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## Living in a Fishbowl or Not: The Role of Transparency and Privacy in Creative Dialogues on Enterprise Social Media

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### Abstract

Transparency—the observability of activities, behaviors, and performance—is often treated as a panacea for modern management. Yet there is a conundrum in the literature, with some studies suggesting that transparency may benefit group creativity and others suggesting that privacy may do so. A similar conundrum exists regarding the effects of different social capital types—structural holes vs. network cohesion—on group creativity. Enterprise social media (ESM) provide a unique opportunity to solve these conundrums by allowing groups to be “transparent” (non-group members can observe and/or participate in group activities) or “private” (group members and activities are hidden from the community) and enabling groups to develop distinct social capital structures. Using data from 28,083 written interactions produced by 109 transparent and 106 private groups in an ESM of a multinational design firm, we found strong support for our contingency hypotheses that both transparent and private groups may produce high levels of creative dialogues, yet in different forms. Specifically, expansion-focused creative dialogues—those *focused on combining or expanding existing concepts—emerge in transparent groups, but only* when the group’s social capital is characterized by structural holes. Conversely, we found that reframing-focused dialogues—those focused on challenging and rethinking—emerge in private groups but only when the group’s social capital is characterized by network cohesion. Theoretically, these findings can help to solve the conundrums in the literature on group creativity and shed light on the role of ESM use in this context. Practically, our findings offer a critical reflection on contemporary initiatives for increasing transparency, whether through physical design or digital transformation.

**Keywords:** Enterprise Social Media, Digital Transformation, Digital Workplaces, Group Creativity, Transparency, Privacy, Social Capital, Structural Holes, Network Cohesion, Group-Level Analysis

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### 1 Introduction

How does transparency affect the proliferation of creative dialogues—conversations aimed at generating potentially novel and useful ideas (Sosa, 2011)—in groups? The implications of transparency on group performance is a topic of great controversy and insights remain irreconcilable. Transparency—the observability of activities, routines, behaviors, output, and

performance (Bernstein, 2012)—is often treated as a panacea in the field of management. Recent advances in workplace technologies, such as enterprise social media technologies (ESM) and internal social networking (Leonardi & Treem, 2020), make communication even more “naked” (Tapscott & Ticoll, 2003), further underscoring the need for an in-depth understanding of the impact of transparency on group performance, especially in the context of such technologies.

Existing research provides ample evidence of the positive effects of transparency on group performance, particularly as it pertains to organizational learning, knowledge sharing, and ultimately creativity. For instance, transparency may improve a unit's access to the expertise of another unit (Hansen, 1999), increase the quantity and quality of knowledge sharing (Argote et al., 2000), enable shared understandings (Bechky, 2003), accelerate organizational learning (Adler & Clark, 1991), and support network relationships that can become conduits for knowledge exchange (Pisano, 1994). Recent literature on enterprise social media (ESM) has been subjected to a similar "ideology of openness" (Gibbs et al., 2013) by emphasizing the positive effects for vicarious learning, knowledge sharing, and innovation (Leonardi, 2014) that result from these tools rendering communication even more visible.

At the same time, there are some suggestions in the extant management literature that the opposite is true: namely, that transparency may harm group-member interactions. Studies have suggested that greater transparency may result in less effective brainstorming (Paulus et al., 1995; Paulus & Yang, 2000) and blind conformity (Asch, 1956; Asch & Guetzkow, 1951), which may, in turn, undermine a group's ability to be creative. Indeed, in his study of factory floor workers, Bernstein (2012) showed how privacy—the opposite of transparency—created opportunities for idea incubation and elaboration, resulted in greater productivity, enabled safe experimentation with new knowledge, and safeguarded workers from negative interruptions. Indeed, psychological safety (Edmondson, 1999)—the shared belief that the group is safe for interpersonal risk-taking—afforded by privacy is a critical conduit for the ability of groups to engage in creative dialogues and develop breakthrough ideas, products, and solutions (Delizonna, 2017). There thus appears to be a conundrum in that some studies suggest that the transparency of groups may increase the likelihood of creativity while others suggest the opposite and argue that group privacy, i.e., "the ability to control and limit physical, interactional, psychological, and informational access to the self or to one's group" (Burgoon et al., 1989, p. 132), may increase the generation of novel ideas.

A similar debate exists in the social capital literature regarding the form of social capital—the structural configuration of the social relationships of a group (Gargiulo & Benassi, 2000)—that is beneficial vis-à-vis group performance, in particular knowledge creation and creativity. According to one perspective, cohesive networks with many dense connections are seen as advantageous for collaboration to the extent that networks are closed and help to establish trust, norms of

reciprocity, and shared identity (Coleman, 1988). According to an alternative perspective, however, networks characterized by structural holes are seen as advantageous, given the influx of diverse perspectives and heterogeneous resources that stem from the brokerage opportunities provided by such an open network (Burt, 1992). This inconsistency produces not only different but even contradictory normative implications regarding the optimal social capital type for enhancing creative dialogues. Therefore, it is imperative to clarify the implications of different social capital types—network cohesions vs. structural holes—for creative interactions like solving the conundrum surrounding the impact of transparency vs. privacy.

