

RESEARCH ARTICLE

Does receiving knowledge catalyze creativity? A dyadic-level contingency model of knowledge type and psychological closeness on knowledge elaboration

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Summary

Does receiving knowledge necessarily catalyze the recipient's creativity? Drawing upon the literature on knowledge management, we propose a dyadic-level contingency model in which the type of received knowledge (i.e., explicit vs. tacit) from the partner and the recipient's psychological closeness to the partner jointly determine the recipient's knowledge elaboration and consequent creativity as catalyzed by the partner's knowledge (i.e., catalytic creativity). Results based on three samples from various settings show that receiving tacit knowledge from a partner leads a recipient to elaborate the received knowledge, and this relationship is stronger when the recipient's psychological closeness to the partner is higher. This dyadic-level knowledge elaboration in turn boosts the recipient's catalytic creativity. In contrast, receiving explicit knowledge from a partner generally has a much weaker effect on the recipient's elaboration of the knowledge, regardless of whether the recipient's psychological closeness to the partner is high or low. We extend research on dyadic-level creativity by illustrating (a) the differential effects of explicit versus tacit knowledge receiving and (b) the recipient's knowledge elaboration as a mechanism and dyadic psychological closeness as a boundary condition for such differential effects.

KEYWORDS

creativity, explicit knowledge, knowledge elaboration, psychological closeness, tacit knowledge

1 | INTRODUCTION

Creativity (i.e., generating novel and useful ideas; Amabile, 1996) is largely a social process influenced by the social network within which employees are embedded (Anderson et al., 2014; Perry-Smith, 2020, 2006). One well-established line of inquiry adopts a structural perspective and focuses on how the pattern of social relationships surrounding individuals explains their creativity (Baer et al., 2015; Koseoglu & Shalley, 2021; Mannucci & Perry-Smith, 2022; Perry-Smith & Mannucci, 2017). Despite this valuable insight, this line of research has treated social relationships as homogeneous and undifferentiated in terms of their ability to

contribute to an individual's creative idea generation (Fliaster & Schloderer, 2010). Recent studies have started to shift from this structural perspective to a relational perspective and examine how the nature of the dyadic relationship between individuals and their colleagues may boost creativity (Koseoglu et al., 2022; Sosa, 2011). For example, Sosa (2011) argued that non-redundant knowledge would be transmitted in dyadic interactions with diverse partners and used for a recipient's creative idea generation and thus concluded that dyadic-level diversity of ties benefits the recipient's creativity. This work represents an emerging recognition of the importance of relational factors in explaining creative idea generation as catalyzed by interaction with the other party in a dyad

(Koseoglu et al., 2022; Sosa, 2011; Tortoriello et al., 2015), which we refer to as dyadic-level *catalytic creativity*.¹

However, two questions remain unanswered in this line of research. First, it is unclear what type of knowledge content is transmitted in a dyad and whether this matters to catalytic creativity. Scholars have criticized this oversimplification by arguing that the content of knowledge transmitted through dyadic interactions may vary from one dyad to another (Fleming et al., 2007; Rodan & Galunic, 2004). Accordingly, it is important to understand why some dyadic interactions are more likely than others to transmit certain types of knowledge and catalyze creativity. Indeed, research has not only highlighted dyads as important units of analysis but also stressed dyadic-level relational factors as crucial facilitators of catalytic creativity (Dokko et al., 2014; Koseoglu et al., 2022). Yet without examining the unique characteristics of the different types of knowledge transmitted by dyadic ties and their differential effects, we may be incorrectly attributing the resulting creativity to any type; in reality, one type may catalyze the recipient's creativity and the other may not.

Second, because extant research implicitly assumes that access to a partner's knowledge will catalyze the recipient's creativity, the question of exactly how dyadic knowledge transfer and hence creativity catalyzing occurs also remains unanswered (Koseoglu et al., 2022). We reason that even though dyadic interactions may provide access to specific knowledge, this does not guarantee that such knowledge will necessarily benefit the recipient's creativity (Tortoriello et al., 2015). Conceptual and review work on agency in social networks also highlights that psychological factors are important for individuals (recipients here) to fully reap the benefits of social networks and calls for the integration of the network and psychological perspectives (Casciaro et al., 2015; Kilduff & Lee, 2020; Tasselli & Kilduff, 2021). More specifically, for a recipient to find a dyadic partner's knowledge creatively generative, they must actively consider and process this knowledge (Sosa, 2011). This requirement highlights that it is not the access to a dyadic partner per se that allows a recipient to reap the creative benefits from dyadic interactions, but whether the recipient is sufficiently receptive to the knowledge to be able to process it actively and effectively. In this sense, a recipient could be differentially receptive to each of their dyadic partners, depending on both the content of the received knowledge and the closeness of the specific dyadic relationship (Koseoglu et al., 2022; Lee & Lee, 2015; Levin et al., 2016; Sosa, 2011).

To address the above issues, we investigate *whether*, *how*, and *when* recipients reap creative benefits from knowledge received from a dyadic partner. We adopt the established taxonomy of explicit–tacit knowledge from knowledge management theory (Nonaka, 1994; Nonaka et al., 2000) to distinguish between different types of knowledge receiving. *Explicit knowledge* is objective knowledge

(e.g., documents, reports, and models) that can be articulated, codified, and expressed in formal and systematic language. In contrast, *tacit knowledge* refers to subjective knowledge (e.g., personal experiences, beliefs, professional insights, and know-how) that is typically context specific (Venkitachalam & Busch, 2012); is harder to formalize, articulate, communicate, and assimilate (Alavi & Leidner, 2001; Lam, 2000); and needs further digestion (Ambrosini & Bowman, 2001; Nonaka et al., 2000). We propose that receiving tacit (vs. explicit) knowledge from a dyadic partner is more likely to spur recipients' *knowledge elaboration*—or the process through which recipients synergize and apply knowledge received from others (Rouse, 2020; van Knippenberg et al., 2004)—and in turn catalyze their creativity.

Moreover, we further propose that dyadic *psychological closeness*, meaning the extent to which a recipient has a sense of intimacy with and positive affect for the partner (Levin et al., 2016; Marsden & Campbell, 1984), will accentuate the effect of knowledge receiving on the recipient's elaboration of tacit (but not explicit) knowledge. The knowledge management literature suggests that different levels of motivation and effort are needed to elaborate different types of knowledge (Huang et al., 2014; Lin et al., 2023). Thus, as touched on above, recipients could be differentially motivated to elaborate knowledge received from different partners according to the strength of their connection with a partner (Koseoglu et al., 2022; Levin et al., 2016). Overall, our application of knowledge management theory suggests a moderated mediation model, depicted in Figure 1. We use this model to develop four hypotheses, which we then test with three main studies.

The results of these studies offer three main theoretical contributions. First, by shifting from the structural to the relational perspective and directly targeting knowledge content transmitted in a dyad, we extend research on social networks and creativity by revealing that tacit (vs. explicit) knowledge received from a dyadic partner is more likely to be elaborated and hence catalyze the recipient's creativity. This key insight—namely, that it is the right type of knowledge, and not just access to a dyadic partner, that allows a recipient to reap the creative benefits from dyadic interactions—has been blurred in prior research. Our research not only confirms the explicit–tacit distinction in knowledge management theory (Haas & Hansen, 2007; Huang et al., 2014) but also extends the theory by examining the underexplored downstream consequence of this distinction on the recipient's creativity.

Second, we distinguish receiving from subsequent processing and integration of knowledge, the two subprocesses that are included in the broad concept of knowledge elaboration in past research (van Knippenberg, 2017; van Knippenberg et al., 2004). This fine-grained approach enables us to test for the first time the assumed knowledge elaboration mechanism linking dyadic tacit knowledge receiving and catalytic creativity, opening the “black box” of reaping creative gains from dyadic ties. Finally, we also reveal psychological closeness as a key boundary condition for realizing the creative benefit of dyadic tacit knowledge receiving. Despite the assumed knowledge elaboration mechanism linking knowledge receiving and catalytic creativity, our results show that elaboration of received knowledge does not happen automatically; rather, it depends on dyadic psychological closeness. In this way, we also illuminate a seldom explicitly tested

¹Previous studies label this construct in various ways. More specifically, Sosa (2011) labels it as “ease of generating creative ideas,” Tortoriello et al. (2015) name it “catalysts of innovation,” and Koseoglu et al. (2022) call it “intensity of catalytic contribution.” We use “catalytic creativity” to refer to the creative idea generation as catalyzed by interaction with the other party in a dyad. With this concise concept name, we attempt to capitalize on the connotation of creativity in the broad literature while highlighting our focus on it being catalyzed by interaction with the other party in a dyad.

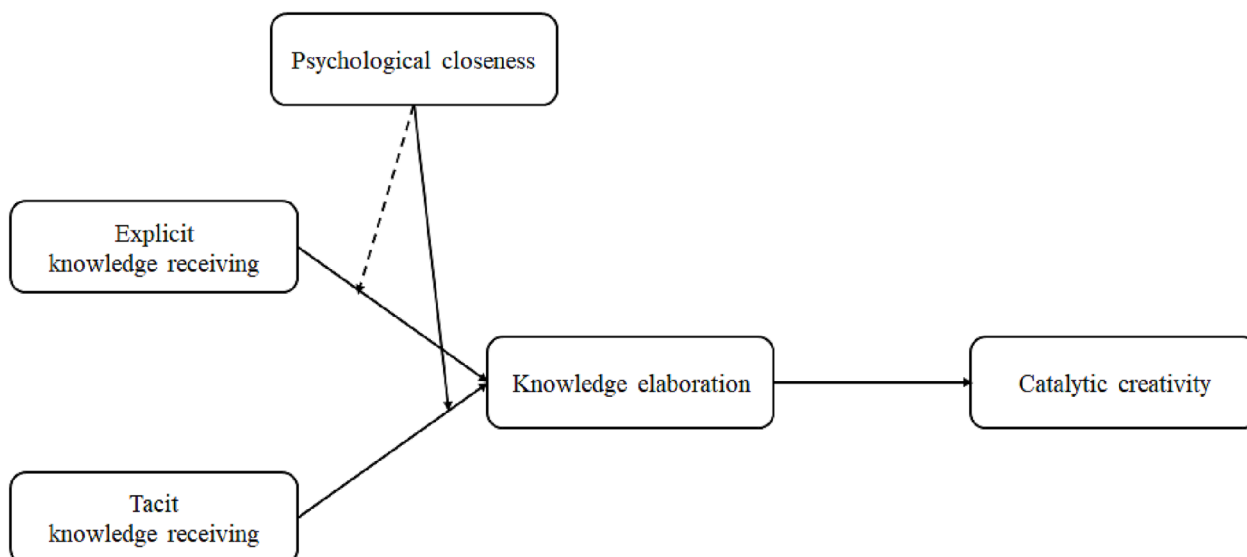


FIGURE 1 Hypothesized overall research model. [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1002/job.2741)]

insight: Access to a dyadic partner's knowledge does not necessarily catalyze the recipient's creativity, and it depends on the psychological characteristics between the recipient and partner (Kilduff & Lee, 2020; Tasselli & Kilduff, 2021).

2 | THEORETICAL BACKGROUND AND HYPOTHESES

2.1 | Explicit versus tacit knowledge receiving and knowledge elaboration

Knowledge receiving describes the extent to which a recipient *has received* knowledge from a partner. In this regard, it is conceptually distinct from knowledge collecting (also known as knowledge seeking or sourcing), which captures an active behavior of asking others to share their intellectual capital (de Vries et al., 2006) and might end with not receiving knowledge due to knowledge hiding or the unavailability of the requested knowledge (Connelly et al., 2012). Naturally, the process of knowledge elaboration can only occur after receiving knowledge from a partner. The essence of this elaboration is in-depth processing of knowledge shared by others (van Knippenberg, 2017; van Knippenberg et al., 2004).

