice to more accurately carry out my own ideas.”

To test the veracity of our psychological safety arguments, we explored potential boundary conditions of receiving advice, and receiver creativity. When asked about major concerns related to taking advice from others, the majority of interviewees indicated it was important to be in an environment where they felt comfortable to freely express ideas without criticism (40 mentions, 78% of recipients). This theme aligns closely with the notion of psychological safety. No other clear themes surfaced more than three times.

Advice givers. As noted previously, research has suggested alternative arguments for how individuals may choose to utilize their brokerage (e.g., hoarding versus sharing unique information). Thus, one objective of our interviews was to learn about brokers’ motives for providing advice to teammates. Our data suggest four key drivers of brokers’ advice giving. In line with our conceptual assertion, the most frequent motive was team interdependence (22 mentions, 54% of givers), which suggests that brokers view providing advice as being congruent with their own goals of obtaining rewards based on team success. The next two most prominent motives, prosocial motivation (18 mentions, 44% of givers) and concern for the organization (17 mentions, 42% of givers), capture more altruistic motives, with the former being more focused on teammates and the latter toward the organization. Finally, some givers were motivated by self-improvement (10 mentions, 24% of givers) and viewed engaging with others as a way to build experience and learn new things.

Before exploring processes of how giving advice affects givers’ creativity, we examined whether the givers’ and receivers’ perspectives converge in terms of how giving advice affects recipients’ creativity enhancement. Givers emphasized that their advice (1) enhanced recipients’ experience and tacit knowledge (54%) and (2) provided recipients with new perspectives (42%). These findings indicate notable convergence.

Next, we sought to uncover the key mechanisms that explain how advice giving affected brokers’ own creativity (e.g., “How does giving advice to other colleagues at work influence your creativity?” “If you think giving advice to other colleagues is helpful to your creativity, then what could be the reason, and what are the ways through which it promotes your

creativity?”). Our analysis yielded six main themes, as shown in Table 4. Specifically, brokers commonly reported that giving advice allows them to (1) integrate others’ ideas with their own to produce new ideas (i.e., idea integration: 17 mentions, 42% of advice givers); (2) see alternative perspectives (26 mentions, 63% of givers); (3) build experiences and knowledge (i.e., knowledge accumulation: 9 mentions, 22% of givers); (4) reflect on existing knowledge (16 mentions, 39% of givers); (5) foster a creativity-enabling social environment (i.e., collective creativity: 13 mentions, 32% of givers); and (6) observe the creative consequences of their advice (i.e., creative feedback: 4 mentions, 10% of givers).

Themes 1–4 can also be categorized into two higher-order themes. The first, which comprises Themes 1 and 2, generally captures the processes by which diverse ideas emerge for individuals. The second, which consists of Themes 3 and 4, taps into more knowledge-related processes. In many ways, these higher-order categorizations (ideas versus knowledge) are similar to concepts in Perry-Smith and Shalley’s (2003) social view of creativity—namely, divergent thinking (e.g., remote association, absorbing new ideas [Mumford & Gustafson, 1988; Perry-Smith, 2006]) and enhancing domain-specific knowledge.

Although Themes 1 and 2 are both related to divergent thinking, they contribute to the process in different ways. Idea integration emphasizes the synthetic and iterative combination of advice recipients’ perspectives and ideas (presented when soliciting advice or when discussing the advice giver’s initial suggestions) and the giver’s ideas in ways that promote altogether new ideas. For example, one informant (#F1T1B1) stated: “When I give advice to my colleague, he must consider how my suggestion fits within his own understanding of the production process. When we discuss his own professional knowledge and experience during this process, I develop ideas that help me improve.”

