Dynamic Leadership Emergence:

Differential Impact of Members' and Peers' Contributions in the Idea Generation and Idea Enactment Phases of Innovation Project Teams

Stephanie M. Lee
Baylor University
Hankamer School of Business
Waco, TX 76798
Tel: (254) 710-4319
stephanie_kunst@baylor.edu

Crystal I. C. Farh
University of Washington
Foster School of Business
Seattle, WA 98195
Tel: (206) 616-2115
farh@uw.edu

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Abstract

Integrating functional leadership theory with models of the team creativity and innovation, we present a dynamic model of leadership emergence where leadership emergence is shaped by a) the *type* of contributions members express (constructive contributions proposing new ideas, or supportive contributions affirming ideas with merit), b) *when* those contributions are expressed (i.e., in the idea generation or idea enactment phase), and c) the extent fellow teammates themselves are contributing in constructive or supportive ways in those phases. We tested our theoretical model in two studies involving simulated teams engaged in an innovation design challenge. In both studies, we found that constructive contributions were more strongly related to leadership emergence in the idea generation phase than in the idea enactment phase. Moreover, the impact of constructive contributions on leadership emergence in the idea generation phase was stronger when there was a "void" – that is, fellow teammates' constructive contributions were *low*. Surprisingly, in both studies, we found consistent evidence that supportive contributions also enhanced leadership emergence in the idea generation phase, while the findings on supportive contributions and leadership emergence in the idea enactment phase were mixed. Overall, our model highlights the importance of integrating dynamic and contextualized aspects of teams into theories of leadership emergence and also sheds new light on the processes underlying emergent forms of leadership in the early phases of the innovation cycle.

Keywords: leadership emergence, creativity process, teams.

With increasing reliance on teams to accomplish complex and creative work in organizations (Mathieu, Hollenbeck, van Knippenberg, & Ilgen, 2017), scholars and practitioners in recent years have turned their attention to the different ways teams are led (Morgeson, DeRue, & Karam, 2010). In hierarchically structured teams, leadership resides in a formal designated role, whereas in other teams, leadership is informal and fluid, such that individual members dynamically "emerge" as leaders over the course of team task accomplishment. Given that the leadership structures of teams matter for team performance (D'Innocenzo, Mathieu, & Kukenberger, 2016), a relevant question is "*what allows a member in the team to be perceived by his or her peers as "leaderlike"* (Hogan, Curphy, & Hogan, 1994: 496) *and prompts them to grant significant influence to that individual* (DeRue & Ashford, 2010)?

Historically, answers to this question have focused on stable characteristics of the individual, such as intelligence (Côté, Lopes, Salovey, & Miners, 2010; Ilies, Gerhardt, & Le, 2004; Lisak & Erez, 2015), traits (Foti & Hauenstein, 2007; Lord, De Vader, & Alliger, 1986; Taggar, Hackett, & Saha, 1999), and demographic markers such as gender (Eagly & Karau, 1991). More contemporary approaches have embraced a behavioral perspective, where those who exhibit leader-like behaviors (e.g., task-, relations-, or change-oriented behaviors) are more likely to accrue leadership perceptions (DeRue, Nahrgang, Wellman, & Humphrey, 2011; Lanaj & Hollenbeck, 2015; Zaccaro, Foti, & Kenny, 1991). What continues to be missing from both perspectives, however, is the role of context in the leadership emergence process – namely, the task and interpersonal context of the team. We think this omission is serious considering that the demands of the task and one's peers represent important aspects of the team environment (Steiner, 1972) and thus are likely to form the backdrop against which one's behaviors are evaluated for leadership (DeRue & Ashford, 2010).

Consider the example of innovation project teams, an organizational form increasingly relied upon to generate and fuel competitive advantage (Zhang & Bartol, 2010). Unlike in teams where task demands may be stable over time (Sundstrom, De Meuse, & Futrell, 1990), innovation project teams begin by generating a divergent set of ideas, then take further action on a subset of those ideas, and ultimately move the idea toward full implementation and widespread adoption in the organization (Harvey, 2014; Perry-Smith & Mannucci, 2017). The initial divergence required to generate new ideas and the increasing convergence of team attention required to enact and implement selected ideas implies that the behaviors allowing members to emerge as leaders may be different in different phases of innovation. Yet, current models do not account for these temporal task contingencies in the leadership emergence process.

Moreover, because leadership emergence is granted by fellow teammates, one's peers are central to this emergence process. Recent work has demonstrated that peers' own characteristics (e.g., extraversion and conscientiousness) affects who emerges as a leader (Kalish & Luria, 2016), but it has not considered how fellow teammates, along with the focal individual, are also active contributors to the team task. Because others' contributions to the task likely shape the way a given member's contributions are valued for leadership emergence, it is important to consider how peers' contributions to addressing divergent and convergent task demands in the innovation process also serve as a contingency of leadership emergence.

Toward this purpose, we propose a middle range theory of leadership emergence in innovation project teams. We focus on this context not only because of their prevalence and strategic importance to organizations, but also because the dynamic nature of the innovation process offers new insights on how the temporal task and interpersonal context of the team can shape leadership emergence processes, which may also be useful in informing leadership

emergence processes in other dynamic team contexts (Kozlowski, Gully, McHugh, Salas, & Cannon-Bowers, 1996; Pinder & Moore, 2012). We rely on a functional leadership perspective (McGrath, 1962) as our overarching framework, which posits that leadership emergence accrues to individuals whose actions address needs of the team that are otherwise not being addressed (Morgeson et al., 2010). Functional leadership theory fits our research purpose in that it allows for leadership emergence to be behavior-based *and* sensitive to contingencies associated with the dynamic task and interpersonal context in the course of task accomplishment.

By integrating functional leadership theory with the team creativity and innovation literature, our theoretical model has three distinct features. First, we delineate leadership emergence processes as they unfold in the *idea generation phase* and *idea enactment phase*. As these two phases represent the initial shift from divergence (generating many different alternatives) to convergence (taking action on a selected alternative), they are strategic from the standpoint of understanding how leadership emergence occurs in view of these dynamic task demands (Harvey, 2014; Perry-Smith & Mannucci, 2017). In addition, because the two phases occur relatively early in the innovation process, they powerfully shape both the quality of idea that is generated as well as the quality of implementation downstream (Harvey, 2014; Perry-Smith & Mannucci, 2017). Therefore, understanding how leadership emergence occurs in these phases may hold important implications for ultimate outcome of the innovation project team.

Second, in view of requirements to be divergent and convergent across these phases, our model focuses on two behaviors likely to facilitate leadership emergence in this context: expressions of new ideas that expand the menu of options the team is considering (*constructive contributions*) and expressions of support for ideas with merit (*supportive contributions*). Our focus on constructive and supportive contributions is also consistent with research on leadership

of teams involved in creativity and innovation, which argues that collaborative creativity relies on individuals' creative contributions *and* supportive contributions that trigger, enable, and sustain creative thinking and behavior in the team (Mainemalis, Kark, & Epitropaki, 2015).

Third, in line with functional leadership theory's premise that member behaviors meeting task-relevant needs will facilitate leadership emergence, we think phase requirements to be divergent or convergent will produce phase-specific effects on how members' behaviors are evaluated for leadership emergence. That is, we propose that constructive contributions, by meeting needs for divergence, will promote leadership emergence in the idea generation phase, whereas supportive contributions, by meeting needs for convergence, will promote leadership emergence in the idea enactment phase. Based on the additional premise that the functionality of one's contributions for leadership emergence are strongest when others in the team are <u>not</u> contributing to meet those team needs, we further propose the relationship between an individual's constructive and supportive contributions and leadership emergence in each phase to be stronger when peers' like contributions are low. Our overarching model appears in Figure 1.

Insert Figure 1 about here.

Our work offers the following contributions to the existing literature. First, by advancing a dynamic and contextualized understanding of leadership emergence that explains how temporal task demands and peer context jointly shape leadership emergence over time, we extend prior models of leadership emergence that have focused on relatively static individual differences and behaviors and instead highlight the importance of enacting context-relevant behaviors at the right time, among the right peers. Second, we also contribute to the literature on the leadership of creative and innovation teams, which has tended to focus on the actions of formal leaders

facilitating team creativity (Amabile, Schatzel, Moneta, & Kramer, 2004; Mumford, Scott, Gaddis, & Strange, 2002a; Mainemalis et al., 2015) but rarely considered informal forms of leadership or the processes by which they dynamically emerge over time. Our approach is potentially valuable given that such fluid leadership structures may help teams to navigate opposing requirements of divergence and convergence in the innovation process (Miron-Spektor & Erez, 2017). In addition, as recent work has highlighted the idea enactment phase as a strategically important yet understudied intermediate stage that straddles between idea generation and idea implementation (Harvey, 2014; Perry-Smith & Mannucci, 2017), our investigation contributes new insights on how the demands of idea generation and idea enactment hold unique implications for leadership emergence. Lastly, we contribute to the team creativity and innovation literature, which to date has not explored the social consequences that accrue to individuals as a function of how they contribute to the innovation process. Our emphasis on leadership emergence is fitting, not only because achieving higher social standing in groups is psychologically and instrumentally desirable for the individual (Magee & Galinsky, 2008), but also because leadership emergence lends specific individuals the agency to influence the direction, process, and outcomes of the team (Aime, Humphrey, DeRue, & Paul, 2014). Our work thus sheds light on whether and when it is personally advantageous for members to contribute in a constructive or supportive manner.

Theoretical Background and Hypotheses Development

A Functional Leadership Perspective of Leadership Emergence

Leadership emergence describes the extent to which a person who is not in a formal position of authority is perceived to "lead" other members of a group (Lord et al., 1986; Schneider & Goktepe, 1983; Taggar et al., 1999). Because leadership can be conceptualized as a

shared property of the group (Carson, Tesluk, & Marrone, 2007; Morgeson et al. 2010), leadership emergence describes the degree of leadership status granted to an individual compared to others in the overall level of shared leadership of the team. Thus, an individual's leadership emergence is higher to the extent others in the team collectively and willingly grant leadership status to that individual while simultaneously taking a followership status in relation to him or her (DeRue & Ashford, 2010).

Most centrally, the granting of leadership status is a socially constructed and dynamic process (DeRue & Ashford, 2010), allowing one's leadership status to change over time as a function of contexts and persons (Aime et al., 2014). This fluid and subjective perspective of leadership emergence is consistent with functional leadership theory, which maintains that leadership does not emerge solely as a function of fixed personal characteristics or particular behavior, but also in conjunction with the circumstances under which the group integrates and organizes its activities toward objectives (Bennis, 1959; Knickerbocker, 1948). In fact, McGrath's (1962) insight that a leader's job is "to do, or get done, whatever is not being adequately handled for group needs" (p. 5) further implies a contingency perspective in which one is more likely to emerge as a leader when one's contributions are well-matched to address task demands presently facing the team, particularly when those demands aren't otherwise being addressed in the team. Consistent with this line of reasoning, prior research has shown that more leadership status is granted to members seen as fulfilling roles necessary for group functioning and team task accomplishment (Hollander, 1961; Mann, 1959) and whose contributions are perceived to be valuable in the eyes of peers (Berger, Rosenholtz, & Zelditch, 1980).

Although helpful as an overarching framework, functional leadership theory remains open with respect to the content of team needs and how members can best address those needs.

As such, applications of functional leadership theory depend heavily on the context (Hackman & Wageman, 2005; Klein, Ziegert, Knight, & Xiao, 2006; Morgeson et al., 2010; Zaccaro, Rittman, & Marks, 2001). Innovation project teams are no exception as the types of task requirements associated with the innovation process inform both the types of contributions likely to enhance leadership emergence as well as form contingencies of those relationships.

Constructive and Supportive Contributions in Innovation Teams

Process models have followed a cyclical perspective to depict the way innovation project teams achieve collective outputs (Van de Ven & Poole, 1995). According to this perspective, innovation project teams cycle through several distinct phases of activity (Harvey, 2014). In the idea generation phase, the team moves from a blank slate towards generating a divergent list of potential ideas or solutions to a problem. Once a number of ideas are generated, the team enters the idea enactment phase, during which the team selects one option from the list generated and collectively takes action on it toward greater refinement and physical realization. (Harvey, 2014). The action taken depends on the nature of the innovation team task. For example, idea enactment with respect to a new product idea might involve developing a proposal that describes the look, feel, and messaging for the product, whereas in a design context, idea enactment might involve building a prototype and testing its viability (Perry-Smith & Mannucci, 2017).

