TALK, TALK, TALK: EXPLORING IDEA CONVERSATIONS AND THE MICRO-LEVEL FOUNDATIONS OF KNOWLEDGE SHARING FOR INNOVATION

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ABSTRACT

In this study we explore the drivers and consequences of micro-level instances of knowledge sharing for innovation. We do so by focusing on the temporally bounded conversations that colleagues have about new ideas and we study specifically how the strength of ties between these colleagues influences the duration and breadth of knowledge sharing in the idea-related conversations they have over time. A 14-month on-site field study in a multinational company, in which we mapped 496 dyadic relationships regarding 17 new product ideas, shows that knowledge sharing can be explained by the ties between people being either strong or weak, rather than intermediate. We also discover that characteristics of the idea itself shape how tie strength influences the duration and breadth of knowledge sharing in idea conversations. Finally, we provide initial evidence to show how important conversations are for the success of an idea. Our study sheds light on micro-level instances of knowledge sharing for innovation and provides important insights into how managers can foster an environment in which weak and strong ties can be utilised optimally for sharing knowledge about ideas.

KEYWORDS: Idea conversations, knowledge sharing, tie strength, ideas, creativity, innovation, micro-level.

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INTRODUCTION

To develop innovation, people frequently discuss ideas in conversations with others in their social network (Burt, 2004; Deichmann & Van den Ende, 2014; Perry-Smith, 2006; Rhee & Leonardi, 2018). Conversations are 'clusters of interrelated speech acts' (Ford & Ford, 1995: 545) that occur in communication between people. Researchers have long recognised the importance of communication in organisations—for example, in the extant literature on organisational discourse (e.g., Floris, Grant, & Oswick, 2019; Orlikowski & Yates, 1994; Phillips, Lawrence, & Hardy, 2004) or narratives (e.g., Gross & Zilber, 2020; Quinn & Worline, 2008). Conversations are the building blocks of overarching discourses and narratives, where people can obtain information and create understanding (Ford & Ford, 1995). Through conversations, collective efforts can be aligned that spur creativity (Hargadon & Bechky, 2006) and facilitate information search and knowledge transfer (Niederman & DeSanctis, 1995). Moreover, conversations about ideas can lead to different perspectives on the problem and a greater range of possible solutions (Hasan & Koning, 2019; Volkema Gorman & Ronald, 1998) while also allowing ideas to be evaluated as part of the creative process (Harvey & Kou, 2013). Although conversations with others about new ideas should therefore be important for our understanding of idea generation and development, scholars have paid little attention to these idea-related conversations that people have.

Undoubtedly, the rich knowledge-sharing literature (for reviews, see, for example, Foss, Husted, & Michailova, 2010; Hadjimichael & Tsoukas, 2019; Phelps, Heidl, & Wadhwa, 2012) provides important insights that inform questions about the extent and nature of idea-related conversations. However, in empirical studies, knowledge sharing is often considered to be an aggregate measure that reflects the average behaviour of people over a long period of time (Moser, Groenewegen, & Ferguson, 2017). This relatively coarse view can mask a situation in which people might not share much knowledge with each other generally but do have incidental yet extensive conversations about a new idea. We therefore suggest that it is important to consider the micro-level instances of knowledge sharing for innovation by studying the actual conversations people have in the course of developing and refining new ideas. For the purpose of this paper, we understand micro-level instances of knowledge sharing for innovation as instances of social interaction, delimited in terms of time and effort, that are concerned with discussing a particular idea. A better understanding of when and why people engage in idea conversations could help organisations become more effective at realizing the full potential of knowledge sharing for innovation. To that end, we are interested in discovering the drivers and consequences of idea conversations and thus aim to address the following research question: *Why is it that some people have more extensive conversations about new ideas than others, and what consequences do idea conversations have for the success of an idea?*

Data for this exploratory study stems from the idea-related conversations of R&D scientists working in the lab of a European company in the fast-moving consumer goods industry. During a 14-month longitudinal field study, we collected data through survey interviews and archival records; these served as a basis for our main quantitative analysis in which we explore the different factors that affect the extent and nature of idea conversations between colleagues. The research setting and access made it possible to trace nearly all the people involved in developing and refining a voluntarily generated idea over the course of several months. It enabled us to follow idea conversations as they unfolded and to observe ideas over their whole lifespan. Our study maps 496 dyadic relationships between colleagues and their conversations relating to 17 new product ideas. R&D scientists submitted these ideas to an innovation funnel system. In all cases, it was unclear at the time whether the ideas would be adopted by the company, but we followed all the ideas until a decision on adoption was made. Our study concentrates on idea-related conversations during two phases of the funnel system; more specifically the idea development and the idea refinement phase. After the initial data collection, we conducted 11 open-ended interviews that allowed us to undertake a complementary analysis to interpret our quantitative data more precisely and enrich the discussion of our results.

Foreshadowing some of our results, we find that, surprisingly, not only do people with strong ties invest heavily in sharing knowledge, but so too do people with weak ties. In addition, the novelty and feasibility of an idea affect how different types of ties are used for knowledge sharing for innovation. Finally, our results provide some initial evidence that the duration and breadth of idea conversations—two indicators we use to measure knowledge sharing—are critical drivers for the success of an idea.

By shedding more light on the drivers and consequences of idea-related conversations, our study makes several contributions to the literature. First, instead of examining knowledge sharing on a general level, we shed light on the actual idea conversations people have. In so doing, we help to build a better understanding of the micro-level foundations of knowledge sharing for innovation by examining the time and effort that people invest in idea conversations. Second, our study explores the different drivers of idea conversations. We advance the literature by showing that it is not only those in strong ties who invest heavily in idea conversations—as one would assume from the knowledge-sharing literature—but also those in weak ties. Besides unpacking how social ties between colleagues affect the extent and nature of idea conversation, we demonstrate when and how the novelty and feasibility of an idea affects how different types of social ties are used for idea conversations. This enables us to tease out how and when social ties are actually utilised for idea conversations that will help in developing and refining ideas.

By examining how people share knowledge in different conversations about new ideas and how this sharing can potentially improve the success of those ideas, our study also offers several important practical insights. We show what types of relationship managers should encourage so that colleagues share more knowledge about ideas as part of the innovation process. Our findings suggest that managers should focus on colleagues that have either weak or strong ties with one another. Taking a more active role in bringing people together is important for idea development and refinement (Deichmann and Van den Ende, 2014; Deichmann & Jensen, 2018). Indeed, the findings of our study suggest that once people talk for longer and in greater depth about an idea, this will benefit the idea and enhances its chances of successful adoption.

KNOWLEDGE SHARING IN IDEA CONVERSATIONS

Knowledge has long been considered a key asset in firms (Grant, 1996; Nonaka & Takeuchi, 1995). The literature on knowledge-related processes in organisations is multifaceted and spans several levels of analysis. Prior research has differentiated, for example, between knowledge creation, provision, and acquisition (Ben-Menahem, von Krogh, Zynep, & Schneider, 2016; Reinholt, Pedersen, & Foss, 2011; Soda, Stea, & Pedersen, 2019), knowledge search and transfer (Hansen, Mors, & Løvås, 2005), and has also looked at the benefits of sharing different types of knowledge (Haas & Hansen, 2007) between individuals, groups, and organisations (Xue, 2018). Indeed, knowledge sharing is very much linked to and intertwined with other knowledge processes (Foss et al., 2010). For instance, it is often seen as a critical antecedent of knowledge creation and absorption (Tsai, 2001). In this paper—and echoing prior literature (Foss et al., 2010; Hadjimichael &

Tsoukas, 2019; Hansen, Mors, & Løvås, 2005; Kuk, 2006; Soda et al., 2019; Wang, Noe, & Wang, 2014)—we focus specifically on knowledge sharing as the 'provision or receipt of task information, know-how, and feedback' (Cummings, 2004: 352). Here our particular interest is in social interactions, delimited in terms of time and effort, that are concerned with discussing a particular idea.