The distinction between explicit and tacit knowledge is especially relevant to the successful elaboration of knowledge transferred in dyads, as each type of knowledge has nuanced effects on elaboration. Specifically, explicit knowledge is objective and often presented in a self-explanatory and easy-to-follow format (e.g., a step-by-step manual). Thus, an individual can easily utilize a partner's explicit knowledge without considerable processing (Hoever et al., 2012; Shah et al., 2018). The clearly codified nature of explicit knowledge makes it contact-free in transmission and less reliant on rework or adaptation prior to being reused in one's own task. For example, a software

module or an electronic document residing in a firm's knowledge management system is usually readily applicable and requires little adaptation for reuse (Haas & Hansen, 2007; Hansen, 1999).

Tacit knowledge, on the contrary, requires direct and often intimate interactions between the partner and the recipient because it is hard to fully articulate this type of knowledge in writing (Grant, 2007; Polanyi, 1966). The context-specific (e.g., know-how and skills) and individual-specific (e.g., mental model) nature of tacit knowledge limits the possibility that a recipient can easily digest and directly reuse it (de Stobbeleir et al., 2011). Rather, to understand a partner's tacit knowledge and apply it in their own tasks, recipients must invest considerable effort in cognitively processing and then adapting and customizing the received knowledge, entailing a high level of elaboration (Haas & Hansen, 2007; Hoever et al., 2012). Although certain forms of explicit knowledge (e.g., market analysis reports) can also require some rework to absorb and reuse, evidence is inconclusive regarding the effect of explicit knowledge receiving on efforts in its adaptation and assimilation (Haas & Hansen, 2007). Therefore, we expect that tacit knowledge receiving is more likely to trigger the recipient's knowledge elaboration than explicit knowledge receiving. To sum up, we hypothesize:

Hypothesis 1. Tacit knowledge receiving from a dyadic partner has a stronger positive effect on knowledge elaboration by the dyadic recipient than explicit knowledge receiving from a dyadic partner has.

2.2 | Tacit knowledge receiving and catalytic creativity: Elaboration as mediator

The literature on creativity has confirmed that creativity often arises from the in-depth assimilation, integration, and application of different knowledge into a novel and useful solution (Li, Li, & Lin, 2018; Li

et al., 2017; Liu et al., 2023). Knowledge elaboration epitomizes these processes (Rouse, 2020; van Knippenberg et al., 2004). Previous studies at both team and individual levels have suggested that knowledge elaboration is a crucial process leading to creativity (see Samba et al., 2018; van Knippenberg & Hoefer, 2018; Zhou & Hoefer, 2014 for reviews). Building on this literature, we submit that recipients' elaboration of knowledge from a partner would also affect their creativity as catalyzed by the partner (Chua & Jin, 2020; Fliaster & Schloderer, 2010).

Combining the above rationale with that leading to Hypothesis 1 implies that tacit knowledge receiving is more likely to increase recipients' catalytic creativity than explicit knowledge receiving does, because tacit knowledge leads to greater knowledge elaboration which stimulates creativity catalyzed by a partner. More specifically, because tacit knowledge often dwells deep in the mind and is dependent upon one's cognitive schema (Nonaka & von Krogh, 2009), the recipient's thoughtful elaboration of received tacit knowledge arouses the awareness of different ways of thinking or practice from the partner, unfreezing the existing cognitive structure as the first step of the creative process (Gong et al., 2020; Huang et al., 2014). Moreover, elaboration of tacit knowledge received from a partner allows the recipient to critically evaluate whether the mental models or rules of thumb held by the partner are adaptable to the new (i.e., recipient's) context, facilitating connection between previously unconnected knowledge structures (Gong et al., 2013; Zhou & Hoefer, 2014). Ultimately, the recipient synthesizes different perspectives, insights, and know-how from both parties in the dyad and applies the integrated tacit knowledge in their own creative problem-solving (Chua & Jin, 2020; Maurer et al., 2011). The aforementioned arguments are illustrated by the following example. Engineer B working at a super-market was developing new applications (apps) for users to place orders on a smartphone. Engineer A shared a personal insight that his father found using apps frustrating—many have very small font size, making it difficult to read menus or instructions clearly. This personal sharing reminded Engineer B that one of the most important principles for app development is user friendliness, especially for elderly people. With this principle activated in his mind, Engineer B carefully evaluated whether the app he had developed was user-friendly enough. Consequently, he modified the algorithm based on the principle so that it automatically adjusts the font size of menus based on registered users' self-claimed age. Moreover, Engineer B also extended this idea to create different algorithms to automatically adjust the menus based on users' gender, nationality, and past shopping record. In sum, the recipient's (Engineer B here) elaboration of tacit knowledge from a partner (Engineer A here) promotes the recipient's catalytic creativity by increasing their awareness, evaluation, integration, and application of the tacit knowledge.

By contrast, as we argue earlier, explicit knowledge is often presented in a self-explanatory and easy-to-follow format. Thus, receiving such knowledge is less likely to trigger the recipient's considerable processing (e.g., evaluation of assumptions and principles behind and integration with existing knowledge structure) and catalyze the generation of creative ideas from the interaction. Therefore, we argue that tacit knowledge receiving is more likely to promote the recipient's

catalytic creativity via knowledge elaboration than explicit knowledge receiving. To sum up, we hypothesize:

Hypothesis 2. Tacit knowledge receiving from a dyadic partner has a stronger positive indirect effect on the recipient's catalytic creativity via the recipient's elaboration of the received knowledge than explicit knowledge receiving from a dyadic partner has.

2.3 | Moderating role of psychological closeness

Knowledge management research has long advanced that the nature of an interpersonal relationship significantly impacts the sharing and consequent use of tacit knowledge from the relationship (Dhanaraj et al., 2004; Hansen, 1999; Nahapiet & Ghoshal, 1998; Reagans & McEvily, 2003). As Nonaka (1994) asserts, tacit knowledge transfer and utilization usually starts with the building of a sense of “team” or “field” which forms a closed boundary for the recipient to understand the partner's experience and perspective. Recent research on the differential effect of explicit and tacit knowledge also affirms that the value of tacit knowledge is more likely to be realized in embedded relations (Becerra et al., 2008; Kijkuit & van den Ende, 2010; Levin & Cross, 2004; Maurer et al., 2011). Evidence shows that the relational aspect of social interaction between a recipient and a partner strongly affects how productive dyadic knowledge receiving will be (Levin et al., 2016; Moran, 2005; Tsoukas, 2009).

Building on the aforementioned research, we introduce psychological closeness between the recipient and partner as a theory-driven moderator for the effect of tacit knowledge receiving on knowledge elaboration. More specifically, we posit that psychological closeness moderates the effect of tacit knowledge receiving on knowledge elaboration for two reasons. First, a high level of psychological closeness cultivates a cohesive environment characterized by trust and support (Levin & Cross, 2004), which (a) reduces the uncertainty involved in recipients' processing of complex knowledge (Lee & Lee, 2015) and (b) increases recipients' certainty that they can acquire the necessary support and encouragement instead of ridicule or rejection from the partner (McGrath, 2015; Rouse, 2020). Both forms of increased certainty promote recipients' willingness to elaborate the knowledge received from a partner. Previous studies have suggested that the interpersonal intimacy and emotional intensity, which characterize psychological closeness, elevate individuals' willingness and motivation to carefully consider complex knowledge and apply it in their own work (Gong et al., 2020; Tsai & Ghoshal, 1998). Second, a high level of psychological closeness indicates that the relationship is charged with positive affect and relational energy (Rese et al., 2022; Sosa, 2011), which increases recipients' cognitive flexibility and persistence in processing the complex knowledge (Isen, 1987; Owens et al., 2016), thereby increasing their motivation to elaborate the knowledge received from the partner.

In short, the feeling of psychological closeness with a partner promotes recipients' willingness to appreciate the partner's tacit knowledge and further devote substantial time and effort to absorbing and

adapting the knowledge and then integrating it with their own knowledge (Baer et al., 2015; Gong et al., 2020). Conversely, the absence of psychological closeness may cause recipients to focus on their own knowledge and knowledge that supports their own initial viewpoint rather than any knowledge received from a partner (de Wit et al., 2013; Rost, 2011), reducing the likelihood of knowledge elaboration. By extension, receiving tacit knowledge from a partner should lead to more catalytic creativity when the recipient has psychological closeness to the partner; this is because the greater resulting elaboration of received tacit knowledge under stronger psychological closeness provides a greater potential for stimulating the recipient's catalytic creativity. Hence, we hypothesize:

Hypothesis 3a. Psychological closeness with a partner moderates the effect of tacit knowledge receiving from the partner on knowledge elaboration by the recipient, such that the positive effect is stronger when psychological closeness is higher rather than lower.

Hypothesis 3b. Psychological closeness with a partner moderates the positive indirect effect of tacit knowledge receiving from the partner on the recipient's catalytic creativity via the recipient's knowledge elaboration, such that the indirect effect is stronger when psychological closeness is higher rather than lower.

3 | OVERVIEW OF STUDIES

We conducted four studies to test the above hypotheses. In Study 1, we developed the measures for two core constructs in our research: explicit knowledge receiving and tacit knowledge receiving. Next, we collected survey data from three different samples to establish the reliability and validity of the new scales in various industrial contexts. Drawing upon the validated scales from Study 1, we then conducted Study 2 to test the hypothesized effects of tacit knowledge receiving on knowledge elaboration using a sample of 101 members in 24 teams from a Chinese technology company. In Study 3, we used a sample of 143 students in 38 business simulation teams from a university in China to examine the overall hypothesized model. Finally, we conducted another field study in a nuclear power company (Study 4) with 144 members in 24 teams to replicate the findings from Studies 2 and 3.

4 | STUDY 1: MEASUREMENT DEVELOPMENT FOR KNOWLEDGE RECEIVING

Although some extant constructs in the literature are similar to the ones in this study, none of them meet our research need to (a) focus on knowledge receiving rather than giving and (b) distinguish between explicit and tacit knowledge, a key requirement to answer our

research questions. Therefore, the existing scales of similar constructs, such as the generic measurements for information sharing (Jehn & Shah, 1997), knowledge sharing (Huang et al., 2014), and conceptually distinct constructs like knowledge collecting (de Vries et al., 2006), are not ready-to-use for our purposes.

In addition, research suggests that knowledge sharing—especially tacit knowledge sharing—is difficult to observe and resists measurement (Huang et al., 2014). Among the very few studies examining the two types of knowledge, we did not find any measure that satisfactorily meets the core requirement of our study to depict two types of knowledge receiving as accurately as possible. Thus, new measures were required to separate the types of received knowledge and develop a more nuanced understanding of their differentiated effects on knowledge elaboration and catalytic creativity. Accordingly, we followed extant methodology to systematically develop, assess, and validate new measurement instruments for these two key constructs, as reported below.

In order to develop suitable measures of explicit and tacit knowledge receiving that accurately capture the domain of interest and avoid inherent disadvantages associated with inductive and deductive approaches, we undertook a combined approach of scale development (Crawford & Kelder, 2019; Zheng et al., 2015; Zhu et al., 2019). We began with a deductive approach of scale development because a solid theoretical foundation exists (Hinkin, 1998), which has provided clear definitions and elaborations of two types of knowledge. Based on Nonaka's (1994) conceptualization of explicit and tacit knowledge and an extensive review of prior knowledge sharing literature distinguishing between the two knowledge types (Bock et al., 2005; Holste & Fields, 2010; Huang et al., 2014), we followed Holste and Fields's (2010) approach of specifying knowledge items and particular means of receiving a certain type of knowledge to formulate an initial set of four items measuring explicit knowledge receiving and six items measuring tacit knowledge receiving.

Next, following the best practice suggested by Crawford and Kelder (2019) and the guidelines of the inductive approach (Hinkin, 1998), we conducted a focus group interview with nine experts: three scholars in the knowledge management area who were not part of the research team and six external professionals from the manufacturing, financial, and technology industries who had been extensively engaged in knowledge sharing activities in their organizations. After articulating the distinction between explicit and tacit knowledge (Haas & Hansen, 2007; Nonaka, 1994), we asked the panel of experts to describe how they would give and receive explicit and tacit knowledge in their own working environments. Open discussions on the item descriptions that we generated in the first step then followed. Results from the focus group interview helped minimize contextual bias, which led to the exclusion of two items on apprenticeship and demonstration for tacit knowledge receiving. After collecting interviewees' feedback to refine the items, we further conducted face validity checks by holistically reviewing each item against the conceptual definitions of the constructs (Crawford & Kelder, 2019).