In this regard, idea enactment embodies elements of creative idea refinement because generating and enacting ideas can become the source of new associations and breakthrough advancements (Harvey, 2014). At the same time, because idea enactment represents an initial step toward implementation, it can be a starting point for discovering requirements, uncovering unforeseen problems, and generating plans for successful full implementation (Mumford, Schultz, & Osburn, 2002b). However, idea enactment is not full implementation because the idea

itself is still evolving and the activities involved with idea enactment do not yet include idea championing, diffusion, or adoption in the organization (Anderson, Potočnik, & Zhou, 2014; Basadur, 2004; Perry-Smith & Mannucci, 2017). Thus, because the phases of idea generation and idea enactment have implications for both the idea that is developed as well as the team's subsequent ability to implement the idea (Perry-Smith & Mannucci, 2017), it is important to understand how leadership emergence occurs similarly (or differently) in each phase.

One reason why leadership emergence likely differs across the two phases is because generating a plethora of potential ideas in the idea generation phase and making decisions about which idea to enact and how it should be enacted in the idea enactment phase reflect the first shift in the team's focus from divergence and exploration to convergence and execution in the innovation process. Whereas idea generation emphasizes random variation and divergent inputs, the process of selecting a single alternative and taking action on it is thought to facilitate creative synthesis precisely because it provides a focal point for collective attention, converges group members' perspectives into a shared understanding, and moves the team toward developing and refining the enacted idea (Carlile, 2002; Nicolini, Mengis, & Swan, 2012). These phase differences suggest that teams must navigate divergent then convergent task demands to be successful (Miron-Spektor, Erez, & Naveh, 2011), and, consistent with functional leadership theory, member contributions that help to address these phase-specific demands should facilitate leadership emergence (DeRue & Ashford, 2010; Morgeson et al., 2010).

Although there are a number of other ways members can contribute to the innovation process, such as creating an open social climate, coordinating and monitoring team actions, or engaging in strategic planning (Marks, Mathieu, & Zaccaro, 2001; Taggar, 2002), we focus on constructive and supportive contributions because they directly address divergent and convergent

requirements of the task, respectively. Similar to the expressions of individual creativity in a group setting (Kurtzberg & Amabile, 2000-2001), we define *constructive contributions* as the expressions of new ideas that expand the menu of options the team is considering (Harvey, 2014; Harvey & Kou, 2013; Mainemelis et al., 2015). However, constructive contributions can also include expressions that alter others' ideas. For example, constructive contributions can improve an idea by revising, adding, or subtracting details from it (Harvey, 2014; Graham & Bachmann, 2004). Importantly, constructive contributions can occur in both the idea generation phase and the idea enactment phase. In the idea generation phase, constructive contributions help move a team from a "blank slate" to one filled with different options from which the team can choose for further development. In the idea enactment phase, constructive contributions help to create a menu of action-oriented options for how to enact a chosen idea. Thus, regardless of the phase, the core function of constructive contributions is to help promote divergence by populating and expanding the options, ideas, or actions the team is considering.

By *supportive contributions*, we refer to expressions of support for ideas with merit. Also referred to some as affirmations (Harvey & Kou, 2013), supportive contributions produce convergence around specific ideas or actions. Compared to constructive suggestions, which are thought to be proactive and agentic in nature (Liang, Farh, & Farh, 2012), supportive contributions are nearly always reactive in that they are expressed in response to others' suggestions. Although supportive contributions are sometimes construed as the antitheses of creativity (Harvey & Kou, 2013) and may appear to be more "follower-like" than facilitative of leadership emergence (DeRue & Ashford, 2010), supporting others' ideas may play an important function in settings where creativity occurs in a collaborative context (Mainemelis et al., 2015). As qualitative and quantitative observations of innovation teams have found, convergence and

conformity are essential components to determining which ideas have value and are worth pursuing, without which the team is unable to select or rally around high quality ideas (Harvey, 2014; Miron-Spektor et al., 2011). By expressing support for an idea, supportive contributions affirm and build solidarity around ideas that should be retained and further developed (Perry-Smith & Mannucci, 2017). Supportive contributions can occur in both the idea generation and idea enactment phases. In the former, it facilitates convergence around initially generated ideas; in the latter, it creates convergence around suggested ideas about how a specific idea might enacted. Thus, regardless of phase, the core function of supportive contributions is to solidify and build convergence for the ideas or actions the team is considering.

Phase- and Peer Context as Contingencies of Leadership Emergence

We now consider *when* exhibiting constructive or supportive contributions will accrue to more or less leadership emergence for the individual. As noted previously, the connection between behavior and leadership emergence depends on the subjective process by which fellow members perceive, interpret, and value each other's contributions. Applying functional leadership theory (McGrath, 1962), we think those perceptions are driven by a) how well members' contributions address the task demands of a specific phase of the innovation cycle, and b) how other members of the team are addressing those task demands. The sequential progression from idea generation to idea enactment also creates a dynamic where, as a team traverses toward idea enactment, the need to collectively execute on courses of action becomes increasingly salient (Gersick, 1988). These differential and sequential demands across phases have important implications for *when* constructive and supportive contributions are more or less related to leadership emergence. Consistent with functional leadership theory's emphasis on matching one's contributions to address salient task demands facing the team, we expect that

leadership emergence will increase for members whose actions facilitate divergence in the idea generation phase (i.e., engage in constructive contributions) and convergence in the idea enactment phase (i.e., engage in supportive contributions).

At the same time, the functional leadership perspective allows for the possibility that anyone who attempts to address the needs of the team can emerge as a leader (Morgeson et al., 2010). This suggests that, along with the focal member, other members can also contribute in ways that functionally address team needs, which in turn form a context for interpreting the extent to which a particular member's contributions are valued. Consistent with functional leadership theory's emphasis on addressing unmet team needs, we think that when fellow teammates' constructive or supportive contributions are high, a given member's contributions in the same domain will be seen as less functionally important because team needs are amply addressed by others. These arguments are reminiscent of substitutes for leadership theory (Kerr & Jermier, 1978) in that when elements of the context fulfill needs of the team, the impact of leader behavior is diminished. On the other hand, when fellow teammates' contributions in a given domain are low, this presumably creates a context of stronger need, which in turn amplifies the extent a given member's contributions meeting those needs will merit leadership emergence. Indeed, studies have shown that leader impact was more positive when the team was *not* prepared to handle certain types of task events (Morgeson, 2005; Yun, Faraj, & Sims, 2005).

Implications for Leadership Emergence

Taken together, we think a) constructive and supportive contributions will enhance leadership emergence differently across the idea generation and idea enactment phases and b) these relationships will further be modified by the contributions of one's fellow teammates. Specifically, we expect that constructive contributions will primarily enhance leadership

emergence in the idea generation phase. By supplying new ideas and suggesting ways in which existing ideas can be improved (Harvey, 2014), constructive contributions help to generate a broad list of viable ideas that are divergent, novel, useful, and of high-quality so that further development of ideas at a later point in time is possible (Goh, Goodman, & Weingart, 2013). Also, because raising new ideas may trigger other members to think in new directions and generate alternative solutions (Taggar, 2002), constructive contributions help the team to engage in out-of-the-box and explorative thinking (West, 2002), emphasizing divergence and exploration over convergence and exploitation (cf. March, 1991; Miron-Spektor et al., 2011). In these ways, constructive contributions help the team to meet requirements in the idea generation phase for divergence, which in turn increases the likelihood fellow members will reward constructive contributions with greater leadership emergence in this phase.

As the team transitions to the idea enactment phase, there may continue to be a role for constructive contributions to generate new and divergent ways to enact the idea (Perry-Smith & Mannucci, 2017). However, it is more imperative in this phase for the team to converge in their thought processes, build consensus around specific plans of action, and ensure successful execution of enacting the idea in the time allotted (Harvey, 2014). Because constructive contributions function primarily to increase divergence as opposed to convergence, constructive contributions may not enhance leadership emergence in the idea enactment phase. In indirect support for these arguments, empirical research found that divergent and change-oriented contributions are more positively evaluated in early rather than later phases of project team work (Farh, Lee, & Farh, 2010; Whiting, Maynes, Podsakoff, & Podsakoff, 2012).

Hypothesis 1: Constructive contributions are positively related to leadership emergence in the idea generation phase, more so than in the idea enactment phase.

Further, we expect that in the idea generation phase, a focal individual's constructive contributions will be particularly rewarded with leadership emergence in teams where other members' constructive contributions are low. In this context, peers' contributions are not necessarily ones that expand the menu of ideas (Goh et al., 2013), and therefore it produces a void. Because the divergent needs of the generation phase are not being met by other members of the team, the function of constructive contributions expressed by a focal member to help the team achieve divergent goals is likely to be relatively larger, thus strengthening the relationship between constructive contributions and leadership emergence in this phase.

Hypothesis 2: The positive relationship between constructive contributions and leadership emergence in the idea generation phase is stronger when peers' constructive contributions are low.

With respect to supportive contributions, although some research suggests that affirmations help teams to determine which preliminary ideas have merit (Harvey & Kou, 2013), such contributions may not facilitate leadership emergence in the idea generation phase because reinforcing ideas in a reactive manner does not help introduce divergence during a time when many different ideas is needed. In fact, supportive contributions may potentially produce premature consensus and signal satiation that may suppress others' attempts to add to or improve on ideas in the team's creative thinking (De Dreu & West, 2001), neither of which may be seen as helpful in view of the divergent task demands of the idea generation phase.

In contrast, in the idea enactment phase, teams are tasked with taking an abstract idea and bringing it toward greater physical tangibility (Harvey, 2014). One of the key requirements in this phase is to converge group members' perspectives toward a shared understanding of the idea and using collective attention to develop and refine the enacted idea (Harvey, 2014). Indeed, idea

enactment is an opportunity to build collective knowledge and reduce misunderstanding in the team about the team idea. Given this, we think supportive contributions facilitate this process by creating convergence in the team's thinking around the chosen idea and then building unity and buy-in from the team around how best to enact that idea. Further, because idea enactment involves collective action, supportive contributions reinforcing the plan of enactment facilitates the coordination of resources needed to carry out that plan. Indeed, in her observations of project teams over time, Gersick (1989) noted that unsuccessful teams were those that suffered from low consensus, low solidarity, and fractured attention, especially in the idea enactment phase. Although this research did not look specifically at supportive contributions and leadership emergence, it supports our expectation that because supportive actions facilitate the convergent environment needed for ideas to be successfully enacted, supportive contributions are likely rewarded with leadership emergence in this phase.

These arguments bear some resemblance to prior research suggesting that to be effective, formal leaders of creative and innovation teams should actively encourage and support members' ideas (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Mumford et al., 2002a; Oldham & Cummings, 1996; Mainemelis et al., 2015). However, they differ in that, when enacted by a team member, we think supportive contributions will enhance leadership emergence primarily when convergent task demands are salient in the idea enactment phase. Indeed, Perry-Smith and Mannucci (2017) proposed that as teams move ideas from abstract cognition to a form that is sharable with others, teams need support to fuel their motivation to develop the idea as well as supportive feedback that they are on the right track. When enacted outside of the idea enactment phase, however, members' supportive contributions may be seen as passive and reactive behaviors unlikely to accrue leadership perceptions from others (DeRue & Ashford, 2010).

Hypothesis 3: Supportive contributions are positively related to leadership emergence in the idea enactment phase, more so than in the idea generation phase.

Moreover, we think supportive contributions in the idea enactment phase will be especially rewarded with leadership emergence in teams where fellow peers' supportive contributions are low. When peers are not actively speaking up in the form of supportive contributions that validate and facilitate consensus around specific courses of action, the team's idea enactment process may be stalled because it is unclear whether certain ways of enacting the idea are better than others or whether the team is in agreement that those actions should be carried out. In fact, a lack of supportive contributions may lead the team to abandon otherwise good options for enactment and undermine intrinsic motivation to enact the idea (Perry-Smith & Mannucci, 2017). We think this void created by low peers' supportive contributions is particularly problematic in the idea enactment phase due to the salient need to collectively execute agreed-upon courses of action (Gersick, 1988). Thus, because the convergent needs of the idea enactment phase are not being met by other members of the team, the function of supportive contributions expressed by a focal member to help the team achieve convergent goals is likely to be relatively heightened, thus strengthening the relationship between supportive contributions and leadership emergence in this phase.

Hypothesis 4: The positive relationship between supportive contributions and leadership emergence in the idea enactment phase is stronger when peers' supportive contributions are low.