We study micro-instances of knowledge sharing for two main reasons. First, knowledge sharing is a critical process in any organisation, because without it 'the cognitive resources available within a team remain underutilized' (Srivastava, Bartol, & Locke, 2006: 1241). Knowledge sharing enhances the synthesis of knowledge from the different people involved, which in turn fosters group (Cummings, 2004) and organisational performance (Collins & Smith, 2006; de Miguel Molina, Hervás-Oliver, & Boix Domenech, 2019). Second, knowledge sharing is considered key to successfully developing and refining new ideas. Indeed, prior research has linked knowledge sharing in organisations to higher levels of innovativeness (Van Wijk, Jansen, & Lyles, 2008). However, many previous studies have added to the literature by examining knowledge sharing as a general phenomenon, rather than looking at particular instances of social interaction (Moser et al., 2017). For example, scholars have studied general patterns of knowledge sharing using binary variables (Hansen, Mors, & Lovas, 2005; Tsai, 2002). An often-used measure of knowledge sharing is to investigate the frequency of sharing over a given period of time—for example, 'daily', 'once a week', or 'once a month' (Razmerita, Kirchner, & Nielsen, 2016). Other studies have mapped general willingness to share knowledge with others (Chiu, Wang, Shih, & Fan, 2011; Fehrenbacher & Wiener, 2019).

Given that these studies had different goals, the knowledge-sharing variables that were used reveal how, in general, knowledge sharing took place in the organisations that were studied. However, not much light has been shed on micro-level instances of actual knowledge sharing.

The relatively coarse view on knowledge sharing in prior research can mask a situation in which people do not generally share much with each other, but nevertheless have impromptu but quite lengthy conversations about a particular new idea. We therefore suggest that it is important to consider the micro-level instances of knowledge sharing by studying the actual conversations people have in the course of developing and refining new ideas. Recently, scholars in other fields, including dynamic capabilities (Suddaby, Coraiola, Harvey, & Foster, 2020), institutional theory (Lawrence & Suddaby, 2006), strategy (Vaara & Whittington, 2012), or corporate social responsibility (Gond & Moser, 2019), have rediscovered the importance of focusing on the micro-foundations as well. With this study, we take a first step in exploring the micro-foundations of knowledge sharing for innovation.

We do so by focusing on the temporally bounded conversations between colleagues about a new idea. We conceptualise these idea conversations as discussions between two people about a particular idea that are geared to developing and refining it (Harvey & Kou, 2013) and in which knowledge is shared (Hasan & Koning, 2019). Idea conversations help to align collective efforts that instigate creativity (Hargadon & Bechky, 2006). In particular, idea conversations are associated with increased information search (Niederman & DeSanctis, 1995) and better understanding of problems (Volkema & Gorman, 1998). By having conversations with others, people get feedback and advice about an idea, which helps them to resolve any issues that are potentially unclear and to build a more compelling case for their idea (Deichmann & Van den Ende, 2014). Moreover, they facilitate the integration of diverse perspectives into one common framework (Harvey & Kou, 2013). Conversations are also important as a way of enthusing people about an idea so that they are willing to support its further development (Baer, 2012; Sosa, 2010). All in all, however, contributing to an idea by investing time in talking about it is done voluntarily, and there is no guarantee of direct repayment for this favour. Given the importance of idea conversations and their discretionary nature, in this study we intend to shed light on why some people have more extensive conversations about ideas than others and how these conversations potentially improve the success of ideas.

Following earlier research which demonstrated the importance of networks (Stephens, Chen, & Butler, 2016), and specifically tie strength between colleagues, for successful knowledge sharing (Hansen, 1999; McFadyen & Cannella, 2004; Reagans & McEvily, 2003; Tortoriello & Krackhardt, 2010; Tortoriello, Reagans, & McEvily, 2012; Uzzi, 1997), we start from the view that tie strength is important when examining to what extent people invest in idea conversations and the knowledge-sharing activities that took place during the process of developing and refining an idea. Besides illuminating the question of how tie strength influences micro-level instances of knowledge sharing in conversations, we also investigate the role of idea novelty and feasibility. Both novelty and feasibility have long been identified as core aspects of creative ideas (Litchfield, Gilson, & Gilson, 2015). However, how these aspects shape the micro-foundations of knowledge sharing and conversations has not been discussed to date in this literature. Teasing out how and under what circumstances social ties are actually used for idea conversations will help in developing and refining ideas.

Thus, the aim of our study is to investigate how people utilise different types of ties in idea conversations—contingent on the novelty and feasibility of the idea itself. Adopting such a micro-level perspective on knowledge sharing for innovation is important because organisational processes, including knowledge sharing, are ultimately rooted in interactions between individuals (Foss et al., 2010) and these interactions are vital to improve an idea's chances of success.

METHOD

Sample and Setting

Data for this study stems from a 14-month longitudinal field study which we conducted on site in a Western European company in the fast-moving consumer goods industry. We call this company 'Faco' for the purposes of anonymity. We collected data in a research lab where R&D scientists were employed in knowledge-intensive work. The setting and access to the R&D scientists made it possible to trace nearly all the people involved in developing and refining a voluntarily generated idea over the course of several months. This enabled us to follow idea-related conversations as they unfolded. Access to the company was gained through the director of Faco's R&D lab. After signing a confidentiality agreement stating that we would not disclose any specific details on ideas, we started our research with extensive discussions with the head of personnel, various scientists, other departmental heads, and the lab director to understand how the labs at Faco functioned.

Our study maps dyadic relationships between R&D scientists working on 17 new product ideas that came up during information sessions on specific topics organised by the lab. These sessions were part of an initiative at Faco designed to boost innovation. The R&D scientists in the lab could submit new ideas to a funnel system. We chose the 17 ideas as these were all the ideas that were submitted to the funnel system during the field study. In all cases, it was unclear at the time whether they would be adopted by Faco, but we followed all the ideas until such a decision was made. The funnel system had two gates, one after the idea development phase and another after the idea refinement phase. The idea development phase started when people formulated their idea, and ended at the first gate where a panel reviewed the idea for 'readiness', using standardised criteria such as company fit, market potential, and fit with the lab's competences. In the refinement phase, idea inventors developed more accurate estimates of the resources required and the risks involved, drafted a detailed technical plan, and included a detailed analysis of company and portfolio fit to pass the second and final review gate.

Data

We collected data using structured survey interviews and archival records for variable construction and semi-structured interviews for interpreting our quantitative data and to enrich the discussion of our results.

Survey interviews. The interview protocol was piloted with ten Faco employees from various hierarchical levels. We then interviewed the idea inventors (i.e., the first group) and asked them for a description of the new idea and to list the people with whom they had conversed and shared knowledge about the idea. We then interviewed all those people (i.e., second group), and asked them whom they had discussed the idea with (i.e., third group). Those in the third group did not contact any additional people. We scheduled interviews at least every two months with idea inventors still actively involved in the idea. In total, we conducted 200 interviews (the overall response rate was around 95%) about 496 interactions between 188 unique individuals, capturing nearly all idea-related conversations about the 17 ideas within our study.

Archival data. We collected archival data from Faco's personnel department, which provided information about function, departmental affiliation, seniority, and prior shared projects.