To conduct content adequacy assessment prior to a full-scale empirical test (Crawford & Kelder, 2019; Ebel, 1977; Schriesheim

et al., 1993), we tested the scale's content adequacy with a panel of 34 master of business administration (MBA) students at a large public university in the United States. Among the participants, 58.8% were male, and 38.2% were full-time professionals working in managerial positions in various sectors. The assessment was conducted during the break of a regular class meeting of an introductory information technology course. We adopted the “sum score” decision rule since the literature suggests it is an effective decision method required of judges in content validity assessment (Crawford & Kelder, 2019). As a result of this procedure, three items measuring explicit knowledge receiving and three items measuring tacit knowledge receiving (see Table 1 for the full list of items) were identified.

After gathering evidence supporting the content validity of our newly developed measures, we further undertook evaluations of the two measures in three samples of survey data. First, we assessed the factor structure of the new measures using a sample of 102 employees from four Chinese firms in three different industries (manufacturing, financial services, and information technology). The mean age of respondents in this study was 31 years ($SD = 5.1$), and the mean organizational tenure was 3.7 years ($SD = 3.0$); 52% of respondents were male. Participants responded to the six items using a 7-point scale (1 = *never* to 7 = *always*). We performed an exploratory factor analysis (EFA) to assess the measurement properties of the items. The results showed that two factors with eigenvalues greater than 1 were extracted; there were no major cross-loadings. These two factors explained 65.2% of common variance. The EFA results and Cronbach's alphas for the factors are provided in Table 1.

Next, we collected another sample of 264 employees from a telecommunication company in China to conduct confirmatory factor analyses (CFAs). The same anchors and scales were used. The mean age of participants was 35.71 years ($SD = 5.74$), and the mean organizational tenure was 5.44 years ($SD = 3.82$); 49% of respondents were male. The results indicated that the two-factor model had an acceptable fit ($\chi^2/df = 1.25$, $p = .27$, $RMSEA = .03$, $CFI = .99$, $TLI = .99$, $SRMR = .03$). Indeed, this model fitted the data better than the

alternative model in which the two variables were combined ($\Delta\chi^2 [1] = 154.60$, $p < .001$).

Finally, we further assessed the discriminant validity of the newly developed measures with a sample of 231 Chinese participants recruited from [sojump.com](https://www.sojump.com), a platform similar to Prolific Academic. To be eligible to participate, individuals had to be working full time within a face-to-face (rather than virtual) work group. On average, the participants were 32.14 years old ($SD = 5.81$ years); 110 of them (47.6%) were male. The new measures for explicit and tacit knowledge receiving were compared with a series of related but distinct constructs in prior studies. Specifically, we compared our measure of explicit and tacit knowledge receiving with knowledge collecting (de Vries et al., 2006), information sharing (Jehn & Shah, 1997), individual explicit knowledge (Fan & Cheng, 2006), bringing expertise to bear (Faraj & Sproull, 2000), willingness to share tacit organizational knowledge (Holste & Fields, 2010), and willingness to use tacit organizational knowledge (Holste & Fields, 2010). All items were rated on a 7-point Likert scale (1 = *strongly disagree/never* to 7 = *strongly agree/always*).

To assess discriminant validity, we conducted a series of CFAs on the eight variables. The results indicated that the hypothesized eight-factor model had a good fit with the data ($\chi^2/df = 1.77$, $p < .001$, $RMSEA = .06$, $CFI = .92$, $TLI = .91$, $SRMR = .05$). Moreover, the standardized factor loading of each item was larger than .55 and significant ($p < .001$). The hypothesized model also fitted the data better than other alternative models when we combined (1) explicit knowledge receiving and tacit knowledge receiving ($\Delta\chi^2 [7] = 13.49$, $p < .001$); (2) explicit knowledge receiving and individual explicit knowledge ($\Delta\chi^2 [7] = 14.51$, $p < .001$); (3) tacit knowledge receiving and willingness to use tacit organizational knowledge ($\Delta\chi^2 [7] = 16.78$, $p < .001$); (4) willingness to share tacit organizational knowledge and willingness to use tacit organizational knowledge ($\Delta\chi^2 [7] = 2.86$, $p < .05$); (5) explicit knowledge receiving, tacit knowledge receiving, and knowledge collecting ($\Delta\chi^2 [13] = 17.22$, $p < .001$); (6) tacit knowledge receiving, willingness to share tacit organizational

TABLE 1 Exploratory factor analysis results for knowledge receiving scales (Study 1).

Variable	Item	Factor 1	Factor 2
Explicit knowledge receiving $\alpha = .95$	I receive work reports, official documents, and self-explanatory software from him/her.	.91	.26
	I receive well-documented manuals, methodologies, and models from him/her.	.91	.33
	I receive shareable internal and/or external data (e.g., articles, reports, and data results) from him/her.	.89	.36
Tacit knowledge receiving $\alpha = .91$	I receive hands-on experiences and perspectives from him/her through dialogue and interactions.	.26	.91
	I receive expertise from him/her through working together in a specific work context.	.31	.88
	I get his/her intuition or rules of thumb through metaphors and storytelling.	.36	.83

Note: $N = 102$.

knowledge, and willingness to use tacit organizational knowledge ($\Delta\chi^2 [13] = 24.72, p < .001$); and (7) all of the constructs ($\Delta\chi^2 [28] = 82.75, p < .001$). Thus, our measure of explicit and tacit knowledge receiving showed discriminant validity.

In sum, the results supported the validity of the explicit and tacit knowledge receiving measures. We then used the validated measures and adapted them to the round-robin method in the following three main studies to test our hypothesized model at the dyadic level.

5 | STUDY 2: TESTING THE EFFECTS OF KNOWLEDGE RECEIVING ON ELABORATION

5.1 | Sample and data collection

In Study 2, we sought only to test the effects of explicit versus tacit knowledge receiving on knowledge elaboration. To do so, we collected data from a high-technology company in northwestern China. The company develops and sells software for emergency management. To manage its complex technical demands, this company has adopted a team structure. The functional roles of team members invited to participate in this study involve software architect, developer, and tester. All of them are expected to jointly contribute to the development of the emergency management software and the company provided necessary support to team members in creating the knowledge-intensive outputs (i.e., software). Further, in accomplishing their focal tasks and shared objectives, team members typically exchange both codified documents and tacit ideas with each other in their daily work. As such, although the basic unit of effectiveness evaluation in this company is the team, dyadic interaction is valued and viewed by the managers as the foundation for the team to achieve excellence in executing interdependent development tasks. Therefore, this company provided a suitable context for testing our hypothetical effects of dyadic-level knowledge receiving on knowledge elaboration.

With the company's endorsement, we conducted two waves of surveys with team members. Prior studies on knowledge exchange and help seeking/giving have adopted various time intervals when conducting surveys, ranging from 2 weeks (Chen et al., 2021) to 1 month (Sherf & Morrison, 2020), to 3 months (Koopmann et al., 2019), and even 6 months (Li, Li, Guo, et al., 2018). We chose the 1-month time lag because it (a) aligned with the performance review cycle in this company, (b) allowed the effect of knowledge receiving on knowledge elaboration to reasonably emerge, and (c) could realistically accommodate our two-wave data collection plan with the likelihood of obtaining as many matched responses as possible.

Before the data collection, we obtained a roster of 119 team members nested in 28 teams. At Time 1, each member answered questions regarding the explicit and tacit knowledge received from each of the other team members. In assessing explicit and tacit knowledge receiving, we utilized the round-robin method (Kenney, 1994)—that is, each member of a team rated, and was correspondingly rated by, every other member in terms of the frequency of explicit and tacit knowledge receiving. Approximately 1 month later (Time 2), we asked

the same respondents to rate their elaboration of the knowledge received from each of the other team members.

Among the 119 team members, 109 responded to the multi-wave questionnaires completely, with a response rate of 91.6%. In addition, the average within-team response rate was 94.1%. According to Warner et al. (1979), to obtain the estimates in social relations modeling (see the detailed description in the analytic strategies section below), each team needs to have at least three members. Therefore, we excluded four teams with only two members. Following Rogelberg and Stanton's (2007) suggestion, we compared the focal variables of those who were excluded with the focal variables of those who were retained. We found no significant differences between the two groups in terms of explicit knowledge receiving ($t = -1.72, p = .09$), tacit knowledge receiving ($t = -1.55, p = .16$), and knowledge elaboration ($t = -1.55, p = .12$). Thus, our final sample consisted of 353 dyads among 101 members in 24 teams. The mean age was 29.87 years ($SD = 4.77$), 46.5% of the members were male, and 69.3% had a bachelor's degree or above.

5.2 | Measures

We used the same multiple-item scales of knowledge receiving validated in Study 1 but adapted them to the round-robin method by including the names of teammates. For all other variables in our research model, we adopted established scales. Moreover, we strictly followed the translation-back-translation procedure recommended by Brislin (1980) in creating the Chinese version of the surveys. Every item was rated with a 7-point Likert scale (1 = *strongly disagree/never* to 7 = *strongly agree/always*).

5.2.1 | Knowledge receiving

Team members were instructed to report how frequently they received knowledge from each other member of the team. Sample items were “I receive work reports, official documents, and self-explanatory software from [X]” (explicit knowledge receiving) and “I receive hands-on experiences and perspectives from [X] through dialogue and interactions” (tacit knowledge receiving).

5.2.2 | Knowledge elaboration

Team members reported the extent to which they elaborate the knowledge received from a partner. Drawing on the information elaboration literature (van Knippenberg et al., 2004), we used three items that were adapted to the dyadic level and focused on the processing of knowledge and perspectives. Items included “I often consider the knowledge that [X] shares with me and its possible applications in my work,” “I discuss with [X] by seeking clarification on their perspective and integrate the information in my work,” and “I integrate my own knowledge with that from [X] by considering the implications of the received knowledge.”

5.2.3 | Control variables

To strengthen the incremental predictive validity of our independent variables, we controlled for several other variables at different levels.² At the dyadic level, considering that dyadic task interdependence may have a substantial influence on interpersonal interactions and knowledge elaboration processes between two members in a particular dyad (de Jong et al., 2007; Poile, 2017; van der Vegt et al., 2010), we controlled for the dyadic task interdependence within each dyad. More specifically, we adopted a single item used by de Jong et al. (2007) and asked each team member to rate themselves according to the following: “How dependent are you on [X] for materials, means, information, etc. in order to carry out your work adequately?” (1 = *not dependent* to 7 = *fully dependent*).

At the individual level, because prior studies on knowledge exchange have shown that demographics are stereotypical cues and associated with knowledge recognition and utilization (Bunderson, 2003; Joshi, 2014; Joshi & Knight, 2015), we controlled for the demographic information of both parties of a dyad, including age, gender, educational level, and organizational tenure. We also controlled for the recipient's and partner's status within a work group because status (i.e., the prominence, respect, and influence that an individual has in the eyes of others in the group; Anderson et al., 2001; Li et al., 2016) may influence knowledge elaboration processes (Thomas-Hunt & Phillips, 2004; Veltrop et al., 2017). Hence, we followed the process of Anderson et al. (2003), first asking each team member to rate other members in terms of their status within the group using a three-item scale (Anderson et al., 2001) and then averaging all of these ratings.

At the team level, shared higher level goals (i.e., vision) (Pearce & Ensley, 2004) and team reflection (Schippers et al., 2015) can promote knowledge exchange activities. We therefore asked team leaders to report the shared goals of members in the same team using Lam et al.'s (2011) three-item scale and to report team reflection using De Dreu's (2007) four-item scale.