Overview of Studies

We tested our model in two studies using laboratory teams engaged in idea generation and enactment phase simulations of innovation project work (West, 2002). Study 1 featured computer-mediated teams that generated new product ideas for a college student market and then

enacted one of those ideas by developing the look, feel, and messaging for the product. Study 2 featured face-to-face teams that generated designs for an egg safety device and then enacted one of those designs by building a prototype from an array of materials. The phase structure in both studies allowed us to capture members' contributions and their impact on leadership emergence in the idea generation and idea enactment phase, respectively. At the same time, the two studies differed with respect to a) the mode of collaboration (computer-mediated versus face-to-face), and b) the nature of idea enactment demands. We did this in order to assess which aspects of our theoretical model would generalize across different types of team collaboration and innovation task demands (Lykken, 1968). Indeed, given that innovation project teams increasingly collaborate using virtual tools and platforms to generate and enact ideas (Kratzer, Leenders, & Van Engelen, 2006) and the wide variety of ways in which creative ideas can be enacted (Harvey, 2014; Perry-Smith & Mannucci, 2017), mirroring these variations in our two studies allowed us to generate more precise knowledge of how our proposed relationships might or might not hold across a variety of innovation project teams. Both studies were approved by the Institutional Review Board of Michigan State University (IRB#12-1084: Voice & Innovation Team Task Study).

Study 1 Method

Participants and Procedure

We composed 97 leaderless innovation teams from 379 undergraduate business students of a large university in the Midwestern region of the United States. Prior to arriving at the lab, participants completed an online survey that assessed demographics, cumulative GPA, and personality traits. Upon arrival, participants were randomly assigned to teams (~3.89 members) and briefly introduced themselves to each other in a face-to-face meeting. Participants were then

given five minutes to independently generate new product ideas, which served as a baseline for each individual's generative capabilities prior to beginning the team task.

To simulate the dual phases of idea generation and idea enactment, teams were given two tasks in succession. In the idea generation phase, teams were given 25 minutes to generate a team list of innovative product ideas by discussing individually-generated ideas with one another and/or generate new ones together as a team in Google Hangouts using assigned usernames, and record a "team list of ideas" in Google Drive. In the idea enactment phase, teams were instructed to select what they believed to be their best idea and given 45 minutes to enact it by producing a written pitch describing key characteristics of the product and a graphic representation of their product in Google Drive. These activities reflected elements of idea enactment with respect to creating physical documents that elaborate on the look, feel, and messaging of a chosen product idea (Perry-Smith & Mannucci, 2017). We chose to have teams collaborate through Google tools because they allowed us to cleanly capture members' expressed contributions over the course of task accomplishment without potential complications such as production losses or other confounding factors such as vocal tone (Hall, 1980), vocal intensity (Laplante & Ambady, 2003), and physical proximity of the speaker (Albert & Dabbs, 1970) that might affect leadership emergence ratings. Missing data from five teams reduced our final sample to 92 teams composed of 358 members (44.1% female, average age 21.2 years, 68.6% White).

Measures

Table 1 shows the descriptives and correlations for all study variables.

Insert Table 1 about here.

Focal member's and peers' constructive and supportive contributions. As an objective indicator of members' contributions, we trained two hypothesis-blind research assistants to assess the amount of constructive and supportive contributions expressed by a given member in each phase, as observed from Google Hangouts records. Research assistants coded constructive contributions as instances where individuals spoke up with new ideas for the team to consider, and supportive contributions were coded as instances where individuals spoke up to affirm others' suggestions. In cases where both types of contributions occurred in the same utterance, they were double-coded as both constructive and supportive contributions. Examples of constructive and supportive contributions appear in Table 2.

Insert Table 2 about here.

After extensive training on pilot data, all 92 team chats were independently coded by the two research assistants and compared for agreement. Correlations of coded data showed high consistency and agreement between the two coders; constructive contributions correlated at r = .92 in the generation phase and r = .96 in the idea enactment phase, and supportive contributions correlated at r = .88 in both phases. Therefore, we averaged the ratings of the coders to produce a single score of constructive and supportive contribution for each phase. To calculate peers' contributions, we averaged observer ratings' of constructive and supportive contributions of all other members on the team for each phase, excluding the focal individual's scores. Moreover, because our moderators reflected between team differences in peers' contributive and supportive contributions, we calculated intra class correlations clustered by team and assessed the variance in contributions across teams compared to variance among members within the team. Based on cut-offs recommended by James (1982) and Bliese (2000), ICC indices for constructive and

supportive contributions in the generation phase were acceptable (constructive contributions: ICC_1 = .44, ICC_2 = .76, $F_{91,266}$ = 4.11, p < .01; supportive contributions ICC_1 = .36, ICC_2 = .69, $F_{91,266}$ = 3.21, p < .01). Likewise, ICC values for constructive contributions (ICC_1 = .31, ICC_2 =.64, $F_{91,266}$ = 2.80, p < .01) and supportive contributions in the idea enactment phase (ICC_1 = .38, ICC_2 = .71, $F_{91,266}$ = 3.44, p < .01) were also acceptable. These results suggest that there was meaningful variance between teams on our moderating variables.

Leadership emergence. Referencing each member at the end of each phase, participants were asked "*During the ___ phase, to what degree did your team rely on this individual for leadership?*" (*1 = not at all* to *7 = a very large extent*). Consistent with the notion that leadership is a network-like property composed of dyadic nominations of leadership emergence (Carson et al., 2007), we operationalized an individual members' leadership emergence as centrality in the leadership network. Specifically, we treated the sum of peers' ratings of an individual member's leadership emergence as "votes" of leadership and divided this sum by the total attainable rating for that individual, adjusted for the size of the team. Scores ranged between zero and 1, where higher scores indicated that the individual received more leadership nominations from peers and was granted a higher percentage of the possible leadership attainable as a member of the team.

Control Variables

On the basis of prior research on personal antecedents of leadership emergence, we controlled for gender (e.g., Eagly & Karau, 1991) and GPA as a proximal measure of intelligence (e.g., Taggar et al., 1999). Given their association with leadership emergence (Judge et al., 2002), we also controlled for the Big Five personality traits using the IPIP (Goldberg, 1999). Because members interacted through Google tools, we controlled for computer attitude as an individual difference in comfort with communicating online using seven items adapted from

Loyd and Gressard (1984) – e.g., "*I'm sure I could communicate with others in an advanced way through computers*" (*1= Strongly Disagree to 7 = Strongly Agree*), α = .75. We also controlled for idea fluency, operationalized as the number of product ideas generated by individual team members, because it serves as a quantitative proxy for cognitive creativity (Kurtzberg, 2005) and an important aspect of our theoretical contribution was to demonstrate how behavioral contributions predicted leadership emergence above and beyond individual differences (Judge et al., 2002). Although higher levels of idea fluency likely facilitates constructive contributions, not all constructive contributions are a direct transfer of one's individually generated idea into the team discussion, and some ideas may be withheld (Paulus & Yang, 2000).

At the team level, we controlled for team size because members' opportunities to contribute and gain leadership may be affected by the number of members on the team. We also controlled for team diversity as operationalized by Blau's Index (Blau, 1977) for both ethnicity and declared area of study to account for the breadth of functional diversity (Shin, Kim, Lee, & Bian, 2012). To account for the possibility that dispersion of contributions at the team level might provide an affect members' emergence as leaders, we also controlled for the variations in teams' supportive and constructive contributions, operationalized as standard deviations.

Finally, as a rigorous test of Hypotheses 2 and 4, we included all possible interaction terms combining the focal member's and peers' contributions. This acknowledges the possibility that leadership emergence may arise when peers' and a focal member's contributions complement each other, especially in an innovation context where achieving a balance between divergent and convergent approaches may be desirable (Miron-Spektor et al., 2011).

Analyses

Given the multilevel nature of our model, we tested our hypotheses using hierarchical linear modeling (HLM; Raudenbush, Bryk, & Congdon, 2004). Level 2 variables included the control variables of team size, team diversity, and standard deviations of teams' constructive and supportive contributions, and Level 1 variables included remaining controls, focal members' constructive and supportive contributions in both phases, and leadership emergence in both phases. Because the set of peers differed by focal individual, aggregate values of peers' constructive and supportive contributions varied at the individual level of analysis and were also treated as Level 1 variables. However, because a subset of those peers were shared across individuals, it was important to address this nesting effect by using HLM.

All Level 1 variables – except gender and peers' constructive and supportive contributions – were group-mean centered to reflect the possibility that being relatively higher or lower than the group average on these variables might affect leadership emergence. Further, peers' constructive and supportive contributions were grand-mean centered, reflecting between group differences in the central tendency of teams to be higher or lower in their contributions. Interaction terms between a focal member's constructive or supportive contributions with peers' contributions were calculated from centered terms before being entered into HLM as uncentered terms. Team size and other team level control variables were grand-mean centered.

Because the two phases unfolded in a path dependent manner where ideas generated in the generation phase carried forward to be enacted in the idea enactment phase (Goh et al., 2013), and in view of research suggesting that social hierarchies, once formed, tend to be enduring over time (Kilduff & Galinsky, 2013; Magee & Galinsky, 2008), the degree of leadership emergence carryover from one phase to the other made it inappropriate to "stack" or treat the phases as independent, interchangeable observations. Indeed, as seen in our results,

generation and idea enactment leadership emergence were strongly related (B = .667, t = 10.22, p < .05; Table 4, Model 1). To account for the reality that the two phases are fundamentally linked within the same episode and acknowledge the sequential ordering of the two phases, we controlled for all predictors of generation phase leadership emergence when examining the effects of predictors on idea enactment phase leadership emergence (Farh & Chen, 2018). This latter step isolates the incremental variance gained in the idea enactment phase.

Results

Table 3 and Table 4 summarize the results of our analyses. Because prior research suggests that constructive and supportive contributions are unlikely to produce *negative* effects on leadership emergence (DeRue & Ashford, 2010; DeRue et al., 2011; Harvey & Kou, 2013; Mainemelis et al., 2015) and because our hypotheses were directional, one-tailed tests of significance were used (Kimmel, 1957).

Insert Table 3 and Table 4 about here.

Hypothesis 1 predicted that constructive contributions are positively related to leadership emergence in the idea generation phase, more so than in the idea enactment phase. Model 2 (Table 3) shows constructive contributions significantly predicted leadership emergence in the idea generation phase (B = .017, t = 4.256, p < .01). Model 2 (Table 4) shows, controlling for idea generation phase contributions and leadership emergence, constructive contributions were not related to leadership emergence in the idea enactment phase (B = -.003, t = 1.445, *n.s.*). Using MPLUS (Muthén & Muthén, 2012), we compared the effects of constructive contributions on leadership emergence in each phase and found the effects to be significantly and

comparatively stronger in the idea generation phase than in the idea enactment phase (B = .017, s.e. = .004, t = 3.912, p < .01). Thus, Hypothesis 1 was supported.

Hypothesis 2 predicted that the positive relationship between constructive contributions and leadership emergence in the idea generation phase is stronger when peers' constructive contributions are low. In Model 3 (Table 3), only the interaction term composed of constructive contributions and peers' constructive contributions significantly predicted idea generation phase leadership emergence (B = -.001, t = -1.783, p < .05). Simple slope calculations (Aiken & West, 1991; Figure 2) showed that the slope between idea generation phase constructive contributions and leadership emergence when peers were low in constructive contributions (B = .025, t = 4.053, p < .01) was more positive than the slope when peers were high in constructive contributions (B = .017, t = 3.827, p < .01). Therefore, Hypothesis 2 was supported.

Hypothesis 3 predicted that supportive contributions are positively related to leadership emergence in the idea enactment phase, more so than in the idea generation phase. Model 2 (Table 4) shows supportive contributions were positively related to leadership emergence in the idea enactment phase (B = .011, t = 1.737, p < .05). However, contrary to our expectations, Model 2 (Table 3) shows supportive contributions were positively related to leadership emergence in the idea generation phase as well (B = .013, t = 3.081, p < .05). In fact, in comparing the effects of supportive contributions on leadership emergence in each phase, we found the difference to be nonsignificant (B = -.002, s.e. = .008, t = -.294, *n.s.*). Thus, Hypothesis 3 was not supported.

Finally, Hypothesis 4 predicted that the positive relationship between supportive contributions and leadership emergence in the idea enactment phase is stronger when peers' constructive contributions are low. Model 3 (Table 4) shows the interaction term composed of a

focal member's supportive contributions and peers' supportive contributions did not significantly predict idea enactment phase leadership emergence (B = .002, *t* = .576, *n.s.*). Therefore, Hypothesis 4 was not supported.

Insert Figure 3 about here.