Semi-structured interviews. Finally, we conducted semi-structured interviews after the initial data collection. Our contact person at Faco asked 11 researchers who had participated in the original survey interviews to talk to us. We recorded all the interviews, nine of which took place at Faco and two of which were done by telephone. Lasting between 15 and 120 minutes, the interviews followed a topic list which included questions on reasons for having idea-related conversations with others and on knowledge sharing for innovation at Faco in general.

Knowledge Sharing in Idea Conversations

We used two indicators to measure micro-level instances of knowledge sharing relating to idea conversations: *duration* and *breadth*.

Duration. Duration denotes how long two colleagues conversed about an idea. A similar approach has been used in other studies; for instance, Gorman and Sahlman (1989) investigated how much time venture capitalists spent with their portfolio company, and Levin, Walter, and Murnighan (2011) studied how much time people spent consulting others about a project they needed to complete. We grouped our results into four categories: 1 = less than 30 minutes, 2 = between 30 and 90 minutes, 3 = between 90 and 180 minutes, and 4 = more than 180 minutes.[1] Such ordinal classification of frequency is consistent with earlier studies (Reagans, 2011; Sosa, 2011).

Breadth. For every idea conversation, we sought details of the topics discussed. Specifically, we measured three aspects that people might cover while sharing knowledge about an idea: scientific content (i.e., subject-related knowledge concerning scientific problems or ideas), organisational content (i.e., administrative issues relating to the review process and possible contact persons), and/or business content (i.e., how the idea could be exploited). Breadth therefore captures the content of the actual conversations, and was greatest when all three possible aspects were covered.

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[1] The categorization of this variable was a direct consequence of our respondents' own categorization. Ideally, we would have measured the exact amount of time that people spent talking to each other about an idea. However, in the interviews the respondents would never state how long *precisely* (e.g., '39 minutes') they conversed with a colleague. Instead, they estimated the duration. Nevertheless, the estimate is likely to be quite precise. For more formal projects that employees at Faco were typically involved in, they needed to record project hours. Therefore, they were used to indicating how much time they spent on a certain activity.

Tie Strength

As a main predictor for knowledge sharing in idea conversations, we measure the strength of a tie between two colleagues—focusing on the frequency of work-related communication (Fleming, Mingo, and Chen, 2007; McFadyen, Semadeni, and Cannella, 2009). Drawing on similar scales developed by researchers in the past (Perry-Smith, 2006; Reagans & McEvily, 2003), our answer options were: 1 = no prior contact, 2 = less than once a month, 3 = between once a month and once a week, and 4 = more than once a week. Category 1 indicates a weak tie, given that the interaction relating to the focal idea was the first contact between these two colleagues, and category 4 indicates a strong tie, with the other two categories constituting intermediate ties.

Idea Novelty and Feasibility

Idea novelty. Idea novelty was measured by asking all respondents in the first group to rank the idea in the first month it had been generated, using a scale developed by Booz, Allen, and Hamilton (1982), which is frequently used in research on new product development (e.g., Griffin & Page, 1996) and in marketing studies (e.g., Kyriakopoulos & Moorman, 2004). Specifically, we asked ‘Could you classify what type of product this idea could lead to, if you had to choose from the list below?’ There were six possible categories: 1 = cost reductions, 2 = repositioning, 3 = improvements in/revisions to existing products, 4 = additions to existing product lines, 5 = new to the company, and 6 = new to the world. We averaged the scores for every idea.

Idea feasibility. This variable was measured by asking all respondents in the first group, in the first month after the idea was generated, to indicate its technical feasibility on a scale ranging from 1 = low feasibility to 6 = high feasibility. We averaged the scores for every idea.

Control Variables

People are most often assigned to a specific organisational function based on their capabilities, and they generally belong to a specific department. Members of the same function or department usually share a set of common skills, beliefs, and norms which makes knowledge sharing easier (Ibarra, 1995). When people work in the same function or department, they might see one another more often and therefore have more opportunities to engage in idea-related conversations. We therefore control for *functional* and *departmental co-membership* by constructing two binary variables. A value of 1 indicates that two people belong to the same function or department, and a value of 0 that they belong to different ones.

Social attributes such as similarity in seniority can also shape the use of social ties for idea conversations. For instance, people who are similar in terms of their seniority might be able to find more time for one another. Therefore, we controlled for *similarity of seniority* as indicated by people's organisational rank. To do so, we used human resource management data from Faco on employees' level within the hierarchy. There were six hierarchical levels in the company: entry-level university graduates started at level one, whereas the board of directors had reached level six. We calculated the absolute difference in seniority levels between two people and then reverse-coded the subsequent result to obtain a similarity (instead of a difference) score. If the similarity score was very low, then a low-ranked colleague had had an idea conversation with a high-ranked colleague. If the score was very high, then colleagues on the same hierarchical level had had an idea conversation with each other.

One could argue that when earlier interactions relating to an idea had been useful this might provide a further stimulus for some people to have future idea-related conversations. To rule out such an alternative explanation, we included two control variables. The first variable—*involved in idea initiation*—we coded with a value of 1 if both people in a dyad were involved in the idea initiation process, and 0 otherwise. A second control variable we added is *number of interactions*. To construct this variable, we counted for each individual how many interactions he or she had with other people throughout the idea development and/or the idea refinement phase and then calculated the average.

Some people might be *involved in several ideas*, and this could influence whether they have enough time and motivation to have idea conversations. To operationalise this variable, for both people in a dyad we counted how many new idea trajectories they were involved in, and we then took the average of both scores.

When people know each other from having previously worked together on other projects, they have shared knowledge before and are thus likely to be more familiar with each other's working practices and knowledge base. This could in turn influence the degree to which they engage in idea conversations (Carley, 1991). To control for *prior projects*, we relied on archival data from Faco which contained details of formal R&D projects and project members. This data covered a time span of two years prior to the start of the survey interviews. From the data we constructed affiliation matrices to measure the number of joint projects that the two people in a dyad were involved in.

Network size refers to the number of people who contributed to an idea in any particular phase (Baer, 2010; Kijkuit & Van den Ende, 2010). We controlled for size because it could influence the duration and breadth of idea conversations. For instance, in a large network, there might be less time for people in a particular tie to discuss an idea one-on-one.

Finally, we controlled for the idea *phase* with a binary variable coded 0 for the idea development phase, and 1 for the refinement phase. We added this control to take account of the fact that idea conversations may differ in the idea development phase compared to the idea refinement phase.

Analysis of Quantitative Data

To empirically explore the different factors that affect the extent and nature of idea conversations between colleagues, we used ordinal logistic regression models. Our unit of analysis is the dyad. After excluding missing data (25 ties for which we were unable to identify seniority status, and a further 94 ties where one of the actors was not listed in the database of prior projects), we were left with 378 observations.[2] We included every tie only once in our regression analyses. Given the structure of our data, there is a potential autocorrelation problem, also known as non-independence or within-cluster dependence among the observations. To model the fact that several ties contributed to a specific idea (hence were nested in these ideas), we used models with random intercept. These multilevel models allow us to analyse the data at two levels: dyad (level 1) and idea (level 2). We fitted these multilevel models using the 'meologit' command in Stata 15. For robustness, and to investigate the possible autocorrelation problem, we also analysed the data using the double Dekker semi-partialling multiple regression quadratic assignment procedure (MRQAP) in UCINET VI (Dekker, Krackhardt, & Snijders, 2007; Krackhardt, 1988). The results are consistent with our mixed-effects ordinal logit regression models. We decided to report the results of the mixed-effects models as this type of model takes better account of the hierarchical nature of the ties (i.e., nested in ideas).