5.3 | Analytic strategies

We first conducted multilevel CFAs to check the discriminant validity of our measures. The data collected using the round-robin method has a three-level nested structure in which dyads are nested in individuals and individuals are nested in teams. To account for the non-independence in the data, we adopted an approach which combines cluster-robust standard error (CRSE) modeling and multilevel modeling (MLM). This approach accommodates the first two levels with MLM and the third level with CRSE (McNeish & Wentzel, 2017; Rabe-Hesketh & Skrondal, 2006). Hence, instead of complex multilevel model specification which leads to non-convergence because of the small number of clusters at team level ($N = 24$ in this study), this

approach frees us to focus on a less complex model while accounting for the third-level clustering. Previous studies on dyadic-level relationships using the round-robin method have also adopted this approach (e.g., Pan et al., 2021). Mplus provides a combination procedure that is referred to as “type = complex twolevel” to estimate such three-level models.

Next, we ran social relations modeling (SRM) analyses to test the hypothesis at the dyadic level (Kenny et al., 2006; Snijders & Kenny, 1999; Wong et al., 2022). The SRM accounts for multiple sources of variance associated with the multi-team, round-robin design used in this study. As an illustration, consider a hypothetical three-member team X. In team X, member A is rated by members B and C, and member A also rates members B and C. Thus, the variance in a dyad-level outcome such as knowledge elaboration may be attributed to A as a focal member as well as A as a partner. A, B, and C are also cross-nested within A-B, B-A, A-C, C-A, B-C, and C-B dyads within the team. Moreover, variance in the dyad-level variable must be considered within a specific team. SRM assesses knowledge elaboration as the sum of the overall mean μ , an actor effect A_i , a partner effect B_j , and a dyadic or relationship effect R_{ijk} and accounts for the following: variance in knowledge elaboration attributable to the focal actor (i.e., recipient, in our context) (A_i), variance attributable to the partner (B_j), variance attributable to the dyad or the relationship between the focal actor and the partner (R_{ijk}), error variance (E_{ijk}), and variance attributable to the team (F_k).

We performed three-level CFAs with Mplus 8.0 (Muthén & Muthén, 2017) and tested Hypothesis 1 at the dyadic level with R package pdSRM (Knight & Humphrey, 2019; Wong et al., 2022). To further compare the effects of explicit versus tacit knowledge receiving on knowledge elaboration, we estimated the differences of effect and the associated 95% confidence intervals (CIs) with 20 000 iterations of parameter-based bootstrapping (Preacher & Selig, 2012).

5.4 | Results

5.4.1 | Descriptive statistics and CFAs

As noted, the dataset consisted of three hierarchically nested levels: 353 dyadic relationships nested within 101 members in 24 teams. Table 2 shows the means, standard deviations, and correlations of the variables at the dyadic, individual, and team levels. We conducted three-level CFAs on the four multiple-item variables rated by team members with the round-robin method (i.e., explicit knowledge receiving, tacit knowledge receiving, knowledge elaboration, and status). The four-factor model had an acceptable fit ($\chi^2/df = 1.26$, $p = .04$, $RMSEA = .03$, $CFI = .99$, $TLI = .99$, $SRMR_{within} = .04$, $SRMR_{between} = .10$). This model fitted the data better than alternative models when the following variables were combined: (1) explicit knowledge receiving and tacit knowledge receiving ($\chi^2/df = 5.63$, $p < .001$, $RMSEA = .11$, $CFI = .82$, $TLI = .78$, $SRMR_{within} = .09$, $SRMR_{between} = .20$); (2) explicit knowledge receiving, tacit knowledge receiving, and knowledge elaboration ($\chi^2/df = 8.72$, $p < .001$,

²Adding or removing these control variables does not change our results or conclusions in any meaningful way.

Variables	Mean	SD	1	2	3	4	5
Team-level variables							
1. Team shared goals	5.63	0.65	(.87)				
2. Team reflection	5.83	0.80	.79**	(.90)			
Individual-level variables							
1. Gender	1.53	0.50	—				
2. Age	29.87	4.77	-.20*	—			
3. Educational level	3.75	0.56	.12	-.06	—		
4. Organizational tenure	29.91	26.13	.08	.11	.02	—	
5. Status	4.99	0.71	-.11	-.08	-.04	.26**	(.85)
Dyadic-level variables							
1. Dyadic task interdependence	3.80	1.57	—				
2. Explicit knowledge receiving	3.66	1.62	.16**	(.95)			
3. Tacit knowledge receiving	3.48	1.45	.29**	.43**	(.91)		
4. Knowledge elaboration	4.58	1.06	.08	.02	.32**	(.86)	

TABLE 2 Means, standard deviations, and correlations among variables (Study 2).

Note: $N = 353$ dyads, 101 members, 24 teams. The figures on the diagonal in parentheses are the alpha coefficients.

* $p < .05$, and ** $p < .01$.

$RMSEA = .15$, $CFI = .70$, $TLI = .63$, $SRMR_{within} = .16$, $SRMR_{between} = .37$; and (3) all four variables ($\chi^2/df = 12.15$, $p < .001$, $RMSEA = .18$, $CFI = .56$, $TLI = .46$, $SRMR_{within} = .19$, $SRMR_{between} = .40$). The results indicated discriminant validity for these variables.

5.4.2 | Variance decomposition of knowledge elaboration

Before testing our hypotheses, we first used null models to decompose the variance in knowledge elaboration into team, recipient, partner, and dyad components in order to assess whether SRM would be appropriate for analyzing our data. The dyad-level component, which is a combination of systematic dyadic variation and residual, was sizeable for knowledge elaboration (51%). In line with prior research (e.g., Lee & Duffy, 2019), the variance attributed to the recipient (44%) is larger than the variance attributed to the partner (2%). This pattern suggests that individual team members tend to elaborate knowledge in different ways across different interactions, whereas they generally induce other teammates' knowledge elaboration in a similar manner. Consistent with previous studies on knowledge exchange in teams (Gilson et al., 2013; Majchrzak et al., 2005), team-level components likewise influenced variance in knowledge elaboration (3%). These results of variance decomposition demonstrated the need for analyzing the data with the SRM.

5.4.3 | Knowledge receiving and elaboration

Hypothesis 1 predicts that tacit knowledge receiving has a stronger positive effect on knowledge elaboration than explicit knowledge receiving does. The results in Model 2 of Table 3 indicated that tacit

knowledge receiving was positively and significantly related to knowledge elaboration ($\beta = .17$, $p < .001$), whereas explicit knowledge receiving was not significantly related to knowledge elaboration ($\beta = -.02$, $p = .56$). Moreover, a parameter-based bootstrapping with 20 000 iterations indicated that the difference between the two coefficients was significant (difference = .19; 95% CI [0.081, 0.304]). These results together supported Hypothesis 1.

5.4.4 | Supplementary analyses

Additionally, we also followed van der Vegt et al. (2006) and measured the dyadic-level dissimilarity of continuous demographics (i.e., age, educational level, and organizational tenure) as the product of the recipient's and partner's corresponding demographics. Moreover, we measured the dyadic-level gender dissimilarity as 0 for same-gender dyads and 1 for different-gender dyads. We reported the results in Table S1. The results of supplementary analyses are substantively similar to those aforementioned. Moreover, most of the coefficients associated with demographic dissimilarities are not significant.

6 | STUDY 3: MAIN STUDY OF HYPOTHESES TESTING

6.1 | Sample and data collection

We tested the overall hypothesized model in Study 3. The sample involved in this study comprised undergraduate or graduate students participating in a team-based business simulation competition hosted by a university in northern China. Considering that business simulations can mimic the dynamic market environment in which managers make complex decisions to provide innovative products

TABLE 3 Results of SRM analyses predicting knowledge elaboration (Study 2).

Variables	Knowledge elaboration					
	Model 1			Model 2		
	β	se	p	β	se	p
Dyadic-level controls						
Dyadic task interdependence	.03	.03	.33	-.01	.03	.71
Individual-level controls						
Recipient's gender	.25	.18	.15	.24	.18	.18
Recipient's age	-.01	.02	.76	-.00	.02	.87
Recipient's educational level	-.31	.15	.04	-.28	.15	.07
Recipient's organizational tenure	-.00	.00	.49	-.00	.00	.56
Recipient's status	.11	.13	.41	.09	.13	.48
Partner's gender	.03	.11	.81	.01	.12	.92
Partner's age	-.01	.01	.41	-.01	.01	.45
Partner's educational level	-.15	.09	.12	-.14	.10	.17
Partner's organizational tenure	-.00	.00	.15	-.00	.00	.23
Partner's status	.33	.09	.00	.30	.09	.00
Team-level controls						
Team shared goals	-.40	.18	.04	-.42	.18	.03
Team reflection	.45	.22	.05	.44	.21	.05
Dyadic-level independent variables						
Explicit knowledge receiving				-.02	.04	.56
Tacit knowledge receiving				.17	.04	.00
Sources of variances						
Team	.00			.00		
Recipient	.60			.46		
Partner	.00			.04		
Dyad	.45			.52		

Note: $N = 353$ dyads, 101 members, 24 teams. The estimated coefficients are unstandardized.

or services, they have been used in previous studies to investigate knowledge management (Mathieu & Schulze, 2006), interpersonal interactions (Ferrin et al., 2008), and creativity (Mai et al., 2022) in teams. The particular simulation game chosen for this competition, Cesim Global Challenge (www.cesim.com), has been widely adopted in prior research (Hernández-Lara, Perera-Lluna, & Serradell-López, 2019; Hernández-Lara, Serradell-López, & Fitó-Bertran, 2019). This team-based simulation allows team members to practice management knowledge and skills across several disciplines, such as finance, accounting, human resources, research and development, production, and marketing.

The business simulation competition lasted for 4 weeks. All teams began with equal amounts of resources and equal market positions. Team members were required to make operating decisions on a weekly basis and each decision cycle corresponded to a 1-year simulated timeframe. At the end of each week, team members had to submit two decisions: The first was an individual-based decision, and the second was a team-based decision. It is worth noting that there was no role differentiation in teams. As such, team members worked on the same set of operating issues in both the individual- and team-

based decisions. According to the host of the competition, requiring team members to make individual decisions before team decisions gave them the opportunity to reflect and practice the management knowledge individually.

To survive and thrive in the simulated dynamic and competitive marketplace, team members needed to allocate finite resources in a wise or creative way in both individual- and team-based decisions. From this perspective, all of them were expected to complete comparably creative tasks in the decision of each cycle, with supporting staff from the host providing necessary support to all teams during the competition. Moreover, before either type of decision-making occurred, team members were allowed to exchange information and ideas with each other. Similar to the context in Study 2, although performance feedback in each cycle was based on the revenues resulted from the team decision, dyadic interaction and catalytic creativity were the critical micro-dynamics for teams to achieve an advantaged position in the competition. Thus, this competition provided a suitable context for testing our overall hypothesized model.

With the competition host's endorsement, we conducted three waves of surveys when team members submitted their decisions at

Weeks 2, 3, and 4, respectively. We did not conduct a survey at Week 1 because team members still needed to become more familiar with each other and establish sufficient interactions at this early stage (Knight, 2015). Before the data collection, we obtained a roster of 184 team members nested in 46 teams. As in Study 2, we adopted the round-robin method to collect data on key variables in our hypothesized model. At Time 1 (the end of Week 2), each member answered questions regarding the explicit and tacit knowledge received from each of the other team members as well as psychological closeness with each of the other team members. At Time 2 (the end of Week 3), we asked the same respondents to rate their elaboration of the knowledge received from each of the other team members. Then, at Time 3 (the end of Week 4), we requested the same respondents to evaluate their catalytic creativity based on the interaction with each of the other team members.

Among the 184 team members, 157 responded to the multi-wave questionnaires completely, with a response rate of 85.3%. In addition, the average within-team response rate was 85.3%. Because of the same reasons as in Study 2 (Warner et al., 1979), we excluded eight teams with one or two members. Again, we found no significant differences between those who were excluded and those who were retained in terms of explicit knowledge receiving ($t = -0.23$, $p = .82$), tacit knowledge receiving ($t = -0.43$, $p = .67$), psychological closeness ($t = 0.18$, $p = .86$), knowledge elaboration ($t = -0.27$, $p = .79$), and catalytic creativity ($t = -1.87$, $p = .06$). Hence, our final sample consisted of 402 dyads among 143 members in 38 teams. The mean age was 21.54 years ($SD = 5.82$), 49% of the members were male, and 83.2% were undergraduates.