Study 1 Discussion

The results from Study 1 supported our predictions regarding constructive contributions; the relationship between constructive contributions and leadership emergence is stronger in the idea generation phase than in the idea enactment phase, and this relationship is enhanced when peers' constructive contributions are low. Yet, while study results confirmed our expectations that supportive contributions would promote leadership emergence in the idea enactment phase, we also found that they promoted leadership emergence in the idea generation phase as well. Finally, we did not observe an interaction between focal member and peers' supportive contributions in the idea enactment phase.

Study 1 featured several strengths – namely, observer coding of constructive and supportive contributions in each phase using Google chat transcripts and a realistic product innovation task. However, there were also some limitations. Although some R&D teams are becoming more virtual due to the need for specialized knowledge and skills in the generation of new products (Kratzer et al., 2006), the reliance on computer-mediated technology to accomplish team tasks may have dampened certain aspects of the interpersonal processes involved in leadership emergence compared to face-to-face teams (Kerr & Murthy, 2004). Furthermore, although producing the written pitch and graphic representation of the chosen idea reflected idea enactment activities, this reflects only one type of idea enactment. Thus, we conducted a second

study to test our model in a setting where members interacted face-to-face to design a product and were tasked with build a physical prototype of the selected design.

Study 2 Method

Participants and Procedure

We composed 50 leaderless teams from 189 undergraduate students (36% female, average age 21.07 years, 64.6% White) of a large Midwestern university in the United States. Participants completed an online survey that assessed demographics, cumulative GPA, and personality traits prior to arriving at the lab. Upon arrival, participants were randomly assigned to teams (~3.83 members), seated together, and given time to introduce themselves to one another. The teams were then briefed on the task: using an assortment of materials, each team had to design and build a physical prototype of a device that would protect a raw egg from breaking when dropped from a height of approximately eight feet. Participants were given five minutes to individually generate their own design ideas. Teams were then assigned two tasks in succession. First, to simulate the idea generation phase, teams were given 15 minutes to discuss individually-generated ideas with one another and/or generate new ideas together as a team to produce a team list of design ideas. Then, to simulate the idea enactment phase, teams were given 15 minutes to select a design and build the prototype using the supplies provided.

Measures

Descriptives and correlations for all study variables are presented in Table 5.

Insert Table 5 about here.

Focal member's and peers' constructive and supportive contributions. Team members responded to network-style items rating each other's constructive and supportive

contributions after the generation and idea enactment phases, respectively. Items from Maynes and Podsakoff's (2014) descriptions of constructive and supportive voice were adapted to the innovation context. Constructive contributions were assessed with *"To what extent did this individual speak up with new ideas?"* while supportive contributions were assessed with *"To what extent did this individual speak up in support for ideas with merit?"* (1 = *not at all* to 5 = *a very large extent*). We operationalized focal members' constructive and supportive contributions for both phases as the average of peers' ratings of the focal member. The median r_{wg} for both types of contributions in both phases were the same, $r_{wg} = .83$, indicating that agreement was high among raters. ICC values were acceptable for generation phase constructive contributions ($ICC_1 = .36$, $ICC_2 = .62$, $F_{188,346} = 2.65$, $p < .01$), generation phase supportive contributions ($ICC_1 = .27$, $ICC_2 = .52$, $F_{188,346} = 2.08$, $p < .01$), and enactment phase constructive contributions ($ICC_1 = .14$, $ICC_2 = .33$, $F_{188,436} = 1.49$, $p < .01$). They were marginally significant for idea enactment phase supportive contributions ($ICC_1 = .06$, $ICC_2 = .15$, $F1_{188,346} = 1.18$, $p = .09$).

As in Study 1, peers' contributions were operationalized as the average of constructive and supportive contributions of all other members on the team for each phase, excluding the focal individual's scores. When clustered by team, ICC values for generation phase supportive contributions ($ICC_1 = .29$, $ICC_2 = .61$, $F_{49,139} = 2.58$, $p < .01$), enactment phase constructive contributions ($ICC_1 = .38$, $ICC_2 = .70$, $F_{49,139} = 3.32$, $p < .01$), and enactment phase supportive contributions ($ICC_1 = .52$, $ICC_2 = .80$, $F_{49,169} = 5.10$, $p < .01$) were all well above the recommended cut-offs. ICC values for generation phase constructive contributions ($ICC_1 = .10$, $ICC_2 = .30$, $F_{49,139} = 1.43$, $p = .06$) were marginally significant. These results suggest that there was meaningful variance between teams on our moderating variables.

Leadership emergence. Using the same measure and operationalization as in Study 1, participants were asked to rate each individual's leadership emergence (Carson et al., 2007) (1 = *not at all* to 5 = *a very large extent*).

Control variables

Similar to Study 1, we controlled for gender, GPA, the Big Five personality traits, and individual idea fluency. We also controlled for team size, ethnic diversity, diversity in area of study, and teams' dispersion of constructive and supportive contributions in each phase.

Analyses

We tested our hypotheses using hierarchical linear modeling (HLM; Raudenbush et al., 2004) and centered all predictors in the same manner as in Study 1. We observed a strong carryover effect of generation phase leadership emergence (B = .431, t = 6.46, $p < .05$; Table 7, Model 1). Thus, we controlled for all predictors and leadership emergence in the generation phase when analyzing the effects of predictors on leadership emergence in the enactment phase.

Results

As in Study 1, we employed one-tailed tests for hypothesis testing. Hypothesis 1 predicted that constructive contributions are positively related to leadership emergence in the generation phase, more so than in the idea enactment phase. Model 2 (Table 6) shows constructive contributions significantly predicted leadership emergence in the generation phase (B = .153, t = 6.861, $p < .01$). Model 2 (Table 7) shows constructive contributions were also positively related to leadership emergence in the idea enactment phase (B = .063, t = 2.424, $p < .05$). The effects of constructive contributions on leadership emergence in each phase were found to be significantly and comparatively stronger in the generation phase than in the idea enactment phase (B = .091, s.e. = .032, t = 2.885, $p < .01$). Thus, Hypothesis 1 was supported.

Hypothesis 2 predicted that the positive relationship between constructive contributions in the generation phase and leadership emergence in the generation phase would be moderated by peers' constructive contributions in the generation phase, such that the relationship would be stronger when peers' constructive contributions were low. We found only the interaction term composed of generation phase constructive contributions and peers' constructive contributions was a significant predictor of generation phase leadership emergence (B = -.066, t = -1.760, p < .05; Model 3, Table 6). Simple slope calculations (Aiken & West, 1991; Figure 3) showed that the slope for the relationship between constructive contribution and peers' constructive contribution in the generation phase was stronger when peers were low in constructive contributions (B = .182, t = 6.862, p < .01) than when peers were high in constructive contributions (B = .117, t = 3.447, p < .01). Therefore, Hypothesis 2 was supported.

Hypothesis 3 predicted that supportive contributions are positively related to leadership emergence in the idea enactment phase, more so than in the generation phase. Model 2 (Table 6) shows supportive contributions demonstrated a positive main effect on leadership emergence in the generation phase (B = .085, t = 2.600, p < .05), but this relationship was only marginally significant in the idea enactment phase (B = .050, t = 1.589, p = .06; Model 2, Table 7). Compared to one another, we found the difference to be nonsignificant (B = .052, s.e. = .037, t = 1.413, *n.s.*). Thus, Hypothesis 3 was not supported.

Finally, Hypothesis 4 predicted that the positive relationship between supportive contributions and leadership emergence in the idea enactment phase is stronger when peers' supportive contributions are low. Model 3 (Table 7) shows the interaction term composed of a focal member's supportive contributions and peers' supportive contributions to significantly but *positively* predict leadership emergence in the idea enactment phase (B = .113, t = 1.773, p <

.05). Figure 4 shows that the slope of the relationship between supportive contributions and leadership emergence in the idea enactment phase was positive and significant when peers were high in supportive contributions (B = .124, t = 2.453, p < .01) but not significant when peers were low in supportive contributions (B = .014, t = .475, *n.s.*). Therefore, Hypothesis 4 was not supported.

Insert Figures 4 and 5 about here.

Insert Tables 6 and 7 about here.

Study 2 Discussion

Consistent with Study 1, we found a) constructive contributions promoted leadership emergence more positively in the generation phase than the idea enactment phase, and b) the former relationship was stronger when peers were low in constructive contributions than when high, though the exact pattern of this interaction was slightly different across studies. While the slopes in Study 1 trended toward intersecting (Figure 3), they clearly intersected in Study 2 (Figure 4). We think the face-to-face nature of the team's interactions in Study 2 may have played a role in amplifying this interaction effect. Also consistent with Study 1, we observed the surprising finding that supportive contributions promoted leadership emergence in the generation phase. Given the design and measurement differences across the two studies, these replications are noteworthy and lend greater confidence to our theoretical model. However, in Study 2 we did not find a main effect for supportive contributions in the idea enactment phase, and contrary to our predictions, we found that supporting contributions were more strongly related to idea enactment phase leadership emergence when peers' supportive contributions were *high*. In this regard, Study 2 replicated Study 1's findings with respect to constructive contributions

(Hypothesis 1 and 2) but demonstrated less support for hypotheses with respect to supportive contributions (Hypothesis 3 and 4). We discuss possible reasons for these findings below.

General Discussion

Theoretical Implications

Our first theoretical contribution is to the leadership emergence literature. Although the leadership literature has acknowledged the role of the task and the team context in informing functional leadership (Hackman & Wageman, 2005; Kozlowski et al., 1996; Morgeson et al., 2010), these concepts have not yet extended to models of leadership emergence. By demonstrating that innovation phases and peers' contributions exert contingencies on when constructive and supportive contributions will facilitate perceptions of leadership, we advance a dynamic model of leadership emergence and show in concrete ways how the temporal task and peer context of the team shapes the leadership emergence process. For instance, our results across two studies showed consistent evidence that leadership emergence is shaped by the *type* of contributions (i.e., constructive) members express. Moreover, this effect on leadership emergence was further shaped by *when* those constructive contributions were expressed and the extent to which fellow teammates were *not* expressing constructive contributions. These insights represent important advances to the leadership emergence literature, which has tended to be static in nature and focused exclusively on the traits, behaviors, and abilities of the individual (Judge et al., 2002; Lord et al., 1986). Importantly, although theorists have acknowledged the role of the task and peers in the granting of leadership status (DeRue & Ashford, 2010), their combined influence has neither been formally linked to key elements of the task and peer context nor empirically tested in a relevant context. By incorporating these elements, we uncover new insights for how these contextual factors combine to shape leadership emergence over time.

Second, by highlighting constructive and supportive contributions as important for leadership emergence in innovation project teams and specifying when the enactment of those behaviors will be most impactful, our model illustrates how functional leadership theory can be applied to innovation project teams. This represents an important empirical contribution (Colquitt & Zapata-Phelan, 2007), as most applications of functional leadership theory have been theoretical in nature (e.g., Kozlowski et al., 1996; Morgeson et al., 2010). At the same time, we extend understanding of leadership in innovation teams, which has historically focused on the actions of formal and external leaders that facilitate team creativity (Amabile et al., 2004; Mainemelis et al., 2015; Mumford et al., 2002a). This research has shown that teams are more likely to generate alternative solutions to problems (Anderson & Balzer, 1991; Bass, 1967) and less likely to succumb to groupthink (Leana, 1985) when formal leaders withhold their opinions. However, consistent with research suggesting that processes facilitating leadership emergence are different from those that facilitate leadership effectiveness (Judge, Bono, Ilies, & Gerhardt, 2002; Lanaj & Hollenbeck, 2015), our work demonstrates how constructive contributions – if presented at the right time – may be appreciated by peers in a team with no formal leader because suggesting new ideas addresses divergent demands of the task, making them functional. Thus, our work not only provides a helpful launching point for understanding how organic forms of leadership emerge in innovation teams but also offers new insights with respect to how certain behaviors considered overbearing if enacted by a formal leader may, in fact, facilitate leadership emergence if enacted by a member.

Our third theoretical contribution is the elucidation of the social consequences of individuals' contributions to the team creativity process. As the team creativity literature has traditionally focused on team outcomes and emphasized the importance of individual members'

divergent and convergent contributions in achieving those outcomes (e.g., Harvey & Kou, 2013; Miron-Spektor et al., 2011), there has been a strong neglect of what individual members stand to gain by contributing in one way or the other. By examining leadership emergence as an outcome over the course of the different phases of the innovation cycle, our approach helps to address the question, "*when is it better to present new ideas versus support others' ideas?*" We show that the answer to this question goes beyond the inherent merits of constructive versus supportive contributions and depends also on the phase as well as the contributions of fellow peers.