RESULTS

In Table 1 we provide an overview and a summary of all the findings, which we categorise into three sections: 1) the relationship between tie strength and knowledge sharing; 2) how idea characteristics influence the relationship between tie strength and knowledge sharing; and 3) the consequences of knowledge sharing. In Table 2, we report descriptive

[2] Running the analyses without including the control variables seniority similarity and prior projects delivers very similar results to the ones reported in this paper.

statistics. The bivariate correlations of all variables used in our regression analyses are reported in Table 3.

Insert Tables 1, 2, and 3 about here

The Relationship between Tie Strength and Knowledge Sharing for Innovation

Table 4 presents our statistical analyses of how tie strength affects the duration and breadth of knowledge-sharing interactions. We entered control variables as well as idea novelty and idea feasibility in Models 1 and 6, tie strength in Models 2 and 7, and tie strength squared in Models 3 and 8. Model 3 shows that the linear term of tie strength on the duration of a knowledge-sharing interaction during an idea conversation is marginally significant and negative ($b = -1.14$, $p = .075$). The squared term of tie strength is significant and positive ($b = .26$, $p = .031$). Model 8 shows that the linear term of tie strength on the breadth of knowledge sharing is significant and negative ($b = -1.34$, $p = .043$), and that the squared term of tie strength is significant and positive ($b = .26$, $p = .031$). Thus, tie strength follows a U-shaped curve. People connected through weak and strong ties invest more time and effort in knowledge sharing than people connected through ties of intermediate strength.

Insert Table 4 about here

To shed further light on this curvilinear effect, we examined the confidence intervals around the predictions of duration and breadth with increasing values of tie strength (at the mean value of the other variables).[3] Figure 1a illustrates how our predictions of the duration of knowledge sharing are affected by tie strength, whereas Figure 1b shows how tie strength affects the breadth of topics discussed during knowledge sharing in an idea conversation. Both figures suggest that least amount of knowledge sharing occurs when people have intermediate work-related ties. Moreover, the figures show that knowledge sharing is higher when the strength of the tie between two people is either low or high. However, when tie strength is low (when individuals have had no previous work-related communication with one another), the confidence intervals are also very large. This suggests that knowledge sharing for innovation can vary much more when tie strength is low.

Insert Figures 1a and 1b about here

One explanation for this might be that those in a weak tie may not know much about each other. When approaching others, people can only assume that the other person has relevant knowledge to share. However, their assumption about the other person's knowledge might be wrong. In that case, an encounter between two people with weak ties might be very short, because it quickly becomes apparent that the person approached does not actually have relevant knowledge to share and continuing the conversation would therefore not make much sense. Indeed, one respondent summarised this situation: 'If you approach someone who doesn't have what you need […], then [the conversation] is over really quickly.' Conversely, there was more knowledge sharing when people found out that the other person did have the relevant knowledge they were hoping for. In this case, however, people needed to establish a shared language. For example, one respondent told us that '[…] I had to approach people I

[3] Since the command we use to do this in Stata ('prvalue') does not run with mixed-effects ordered logistic regressions, we used estimates from a linear regression with robust standard errors. However, the estimates from these different models are very similar.

didn't know at all. And then you notice that it's going a little bit difficult now and then, and that you talk a different language.' In order to overcome these language differences, people engaged in long conversations: 'I think that these conversations can take a long time because it's about a new relationship, so it's about exploring.'

How Idea Novelty and Feasibility Influence the Relationship between Tie Strength and Knowledge Sharing for Innovation

Model 4 in Table 4 shows that the coefficient of the interaction between tie strength squared and idea novelty is positive and significant (b = .51, p = .018) for the duration of knowledge sharing. However, the same interaction is not significant in Model 9 when predicting the breadth of knowledge sharing (b = -.03, non-significant). We find the opposite results for idea feasibility. Model 5 shows that idea feasibility has no statistically significant moderating effect on the relationship between tie strength squared and the duration of a knowledge-sharing interaction (b = -.43, non-significant). However, in Model 10, which predicts the breadth of knowledge sharing, idea feasibility interacts marginally with tie strength squared (b = -.56, p = .078). In Figures 2 and 3 we plotted the significant interactions at high and low values of the moderators (one standard deviation above and below the mean).[4] Figure 2 reveals that those with weak and strong ties share more knowledge—i.e., have longer conversations—when the idea being discussed is very novel. When an idea is less novel, the U-shaped relationship between tie strength and knowledge-sharing duration flattens. Figure 3 shows that the U-shaped relationship between tie strength and breadth of knowledge sharing still holds when the idea being discussed has low feasibility. However, when the idea is considered to be very feasible, then the relationship between tie strength and

[4] In order to depict the interactions we ran other models that use not ordinal but linear regression specifications. Thus, in these specifications we treated duration and breadth as interval variables.

breadth of knowledge sharing is flattened.

Insert Figures 2 and 3 about here

We also conducted a simple slopes (see Table 5) test using the Johnson–Neyman approach (Miller, Stromeyer, & Schwieterman, 2013), which revealed that when idea novelty was low (one standard deviation below the mean), there was a non-significant relationship between different levels of tie strength and knowledge-sharing duration. When idea novelty is high (one standard deviation above the mean), the relationship between different levels of tie strength and knowledge-sharing duration was mainly significant. Again, we found the findings to be reversed for idea feasibility. For low idea feasibility, the simple slopes were mainly significant, whereas they were not when idea feasibility was high.

Insert Table 5 about here

The Consequences of Knowledge Sharing for Innovation

Next, we provide some initial evidence of how knowledge sharing affects idea success. Evidence from the interviews we conducted at Faco shows that the researchers there were convinced that knowledge sharing in general was conducive to idea success and that there were two reasons for this. First, they would often seek out others who had expertise that was different to theirs, in order to push their project further and enhance the idea's chances of success. As project leaders, they were keen to understand exactly what the colleague could and would contribute to the project. Also, as project leaders they would want to know the colleague's background and history, as one of our respondents noted: '[…] If someone is totally new, […] you think: hey, who are you, what are you doing here, where are you from? Then you chat a long time with that person.' Second, researchers at Faco engaged in knowledge-sharing activities in order to sharpen their ideas. Many of our respondents told us that 'sparring' with team members and other colleagues would improve their ideas: 'When I have an idea I go to people who know more about it, to spar with them. To check if my idea makes sense.' Researchers at Faco felt that more sparring—i.e., investing more time and effort in conversations—ultimately led to better ideas, with a greater chance of success.

Moreover, we analysed information on whether the ideas that we followed over time were eventually adopted by Faco. For that purpose, we aggregated the information idea conversations from the dyad (i.e., conversations between two people) to the idea (i.e., conversations of the whole team) level. Of the 17 ideas that were submitted to the funnel system within our study period, five were eventually adopted. For these five ideas, the average duration of conversations was longer and they also covered a greater depth of topics than was the case for ideas that were subsequently not adopted. T-tests show that the mean for knowledge sharing duration between ideas that were adopted was marginally significantly higher than for those that were not adopted ($t = 1.49$, $p = .085$, one-tailed test). In addition, the mean for breadth of knowledge sharing was marginally significantly higher for ideas which were adopted compared with those which were not ($t = 1.60$, $p = .071$, one-tailed test). We also ran a correlation analysis. The duration and breadth of knowledge sharing have positive correlations with final idea adoption ($r = .34$, $p = .092$ and $r = .35$, $p = .082$, one-tailed tests). While these findings provide initial evidence for the importance of conversations between people for idea success, we acknowledge the limitations of these statistics due to the relatively small sample of 17 ideas. However, we believe that the overall picture that we paint here shows a clear trend: people tend to have longer conversations about ideas with people with whom they have either a strong *or* a weak tie. Longer and broader conversations tend to improve idea success.