6.2 | Measures

We followed the same translation-back-translation procedure used in Study 2 to ensure the appropriateness of all our measures. A 7-point Likert scale was used for all variables in this study. For knowledge receiving and knowledge elaboration, we again used the same scales as in Study 2 but slightly adapted them to fit the competition context.

6.2.1 | Psychological closeness

Following previous research on knowledge transfer and creativity (Levin et al., 2016; Moran, 2005), we measured psychological closeness with Seibert et al.'s (2001) single-item scale. We asked participants to rate their psychological closeness with [X] (name of each teammate) on a 7-point Likert scale.

6.2.2 | Catalytic creativity

We adopted Dokko et al.'s (2014) single-item scale to measure catalytic creativity, which was also used by prior studies (e.g., Tortoriello et al., 2015). Specifically, we asked participants to rate, for each

teammate, how strongly they agreed with the following statement on a 7-point Likert scale: "When I interact with [X], it is easy for me to generate creative solutions and/or ideas."

6.2.3 | Control variables

We controlled for almost all the control variables at the dyadic, individual, and team levels in the same way as in Study 2, with three exceptions. First, we did not control for educational level because members' educational level was equivalent in each team due to the rules of the simulation. Second, we measured status with Anderson et al.'s (2006) single-item scale ("This person has a lot of status within the group") to lessen participants' burden in responding to the survey with the round-robin design. Third, since there were no formal team leaders, we asked team members to indicate shared goals and team reflection on the same scales used in Study 2.

In addition, we included four more control variables and asked team members to report them on a 7-point Likert scale. First, even though there was no role differentiation in the business simulation teams, different members may perceive different levels of requirements and expectations for creativity. Therefore, we controlled for team members' job requirements for creativity and measured the same with Yuan and Woodman's (2010) five-item scale. Second, although the supporting staff was supposed to provide equitable support to teams, different teams may actually perceive different levels of support for creativity from the university, instructors, and other relevant parties in the context. As such, we included team support for creativity as a control variable and measured it with Zhou and George's (2001) four-item scale. Third, members may receive knowledge not only from teammates but also from others outside of their team (Ancona & Caldwell, 1992; Bresman, 2010; Bresman & Zellmer-Bruhn, 2013). To exclude the influences of received external knowledge, we controlled for Bresman's (2010) contextual learning and vicarious learning from external teams and measured them with four- and five-item subscales, respectively.³

6.3 | Analytic strategies

Similar to Study 2, we first conducted three-level CFAs with Mplus 8.0 (Muthén & Muthén, 2017) and then tested the hypothesized model with SRM analyses by using the R package pdSRM (Knight & Humphrey, 2019; Wong et al., 2022). To improve the interpretability of the interactions (Cohen et al., 2003), we centered the variables used to create the interaction terms. Following Wong et al.'s (2022) suggestion for centering variables in SRM, we first computed the SRM effect scores at team, actor, and partner levels for each variable measured at the dyadic level based on Warner et al.'s (1979, pp. 1746–1747) formulas. Next, we subtracted these SRM effect scores at team, actor,

³Again, adding or removing these control variables does not change our results or conclusions in any meaningful way.

and partner levels from the raw scores of variables at the dyadic level based on Warner et al.'s (1979, p. 1747) formula. Lastly, we created the interaction terms by computing the products of centered independent variables and the moderator. We also compared the effects and examined the mediation and moderated mediation hypotheses with parameter-based bootstrapping (Preacher & Selig, 2012).

6.4 | Results

6.4.1 | Descriptive statistics and CFAs

Table 4 shows the means, standard deviations, and correlations of the variables at the dyadic, individual, and team levels. We conducted three-level CFAs on the three multiple-item variables rated by team members with the round-robin method (explicit knowledge receiving, tacit knowledge receiving, and knowledge elaboration). The three-factor model had an acceptable fit ($\chi^2/df = 1.34$, $p = .06$, $RMSEA = .03$, $CFI = .99$, $TLI = .99$, $SRMR_{within} = .03$, $SRMR_{between} = .02$). This model fitted the data better than alternative models when the following variables were combined: (1) explicit knowledge receiving and tacit knowledge receiving ($\chi^2/df = 9.10$, $p < .00$, $RMSEA = .14$, $CFI = .81$, $TLI = .75$, $SRMR_{within} = .22$, $SRMR_{between} = .12$) and (2) all three variables ($\chi^2/df = 21.30$, $p < .00$, $RMSEA = .23$, $CFI = .51$, $TLI = .36$, $SRMR_{within} = .32$, $SRMR_{between} = .30$). The results indicated discriminant validity for these variables.

6.4.2 | Variance decomposition of dependent variables

Similar to Study 2, we first used null models to decompose the variance in knowledge elaboration and catalytic creativity to different components. As with the results in Study 2, the dyad-level component was considerable for knowledge elaboration (41%) and catalytic creativity (31%). In addition, the variances attributed to the recipient are larger than the variances attributed to the partner for knowledge elaboration (recipient = 35%, partner = 1%) and catalytic creativity (recipient = 48%, partner = 4%). This pattern suggests that individual team members tend to elaborate knowledge and realize catalytic creativity in different ways across different interactions, whereas they generally trigger other teammates' knowledge elaboration and catalytic creativity in a similar manner. Moreover, team-level components also contributed to variances in knowledge elaboration (22%) and catalytic creativity (17%). These results of variance decomposition showed the need for analyzing the data with the SRM.

6.4.3 | Knowledge receiving and elaboration

The results in Model 2 of Table 5 indicated that tacit knowledge receiving was positively and significantly related to knowledge elaboration ($\beta = .16$, $p < .001$), whereas explicit knowledge receiving was not significantly related to knowledge elaboration ($\beta = .02$, $p = .54$). Moreover, the difference between the two coefficients was

TABLE 4 Means, standard deviations, and correlations among variables (Study 3).

Variables	Mean	SD	1	2	3	4	5	6
Team-level variables								
1. Team support for creativity	5.61	0.56	(.89)					
2. Team contextual learning	5.09	1.32	.18	(.90)				
3. Team vicarious learning	4.68	1.66	.01	.67**	(.89)			
4. Team shared goals	5.81	0.61	.76**	-.01	-.10	(.86)		
5. Team reflection	5.40	0.56	.76**	.31	.17	.58**	(.89)	
Individual-level variables								
1. Gender	1.51	0.50	—					
2. Age	21.54	5.82	-.14	—				
3. Organizational tenure	1.64	0.91	-.08	.49**	—			
4. Status	5.71	0.81	.09	.07	-.20*	—		
5. Individual job requirements for creativity	5.29	0.91	-.14	.15	.08	.06	(.93)	
Dyadic-level variables								
1. Dyadic task interdependence	5.14	1.43	—					
2. Explicit knowledge receiving	4.20	1.62	.23**	(.94)				
3. Tacit knowledge receiving	4.87	1.42	.23**	.30**	(.95)			
4. Psychological closeness	5.34	1.25	.11*	.33**	.49**	—		
5. Knowledge elaboration	5.61	0.98	.25**	.22**	.42**	.33**	(.94)	
6. Catalytic creativity	5.14	1.38	.39**	.16**	.44**	.21**	.37**	—

Note: $N = 402$ dyads, 143 members, 38 teams. The figures on the diagonal in parentheses are the alpha coefficients.

* $p < .05$, and ** $p < .01$.

TABLE 5 Results of SRM analyses predicting knowledge elaboration (Study 3).

Variables	Knowledge elaboration								
	Model 1			Model 2			Model 3		
	β	se	p	β	se	p	β	se	p
Dyadic-level controls									
Dyadic task interdependence	.28	.03	.00	.22	.03	.00	.12	.06	.04
Individual-level controls									
Recipient's gender	−.03	.10	.73	.03	.10	.78	−.00	.18	.98
Recipient's age	.01	.01	.61	.01	.01	.65	−.00	.03	.90
Recipient's organizational tenure	−.25	.23	.28	−.31	.22	.15	−.49	.55	.37
Recipient's status	−.10	.08	.21	−.09	.08	.25	.01	.14	.96
Partner's gender	−.02	.08	.79	−.03	.08	.69	−.09	.10	.36
Partner's age	−.01	.01	.53	−.01	.01	.49	−.01	.02	.77
Partner's organizational tenure	.22	.23	.33	.29	.22	.18	−.14	.29	.64
Partner's status	.39	.07	.00	.36	.06	.00	.58	.07	.00
Recipient's job requirements for creativity	.05	.06	.42	.04	.06	.52	.01	.08	.86
Team-level controls									
Team support for creativity	−.20	.13	.14	−.24	.14	.10	−.18	.21	.39
Team contextual learning	.18	.05	.00	.13	.05	.01	.23	.06	.00
Team vicarious learning	−.03	.04	.43	−.05	.04	.17	.01	.05	.87
Team shared goals	.33	.12	.01	.29	.13	.03	.88	.16	.00
Team reflection	−.02	.11	.87	.05	.12	.67	−.04	.18	.82
Dyadic-level independent variables									
Explicit knowledge receiving				.02	.03	.54	.03	.06	.66
Tacit knowledge receiving				.16	.03	.00	.24	.06	.00
Dyadic-level moderator									
Psychological closeness							.10	.05	.06
Dyadic-level interactions									
Explicit knowledge receiving × psychological closeness							.02	.10	.87
Tacit knowledge receiving × psychological closeness							.27	.09	.00
Sources of variances									
Team	.00			.00			.01		
Recipient	.14			.16			.34		
Partner	.00			.00			.02		
Dyad	.31			.28			.27		

Note: $N = 402$ dyads, 143 members, 38 teams. The estimated coefficients are unstandardized.

significant ($\text{difference} = .14$; 95% CI [0.053, 0.230]). The results together supported Hypothesis 1 again.

6.4.4 | Mediating effect of knowledge elaboration

Hypothesis 2 proposes that tacit knowledge receiving has a stronger positive indirect effect on catalytic creativity through knowledge elaboration than explicit knowledge receiving does. As can be seen in Model 3 of Table 6, the relationship between knowledge elaboration

and catalytic creativity was positive and significant ($\beta = .24$, $p < .001$). In addition, the indirect relationship between tacit knowledge receiving and catalytic creativity via knowledge elaboration was positive and significant ($\text{indirect effect} = .04$, 95% CI [0.015, 0.067]), whereas the indirect relationship between explicit knowledge receiving and catalytic creativity via knowledge elaboration was not significant ($\text{indirect effect} = .00$, 95% CI [−0.010, 0.020]). Moreover, the difference between the indirect effects was positive and significant ($\text{difference} = .04$, 95% CI [0.007, 0.066]). Thus, Hypothesis 2 was supported.

TABLE 6 Results of SRM analyses predicting catalytic creativity (Study 3).