Interestingly, both studies showed evidence that supportive contributions mattered in both the idea generation *and* idea enactment phase, which is counterintuitive because supporting others' ideas can often be type-casted as a "follower"-type behavior that supports others' leadership emergence (DeRue & Ashford, 2010) and may be considered secondary to contributing new ideas in an innovation context. On the other hand, our findings are consistent with team ideation techniques (e.g., Synectics) that emphasize the importance of facilitating, supporting, and encouraging members' ideas. Particularly in the idea generation phase, because it is unclear whether the solutions generated are sufficiently of high quality to address those problems (Mumford et al., 2002a), the process of generating divergent ideas can be fraught with uncertainty and may feel risky and self-defeating. Without some external sign of validation, individual members may not voice divergent ideas and instead abandon them prematurely (Perry-Smith & Mannucci, 2017). The emotional support and affirmation provided by supportive contributions may thus help to reduce uncertainty (Madjar, Oldham, & Pratt, 2002) and facilitate the intrinsic motivation and efficacy needed to sustain the generation of creative ideas (Zhou, 1998; Shalley & Perry-Smith, 2001). Thus, although supportive contributions do not directly facilitate the content of idea generation and divergent thinking as constructive contributions

might, they nonetheless may serve as a form of positive feedback that the ideas are indeed of high quality, indicate that the team is making progress toward task completion, and fulfill an indirect, supporting function that enables teams to generate divergent ideas in this phase.

Additionally, neither study showed that supportive contributions were more related to leadership emergence in the idea enactment phase when peers' supportive contributions were *low*, indicating that unlike the case of constructive contributions in the idea generation phase, leadership emergence as a function of supportive contributions does not accrue to those who fill unmet needs. A void in peers' supportive contributions may indicate that no one believes the ideas that the team has come up with are worth pursuing or enacting. Although speaking up with supportive contributions technically fills this void, peers may view such behaviors as pushing for an idea that no one else on the team likes or agrees with. Such counter-normative deviance in a phase where convergence and conformity are needed is unlikely to be valued as leadership. In contrast, if a member engages in supportive contributions when his/her peers are also highly supportive, the focal member's behavior may be viewed as conforming to the opinions of others' in the team and also helping to facilitate the convergence needed to accomplish idea enactment.

Practical Implications

Prior to making practical recommendations, it may be useful to first consider the effect sizes and practical significance of our replicated findings. In Study 1, even after controlling for other predictors of leadership emergence, the unstandardized coefficients for constructive contributions and supportive contributions suggest that for every additional contribution made, an individual's leadership emergence increased 1.3-1.7%. While seemingly small, these increases are not insignificant considering that, on average, individuals made 4.57 constructive contributions (SD = 3.27) and 3.37 supportive contributions (SD = 2.68) in the generation phase.

At one standard deviation above the mean, an individual could accrue an additional 13.6% and 7.8% of possible leadership emergence in the generation phase by engaging in constructive contributions and supportive contributions, respectively. Similar impact was found in Study 2, where one standard deviation above the mean in peers' ratings of member's constructive contributions (SD = .76) accrued an additional 11.6% in leadership emergence, while one standard deviation above the mean in peers' ratings of member's supportive contributions (SD = .77) accrued to a 6.5% gain in leadership emergence. Moreover, both studies showed that members saw an additional .4% of variation in generation phase leadership emergence when they engaged in constructive contributions when their peers did not.

We also calculated standardized coefficients of both studies by multiplying the unstandardized regression coefficient by the ratio of the standard deviation of each predictor to the standard deviation of leadership emergence in the generation phase (Snijders & Bosker, 2012), allowing us to compare effect sizes across predictors within each study. In both Study 1 and Study 2, we found the standardized coefficients for constructive contributions (Study 1 = .36, Study 2 = .73) and supportive contributions (Study 1 = .22, Study 2 = .41) were larger than that for trait extraversion (Study 1 = .17, Study 2 = .09), which has been widely accepted as one of the strongest predictors of leadership emergence (Judge, Bono, Ilies, & Gerhard, 2002). These results indicate that engaging in well-timed contributions that promote the team's progress toward task completion are stronger predictors of leadership emergence than trait extraversion.

In sum, the analyses above point to the value of engaging in constructive and supportive contributions to enhance one's leadership status. However, to see these gains, one must engage in constructive and supportive contributions in a dynamic and context-sensitive manner by matching the timing of one's contributions to meet salient demands of the phase and considering

teammates' contributions. Indeed, we found that while constructive contributions yielded leadership emergence in the generation phase, those same behaviors did not generate additional leadership emergence in the idea enactment phase. Additionally, enacting constructive contributions may not enhance leadership emergence if others are already enacting behaviors that meet the need.

For managers of innovation teams, our study results hold implications for strategically shaping the leadership emergence processes of innovation teams. Specifically, managers can foster the leadership emergence of specific individuals by encouraging them to contribute in constructive or supportive ways at different times in the innovation cycle or training them to observe their peers' contributions and recognize when their contributions may be particularly valued. Relatedly, in view of the need to manage opposing requirements to diverge and converge throughout the creativity process (Gebert et al., 2010; Gong, Zhou, & Chang, 2013), this tension may potentially be made less onerous if managers not only composed teams of divergent and convergent thinkers (Miron-Spektor et al., 2013), but also encouraged a constructive versus supportive leader to emerge in response to task demands. Future research may assess these possibilities.

Limitations, Thoughts on Replications, and Future Research

As with all research, no study is perfect, and the theoretical and practical implications outlined above should be considered in light of our studies' limitations. The inconsistent pattern of results for supportive contributions across our two studies is certainly a limitation. Specifically, we found support for a positive main effect of supportive contributions on idea enactment phase leadership emergence in Study 1, but not in Study 2. Additionally, we found no interaction effect between a focal member's supportive contributions and that of his or her peers

in Study 1, but in Study 2, we found peers' supportive contributions *enhanced* the relationship between supportive contributions and leadership emergence in this phase. One possible explanation for these inconsistent results is the difference in power to detect effects in our studies. Post-hoc statistical power analyses showed that, for a desired alpha value of .05, we had high power (i.e. .78 and above) to detect the main effect for constructive contributions in the generation and enactment phases of both Study 1 and Study 2. However, power to detect an effect for supportive contributions in the enactment phase was low (i.e., .57 in Study 1 and .47 in Study 2). Moreover, power to detect interactions was mixed. Specifically, in Study 1, power was .99 for testing Hypothesis 2 but .25 for testing Hypothesis 4; in Study 2, power was .50 for testing Hypothesis 2 but .99 for testing Hypothesis 4.

Relatedly, our inconsistent results also call to attention the issue of different replication study designs and their tradeoffs. Tsang and Kwan (1999) differentiate exact replications that employ the same methods, procedures, and populations from conceptual extensions that test the same theory but utilize different procedures, measures, or analytical approaches to do so. The former has the potential to provide greater credibility to the internal validity of the findings in the original study but does not necessarily extend theory while the primary advantages of conceptual extensions are the refinement and development of theory, as well as enhanced external validity and generalizability in cases where different populations and contexts are employed (Hendrick, 1990; Rosenthal, 1990; Tsang & Kwan, 1999). At the same time, conceptual extensions are risky ventures because failures to replicate can be due to a number of reasons, including inaccurate theory about the postulated mechanisms or contingencies differing across the two studies that modified the postulated mechanisms (Tsang & Kwan, 1999).

With Study 2 being a conceptual extension rather than an exact replication, our inconsistent results across Studies 1 and 2 embody this limitation. The face-to-face mode of collaboration in Study 2 could have injected teams with more salient aural and visual cues that affected the way members perceived each other's contributions (Bazarova, Walther, & McLeod, 2012). The perception-based measures of both the focal member's and peers' supportive contributions (Alexander & Wilkins, 1982; Krosnick, 1999) and the physical nature of idea enactment in Study 2 may have exacerbated these effects. We also observed relatively low ICC values for supportive contributions in Study 2, which may partially explain why we did not find a main effect for supportive contributions on leadership emergence in the idea enactment phase as we did in Study 1. However, low ICC(2) values may be more of a consequence of having smaller team sizes with lower – albeit still meaningful – variance between groups rather than a reflection of low reliability of group means (Koopmann, Lanaj, Wang, Zhou, & Shi, 2016).

Still, we believe the limitation of these inconsistent results is a reasonable tradeoff given the insights we gained from replicating some of our results across studies, enabling us to conclude that aspects of our theoretical model *are* generalizable across a variety of innovation team contexts, modes of interaction, and forms of measurement. Specifically, by conducting Study 2 as a conceptual extension, we were able to speak to the robustness of the relationship between constructive contributions and leadership emergence in the idea generation phase (Rosenthal, 1990; Tsang & Kwan, 1999). Nonetheless, the inconsistencies we found merit further investigation, particularly with respect to the form and function of supportive contributions in the idea enactment phase. Clearly, supportive contributions do not function the same way as constructive contributions, and we urge future research to prioritize this as an area for theory development and additional empirical testing. As a first step, we recommend future

research to consider a partial replication of the studies featured here (Hendrick, 1990) by making fewer procedural changes to the original study's design compared to conceptual extensions – for instance, changing the team innovation task but employing the same measurement approaches, or retaining the same task but employing the same measurement mode for capturing core constructs. Future research can also improve on our methodology by utilizing alternative means of capturing supportive contributions that yield higher ICC2 values. Lastly, future research may focus on identifying other behaviors other than supportive contributions that are important for leadership emergence in the idea enactment phase.

A second limitation of our study is our use of simulated innovation project teams. Although our reliance on student teams is certainly a limitation, these teams catered well to our research question and allowed us to capture phase-specific data on members' contributions and leadership emergence that might not have been possible in the field. Moreover, we think that the nature of our research question as well as the psychological fidelity of our tasks helped to mitigate concerns of generalizability (Berkowitz & Donnerstein, 1982; Colquitt & Zapata-Phelan, 2007). Given that many influential frameworks on team dynamics began with the observation of student teams (Gersick, 1988, 1989), our findings can be thought of as a valuable launching point for future research to investigate leadership emergence dynamics in innovation teams in the field.

An additional advantage of replicating our findings in the field is that, in reality, teams may dynamically move between the innovation phases. For instance, one of the primary reasons why the idea enactment phase is of strategic importance is because even in the course of idea enactment, the idea itself can still continue to develop and possibly lead to higher levels of creativity (Harvey, 2014). The cyclical repetition between the idea generation and idea

enactment phases may give rise to interesting carryover effects that our study of single-shot teams could not reveal (Ilgen, Hollenbeck, Johnson, & Jundt, 2005). For instance, as idea enactment activities feed into the next round of idea generation, leadership emergence may accrue as a function of more complex contributions, such as the ability to use feedback in the idea enactment phase to fuel higher quality ideas or speaking up about problematic components of the solution that need to be re-thought (Liang et al., 2012). Likewise, because idea enactment is thought of as the initial step toward idea championing and implementation (Perry-Smith & Mannucci, 2017), behaviors that aid this transition and prepare the idea to be promoted among an external audience may also become relevant for leadership emergence.

Finally, future research can assess the interplay between constructive and supportive contributions for leadership emergence of the self and others, as the two may operate in a complementary function. Although we did not find empirical evidence for this in our data, it could be argued that when accompanied by someone else's supportive contributions, one's own constructive contributions may be more likely to enhance leadership emergence because of the added affirmation from another that one's ideas have merit (Harvey & Kou, 2013; Laughlin, 1980). This presents an added point of interest to supportive contributions; in addition to aiding one's own emergence, expressing support may also lend legitimacy to others' leader emergence.

Conclusion

We advanced and tested a theoretical model where leadership emergence depends on whether one contributes in constructive or supportive ways, when those contributions are made (i.e., in the idea generation versus idea enactment phase), and the extent to which others in the team are contributing in similar ways. Our model highlights the importance of integrating dynamic and contextualized aspects of innovation teams into theories of leadership emergence

and also sheds new light on the behaviors and processes leading to emergent forms of leadership in innovation teams. As organizations increasingly leverage innovation teams to accomplish complex and strategic objectives, we hope our work serves as a launching pad for understanding how individuals contribute to that process and the social consequences that accrue as a result.