DISCUSSION

What shapes conversations about ideas between two people? Our study reveals that tie strength significantly affects what people will invest in discussing an idea. We found that idea-related conversations, operationalised as the duration and breadth of knowledge sharing, were less intense when the ties between two people were of intermediate strength, and more intense when the ties were either weak or strong. Thus, our study advances our understanding of how weak *or* strong ties are used for knowledge sharing in idea-related conversations. We also found that when the ideas being discussed were very novel, people who were connected through weak or strong ties generally held more intense (i.e., longer and/or broader) idea conversations than when they were discussing ideas that were less novel. In contrast, the effect of weak and strong ties on the breadth of knowledge sharing decreased when the idea was considered to be very feasible. Finally, we provided some initial evidence of the consequences of knowledge sharing for the success of an idea. We now discuss these findings and highlight their theoretical and practical implications, limitations, and directions for future research.

Theoretical Implications

With our study, we explored the drivers and consequences of micro-level instances of knowledge sharing for innovation and showed how knowledge sharing culminates in conversations about ideas. Our findings confirm prior work on conversations, where collective efforts can be aligned to spur creativity (Hargadon & Bechky, 2006). In addition, and adding to that literature, we shed light on instances of knowledge sharing at the micro-level, here defined as instances of social interactions, delimited in terms of time and effort, that are concerned with discussing a particular idea. Instead of investigating knowledge sharing at a rather coarse level, we were interested how idea-related conversations took place in daily work routines. Our study shows that it is indeed important to investigate the micro-level foundations of knowledge sharing about ideas. Our two indicators of knowledge sharing in idea conversations—duration and breadth—varied between people: the indicators are contingent on social relationships as well as on characteristics of the idea itself.

Our findings suggest that people can capitalise on their social network by utilising weak *or* strong ties to share knowledge when discussing new ideas. Thus, we contribute to the ongoing debate about the role of tie strength in achieving outcomes such as creativity (Dokko & Kane, 2014), knowledge creation and diffusion (Deichmann et al., 2020; McFadyen et al., 2009; Wang, 2016), or organisational performance more generally (Brennecke & Stoemmer, 2017). On the one hand, our findings imply that people who are connected through weak ties are often very different from each other. For instance, they are likely to have different technical expertise (Jeppesen & Lakhani, 2010). This might result in longer and broader idea conversations. There are two possible reasons for this. First, people in weak ties might invest more in knowledge sharing because they are searching for new and thus valuable knowledge (Brass, 1995; Perry-Smith, 2006). However, searching for this type of knowledge is time-consuming and takes more effort (Hansen, 1999; Laursen and Salter, 2006), so people connected through weak ties step up their investment in knowledge sharing by having longer and broader idea conversations. Second, idea conversations are longer and broader because people in weak ties need to adjust their vocabulary and develop heuristics to communicate (Hansen, 1999). This is due to the fact that people in weak ties often do not know each other very well. Given that the knowledge shared by weakly tied individuals is likely to be valuable, diverse, and new (Brass, 1995; Perry-Smith & Shalley, 2003), it can be challenging to explain, validate, and integrate (Baer, 2010)—thus the knowledge-sharing investment increases, and with it the conversation length and breadth.

Our study also shows that people connected through strong ties share a great deal of knowledge for two reasons. The first is that they feel goodwill towards one another (Granovetter, 1983; Krackhardt, 1992) and probably expect some form of pay-back in the future (Nelson, 1989). Indeed, prior research suggests that the cooperative behaviour associated with strong ties follows from norms of mutual gain and reciprocity (Argote, McEvily, & Reagans, 2003; Bouty, 2000; Granovetter, 1973; Rowley, Behrens, & Krackhardt, 2000). The expectancy of reciprocation thus seems to increase people's motivation to share knowledge—resulting in both longer and broader idea conversations. The second reason for greater knowledge sharing between those with strong ties is, as confirmed by our findings, that these individuals are better able to transfer complex, tacit, or uncertain knowledge (Hansen, 1999; Smith, Collins, & Clark, 2005; Uzzi, 1997). For example, one of our respondents said, 'I find it much easier to talk with people I know.' This is because people who know and trust each other are better able to evaluate and categorise the knowledge that they are exchanging (Moenaert & Souder, 1996). Sharing complex knowledge is often time-consuming (Bouty, 2000; Levin & Cross, 2004) and therefore people who have strong ties spend more time discussing ideas.

Next, we found that people with intermediate ties share less knowledge. On the one hand, these people know each other better than those connected by weak ties, and therefore do not necessarily share new knowledge. Also, they are likely to spend less time creating a shared language to convey knowledge or comments about an idea. This is because they have established some degree of familiarity with each other's language in the past. Indeed, one of our respondents indicated that 'You know each other a little bit. You know what the other knows. So, you can get to the core [of the problem] quite quickly.' On the other hand, we find that people connected through intermediate ties have at least a baseline motivation to help, but will not be as motivated as those who are connected through a strong tie (Sosa, 2011). They are also less able to transfer the complex knowledge that is often needed to further develop an idea because they 'have not established a relationship-specific heuristic to communicate knowledge between them' (Hansen, 1999: 88). This implies that people connected by intermediate ties will have shorter and less broad idea conversations than those with either weak or strong ties.

Our results also show that two specific characteristics of ideas—novelty and feasibility—influence the utilisation of work-related ties for knowledge sharing during idea conversations. The findings underscore how those idea characteristics can shape the way in which a network structure affects knowledge sharing around the development and refinement of that idea (Perry-Smith & Shalley, 2003). To begin with, idea novelty enhances the effect of weak and strong ties on the duration of knowledge sharing. Idea novelty increases the degree to which ties are utilised, as novelty may be seen as offering the kind of challenge that motivates people to devote time to being part of the creation process (Deichmann & Jensen, 2018). Idea novelty adds another level of complexity, requiring people who have only a weak relationship with one another to invest even more time in explaining their novel idea or their comments on such an idea. People who have a strong tie with each other also have longer idea conversations about novel ideas because these ideas allow them to use more of their creative skills and imagination, making it more enjoyable to help shape that idea (Wasko & Faraj, 2005). Indeed, people who are able to contribute to the development of a novel idea tend to be very engaged and enthusiastic (Sandberg, 2007). Our findings show that this enthusiasm enhances the duration of idea conversations between colleagues connected through strong ties. When the idea is less novel, the U-shaped effect of tie strength on knowledge-sharing duration flattens. Moreover, idea novelty does not significantly moderate the relationship between tie strength and the breadth of topics discussed. Thus, the additional enthusiasm and challenge that a novel idea can spark among colleagues connected through weak or strong ties is reflected largely in their investing more time in sharing knowledge that can be used to develop and refine the idea.

We find the opposite effect for idea feasibility. Idea feasibility does not significantly alter the effect of tie strength on the duration of knowledge sharing. While some research suggests that people generally have a preference for feasibility (Rietzschel, Nijstad, & Stroebe, 2010), our findings demonstrate that ideas which are considered feasible do not generate greater enthusiasm or provide learning opportunities for people (Deichmann & Van den Ende, 2014). Consequently, people who are connected through weak or strong ties do not necessarily spend more time sharing knowledge for innovation with each other. However, the effect of weak and strong ties on the breadth of knowledge sharing decreases when the idea being discussed is evaluated positively in terms of feasibility. In turn, when an idea is regarded as not being very feasible, the relationship between tie strength and the breadth of knowledge sharing is curvilinear; those with weak and strong ties discuss a broader range of topics than those with intermediate ties. When the technical feasibility of an idea is low there is more uncertainty about it; incorporating new knowledge would complicate matters and would require people—especially those who have weak ties with each other—to invest more in knowledge sharing (Jehn, Northcraft, & Neale, 1999; Katila & Ahuja, 2002). Addressing a broad range of topics is important for people to develop detailed plans for potential implementation of an idea (Benbunan-Fich, Hiltz, & Turoff, 2003). To that end, they might cover more topics in order to resolve scientific, administrative, and business issues relating to an idea. In addition, colleagues with strong ties discuss a broader range of topics in their conversations about ideas with low technical feasibility because such ideas could be perceived as more challenging (Deichmann & Jensen, 2018). Investing more in these ideas is a way to overcome any potential hurdles or stumbling blocks.