Perspective taking, by comparison, emphasizes how being exposed to different outlooks inspires the giver to generate his or her own ideas. Although related to idea generation, perspective taking does not require the broker to integrate previously distinct bodies of information; it is similar to the idea of remote association (Perry-Smith, 2006; Perry-Smith & Shalley, 2003). As an example, an informant (#F4T3B1) indicated: “Some new ideas just occur to me when I give advice. For instance, my colleague might not know how to use some aspects of a key software. When I’m instructing him, I may observe

TABLE 4
The Emergent Mechanisms of Advice-giving Actions on the Advice Giver's Creativity Enhancement (Study 2)

Emergent Themes	Number (Percentage) of Respondents Reporting the Theme	Description	Sample Quotes
1. Idea integration	17(42)	Integrate others' ideas with their own to produce new ideas	"When I give advice to my colleague, he must consider how my suggestion fits within his own understanding of the production process. When we discuss his own professional knowledge and experience during this process, I develop ideas that help me improve." (#F1T1B1)
2. Perspective taking	26(63)	Take different perspectives to broaden their own outlook	"Sometimes too much experience can restrain my thoughts. Therefore, when some young colleague who has just worked for a short period of time ask[s] me questions, although some of their questions seem naïve, they can inspire me to think of issues from a different perspective, and improve my ideas." (#F3T3B2)
3. Knowledge accumulation	9(22)	Build experiences and knowledge that can be used to solve future problems	"I think in the process of giving advice to others, I learn something. For instance, one of my colleagues encountered a problem at work and it was not familiar to me. Helping him [gave] me experience to deal with similar problems in the future." (#F4T5B1)
4. Reflection	16(39)	Systematically reflect on existing knowledge	"In the past, my knowledge was separated into several parts, but holding the knowledge is different from sharing it systematically with others. In order to make them understand, I need to summarize and sublimate my knowledge and tell them persuasively how everything works together. By offering advice to them, I am forced to link the independent parts of my knowledge together and sort out existing issues, which contributes to a deeper understanding of things." (#F1T2B1)
5. Collective creativity	13(32)	Foster a creativity-enabling social environment that encourages idea exchange, mutual learning, and development	"Giving them advice and communicating with them can help everyone in the team to generate more novel ideas and improve our efficiency, which is helpful to me in producing new thoughts." (#F2T1B2)
6. Creative feedback	4(10)	Evaluate their own ideas by observing the eventual consequences of the advice	"When I give them advice, I get to see the results of implementation and figure out if my advice was reasonable. The feedback helps me refine my ideas." (F4T2B1)

Notes: $n = 41$; respondents were the identified advice giver.

how he was previously doing things—some unique operation or a quick way to search for content—that suddenly inspires a new idea for how to do things."

The third and fourth themes suggest that giving advice provides an avenue for enhancing domain-relevant knowledge. Specifically, knowledge accumulation suggests that by providing advice to teammates in different areas, givers gain valuable experience in solving problems in novel contexts that they can apply later to other problems. One respondent (#F2T1B3) noted: "Giving advice is also

a process of learning and accumulation for me, and the solutions of others' problems may be something I can apply in my own job in the future."

The fourth theme goes beyond simply building new knowledge to include processes of deeper reflection on one's own knowledge. That is, when individuals provide advice to others, they must not only draw from what they already know—which may be used in a rather routine manner in a typical day-to-day role—but also think carefully about how that knowledge can be applied to other types of

problems. This pushes advice givers to think critically about their knowledge base and thoughtfully organize their ideas to a greater extent than typically required. Speaking to this theme, one respondent (#F1T2B1) stated: “By offering advice to them, I have to link the independent parts of my knowledge together and sort out my ideas, which helps me gain a deeper understanding of the relevant knowledge.”

Although Themes 1–2 and 3–4 fit neatly into two previously identified drivers of creativity (Perry-Smith & Shalley, 2003), Themes 5 and 6 are more distinct. Theme 5, collective creativity, suggests that helping others find creative solutions can facilitate a creative social context that encourages idea exchange, knowledge sharing, and mutual learning. Although almost one third of interviews conveyed sentiments related to this category, it most often emerged in conjunction with other themes. For example, one interviewee (#F2T3B2) said: “In this process, we exchange new ideas with each other, learn from each other, and improve together.”

The final and least frequent theme, creative feedback, suggests that some advice givers benefited from observing the outcomes associated with how others used their advice. In essence, this theme captures a feedback loop whereby advice givers can vicariously evaluate the success or failure of their suggestions. When his or her advice leads to positive creative outcomes for others, the giver may experience a boost in creative self-efficacy (Tierney & Farmer, 2002) that drives the giver’s own creative performance (this effect can be especially pronounced in teams with diverse information sources [Richter et al., 2012]). When advice does not generate positive outcomes for recipients, the advice giver may improve his or her own creativity by modifying his or her approach. For example, one advice giver (#F4T2B1) noted: “I analyze feedback and results from others so that I can put forward more reasonable ideas next time when I encounter a similar problem.” Unfortunately, the framing of our interview questions limited our ability to explore the alternative case, whereby observing recipients’ failures might discourage givers’ future creativity.