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Table 1

Examples of Behaviors Coded as Constructive and Supportive Contributions in Study 1

	Idea Generation Phase	**Idea Enactment Phase**
Constructive Contributions	*"I thought about a smart pen that automatically records what you are writing in an electronic copy and auto-corrects your mistakes"*	*"So for our letter, we need to put a person who we address it to. First line should be Dear Hank Meijer or something like that"*
	"Ok, I came up with a built in fan like a shelving unit that you can connect to the bed or head of your bed"	*"I think we should get a more modern alarm clock [image]"*
Supportive Contributions	*"I like [the conserving space + displaying art idea] too, I'll put it on the list"*	*"I like the new background for the graphic a lot!"*
	"I love the height adjustable desk. I'm a stander"	*"Yeah, I agree a solid background [in the graphic] is probably more professional."*

Table 2

Study 1 Means, Standard Deviations, and Correlations

	Variable	M	*Sd.*	1	2	3	4	5	6	7	8	9	10
1	GPA	3.45	0.34	--									
2	Gender	1.44	0.50	.17**	--								
3	Extraversion	5.01	1.16	-.02	.04	--							
4	Conscientiousness	5.51	0.89	.13*	.15**	.16**	--						
5	Openness	4.88	0.97	.05	.17**	.29**	.25**	--					
6	Neuroticism	2.39	1.22	.04	.00	-.24**	-.15**	.05	--				
7	Agreeableness	5.60	0.85	-.04	.19**	.26**	.37**	.42**	-.22**	--			
8	Computer Attitude	4.96	0.92	-.02	.14**	.00	.18**	.18**	-.06	.13*	--		
9	Individual Creative Fluency	3.14	1.60	.08	.06	.12*	.01	-.03	-.01	.01	-.10*	--	
10	Constructive Contributions (Gen)	4.57	3.27	.01	-.01	.12*	.09	.02	-.05	-.02	.02	.21*	--
11	Supportive Contributions (Gen)	3.37	2.68	.06	.24**	.12*	.15**	-.04	-.13*	.10	.08	.10	.40**
12	Constructive Contributions (Enact)	5.60	5.64	-.05	-.02	.13*	.01	.06	-.07	.01	.11*	.05	.23**
13	Supportive Contributions (Enact)	1.75	1.85	.01	.03	.07	.08	.02	-.12*	.06	.12*	.04	.08
14	Peers' Constructive Contributions (Gen)	4.57	2.61	.07	.03	-.03	.10	-.04	-.04	.02	.00	.04	.55**
15	Peers' Supportive Contributions (Gen)	3.37	2.04	.03	.06	.01	.07	-.03	-.13*	.01	-.01	.02	.44**
16	Peers' Constructive Contributions (Enact)	5.60	4.18	.03	-.09	.03	.07	.05	.01	-.03	.07	-.03	.05
17	Peers' Supportive Contributions (Enact)	1.75	1.43	-.05	-.02	.02	.11*	.02	-.09	-.02	.10	-.02	.03
18	Team Size	3.94	0.44	.02	.00	.12*	-.04	.06	-.03	.04	-.10	.06	-.07
19	Team Ethnic Diversity	0.67	0.10	-.01	.07	-.02	.04	.03	-.12*	-.03	.02	.03	.09
20	Team Major Diversity	0.34	0.22	.00	.04	-.17**	.01	.09	.10	.01	-.02	-.06	-.03
21	Leadership Emergence (Gen)	0.56	0.16	-.03	-.01	.20**	.05	-.04	-.15**	.04	.03	.12*	.29**
22	Leadership Emergence (Enact)	0.65	0.16	-.05	.02	.16**	.07	-.01	-.07	.00	.11*	.11*	.21**

Note. Level 1 n based on listwise deletion = 358. Level 2 N = 92. Gender is coded as "1" = male and "2" = female. Idea generation phase is abbreviated as (Gen) and idea enactment phase is abbreviated as (Enact). One-tailed significance test results are reported. * $p < .05$, ** $p < .01$.

Table 2 (continued)

	Variable	11	12	13	14	15	16	17	18	19	20	21	22
11	Supportive Contributions (Gen)	--											
12	Constructive Contributions (Enact)	.08	--										
13	Supportive Contributions (Enact)	.21**	.47**	--									
14	Peers' Constructive Contributions (Gen)	.42**	.05	.03	--								
15	Peers' Supportive Contributions (Gen)	.47**	.00	.04	.59**	--							
16	Peers' Constructive Contributions (Enact)	.00	.43**	.45**	.18**	.05	--						
17	Peers' Supportive Contributions (Enact)	.04	.43**	.49**	.06	.15**	.66**	--					
18	Team Size	.01	-.03	-.05	-.09	.01	-.04	-.06	--				
19	Team Ethnic Diversity	.09	.01	.17**	.11*	.12*	.01	.22**	.16**	--			
20	Team Major Diversity	-.05	-.04	-.09	-.04	-.07	-.05	-.11*	.01	.08	--		
21	Leadership Emergence (Gen)	.21**	.07	-.08	.11*	.07	-.08	-.19**	.07	-.12*	.05	--	
22	Leadership Emergence (Enact)	.13*	.13*	.09	.03	-.02	.01	-.08	.10	-.08	.00	.62**	--

Note. Level 1 n based on listwise deletion = 358. Level 2 N = 92. Gender is coded as "1" = male and "2" = female. Idea generation phase is abbreviated as (Gen) and idea enactment phase is abbreviated as (Enact). One-tailed significance test results are reported. * $p < .05$, ** $p < .01$.

Table 3

Study 1 Hierarchical Linear Modeling Results for Leadership Emergence in the Idea Generation Phase

	Model 1			Model 2			Model 3		
	B	**s.e.**	**t**	**B**	**s.e.**	**t**	**B**	**s.e.**	**t**
Intercept	0.580*	0.024	24.059	0.587*	0.024	24.727	0.581*	0.024	24.114
Level 2 Effects									
Team Size (b_{01})	0.035	0.032	1.090	0.047*	0.028	1.664	0.048*	0.028	1.700
Team Ethnic Diversity (b_{02})	-0.238*	0.108	-2.209	-0.274**	0.103	-2.646	-0.273**	0.103	-2.646
Team Major Diversity (b_{03})	0.042	0.050	0.849	0.055	0.045	1.233	0.057	0.045	1.268
Dispersion of Team Constructive Contributions (Gen) (b_{04})				-0.009	0.015	-0.571	-0.011	0.016	-0.708
Dispersion of Team Supportive Contributions (Gen) (b_{05})				-0.009	0.010	-0.906	-0.012	0.011	-1.115
Level 1 Effects									
GPA (b_{10})	-0.010	0.023	-0.448	-0.005	0.022	-0.204	-0.003	0.022	-0.162
Gender (b_{20})	-0.014	0.014	-1.007	-0.020	0.015	-1.364	-0.019	0.015	-1.313
Extraversion (b_{30})	0.031**	0.006	4.859	0.023**	0.006	4.093	0.022**	0.006	3.833
Conscientiousness (b_{40})	0.001	0.009	0.091	-0.002	0.008	-0.214	0.001	0.008	0.102
Openness (b_{50})	-0.014*	0.007	-1.828	-0.011	0.007	-1.421	-0.010	0.007	-1.309
Neuroticism (b_{60})	-0.020**	0.006	-3.552	-0.021**	0.006	-3.303	-0.020**	0.006	-3.141
Agreeableness (b_{70})	-0.013	0.012	-1.050	-0.011	0.012	-0.928	-0.012	0.012	-1.034
Computer Attitude (b_{80})	0.015*	0.008	1.798	0.010	0.008	1.314	0.009	0.008	1.151
Individual Creative Fluency (b_{90})	0.017**	0.005	3.597	0.011**	0.004	2.522	0.010**	0.004	2.190
Constructive Contributions (Gen) (b_{100})				0.017**	0.004	4.256	0.021**	0.005	4.280
Supportive Contributions (Gen) (b_{110})				0.013**	0.004	3.081	0.014**	0.005	3.008
Peers' Constructive Contributions (Gen) (b_{120})				0.015*	0.009	1.732	0.016*	0.009	1.737
Peers' Supportive Contributions (Gen) (b_{130})				0.007	0.008	0.812	0.006	0.008	0.783
Interactions									
Constructive Contributions (Gen) X Peers' Constructive Contributions (Gen) (b_{140})							-0.001*	0.001	-1.783
Constructive Contributions (Gen) X Peers' Supportive Contributions (Gen) (b_{150})							0.001	0.001	-0.382
Supportive Contributions (Gen) X Peers' Constructive Contributions (Gen) (b_{160})							0.001	0.002	0.486
Supportive Contributions (Gen) X Peers' Supportive Contributions (Gen) (b_{170})							0.002	0.001	-1.448
Pseudo R^2		.151			.246			.250	
Pseudo R^2 *change*		--			.095			.004	

Note. Level 1 n based on listwise deletion = 358. Level 2 N = 92. Coefficients (Bs) reflect unstandardized effect sizes. Idea generation phase is abbreviated as (Gen) and idea enactment phase is abbreviated as (Enact). One-tailed significance test results are reported. * $p < .05$, ** $p < .01$.

Table 4

Study 1 Hierarchical Linear Modeling Results for Leadership Emergence in the Idea Enactment Phase

	Model 1			Model 2			Model 3		
	B	**s.e.**	**t**	**B**	**s.e.**	**t**	**B**	**s.e.**	**t**
Intercept	0.627**	0.022	28.392	0.625**	0.022	28.048	0.625**	0.022	27.944
Level 2 Effects									
Team Size (b_{01})	0.042	0.029	1.439	0.043	0.028	1.517	0.042	0.028	1.517
Team Ethnic Diversity (b_{02})	-0.188*	0.112	-1.677	-0.168	0.117	-1.435	-0.171*	0.116	-1.473
Team Major Diversity (b_{03})	-0.004	0.057	-0.070	-0.005	0.057	-0.090	-0.004	0.057	-0.075
Dispersion of Team Constructive Contributions (Enact) (b_{04})				-0.006	0.006	-0.944	-0.005	0.005	-1.046
Dispersion of Team Supportive Contributions (Enact) (b_{05})				0.004	0.020	0.174	0.003	0.020	0.145
Level 1 Effects									
GPA (b_{10})	0.020	0.018	1.089	0.016	0.018	0.891	0.014	0.018	0.765
Gender (b_{20})	0.012	0.012	0.990	0.013	0.012	1.086	0.014	0.013	1.131
Extraversion (b_{30})	0.007	0.005	1.319	0.006	0.005	1.320	0.006	0.005	1.261
Conscientiousness (b_{40})	0.023**	0.008	2.965	0.025**	0.008	3.197	0.026**	0.008	3.202
Openness (b_{50})	-0.004	0.007	-0.536	-0.004	0.006	-0.560	-0.003	0.006	-0.529
Neuroticism (b_{60})	0.003	0.006	0.519	0.004	0.006	0.621	0.003	0.006	0.503
Agreeableness (b_{70})	-0.018*	0.009	-1.981	-0.020**	0.009	-2.178	-0.020*	0.009	-2.218
Computer Attitude (b_{80})	0.004	0.006	0.700	0.003	0.006	0.545	0.003	0.006	0.417
Individual Creative Fluency (b_{90})	0.001	0.004	0.275	0.001	0.004	0.171	0.000	0.004	0.043
Constructive Contributions (Gen) (b_{100})	0.005*	0.002	2.030	0.004*	0.002	1.769	0.004	0.002	1.490
Supportive Contributions (Gen) (b_{110})	0.002	0.003	0.607	-0.001	0.003	-0.389	-0.001	0.003	-0.307
Leadership Emergence (Gen) (b_{160})	0.668**	0.065	10.224	0.664**	0.067	9.980	0.665*	0.065	10.206
Constructive Contributions (Enact) (b_{120})				-0.003	0.002	1.445	0.004*	0.003	1.705
Supportive Contributions (Enact) (b_{130})				0.011*	0.006	1.737	0.010	0.006	1.610
Peers' Constructive Contributions (Enact) (b_{140})				0.008	0.006	1.415	0.008	0.006	1.445
Peers' Supportive Contributions (Enact) (b_{150})				-0.010	0.014	-0.727	-0.009	0.014	-0.672
Interactions									
Constructive Contributions (Enact) X Peers' Constructive Contributions (Enact) (b_{170})							0.000	0.000	0.415
Constructive Contributions (Enact) X Peers' Supportive Contributions (Enact) (b_{180})							-0.001	0.001	-1.281
Supportive Contributions (Enact) X Peers' Constructive Contributions (Enact) (b_{190})							-0.001	0.001	0.749
Supportive Contributions (Enact) X Peers' Supportive Contributions (Enact) (b_{200})							0.002	0.003	0.576
Pseudo R^2		.495			.532			.532	
Pseudo R^2 change		--			.037			.000	

Note. Level 1 n based on listwise deletion = 358. Level 2 N = 92. Coefficients (Bs) reflect unstandardized effect sizes. One-tailed significance test results are reported. * $p < .05$, ** $p < .01$.