In our analysis we further revealed that the time and effort invested by both parties in sharing knowledge resulted in better ideas being developed. Indeed, in previous research knowledge sharing in organisations has been shown to be linked to higher levels of performance and innovativeness (Van Wijk et al., 2008). We therefore confirm earlier research which showed that idea conversations help to align collective creative efforts (Hargadon & Bechky, 2006). They facilitate increased information search (Niederman & DeSanctis, 1995) and lead to a better understanding of problems (Volkema & Gorman, 1998). We find additional evidence for the notion that when people have long and wide-ranging idea conversations, they can expect more feedback and advice about an idea (Deichmann & Van den Ende, 2014). The sharing of knowledge allows diverse perspectives to be integrated (Harvey & Kou, 2013) and people become more enthusiastic about supporting and implementing an idea (Baer, 2012; Sosa, 2010).

Managerial Implications

In our study, we focused on knowledge-sharing conversations that are relatively short, ad hoc, and restricted to the development of an idea (Phelps et al., 2012). Our findings demonstrate the circumstances in which weak or strong ties are used for temporally bounded knowledge-sharing conversations about ideas. Our study provides insights and several recommendations regarding the types of relationship that managers should encourage if they want to achieve more knowledge sharing for innovation. First, they could stimulate the development of ties that are either weak or strong. For example, they could organise 'speed-dating' events to help people form weak ties, or they could structure work teams in such a way that people who already have a working relationship continue to build that relationship by working alongside one another on particular projects. Second, managers must be aware that, if the ideas involved are very novel or less feasible, conversations about them between people who are connected by either weak or strong ties will require more time and effort. So, when these types of ideas are being developed, they may need to give employees opportunities to spend extra time and effort on this kind of activity.

Limitations and Future Research

Some limitations of our study provide opportunities for future research. First, our study is set in the context of a particular company, and future research should replicate our study in different organisations. Second, we expect that our findings are likely to hold in settings similar to ours, where informal conversations and knowledge sharing are generally encouraged by senior management and put into practice by employees on a daily basis. However, an interesting path for future research could be to investigate whether our findings would also hold in less knowledge-intensive settings, contexts where the sharing of knowledge is not explicitly encouraged, or where status and hierarchy are more important and might therefore have a stronger effect. Third, one could fruitfully extend our study by investigating not only ideas generated by people in R&D but also those that come from people in other departments—for instance, in marketing. At Faco, ideas were generated and further developed and refined by their own employees. It could also be worthwhile investigating more open innovation approaches, and looking at, for instance, how idea conversations evolve over time with people from outside the company. Finally, in our study, ideas were evaluated at the initial stage of idea generation with regard to their novelty and feasibility. This is because, at Faco, a certain degree of novelty and feasibility was considered a necessary condition for ideas to progress even to the next phase of the funnel. However, the novelty and feasibility of an idea might change as it is being developed and refined. Therefore, an opportunity for future research would be to study these possible changes more closely.

To conclude, our study sheds light on how tie strength and idea characteristics influence conversations about the idea. While previous studies have focused on how enduring and stable working relationships shape general patterns of knowledge sharing for innovation, this study contributes to the literature by adopting a micro-level perspective and investigating how relatively stable work ties are utilised for actual interactions when knowledge is shared in the course of developing and refining a new idea.

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TABLE 1
Summary of Findings

Analytical focus	Finding
The relationship between tie strength and knowledge sharing for innovation	The relationship between tie strength and knowledge sharing is U-shaped: • People with either weak or strong ties have longer idea conversations than those with intermediate ties • People with either weak or strong ties touch on more topics in an idea conversation than those with intermediate ties
How idea characteristics influence the relationship between tie strength and knowledge sharing for innovation	Idea novelty moderates the U-shaped relationship between tie strength and knowledge sharing: • People with either weak or strong ties have longer idea conversations than those with intermediate ties when novel ideas are being discussed. Idea feasibility moderates the U-shaped relationship between tie strength and knowledge sharing: • People with either weak or strong ties touch on more topics in an idea conversation than those with intermediate ties when ideas that are not so feasible are being discussed
The consequences of knowledge sharing for innovation	There is a positive relationship between knowledge sharing and idea adoption: • Idea adoption is associated with idea conversations which are longer • Idea adoption is associated with idea conversations which touch on more topics

TABLE 2
Descriptive Statistics

	N	Mean	SD	Min	Max
1. Duration of idea conversation	496	1.74	0.87	1	4
2. Breadth of idea conversation	496	1.82	0.79	1	3
3. Tie strength	496	2.94	1.02	1	4
4. Idea novelty	496	4.52	0.51	3	5.63
5. Idea feasibility	496	4.82	0.47	3.88	5.67
6. Functional co-membership	496	0.82	0.39	0	1
7. Departmental co-membership	496	0.32	0.47	0	1
8. Similarity of seniority	471	3.38	0.67	1	4
9. Involved in idea initiation	496	0.09	0.29	0	1
10. Number of interactions	496	5.93	2.42	1	16
11. Involved in several ideas	496	1.07	0.97	0	4.50
12. Prior projects	385	0.86	1.59	0	9
13. Network size	496	17.68	9.15	3	36
14. Phase	496	1.29	0.45	1	2

TABLE 3
Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Duration of idea conversation													
2. Breadth of idea conversation	0.39												
3. Tie strength	0.08	-0.01											
4. Idea novelty	0.01	0.06	-0.08										
5. Idea feasibility	0.02	0.14	0.12	-0.13									
6. Functional co-membership	0.08	0.09	0.24	0.10	0.10								
7. Departmental co-membership	0.10	-0.09	0.56	-0.21	0.08	0.24							
8. Similarity of seniority	0.13	0.03	0.19	-0.06	0.08	0.08	0.03						
9. Involved in idea initiation	0.28	0.24	-0.10	-0.05	0.00	0.01	-0.09	0.04					
10. Number of interactions	0.31	0.14	-0.02	-0.04	0.15	0.05	-0.01	0.10	-0.08				
11. Involved in several ideas	-0.06	-0.04	-0.14	-0.05	-0.02	-0.05	-0.14	-0.06	0.04	-0.06			
12. Prior projects	0.01	-0.05	0.25	-0.03	0.10	0.11	0.23	0.06	-0.05	-0.04	-0.03		
13. Network size	0.08	0.05	0.06	0.06	0.26	0.04	-0.10	0.14	-0.09	0.61	-0.07	-0.08	
14. Phase	-0.09	0.09	0.05	0.00	0.04	0.04	0.00	-0.04	-0.04	-0.21	-0.01	0.02	-0.47

TABLE 4
Results of Analysis of Knowledge Sharing in Idea Conversations[a]