Study 2 Discussion

Supplementing and extending the conclusions from Study 1, our qualitative analyses uncovered several distinct mechanisms responsible for the effect of brokers’ advice giving on both recipients’ and givers’ creativity. In doing so, Study 2 provided a more integrative and complete framework for

understanding how brokers’ advice affects creativity in teams. Unsurprisingly, several of the themes that emerged in our data were consistent with prior work (Amabile, 1983; Perry-Smith, 2006; Perry-Smith & Shalley, 2003). Recipients and givers, for instance, both noted that the benefits of brokered advice were related to processes of divergent thinking and enhancing domain-specific knowledge.

However, the data also suggest some additional nuances regarding how brokered advice affects a giver’s own creativity. Specifically, divergent thinking was captured by two subcategories reflecting idea integration and broader perspective taking, whereas domain-specific knowledge was captured by two subcategories reflecting opportunities to accumulate experience or information and thoughtful reflection on one’s existing knowledge. The data also suggest that advice-giving brokers’ creativity may be enhanced via collective creativity effects and creative feedback (Figure 3).

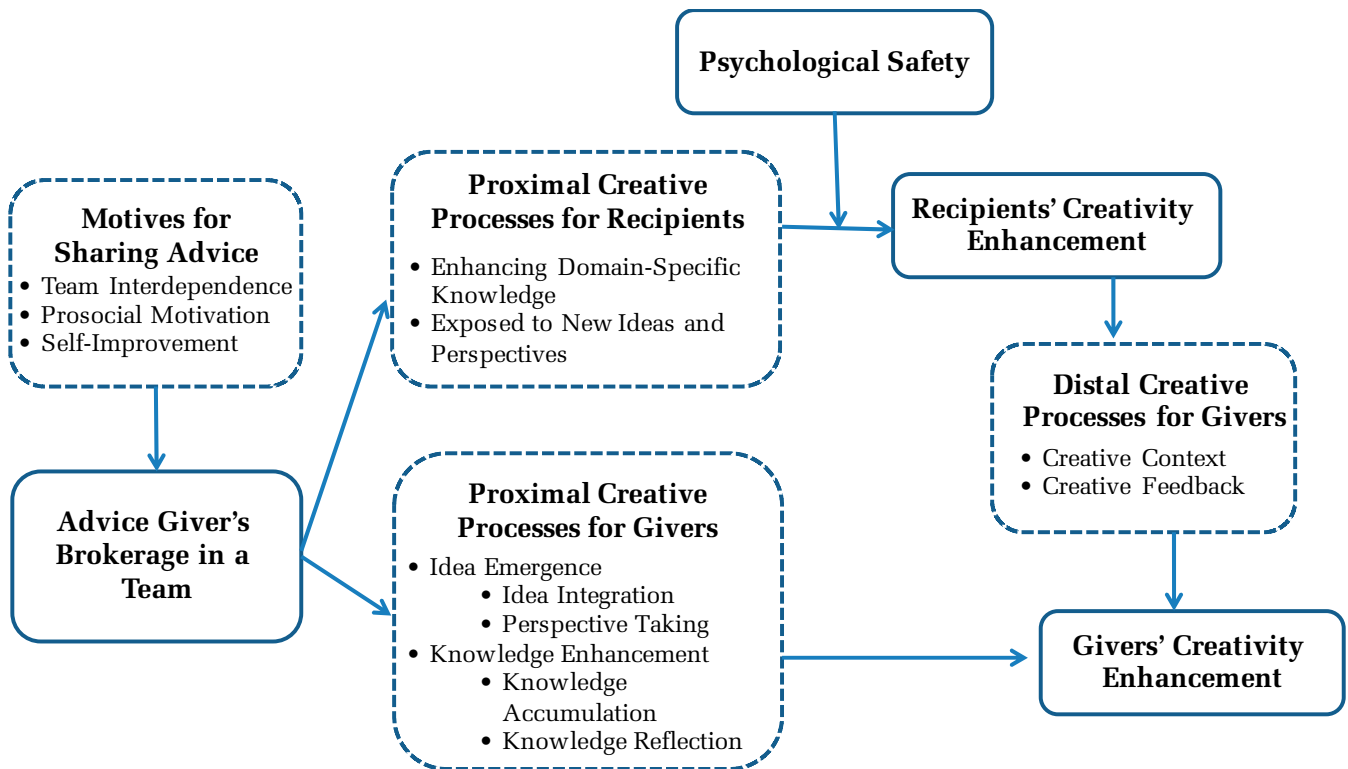
GENERAL DISCUSSION

Theoretical Contributions

Our research finds that brokerage in a team’s advice-giving network is a critical antecedent of creativity for advice recipients and givers through multiple processes, which has several theoretical implications. First, our model enlightens other-oriented perspectives of creativity (e.g., Grant & Berry, 2011; Hargadon & Bechky, 2006; Mueller & Kamdar, 2011) and adds to recent work suggesting that the same behaviors from team members can produce significantly different results dependent on their network position (Li et al., 2017). Brokerage, in essence, informs whether individuals encounter redundant or nonredundant problems and, therefore, offers a more potent way of explaining how advice-giving behaviors contribute to creative process emergence.

Though we hypothesized that givers’ advice brokerage would have distal effects on their own creativity by way of recipients’ improvements, our quantitative data suggested that the process of providing advice might also yield more immediate benefits to givers. This relationship was also supported in our qualitative study, as Themes 1–4 largely supported the proximal benefits of brokers’ advice giving. This finding is consistent with recent work (Perry-Smith & Shalley, 2014) suggesting that diverse ties can quickly shape an individual’s cognitive schemas and influence his or her willingness to embrace more novel thinking.

FIGURE 3
Integrative Research Model of Study 1 and Study 2