Variables	Catalytic creativity								
	Model 1			Model 2			Model 3		
	β	se	p	β	se	p	β	se	p
Dyadic-level controls									
Dyadic task interdependence	.57	.04	.00	.48	.04	.00	.44	.04	.00
Individual-level controls									
Recipient's gender	.09	.13	.51	.17	.13	.18	.17	.13	.19
Recipient's age	.02	.02	.31	.02	.02	.29	.02	.02	.32
Recipient's organizational tenure	−.26	.26	.33	−.36	.25	.15	−.28	.25	.25
Recipient's status	−.03	.11	.74	−.03	.10	.78	−.01	.10	.91
Partner's gender	−.08	.10	.42	−.10	.09	.27	−.09	.09	.30
Partner's age	−.01	.02	.69	−.01	.02	.58	−.01	.02	.67
Partner's organizational tenure	.13	.26	.62	.24	.24	.33	.17	.24	.49
Partner's status	.10	.08	.21	.05	.08	.51	−.04	.08	.63
Recipient's job requirements for creativity	−.00	.08	.98	−.02	.08	.83	−.02	.08	.76
Team-level controls									
Team support for creativity	.36	.22	.11	.30	.22	.18	.36	.22	.11
Team contextual learning	.19	.06	.00	.11	.06	.09	.08	.06	.21
Team vicarious learning	−.02	.05	.74	−.04	.05	.42	−.03	.05	.56
Team shared goals	.04	.19	.83	−.00	.20	.98	−.07	.19	.72
Team reflection	−.19	.18	.30	−.09	.19	.63	−.11	.18	.57
Dyadic-level independent variables									
Explicit knowledge receiving				.01	.04	.86	.00	.04	1.00
Tacit knowledge receiving				.24	.04	.00	.20	.04	.00
Dyadic-level mediator									
Knowledge elaboration							.24	.06	.00
Sources of variances									
Team	.00			.00			.00		
Recipient	.34			.34			.32		
Partner	.00			.01			.01		
Dyad	.47			.42			.41		
Variables	Catalytic creativity								
	Model 4			Model 5					
	β	se	p	β	Se	p			
Dyadic-level controls									
Dyadic task interdependence		.30	.07	.00		.23	.07		.00
Individual-level controls									
Recipient's gender		.00	.28	.99		.00	.25		.99
Recipient's age		−.03	.05	.62		−.03	.05		.57
Recipient's organizational tenure		−.53	.86	.54		−.29	.75		.70
Recipient's status		.00	.21	.98		−.00	.18		1.00
Partner's gender		−.26	.14	.07		−.20	.13		.13
Partner's age		−.01	.03	.57		−.01	.02		.60
Partner's organizational tenure		−.26	.44	.55		−.17	.40		.67
Partner's status		.35	.11	.00		.05	.11		.63
Recipient's job requirements for creativity		.00	.13	1.00		−.00	.11		.97

(Continues)

TABLE 6 (Continued)

Variables	Catalytic creativity					
	Model 4			Model 5		
	β	se	p	β	Se	p
Team-level controls						
Team support for creativity	.42	.37	.27	.52	.30	.09
Team contextual learning	.29	.10	.00	.16	.08	.07
Team vicarious learning	.02	.08	.78	.03	.07	.62
Team shared goals	.66	.29	.03	.20	.24	.42
Team reflection	-.25	.31	.42	-.23	.25	.37
Dyadic-level independent variables						
Explicit knowledge receiving	-.03	.07	.67	-.04	.07	.57
Tacit knowledge receiving	.37	.07	.00	.24	.08	.00
Dyadic-level moderator						
Psychological closeness	.00	.07	.99	-.05	.07	.45
Dyadic-level interactions						
Explicit knowledge receiving $\times$ psychological closeness	-.18	.13	.18	-.19	.13	.15
Tacit knowledge receiving $\times$ psychological closeness	.28	.12	.02	.10	.12	.40
Dyadic-level mediator						
Knowledge elaboration				.51	.07	.00
Sources of variances						
Team	.09			.02		
Recipient	.90			.66		
Partner	.13			.08		
Dyad	.40			.42		

Note: $N = 402$ dyads, 143 members, 38 teams. The estimated coefficients are unstandardized.

6.4.5 | Moderating effect of psychological closeness

Hypothesis 3a predicts that psychological closeness moderates the positive effect of tacit knowledge receiving on knowledge elaboration such that the effect is stronger when psychological closeness is higher. As shown in Model 3 of Table 5, the interaction effect of tacit knowledge receiving and psychological closeness on knowledge elaboration was positive and significant ($\beta = .27$, $p < .001$). Following Cohen et al. (2003), in Figure 2, we display the interaction effect graphically at two levels (i.e., ± 1 SD) of psychological closeness. The simple slope tests indicated that tacit knowledge receiving was positively related to knowledge elaboration at higher levels of psychological closeness ($\beta = .40$, $p < .001$) but was not significantly related to it at lower levels of psychological closeness ($\beta = .09$, $p = .22$). Therefore, Hypothesis 3a was supported.

Likewise, although we did not formally hypothesize about explicit knowledge receiving, we simultaneously included it and its interaction term with psychological closeness in the model to predict knowledge elaboration. The results in Model 3 of Table 5 revealed that the interaction effect of explicit knowledge receiving and psychological

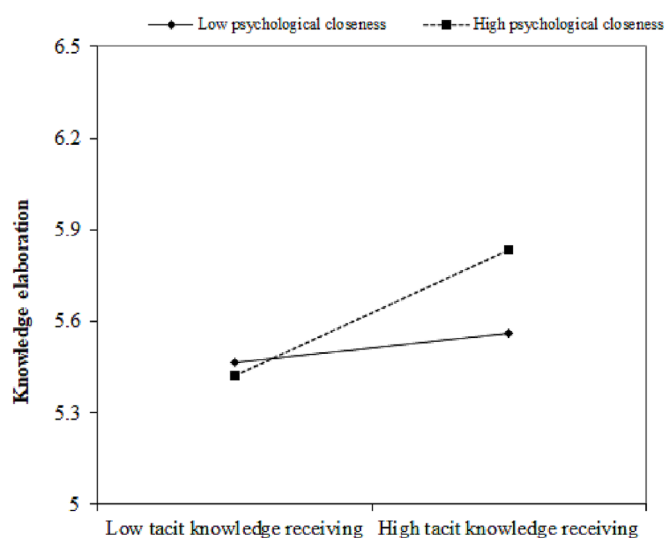


FIGURE 2 Interactive effect of tacit knowledge receiving and psychological closeness on knowledge elaboration (Study 3). [Colour figure can be viewed at wileyonlinelibrary.com]

closeness on knowledge elaboration was not significant ($\beta = .02$, $p = .87$). Hence, psychological closeness did not moderate the effect of explicit knowledge receiving on knowledge elaboration.

Hypothesis 3b proposes that psychological closeness moderates the indirect effect of tacit knowledge receiving on catalytic creativity through knowledge elaboration. Results from the 20 000 iterations of bootstrapping indicated that there was a significant conditional indirect relationship between tacit knowledge receiving and catalytic creativity via knowledge elaboration, such that the indirect relationship was significant when psychological closeness was higher (*indirect effect* = .20, 95% CI [0.112, 0.311]) but not when it was lower (*indirect effect* = .05, 95% CI [−0.027, 0.126]). These results supported Hypothesis 3b.

Considering that neither the main effect of explicit knowledge receiving nor its interaction effect with psychological closeness was significantly related to knowledge elaboration, we did not conduct the post hoc analyses to test the conditional indirect effect of explicit knowledge receiving on catalytic creativity through knowledge elaboration at different levels of psychological closeness.

6.4.6 | Supplementary analyses

Additionally, when testing all the hypotheses, we measured and controlled for dyadic-level dissimilarities as in Study 2. We reported the results in Table S2. Similar to those in Study 2, the results of supplementary analyses are substantively like those aforementioned. Moreover, most of the coefficients associated with demographic dissimilarities are not significant.

7 | STUDY 4: REPLICATING THE MAIN STUDY OF HYPOTHESES TESTING

7.1 | Sample and data collection

We collected data for Study 4 from a nuclear power company located in a city in southeast China. This company generates and distributes electricity to the public. Similar to the context in Study 2, this company also uses teams as its basic unit of operation. The participants invited to this study are all engineers with different functional roles, such as electrical engineering, ventilation management, and fire control. In response to its ever-changing environment and competition from other firms, this company has encouraged team members to generate creative ideas to improve their work and provides necessary support to team members in developing creative ideas or solutions. To manage the complexity arising from the system, team members must exchange documents and ideas with each other in their daily work. Although team creativity is regarded as one of the key criteria to evaluate team effectiveness, catalytic creativity is valued and viewed by company managers as the critical micro-foundation for teams to achieve creativity in joint tasks. Thus, this company provided a suitable context for testing our hypothesized model. With the company's endorsement, we collected survey data at three time points separated by approximately 1 month each time.

Before the data collection, we obtained a roster of 188 team members nested in 33 teams. As with Studies 2 and 3, we again

utilized the round-robin approach to collect data on the key variables in our hypothesized model. At Time 1, each member answered questions regarding the explicit and tacit knowledge received from each of the other team members as well as psychological closeness toward each of the other team members. Approximately 1 month later (Time 2), we asked the same respondents to rate their elaboration of the knowledge received from other team members. After another month, at Time 3, we requested the same respondents to evaluate their catalytic creativity based on their interaction with each of the other team members.

Among the 188 team members, 144 responded to the multi-wave questionnaires completely, with a response rate of 76.6%. The average within-team response rate was 71.1%, and all the teams have three or more members who responded fully. Therefore, we retained all the data and our final sample consisted of 764 dyads among 144 members in 24 teams. The mean age was 32.21 years ($SD = 5.38$), 98.6% of the members were male, and 95.1% had a bachelor's degree or above.

7.2 | Measures

We followed the same translation-back-translation procedure used in Studies 2 and 3 to ensure the appropriateness of all our measures. A 7-point Likert scale was used for all variables in this study. For explicit and tacit knowledge receiving, knowledge elaboration, catalytic creativity, and psychological closeness, we again used the same scales as in Study 3 but slightly adapted them to fit the organizational context.

7.2.1 | Control variables

We controlled for almost all the control variables at the dyadic, individual, and team levels in the same way as in Study 2 and further included educational level (like in Study 1) since team members' educational level varied in this company.⁴

7.3 | Analytic strategies

Our analytic strategies were identical to those used in Studies 2 and 3, described above.

7.4 | Results

7.4.1 | Descriptive statistics and CFAs

Table 7 shows the means, standard deviations, and correlations of the variables at the dyadic, individual, and team levels. We conducted

⁴Again, adding or removing these control variables does not change our results or conclusions in any meaningful way.

TABLE 7 Means, standard deviations, and correlations among variables (Study 4).

Variables	Mean	SD	1	2	3	4	5	6
Team-level variables								
1. Team support for creativity	5.79	0.47	(.91)					
2. Team contextual learning	4.40	0.61	.53**	(.94)				
3. Team vicarious learning	4.51	0.63	.65**	.81**	(.94)			
4. Team shared goals	6.61	0.53	.35	.20	.27	(.91)		
5. Team reflection	6.35	0.56	.16	−.12	.10	.41*	(.88)	
Individual-level variables								
1. Gender	1.01	0.12	—					
2. Age	32.22	5.38	.14	—				
3. Educational level	2.95	0.27	−.42**	−.15	—			
4. Organizational tenure	10.58	4.77	.07	.96**	−.11	—		
5. Status	5.97	0.61	−.34**	−.07	.35**	.01	—	
6. Individual job requirements for creativity	5.11	1.13	−.05	.15	.01	.19*	.09	(.91)
Dyadic-level variables								
1. Dyadic task interdependence	5.35	1.19	—					
2. Explicit knowledge receiving	4.97	1.60	.28**	(.98)				
3. Tacit knowledge receiving	5.39	1.42	.30**	.54**	(.98)			
4. Psychological closeness	5.40	1.18	.37**	.24**	.24**	—		
5. Knowledge elaboration	5.83	0.94	.28**	.22**	.19**	.35**	(.96)	
6. Catalytic creativity	5.81	1.21	.20**	.13**	.16**	.24**	.34**	—

Note: $N = 764$ dyads, 144 members, 24 teams. The figures on the diagonal in parentheses are the alpha coefficients.

* $p < .05$, and ** $p < .01$.

three-level CFAs on the three multiple-item variables rated by team members with the round-robin method (explicit knowledge receiving, tacit knowledge receiving, and knowledge elaboration). The three-factor model had an acceptable fit ($\chi^2/df = 2.61$, $p < .001$, $RMSEA = .05$, $CFI = .98$, $TLI = .98$, $SRMR_{within} = .03$, $SRMR_{between} = .01$). This model fitted the data better than alternative models when the following variables were combined: (1) explicit knowledge receiving and tacit knowledge receiving ($\chi^2/df = 34.42$, $p < .001$, $RMSEA = .21$, $CFI = .61$, $TLI = .48$, $SRMR_{within} = .09$, $SRMR_{between} = .04$) and (2) all three variables ($\chi^2/df = 62.17$, $p < .001$, $RMSEA = .28$, $CFI = .27$, $TLI = .04$, $SRMR_{within} = .27$, $SRMR_{between} = .18$). The results indicated discriminant validity for these variables.