	Duration of idea conversation					Breadth of idea conversation				
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**	**Model 9**	**Model 10**
Fixed part										
Functional	0.34	0.30	0.31	0.30	0.35	0.54	0.52	0.54	0.63	0.65+
co-membership	(0.43)	(0.43)	(0.44)	(0.45)	(0.45)	(0.38)	(0.38)	(0.39)	(0.40)	(0.39)
Departmental	0.51*	0.27	0.17	0.18	0.17	-0.46+	-0.51+	-0.60*	-0.58*	-0.61*
co-membership	(0.24)	(0.28)	(0.29)	(0.29)	(0.29)	(0.24)	(0.27)	(0.28)	(0.28)	(0.28)
Similarity of seniority	0.35*	0.31+	0.25	0.23	0.25	-0.02	-0.03	-0.10	-0.11	-0.09
	(0.17)	(0.17)	(0.18)	(0.18)	(0.18)	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)
Involved in idea	1.88***	1.90***	1.84***	1.81***	1.87***	1.54***	1.54***	1.51***	1.52***	1.55***
initiation	(0.35)	(0.35)	(0.35)	(0.35)	(0.35)	(0.34)	(0.34)	(0.34)	(0.34)	(0.34)
Number of interactions	0.40***	0.41***	0.40***	0.41***	0.41***	0.15**	0.16**	0.14**	0.15**	0.14**
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Involved in	-0.04	-0.04	-0.03	-0.00	-0.03	-0.10	-0.10	-0.10	-0.10	-0.10
several ideas	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)
Prior projects	0.02	0.01	0.00	0.01	0.00	-0.05	-0.05	-0.06	-0.06	-0.06
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Network size	-0.05*	-0.06**	-0.05*	-0.05*	-0.05*	-0.01	-0.01	-0.01	-0.01	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Phase	-0.37	-0.42	-0.39	-0.43	-0.39	0.56+	0.55+	0.61+	0.62+	0.60+
	(0.30)	(0.31)	(0.31)	(0.30)	(0.31)	(0.31)	(0.31)	(0.33)	(0.33)	(0.31)
Idea novelty	0.33	0.33	0.30	3.11*	0.32	0.29	0.29	0.26	-0.61	0.26
	(0.24)	(0.25)	(0.24)	(1.46)	(0.25)	(0.28)	(0.27)	(0.29)	(1.42)	(0.28)
Idea feasibility	-0.07	-0.08	-0.08	-0.11	-3.07	0.50	0.50	0.46	0.47	-5.05+
	(0.30)	(0.30)	(0.30)	(0.30)	(2.58)	(0.32)	(0.32)	(0.34)	(0.35)	(2.68)
Tie strength		0.21	-1.14+	11.05*	-12.54		0.05	-1.34*	-3.12	-18.43*
		(0.13)	(0.64)	(5.45)	(8.75)		(0.13)	(0.66)	(5.27)	(8.95)
Tie strength squared			0.26*	-2.07*	2.28			0.26*	0.40	2.88+
			(0.12)	(0.99)	(1.49)			(0.12)	(0.97)	(1.50)
Tie strength				-2.68*					0.38	
x Idea novelty				(1.18)					(1.15)	
Tie strength squared				0.51*					-0.03	
x Idea novelty				(0.22)					(0.21)	
Tie strength					2.40					3.62+
x Idea feasibility					(1.84)					(1.88)
Tie strength squared					-0.43					-0.56+
x Idea feasibility					(0.31)					(0.31)
Fixed part: Thresholds										
κ_1	4.01*	4.22*	2.47	15.06*	-11.56	4.77*	4.84*	2.84	-1.07	-23.12+
	(2.02)	(2.07)	(2.19)	(6.88)	(12.21)	(2.28)	(2.27)	(2.60)	(6.77)	(12.79)
κ_3	5.48**	5.71**	3.96+	16.57*	-10.06	6.48**	6.55**	4.58+	0.67	-21.37+
	(2.03)	(2.08)	(2.19)	(6.89)	(12.21)	(2.29)	(2.28)	(2.60)	(6.77)	(12.78)
κ_2	8.17***	8.41***	6.68**	19.30**	-7.34					
	(2.08)	(2.12)	(2.23)	(6.91)	(12.21)					
Random part										
Variance of constant	0.09	0.10	0.09	0.08	0.09	0.16	0.15	0.21	0.22	0.16
Log likelihood	-382.77	-381.49	-379.17	-376.28	-378.21	-382.46	-382.38	-380.00	-379.36	-377.55
N	378	378	378	378	378	378	378	378	378	378

[a] Note: Standard errors are in parentheses. + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Two-tailed tests.

TABLE 5
Simple Slope Tests[a]

	Low idea novelty			High idea novelty		
Tie strength	**Simple slope**	**Lower 95% CI**	**Upper 95% CI**	**Simple slope**	**Lower 95% CI**	**Upper 95% CI**
1	0.15	-0.29	0.58	-0.51*	-0.91	-0.11
	(0.22)			(0.21)		
2	0.11	-0.11	0.32	-0.14	-0.33	0.05
	(0.11)			(0.10)		
3	0.07	-0.08	0.21	0.23**	0.08	0.38
	(0.07)			(0.08)		
4	0.03	-0.30	0.37	0.60***	0.25	0.96
	(0.17)			(0.18)		
	Low idea feasibility			**High idea feasibility**		
Tie strength	**Simple slope**	**Lower 95% CI**	**Upper 95% CI**	**Simple slope**	**Lower 95% CI**	**Upper 95% CI**
1	-0.62**	-1.06	-0.18	0.28	-0.28	0.83
	(0.22)			(0.28)		
2	-0.28*	-0.50	-0.06	0.21	-0.08	0.50
	(0.11)			(0.15)		
3	0.06	-0.09	0.21	0.15+	0.00	0.30
	(0.07)			(0.08)		
4	0.40*	0.06	0.74	0.08	-0.27	0.43
	(0.17)			(0.18)		

[a] Note: Standard errors are in parentheses. + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Two-tailed tests. CI = confidence interval.