Second, the processes that emerged from our qualitative study support and extend prior social views of creativity (Perry-Smith, 2006; Perry-Smith & Shalley, 2003). For instance, many recipients highlighted the processes of generating diverse ideas and enhancing domain-specific knowledge as ways in which their creativity benefited from brokers' advice. Advice givers likewise pointed to these two processes, but suggested some additional nuances. Specifically, divergent ideas emerged from the idea integration that often occurs between givers and receivers when discussing a problem and, separately, from the givers' attempts to adopt someone else's perspective before offering advice. Domain-specific knowledge was also driven by two subprocesses, including the direct learning experience that givers undergo when being active in others' problems, as well as the careful and mindful reflection on their existing knowledge, some of which may be underutilized in day-to-day tasks. The latter is in some ways similar to the concept of "*vujà dé*" (*déjà vu* in reverse), which refers to seeing something old and familiar in a new way (Grant, 2017; Sutton, 2002).

Our study also reveals two less discussed mechanisms in the literature. One of these, creative

feedback, suggests that advice brokers in teams are able to evaluate the creative utility of their suggestions by observing how teammates use the information and the outcomes associated with it. This feedback, in turn, may boost the giver's confidence when pursuing creative ideas later (i.e., creative self-efficacy [Tierney & Farmer, 2002]). The other mechanism, a collective creativity effect, suggests that a broker's advice contributes to a more creative team context (via recipients' creativity gains), which he or she can access later; this supports the premise that having creative coworkers can, in some cases, beget more creativity (Hargadon & Bechky, 2006; Shalley & Perry-Smith, 2001; Zhou, 2003).

Third, our research explicitly reveals how individuals' creativity emerges in team contexts. Whereas prior work has focused on how members' shared perceptions, collective behaviors, or, in rarer cases, external network ties drive *team-level* creativity (e.g., Perry-Smith & Shalley, 2014), our work elucidates the individual micro-processes that likely precede it. A particularly valuable implication is that some key tenets of network brokerage can exist even in smaller contexts, where all members may have some working knowledge of one another. Further,

our study indicates that team brokers, motivated in large part by the team's interdependence, may be more likely to share diverse information freely with other teammates, rather than hoard it for selfish gain (similar to discussions regarding *tertius iungens* vs. *tertius gaudens* motives [Obstfeld, 2005]).