7.4.2 | Variance decomposition of dependent variables

Similar to Studies 2 and 3, we first used null models to decompose the variance in knowledge elaboration and catalytic creativity to different components. As with the results in Studies 2 and 3, the dyad-level component was considerable for knowledge elaboration (30%) and catalytic creativity (30%). In addition, the variances attributed to the recipient are larger than the variances attributed to the partner for knowledge elaboration (recipient = 52%, partner = 6%) and catalytic

creativity (recipient = 63%, partner = 4%). This pattern again suggests that the ways that individuals tend to elaborate knowledge and realize catalytic creativity differ across different interactions, whereas they generally trigger others' knowledge elaboration and catalytic creativity similarly. Moreover, team-level components also contributed to variances in knowledge elaboration (12%) and catalytic creativity (3%). These results of variance decomposition showed the need for analyzing the data with the SRM.

7.4.3 | Knowledge receiving and elaboration

The results in Model 2 of Table 8 indicated that tacit knowledge receiving was positively and significantly related to knowledge elaboration ($\beta = .10$, $p < .001$), whereas explicit knowledge receiving was also positively and significantly related to knowledge elaboration ($\beta = .07$, $p = .02$). However, the difference between the two coefficients was significant (difference = .03; 95% CI [0.002, 0.120]). These results again supported Hypothesis 1.

7.4.4 | Mediating effect of knowledge elaboration

As can be seen in Model 3 of Table 9, the relationship between knowledge elaboration and catalytic creativity was positive and

TABLE 8 Results of SRM analyses predicting knowledge elaboration (Study 4).

Variables	Knowledge elaboration								
	Model 1			Model 2			Model 3		
	β	se	p	β	se	p	β	se	p
Dyadic-level controls									
Dyadic task interdependence	.38	.03	.00	.31	.03	.00	.13	.04	.00
Individual-level controls									
Recipient's gender	.29	.42	.49	.21	.42	.61	.32	.58	.58
Recipient's age	.03	.03	.28	.02	.03	.47	.04	.05	.35
Recipient's educational level	−.09	.18	.60	−.04	.18	.84	−.24	.25	.35
Recipient's organizational tenure	−.05	.04	.15	−.03	.04	.40	−.08	.05	.12
Recipient's status	−.12	.11	.28	−.08	.11	.43	−.50	.19	.01
Partner's gender	−.61	.23	.01	−.55	.21	.01	−.69	.26	.01
Partner's age	.01	.02	.77	−.00	.02	.81	.01	.02	.68
Partner's educational level	.12	.09	.19	.08	.09	.36	.19	.11	.08
Partner's organizational tenure	.02	.02	.30	.03	.02	.14	.02	.02	.30
Partner's status	.17	.07	.01	.10	.06	.11	.21	.08	.01
Recipient's job requirements for creativity	.07	.04	.07	.02	.04	.60	.17	.06	.00
Team-level controls									
Team support for creativity	−.02	.16	.91	.00	.15	.99	.01	.22	.96
Team contextual learning	−.05	.21	.83	−.02	.20	.91	.36	.23	.14
Team vicarious learning	.19	.18	.31	.10	.17	.56	.19	.24	.43
Team shared goals	−.04	.13	.74	−.05	.12	.70	.08	.17	.65
Team reflection	−.08	.11	.47	−.09	.10	.41	−.10	.15	.50
Dyadic-level independent variables									
Explicit knowledge receiving				.07	.03	.02	.07	.04	.07
Tacit knowledge receiving				.10	.03	.00	.03	.04	.48
Dyadic-level moderator									
Psychological closeness							.25	.04	.00
Dyadic-level interactions									
Explicit knowledge receiving $\times$ psychological closeness							−.09	.08	.27
Tacit knowledge receiving $\times$ psychological closeness							.19	.08	.01
Sources of variances									
Team	.03			.01			.04		
Recipient	.20			.20			.42		
Partner	.01			.01			.04		
Dyad	.26			.25			.23		

Note: $N = 764$ dyads, 144 members, 24 teams. The estimated coefficients are unstandardized.

significant ($\beta = .37$, $p < .001$). Moreover, the indirect relationship between tacit knowledge receiving and catalytic creativity via knowledge elaboration was positive and significant (*indirect effect* = .04, 95% CI [0.011, 0.065]), whereas the indirect relationship between explicit knowledge receiving and catalytic creativity via knowledge elaboration was also positive and significant (*indirect effect* = .03, 95% CI [0.004, 0.050]). However, the difference between the indirect effects was positive and significant (*difference* = .01, 95% CI [0.001, 0.046]). Therefore, Hypothesis 2 was again supported.

7.4.5 | Moderating effect of psychological closeness

As shown in Model 3 of Table 8, the interaction effect of tacit knowledge receiving and psychological closeness on knowledge elaboration was positive and significant ($\beta = .19$, $p = .01$). Following Cohen et al. (2003), in Figure 3, we display the interaction effect graphically at two levels (i.e., ± 1 SD) of psychological closeness. The simple slope tests indicated that tacit knowledge receiving was positively related to

TABLE 9 Results of SRM analyses predicting catalytic creativity (Study 4).

Variables	Catalytic creativity								
	Model 1			Model 2			Model 3		
	β	se	p	β	se	p	β	se	p
Dyadic-level controls									
Dyadic task interdependence	.31	.04	.00	.23	.04	.00	.13	.04	.00
Individual-level controls									
Recipient's gender	−.08	.71	.92	−.16	.69	.82	−.24	.69	.73
Recipient's age	.04	.05	.49	.03	.05	.60	.02	.05	.71
Recipient's educational level	.14	.30	.64	.20	.30	.50	.21	.29	.48
Recipient's organizational tenure	−.09	.06	.12	−.08	.06	.20	−.06	.06	.27
Recipient's status	−.16	.17	.35	−.14	.17	.40	−.12	.17	.48
Partner's gender	−.57	.30	.05	−.52	.28	.07	−.31	.27	.25
Partner's age	.05	.02	.02	.04	.02	.05	.05	.02	.03
Partner's educational level	.13	.12	.30	.08	.12	.49	.05	.11	.63
Partner's organizational tenure	−.03	.02	.18	−.03	.02	.27	−.04	.02	.11
Partner's status	.27	.09	.00	.19	.08	.02	.16	.08	.05
Recipient's job requirements for creativity	.05	.07	.47	−.00	.07	.96	−.01	.07	.88
Team-level controls									
Team support for creativity	−.25	.22	.26	−.22	.21	.31	−.23	.21	.29
Team contextual learning	.18	.30	.56	.23	.29	.44	.24	.29	.41
Team vicarious learning	.28	.25	.28	.17	.24	.50	.13	.24	.60
Team shared goals	−.10	.17	.58	−.11	.16	.52	−.09	.16	.57
Team reflection	.15	.15	.31	.16	.14	.29	.19	.14	.19
Dyadic-level independent variables									
Explicit knowledge receiving				.04	.04	.32	.01	.04	.78
Tacit knowledge receiving				.15	.05	.00	.11	.04	.01
Dyadic-level mediator									
Knowledge elaboration							.37	.05	.00
Sources of variances									
Team	.00			.00			.00		
Recipient	.65			.61			.60		
Partner	.02			.01			.01		
Dyad	.42			.42			.38		

Variables	Catalytic creativity					
	Model 4			Model 5		
	β	se	p	β	se	p
Dyadic-level controls						
Dyadic task interdependence	.12	.06	.03	.07	.05	.20
Individual-level controls						
Recipient's gender	−.16	.81	.84	−.29	.74	.69
Recipient's age	.05	.07	.42	.04	.06	.56
Recipient's educational level	.10	.36	.78	.20	.33	.54
Recipient's organizational tenure	−.13	.07	.08	−.09	.07	.16
Recipient's status	−.54	.27	.05	−.32	.25	.20
Partner's gender	−.64	.31	.04	−.35	.28	.22
Partner's age	.06	.02	.02	.05	.02	.02

TABLE 9 (Continued)

Variables	Catalytic creativity					
	Model 4			Model 5		
	β	se	p	β	se	p
Partner's educational level	.20	.13	.12	.12	.12	.30
Partner's organizational tenure	−.03	.03	.24	−.04	.02	.09
Partner's status	.31	.10	.00	.22	.09	.01
Recipient's job requirements for creativity	.12	.08	.12	.06	.07	.43
Team-level controls						
Team support for creativity	−.34	.26	.21	−.34	.23	.15
Team contextual learning	.47	.27	.10	.32	.24	.20
Team vicarious learning	.36	.28	.21	.28	.25	.27
Team shared goals	.13	.20	.53	.09	.18	.62
Team reflection	.11	.17	.53	.16	.15	.31
Dyadic-level independent variables						
Explicit knowledge receiving	.02	.05	.70	−.01	.05	.83
Tacit knowledge receiving	.07	.05	.19	.06	.05	.25
Dyadic-level moderator						
Psychological closeness	.22	.06	.00	.12	.05	.03
Dyadic-level interactions						
Explicit knowledge receiving $\times$ psychological closeness	.14	.11	.20	.17	.10	.09
Tacit knowledge receiving $\times$ psychological closeness	.09	.10	.36	.00	.10	.96
Dyadic-level mediator						
Knowledge elaboration				.42	.05	.00
Sources of variances						
Team	.00			.00		
Recipient	.83			.69		
Partner	.04			.02		
Dyad	.40			.38		

Note: $N = 764$ dyads, 144 members, 24 teams. The estimated coefficients are unstandardized.

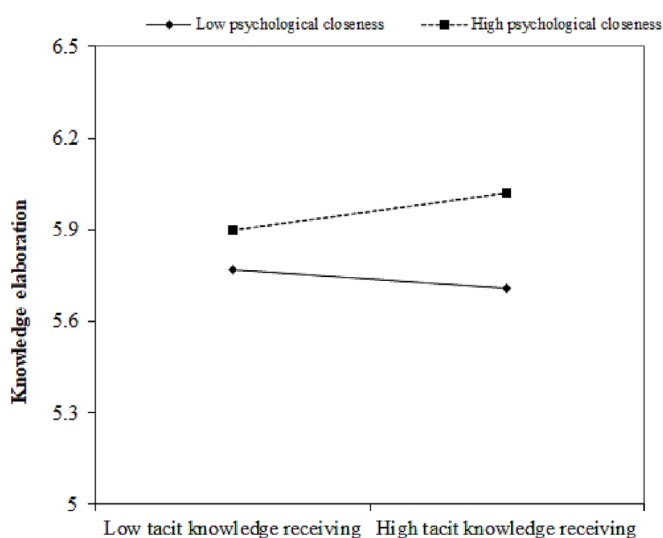


FIGURE 3 Interactive effect of tacit knowledge receiving and psychological closeness on knowledge elaboration (Study 4). [Colour figure can be viewed at wileyonlinelibrary.com]

knowledge elaboration at higher levels of psychological closeness ($\beta = .12$, $p = .04$), but was not significantly related to it at lower levels of psychological closeness ($\beta = -.06$, $p = .27$). Hence, Hypothesis 3a was supported.

Likewise, we also tested the moderating effect of psychological closeness on the effect of explicit knowledge receiving on knowledge elaboration as a post hoc analysis. The results in Model 3 of Table 8 indicated that the interaction effect of explicit knowledge receiving and psychological closeness on knowledge elaboration was not significant ($\beta = -.09$, $p = .27$). Therefore, psychological closeness did not moderate the effect of explicit knowledge receiving on knowledge elaboration.

Regarding Hypothesis 3b, results from the 20 000 iterations of bootstrapping indicated that there was a significant conditional indirect relationship between tacit knowledge receiving and catalytic creativity via knowledge elaboration, such that the indirect relationship was significant when psychological closeness was higher (indirect effect = .05, 95% CI [0.004, 0.096]) but not when it was lower

(indirect effect = $-.02$, 95% CI [$-.069$, 0.018]). These results supported Hypothesis 3b.

Considering that the interaction effect between explicit knowledge receiving and psychological closeness on knowledge elaboration was not significant, we did not conduct the post hoc analyses to test the conditional indirect effect of explicit knowledge receiving on catalytic creativity through knowledge elaboration at different levels of psychological closeness.