FIGURE 1A
Effect of Tie Strength on Duration of Idea Conversation

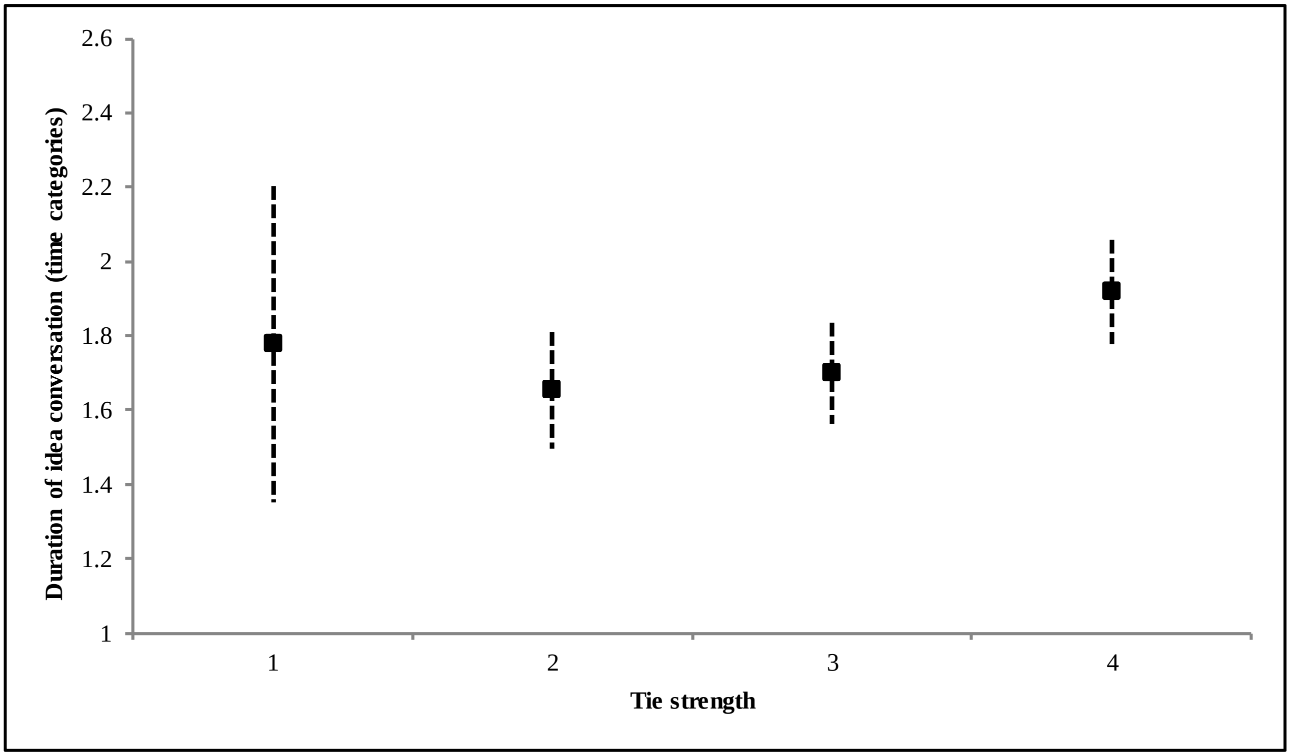

FIGURE 1B
Effect of Tie Strength on Breadth of Idea Conversation

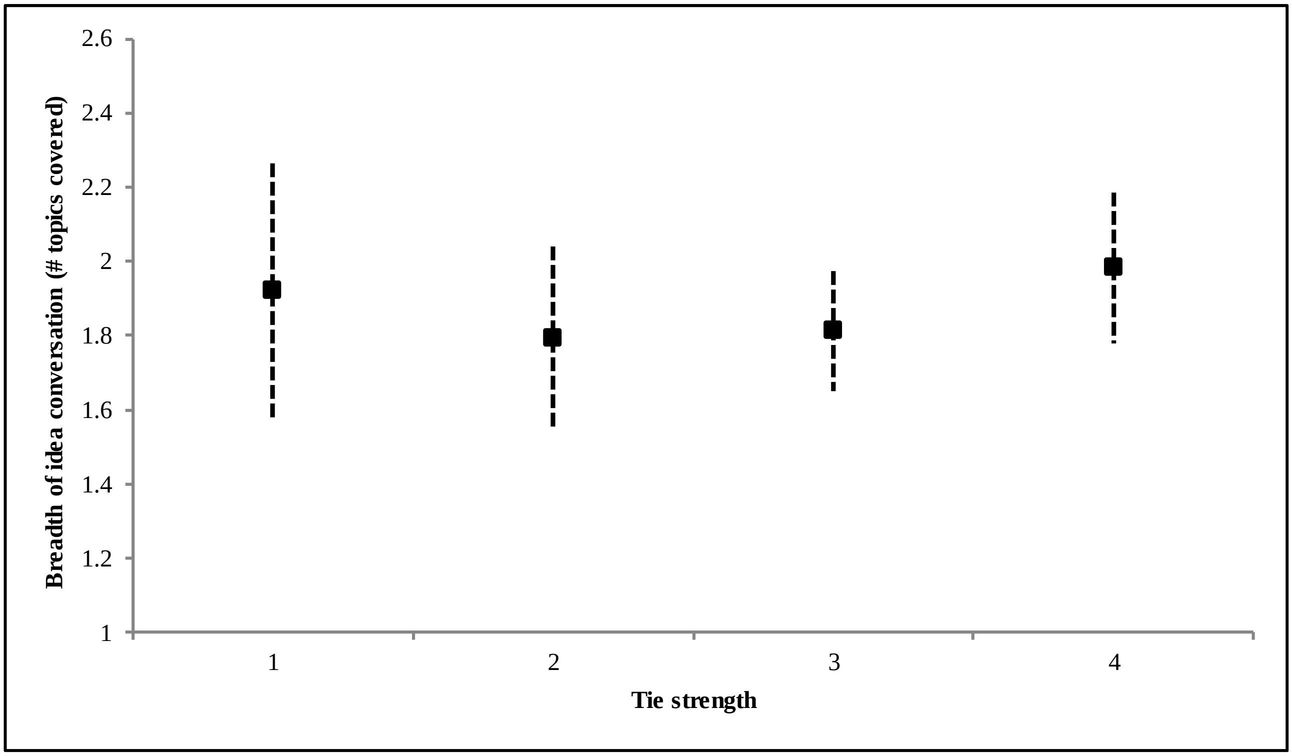

FIGURE 2
Curvilinear Interaction of Tie Strength and Idea Novelty on Duration of Idea Conversation

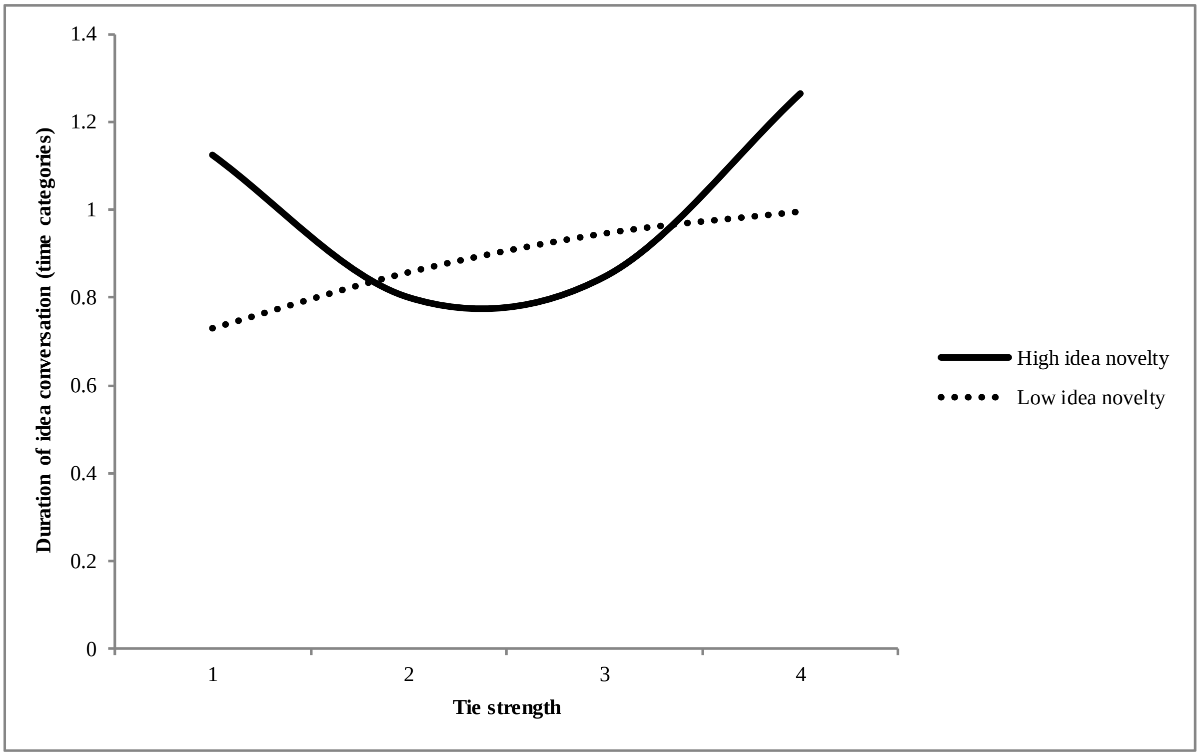

FIGURE 3
Curvilinear Interaction of Tie Strength and Idea Feasibility on Breadth of Idea Conversation