Finally, our study suggests that individuals' attitudinal perceptions of their team context play an important role in the relationships between givers' advice brokerage and subsequent creativity improvements. Namely, the creative impact of a giver's advice brokerage is bound by recipients' perceptions that the team is psychologically safe. This is consistent with previous cross-level studies that have emphasized the important role of team climate in leveraging the creative benefits of team diversity (Li et al., 2015).

Managerial Implications

To capitalize on the relationships identified in our study, organizations should actively encourage employees to provide novel and helpful advice to their coworkers, including those in relatively different "camps." To this end, managers can also proactively look for collaboration opportunities between members who otherwise do not intensively work together (e.g., intrateam boundary spanning). Managers may further facilitate cross-subgroup interactions by explicitly noting members' areas of core expertise in team briefings, thereby helping members become aware of such opportunities themselves (Majchrzak, Jarvenpaa, & Hollingshead, 2007).

Managers seeking creativity should also work to create psychologically safe environments that limit perceptions of fear and risk associated with trying new ideas. To accomplish this goal, managers and team leaders can set positive expectations for creative performance, publicly acknowledge and reward team members who display creative behavior, and prohibit ridicule of "failed" creative attempts. In sum, managers can be proactive agents in bridging informational gaps, promoting divergent thinking, and creating the enabling conditions for creativity in teams.

Limitations and Future Research

Our study has several limitations, which point to numerous avenues for future research. First, we hypothesized a dynamic model to examine how advice-giving actions affect both the recipients' and the givers' creativity improvement. Though we were able to capture this phenomenon in our sample, it is

unclear whether our conclusions would hold in a situation where employees already exhibit extremely high levels of creativity (i.e., ceiling effects). It is possible, for instance, that at some inflection point the resource costs associated with giving advice to diverse sets of teammates might outweigh the incremental gains (Mueller & Kamdar, 2011; Oldroyd & Morris, 2012).

Second, our model was theoretically guided, but nevertheless constrained in its variable choice and overall operationalization. For instance, we focused on advice recipients' creativity enhancement as a critical mechanism to explain the effect of brokerage on creativity, but the observed indirect effect was relatively small. Therefore, other mediators may also explain why giving advice to others can enhance one's own creativity. Our qualitative study suggests several of these potential mechanisms, including creative feedback and knowledge reflection, which we encourage future research to further consider.

Third, our qualitative study focused solely on uncovering the processes that emerged from brokers' advice giving. Although the goal was to extend, rather than replicate, Study 1, the design nevertheless prevented us from reaching strong conclusions regarding broker versus nonbroker differences. Assuming that brokerage's benefits are driven by more nonredundant information, we might expect to see different frequencies, or different themes altogether, emerge in a sample of nonbrokers. Moreover, several processes that emerged occurred concurrently with one another, suggesting some notable thematic overlap. Clearly, replications and extensions could add value.

Fourth, we counterintuitively found a negative correlation between recipients' psychological safety and their creativity in our sample. Other researchers have found similar patterns of relationships between psychological safety and creativity (e.g., $r = -.08$ [Somech & Drach-Zahavy, 2011]) and advanced several explanations that might inform this finding. For example, psychological safety may lead recipients to blindly accept advice without fully integrating it with their own ideas (e.g., Kehoe & Tzabbar, 2015). Burnett, Chiaburu, Shapiro, and Li (2015) similarly found that at high levels of organizational support, employees were less likely to display taking-charge behavior. By contrast, Zhou and George (2001) posited that dissatisfying situations (and perhaps unsafe ones) can sometimes boost creativity. We encourage researchers to continue exploring the conditions under which psychological safety acts as an asset or liability for creativity.

Finally, our studies were conducted in China, yet several of the studies that guided our hypotheses were developed and tested in Western cultures. Thus, we must acknowledge a potential misalignment between our theory and assumed underlying cultural values (Hofstede & Hofstede, 2005). As such, our conclusions should be validated in other cultures.

Conclusion

Drawing from a social view of creativity, we developed and empirically examined a longitudinal model of the positive effects of an advice giver's brokerage on advice recipients' and givers' creativity improvement. Our results, which were based on three waves of empirical data collection and qualitative interviews, reveal the dynamic interplay between network structures, psychological safety perceptions, and creative processes. Importantly, our findings suggest new theoretical pathways by which social interactions drive creativity.

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