7.4.6 | Supplementary analyses

Additionally, when testing all the hypotheses, we measured and controlled for dyadic-level dissimilarities as in Studies 2 and 3. We reported the results in Table S3. Similar to those in Studies 2 and 3, the results of supplementary analyses are substantively like those aforementioned. Moreover, most of the coefficients associated with demographic dissimilarities are not significant.

8 | DISCUSSION

In taking a dyadic-level focus and featuring knowledge type and psychological closeness as two contingencies, we aimed to ascertain (a) when a recipient will be more likely to elaborate received knowledge from a partner to catalyze creative idea generation and (b) when the recipient will reap more catalytic creativity benefit. We found that receiving tacit knowledge from a partner stimulated the recipient's knowledge elaboration, whereas receiving explicit knowledge generally did not. This stimulating effect of receiving tacit knowledge was greater when the recipient perceived a higher level of psychological closeness with the partner. Moreover, the recipient's knowledge elaboration served as the crucial mechanism through which tacit knowledge received from a partner catalyzed the recipient's creativity. Finally, this mechanism was stronger—and hence, the tacit knowledge receiving catalyzed the recipient's creativity more—when the recipient had a stronger psychological closeness with the partner. We discuss the theoretical and practical implications of our findings in the following subsections.

8.1 | Theoretical implications

In a departure from the structural perspective, we integrate relational and psychological perspectives to examine how the characteristics of dyadic relationship between a recipient and their partner may boost catalytic creativity, we make three major theoretical contributions. First, we extend the emerging research on antecedents of catalytic creativity by directly theorizing and testing the effects of different types of knowledge content. Our investigation reveals a general pattern: Tacit (rather than explicit) knowledge from a partner is more likely to be elaborated and hence catalyze the recipient's creativity, and the recipient's psychological closeness with the partner amplifies this pattern. This nuanced insight would have remained undiscovered

had we continued with the unitary concept of knowledge that dominates the literature on catalytic creativity. By challenging this line of research, we uncover the truth that it is the right type of knowledge, and not just access to diverse knowledge from a dyadic partner, that allows a recipient to reap creative benefits from dyadic interactions (Lee & Lee, 2015; Sosa, 2011). Moreover, our new theoretical insight regarding the differential effects of tacit versus explicit knowledge receiving is conspicuously absent from prominent theories of creativity (Amabile, 1988; Hadjimichael & Tsoukas, 2019). For instance, the componential theory of creativity (Amabile, 1988; Amabile & Pratt, 2016) has advocated the positive role of domain-relevant knowledge in creativity without specifying whether one type of knowledge matters more than the other. We extend this theory by showing the value of the explicit-tacit distinction in the context of dyadic-level creativity. In doing so, we highlight the theoretical need to separate explicit and tacit knowledge in future research on dyadic-level knowledge exchange, elaboration, and creativity.

Second, we also advance the emerging literature on creativity catalyzed by a partner by revealing the process's underlying mechanism. In particular, our research directly demonstrates that the critical process in reaping the creative potential of dyadic ties is the deliberate processing of tacit knowledge that a recipient has obtained from a dyadic partner. This mechanism seems to be implicitly presumed, but unpacking it offers a critical insight: The knowledge received through dyadic interaction will be creatively generative only when the recipient consciously considers and elaborates the received knowledge (Sosa, 2011) and such elaboration cannot be simply assumed. Indeed, we demonstrate that recipients are differentially receptive to each of their partners in dyadic interaction for knowledge elaboration, depending on both the content of the received knowledge and the psychological closeness to the partner. Further, by identifying psychological closeness as a theory-driven boundary condition for recipients to reap the creative benefits from dyadic interactions, our research also complements previous research which focuses on the main effect of tie strength or intimacy on knowledge transfer and ultimate creative idea generation (Fleming et al., 2007; Rouse, 2020). This also contributes to the emerging literature that highlights the importance of integrating the network and psychological perspectives to fully understand the effect of social networks (Kilduff & Lee, 2020; Tasselli & Kilduff, 2021). Overall, identifying the moderating role of psychological closeness further highlights that it is not simply recipients' access to knowledge but their *receptivity* to the knowledge that facilitates the creativity-catalyzing benefits of dyadic interactions.

In addition, by unpacking the knowledge elaboration mechanism at the dyadic level, we also extend the application of the knowledge elaboration process, which has been traditionally studied at team and individual levels (Subasi et al., 2021; van Knippenberg, 2017; van Knippenberg et al., 2004). However, our application does not present a simple level difference but extends the notion of knowledge elaboration. Despite the value of the extant singular concept of knowledge elaboration (Hoever et al., 2012; van Knippenberg, 2017; van Knippenberg et al., 2004), it is also valuable to examine the interrelated subprocesses (e.g., knowledge exchange or receiving,

integration, and application) and ascertain whether one subprocess would lead to the other and when it is more likely. Our primary finding is that both types of knowledge and psychological closeness constitute conditions under which one subprocess (i.e., receiving knowledge) is more or less likely to lead to another (i.e., integration and application of such knowledge) at the dyadic level.

Third, our dyadic-level contingency model advances the literature on the creative micro-dynamics in teams. Many creative ideas and resulting innovative work occur when peers interact with each other, beyond full team meetings, to exchange knowledge and spark ideas that each individual could not accomplish alone (Chua & Jin, 2020; Rouse, 2020). We join this emerging research stream and contribute a crucial insight—namely, that even for the same recipient, knowledge from different team peers (i.e., dyadic partners) will differently catalyze the generation of creative ideas (Sosa, 2011; Wu et al., 2016). This crucial insight would have remained missing had we continued with the structural approach which studies dyadic relationships in an aggregated manner. Notably, we observed a large dyad-specific variance component in all the constructs measured across our studies. Moreover, our multiple studies also reveal that the dyadic-level predictors (i.e., explicit knowledge receiving, tacit knowledge receiving, and psychological closeness) explain a larger, and sometimes the largest, amount of variance in recipients' knowledge elaboration and catalytic creativity than predictors at the individual (e.g., demographics, status, and job requirement for creativity) and team (e.g., team support for creativity, team external learning, team internal reflection, and shared goals) levels do. This pattern suggests that explicating catalytic creativity at the dyadic level matters, as dyadic interactions are the building blocks of the collective unit in which they are embedded (Humphrey & Aime, 2014; Ramos-Villagrasa et al., 2018). As a result, our study also provides insights about how a team or unit achieves effectiveness by tackling the micro-dynamics between two individuals who interact with each other dyadically in completing interdependent tasks (Casciaro et al., 2022; Humphrey & Aime, 2014).

8.2 | Practical implications

In addition to expanding the literatures on catalytic creativity and creative micro-dynamics within teams, our results provide managers with two practical insights. First, managers could better realize catalytic creativity by promoting dyadic tacit knowledge sharing or receiving among employees. This approach is easier to implement than other options, such as adjustment of overall network structure (e.g., changing the pattern of ties among actors) or manipulation of the network's composition (e.g., changing the types of actors in a network in terms of their stable traits, features, or resource endowments). For instance, organizations could encourage their employees to use mentoring and storytelling as two effective approaches to transfer tacit knowledge during their dyadic interactions (Swap et al., 2001). Cultivating an organizational culture that encourages interpersonal helping and sharing is another effective means to transfer tacit knowledge (Lin, 2007; Suppiah & Singh Sandhu, 2011).

Second, organizations should also help employees to build psychologically close relationships so that tacit knowledge receiving from functional experts will be better integrated and applied to catalyze creative idea generation. For example, organizations could provide semi-private spaces where people may go get a coffee; two members who feel stuck at work may then run into each other, strike up a conversation, and move to the semi-private space to share different perspectives on their problems without the constraints of a formal team meeting. This type of design not only provides ample opportunities for dyadic interactions but also fosters dyadic closeness over time, stimulating tacit knowledge sharing and hence dyadic creativity.

8.3 | Limitations and future research directions

Our study has several limitations worth noting. First, although our hypotheses were consistently supported across the three studies, the relationships between explicit knowledge receiving, knowledge elaboration, and catalytic creativity were also significant in Study 4 but not in Studies 2 and 3. We conjecture that these differences in outcomes are partially because of the nature of participants' work and the organizational culture of the organizations where we conducted studies. More specifically, we conducted Study 4 in a nuclear power company, which is a high-reliability type of organization. Although the company expects creativity from individual employees, it particularly stresses careful inspection of every piece of knowledge or information in employees' daily work to avoid any potential disastrous accident. Therefore, recipients may not skip the deliberate processing of even explicit knowledge that they receive from a partner, leading to significant relationships between explicit knowledge receiving, knowledge elaboration, and catalytic creativity, even though these relationships are weaker than those for tacit knowledge receiving. These findings imply that that our conclusions may be subjected to the norms and cultures of different organizations. Moreover, we conducted all the studies in China, thus we do not know whether our findings could be generalized to other cultural settings. Considering the potential effects of contextual differences on members' knowledge exchange in teams, future research could further investigate the generalizability of our findings in different cultural and organizational contexts.

Second, we examined psychological closeness as a boundary condition (e.g., for the link between knowledge receiving and knowledge elaboration). Yet other contextual or personal contingencies may exist. For example, the task interdependence between the recipient and partner may also have substantial influence on interpersonal interactions and knowledge elaboration processes between them (de Jong et al., 2007; Poile, 2017; van der Vegt et al., 2010). We conducted post hoc analyses on the moderating effect of task interdependence but did not find significant effects across the three studies.⁵ Moreover, a recipient's absorptive capacity, defined as “the ability of

⁵We thank an anonymous reviewer for bringing this point to our attention.

an organizational member to value, assimilate, and apply new knowledge" (Park et al., 2007, p. 302), may influence the extent to which the recipient considers, integrates, and utilizes the received knowledge in their work. We encourage future research to further investigate these contextual or personal contingencies.

Third, we cannot establish causality despite the use of a time-lagged design. Lab experiments are infeasible in this context because tacit knowledge elaboration takes time to materialize, as does its effect on catalytic creativity. There have been calls for intervention studies using experimental and control groups in real-world organizations that can provide causal evidence for the effects of knowledge receiving on elaboration and creativity (Anderson et al., 2014). Likewise, we encourage future research to use field experiments that manipulate the type of knowledge (explicit vs. tacit) and the level of psychological closeness (high vs. low) between partners in real-life settings to establish causality.

Finally, although we measured tacit knowledge receiving using a scale with cross-context generalizability that was developed and validated based on previous conceptual work, tacit knowledge is subjective, personal, and not easy to articulate, if not impossible (Alavi & Leidner, 2001; Hadjimichael & Tsoukas, 2019; Venkitachalam & Busch, 2012). Previous studies also use situational judgment tests or work samples to capture tacit knowledge (Hadjimichael & Tsoukas, 2019). Therefore, we encourage future research to incorporate more diverse measuring methods and explore the best fit of instruments in specific contexts. Furthermore, explicit knowledge is easily codified and transferred via electronic knowledge repositories (Haas & Hansen, 2007; Kankanhalli et al., 2005). Because of the prevalence of company intranet and electronic technologies, it is likely that some employees would simply ask their colleagues where to find the electronic documents instead of receiving the codified documents from them. Although our measure of explicit knowledge receiving covers where to find an electronic document in a corporate intranet, future research may consider adding item(s) that capture receiving information on where to find codified documents.

9 | CONCLUSION

We develop a model of knowledge receiving and catalytic creativity that features knowledge type and psychological closeness as contingencies and knowledge elaboration as its underlying mechanism. We demonstrate that knowledge elaboration is the mechanism through which tacit knowledge received from a partner catalyzes the recipient's creativity. By introducing the explicit–tacit distinction to dyadic creativity research, we show the differential effects of explicit and tacit knowledge receiving on knowledge elaboration and subsequently catalytic creativity. The new insight is that tacit knowledge receiving is more likely to promote catalytic creativity and that psychological closeness amplifies this benefit. It is our hope that this study will open a new line of research which incorporates both the explicit–tacit distinction and dyadic-specific feature to further

advance our understanding of knowledge exchange and creativity at the dyadic level.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest with the Journal of Organizational Behavior, their representatives, or any organizations that may be interested in this research.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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