Table 5

Study 2 Means, Standard Deviations, and Correlations

	Variable	M	*Sd.*	1	2	3	4	5	6	7	8	9	10	11
1	GPA	3.40	0.40	--										
2	Gender	1.36	0.48	.06	--									
3	Extraversion	3.47	0.87	-.09	-.06	--								
4	Conscientiousness	3.69	0.68	.10	.06	.11	--							
5	Openness	3.75	0.65	.02	-.06	.30**	.11	--						
6	Neuroticism	2.03	0.88	.01	.16*	-.32**	-.18*	-.11	--					
7	Agreeableness	3.97	0.59	-.16*	.07	.27**	.16*	.39**	-.19**	--				
8	Individual Creative Fluency	2.24	0.98	.00	-.03	.11	.06	-.03	-.08	-.06	--			
9	Constructive Contributions (Gen)	4.03	0.76	.07	-.21**	.17*	.13	.11	-.20**	.13	.09	--		
10	Supportive Contributions (Gen)	4.01	0.77	.11	-.20**	.16*	.06	.06	-.21**	.06	.07	.76**	--	
11	Constructive Contributions (Enact)	4.22	0.60	.06	-.12	.10	.10	.02	-.11	.14	.04	.59**	.64**	--
12	Supportive Contributions (Enact)	4.17	0.59	.09	-.20**	.09	.03	.06	-.09	.03	-.04	.55**	.65**	.65**
13	Peers' Constructive Contributions (Gen)	4.03	0.50	-.16*	-.02	.06	.04	.02	-.05	.13	-.06	.15*	.21**	.20**
14	Peers' Supportive Contributions (Gen)	4.01	0.57	-.13	-.03	.09	.07	.04	-.07	.11	.04	.19**	.38**	.30**
15	Peers' Constructive Contributions (Enact)	4.22	0.46	-.05	-.07	.03	.00	.02	-.12	.07	-.06	.17*	.29**	.49**
16	Peers' Supportive Contributions (Enact)	4.17	0.49	-.06	-.11	.13	.05	.11	-.04	.16*	-.04	.25**	.38**	.36**
17	Team Size	3.83	0.38	-.10	.14	-.02	-.02	.00	.06	.07	-.03	.04	.01	-.21**
18	Team Ethnic Diversity	0.34	0.25	.02	-.02	-.04	-.08	-.01	-.02	-.03	-.04	-.08	-.09	-.08
19	Team Major Diversity	0.67	0.13	-.04	.16*	.07	.11	.08	.06	.12	-.10	-.08	-.09	-.21**
20	Leadership Emergence (Gen)	0.66	0.16	.14	-.13	.19*	.16*	.03	-.22**	.01	.08	.72**	.67**	.54**
21	Leadership Emergence (Enact)	0.74	0.15	.07	-.16*	.17*	.13	.06	-.20**	.10	.10	.72**	.67**	.60**

Note. Level 1 n based on listwise deletion = 189. Level 2 N = 50. Gender is coded as "1" = male and "2" = female. Idea generation phase is abbreviated as (Gen) and idea enactment phase is abbreviated as (Enact). One-tailed significance test results are reported. * $p < .05$, ** $p < .01$.

Table 5 (continued)

	Variable	12	13	14	15	16	17	18	19	20	21
13	Peers' Constructive Contributions (Gen)	.32**	--								
14	Peers' Supportive Contributions (Gen)	.43**	.76**	--							
15	Peers' Constructive Contributions (Enact)	.39**	.59**	.65**	--						
16	Peers' Supportive Contributions (Enact)	.61**	.62**	.71**	.66**	--					
17	Team Size	-.01	.06	.01	-.27**	-.01	--				
18	Team Ethnic Diversity	-.14	-.13	-.13	-.11	-.17*	.21**	--			
19	Team Major Diversity	-.07	-.12	-.12	-.27**	-.09	.51**	.00	--		
20	Leadership Emergence (Gen)	.50**	-.09	.10	.10	.15*	-.02	-.07	-.01	--	
21	Leadership Emergence (Enact)	.55**	.05	.19**	.17*	.23**	.03	-.03	-.02	.78**	--

Note. Level 1 n based on listwise deletion = 189. Level 2 N = 50. Gender is coded as "1" = male and "2" = female. Idea generation phase is abbreviated as (Gen) and idea enactment phase is abbreviated as (Enact). One-tailed significance test results are reported. * $p < .05$, ** $p < .01$.

Table 6

Study 2 Hierarchical Linear Modeling Results for Leadership Emergence in the Idea Generation Phase

	Model 1			Model 2			Model 3		
	B	**s.e.**	**t**	**B**	**s.e.**	**t**	**B**	**s.e.**	**t**
Intercept	0.717**	0.038	19.040	0.638**	.024	26.598	0.630**	0.027	23.581
Level 2 Effects									
Team Size (b_{01})	0.004	0.030	0.135	-0.024	0.020	-1.182	-0.022	0.021	-1.034
Team Ethnic Diversity (b_{02})	-0.045	0.048	-0.934	-0.009	0.040	-0.215	-0.010	0.041	-0.251
Team Major Diversity (b_{03})	0.006	0.078	0.072	0.092	0.068	1.344	0.088	0.069	1.275
Dispersion of Team Constructive Contributions (Gen) (b_{04})				0.002	0.035	0.044	-0.016	0.038	-0.415
Dispersion of Team Supportive Contributions (Gen) (b_{05})				0.021	0.032	0.651	0.017	0.045	0.381
Level 1 Effects									
GPA (b_{10})	0.101**	0.033	3.036	0.026	0.021	1.215	0.027	0.021	1.267
Gender (b_{20})	-0.040	0.026	-1.523	0.019	0.016	1.178	0.018	0.017	1.094
Extraversion (b_{30})	0.032**	0.013	2.423	0.017*	0.009	1.799	0.018*	0.010	1.769
Conscientiousness (b_{40})	0.027	0.017	1.551	0.015	0.011	1.402	0.013	0.010	1.310
Openness (b_{50})	-0.011	0.022	-0.504	-0.017	0.011	-1.480	-0.018	0.011	-1.615
Neuroticism (b_{60})	-0.028*	0.013	-2.074	-0.012	0.008	-1.524	-0.011	0.009	-1.276
Agreeableness (b_{70})	-0.003	0.026	-0.131	-0.012	0.012	-0.995	-0.009	0.013	-0.666
Individual Creative Fluency (b_{80})	0.007	0.013	0.556	-0.007	0.008	-0.873	-0.007	0.008	-0.813
Constructive Contributions (Gen) (b_{90})				0.153**	0.022	6.861	0.150**	0.024	6.190
Supportive Contributions (Gen) (b_{100})				0.085**	0.033	2.600	0.083*	0.040	2.065
Peers' Constructive Contributions (Gen) (b_{110})				0.003	0.037	0.079	0.001	0.037	0.019
Peers' Supportive Contributions (Gen) (b_{120})				0.116**	0.033	3.483	0.117**	0.033	3.515
Interactions									
Constructive Contributions (Gen) X Peers' Constructive Contributions (Gen) (b_{130})							-0.066*	0.038	-1.760
Constructive Contributions (Gen) X Peers' Supportive Contributions (Gen) (b_{140})							0.042	0.033	1.289
Supportive Contributions (Gen) X Peers' Constructive Contributions (Gen) (b_{150})							0.010	0.043	0.240
Supportive Contributions (Gen) X Peers' Supportive Contributions (Gen) (b_{160})							-0.035	0.049	-0.717
Pseudo R^2		.090			.741			.745	
Pseudo R^2 change		--			.651			.004	

Note. Level 1 n based on listwise deletion = 189. Level 2 N = 50. Coefficients (Bs) reflect unstandardized effect sizes. Idea generation phase is abbreviated as (Gen) and idea enactment phase is abbreviated as (Enact). One-tailed significance test results are reported. * $p < .05$, ** $p < .01$.

Table 7

Study 2 Hierarchical Linear Modeling Results for Leadership Emergence in the Idea Enactment Phase

	Model 1			Model 2			Model 3		
	B	**s.e.**	**t**	**B**	**s.e.**	**t**	**B**	**s.e.**	**t**
Intercept	0.740*	0.025	29.172	0.734**	0.024	30.617	0.738**	0.021	35.007
Level 2 Effects									
Team Size (b_{01})	0.028	0.036	0.757	0.038	0.041	0.923	0.036	0.041	0.884
Team Ethnic Diversity (b_{02})	-0.018	0.051	-0.351	0.006	0.040	0.140	0.003	0.041	0.073
Team Major Diversity (b_{03})	-0.073	0.084	-0.865	0.040	0.076	0.518	0.039	0.075	0.523
Dispersion of Team Constructive Contributions (Enact) (b_{04})				-0.046	0.040	-1.132	-0.028	0.047	-0.587
Dispersion of Team Supportive Contributions (Enact) (b_{05})				0.058	0.062	0.923	0.076	0.071	1.071
Level 1 Effects									
GPA (b_{10})	0.010	0.017	0.592	0.010	0.016	0.598	0.002	0.016	0.148
Gender[a] (b_{20})	-0.003	0.014	-0.193	0.001	0.015	0.079	0.004	0.014	0.282
Extraversion (b_{30})	-0.005	0.008	-0.602	-0.004	0.007	-0.498	-0.007	0.007	-0.936
Conscientiousness (b_{40})	-0.007	0.011	-0.629	-0.009	0.010	-0.902	-0.006	0.008	-0.707
Openness (b_{50})	-0.007	0.009	-0.774	0.004	0.008	-0.504	-0.004	0.008	-0.463
Neuroticism (b_{60})	0.001	0.007	0.183	-0.002	0.007	-0.223	0.000	0.006	-0.035
Agreeableness (b_{70})	0.032**	0.012	2.650	0.028**	0.012	2.263	0.028*	0.012	2.336
Individual Creative Fluency (b_{80})	0.003	0.006	0.499	0.003	0.006	0.569	0.005	0.005	1.069
Constructive Contributions (Gen) (b_{90})	0.056**	0.018	3.105	0.050*	0.015	3.324	0.038**	0.014	2.642
Supportive Contributions (Gen) (b_{100})	0.017	0.017	0.979	0.002	0.017	0.092	0.008	0.015	0.532
Leadership Emergence (Gen) (b_{150})	0.431**	0.067	6.460	0.395*	0.063	6.238	0.413**	0.071	5.790
Constructive Contributions (Enact) (b_{110})				0.063*	0.026	2.424	0.069**	0.026	2.615
Supportive Contributions (Enact) (b_{120})				0.050	0.032	1.589	0.069**	0.034	2.014
Peers' Constructive Contributions (Enact) (b_{130})				0.071	0.050	1.417	0.077	0.051	1.525
Peers' Supportive Contributions (Enact) (b_{140})				0.065	0.046	1.403	0.060	0.048	1.259
Interactions									
Constructive Contributions (Enact) X Peers' Constructive Contributions (Enact) (b_{160})							0.064	0.039	1.642
Constructive Contributions (Enact) X Peers' Supportive Contributions (Enact) (b_{170})							0.011	0.031	0.359
Supportive Contributions (Enact) X Peers' Constructive Contributions (Enact) (b_{180})							-0.060	0.055	-1.088
Supportive Contributions (Enact) X Peers' Supportive Contributions (Enact) (b_{190})							0.113*	0.063	1.773
Pseudo R^2		.713			.765			.870	
Pseudo R^2 *change*		--			.052			.105	

Note. Level 1 n based on listwise deletion = 189. Level 2 N = 50. Coefficients (Bs) reflect unstandardized effect sizes. One-tailed significance test results are reported. * $p < .05$, ** $p < .01$

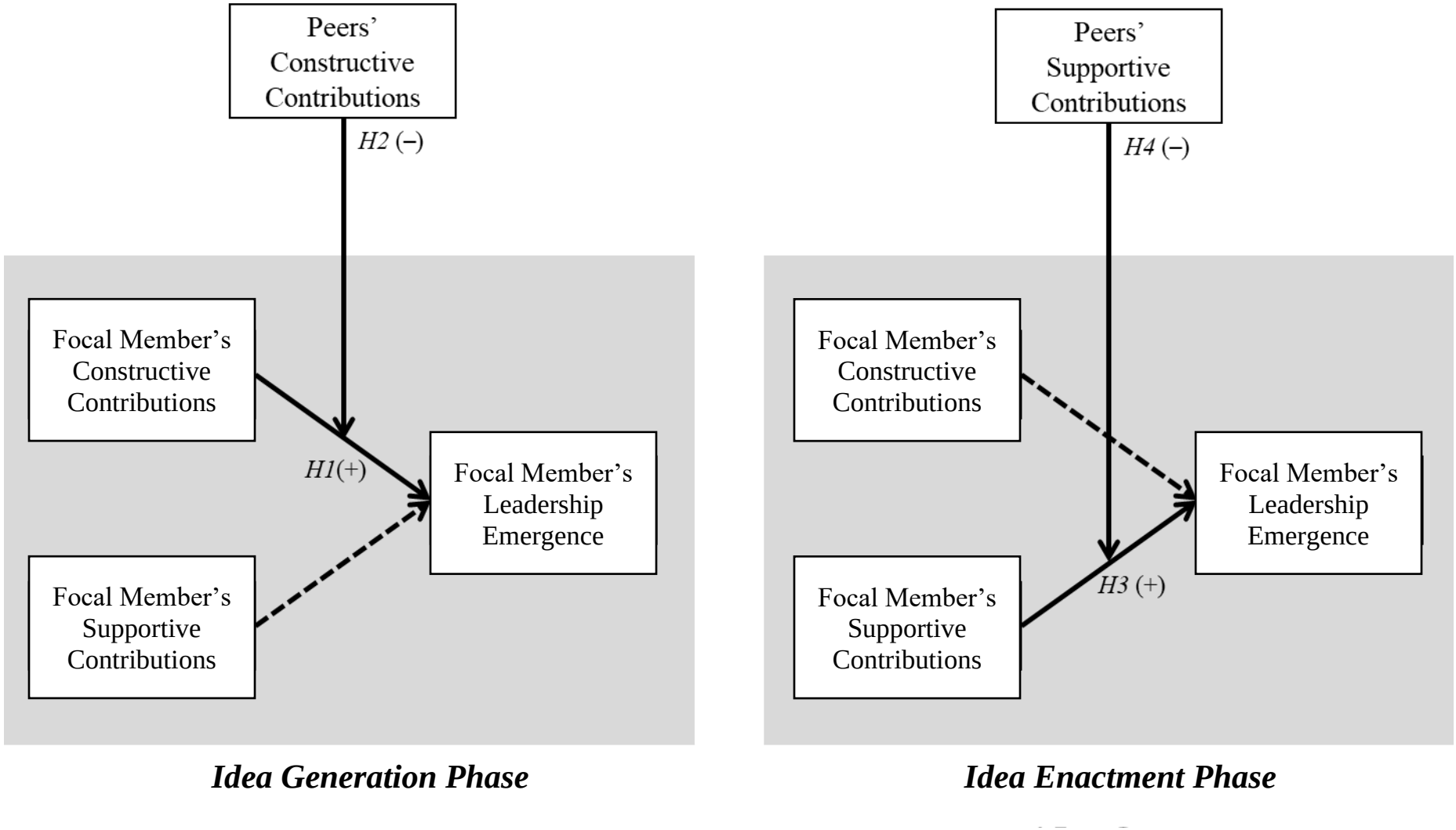

Figure 1. Our overarching theoretical model.

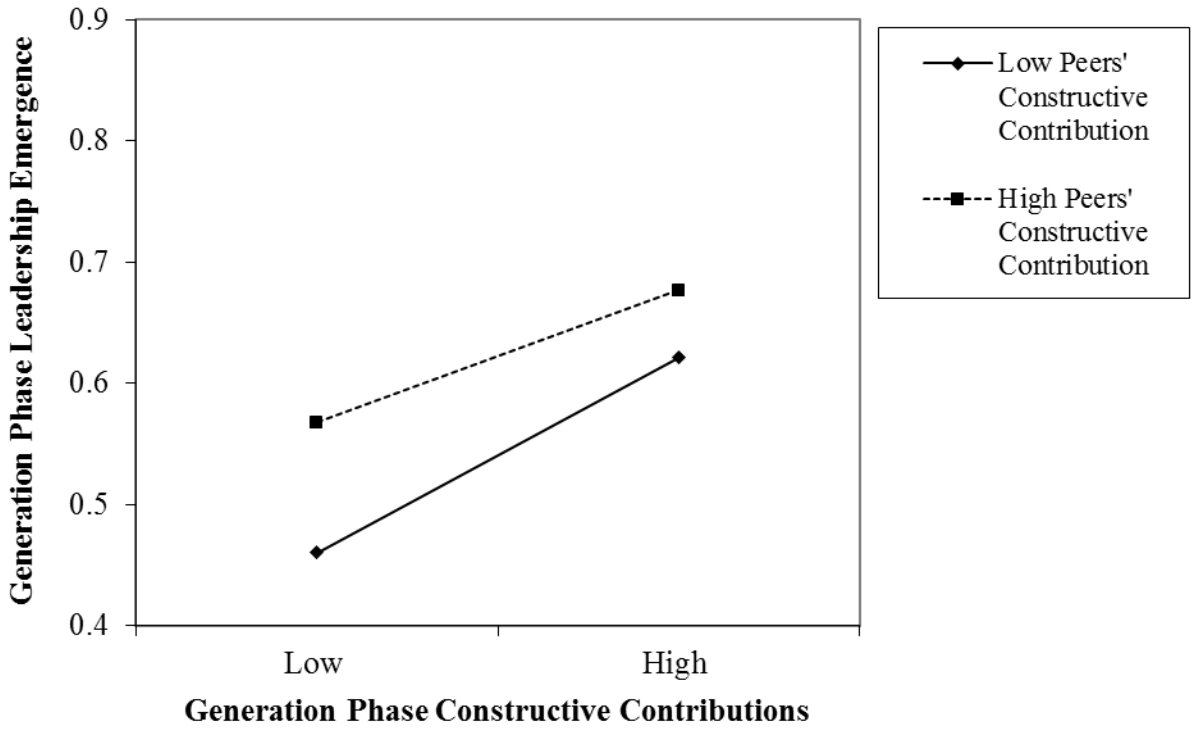

Figure 2. Study 1 Moderating Effect of Peers' Constructive Contribution on the Relationship between Constructive Contributions and Leadership Emergence in the Idea Generation Phase.

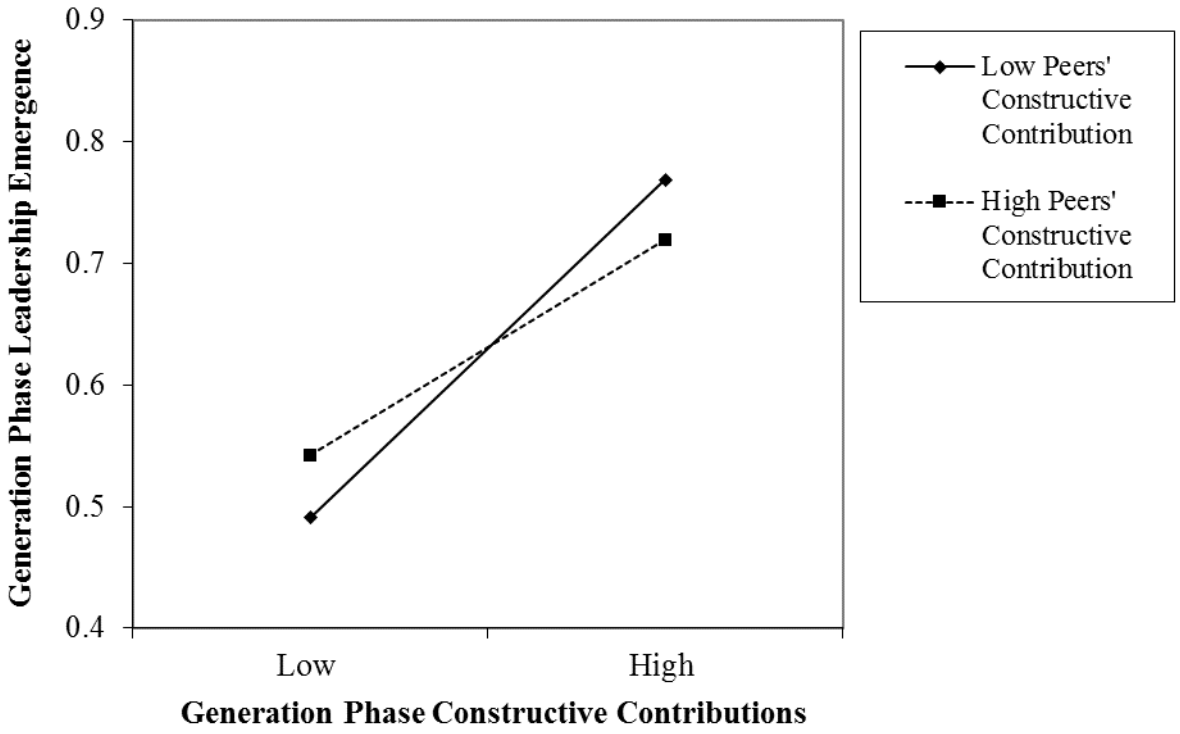

Figure 3. Study 2 Moderating Effect of Peers' Constructive Contributions on the Relationship between Constructive Contributions and Leadership Emergence in the Idea Generation Phase.

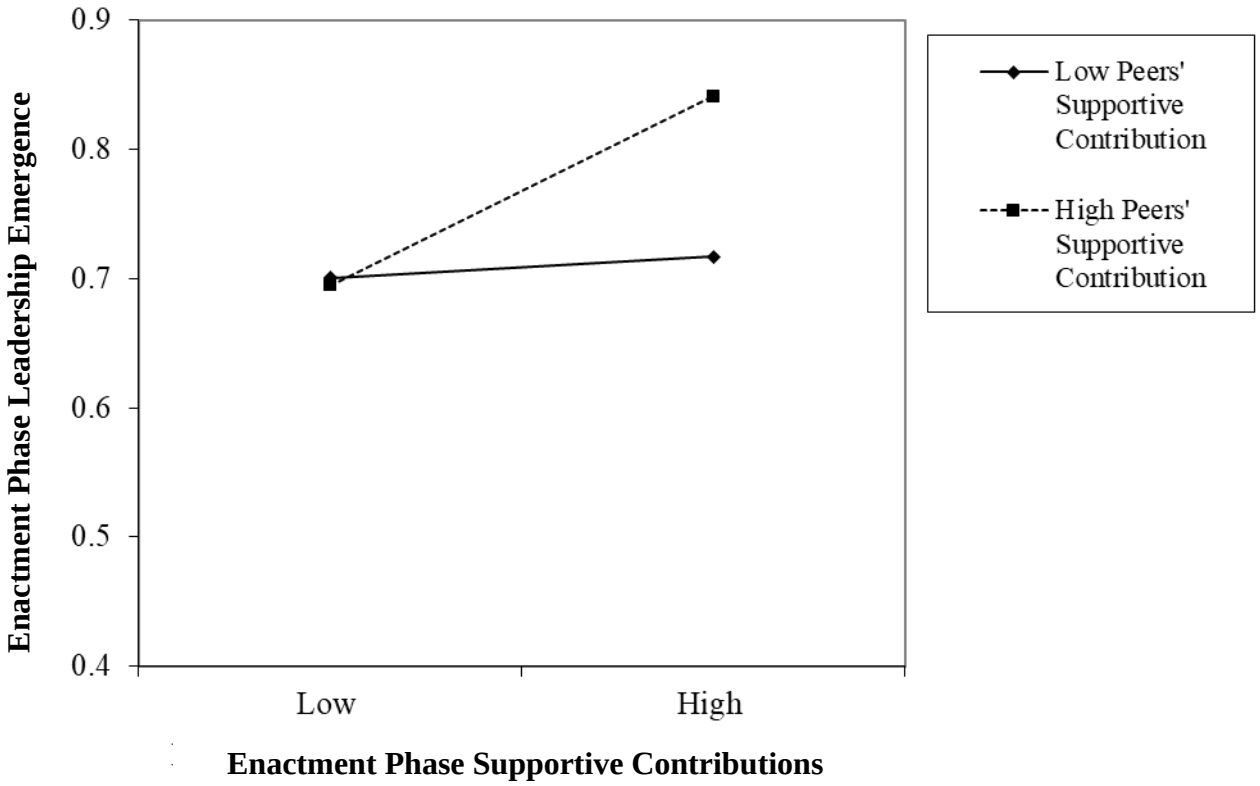

Figure 4. Study 2 Moderating Effect of Peers' Supportive Contributions on the Relationship between Supportive Contributions and Leadership Emergence in the Idea Enactment Phase.