To facilitate theoretical progress in light of these conundrums, a finer categorization of the phenomenon of interest can help to reconcile these contradictions and yield theoretical progress (Christensen & Carlile, 2009). Following past research on knowledge creation and productive dialogues, (Tsoukas, 2009), we suggest two things: First, creativity, in the context of ESM, will be expressed in written dialogues among group members as they jointly engage in the exchange, development, and refinement of ideas. Hence, in this paper, we focus on creative dialogues—written group conversations that focus on producing potentially novel and useful ideas (Sosa, 2011)—as the main dependent variable of interest. Second, we argue that not all creative dialogues are identical, and distinguish *expansion-focused* creative dialogues, which emerge from combining existing ideas in new ways or expanding them to meet new situations, from *reframing-focused* creative dialogues, which stem from the creative destruction of existing concepts to produce novel views of an object or problem (Tsoukas, 2009).

Through a detailed examination of the theory on productive dialogues, we propose a contingency hypothesis: namely that expansion-focused and reframing-focused creative dialogues are likely to occur either in transparent groups or private groups but only when these groups are characterized by their distinct types of social capital, which are characterized by either structural holes or network cohesion, respectively (Gargiulo & Benassi, 2000). Examining the relationship among transparency, social capital, and creative dialogues can provide both an elucidation of the role of transparency vs. privacy as well as an empirical indicator of the effectiveness of different social capital types in creative dialogues.

In this context, ESM provides a unique opportunity to address these two conundrums empirically. A critical, but largely overlooked feature of ESM is that it affords groups the choice to be either transparent or private. That is, when users establish groups in ESM, they are

prompted to select the privacy of their group, a binary choice that either opens the group to the entire ESM community or shields it from non-group members (Van Osch & Steinfield, 2018). Consequently, both transparent and private groups exist simultaneously within the same organization. Furthermore, ESM are internal networking tools that facilitate the creation and maintenance of social capital (Van Osch & Steinfield, 2018) and thus provide a direct opportunity for measuring the distinct types of social capital developed by different groups and their role in creative dialogues. Hence, ESM provide an ideal empirical setting for examining if different forms of creative dialogues (expansion and reframing) are associated with different group types (transparent vs. private) when these groups are characterized by distinct social capital types (structural holes vs. network cohesion). Therefore, we ask the following research question: What are the distinct types of group social capital that are associated with different forms of creative dialogues in transparent vs. private groups?

To take advantage of this empirical setting, we adopted a novel, data-rich, field investigation of 28,083 written interactions of 215 distributed groups, including 109 transparent and 106 private groups, in a multinational product design firm that uses ESM for collaboration. As proposed, we found that expansion-focused creative dialogues—the successful integration or adaptation of existing ideas—occur in transparent groups characterized by structural holes allowing the groups to establish brokerage ties to others outside the group. In contrast, reframing-focused creative dialogues—the dialectical disruption of concepts—occur in private groups that are characterized by network cohesion, i.e., dense ties among group members (Bartunek, 1984b; Benson, 1977; Smith & Lewis, 2011).

We thus conclude that both group transparency and privacy can provide grounds for the emergence of certain types of creative dialogues depending on the type of group social capital characterizing these groups—namely structural holes vs. network cohesion, respectively. Solving these conundrums regarding group transparency and privacy, as well as social capital types, not only represents a significant theoretical advancement but also offers a critical reflection on practical attempts pertaining to the physical design and digital restructuring of organizations that aim to increase transparency. From a practical perspective, it is important to know what type of creative dialogue is the most desirable for groups to determine whether to be transparent or private and how to strategically foster the optimal group social capital. Until a group knows whether a creative task involves expansion or reframing, it is not possible to one-sidedly emphasize the benefits of group transparency vs. privacy or structural holes vs. cohesion. Considering the

accelerated rate of digital transformation experienced by organizations today, understanding how best to organize digital groups and workplaces with the aim of enhancing creativity is more pertinent than ever.

## 2 Literature Review

Group creativity refers to the ability of a collection of individuals to work interdependently (Hackman, 1987) to produce novel and useful products, processes and/or other outputs (Amabile, 1988). Creative output can range from incremental improvements to existing ideas to disruptive, breakthrough, or otherwise radical products, services, or processes (Madjar et al., 2011). Existing research on group creativity has generally explored the characteristics of groups (Burke et al., 2006), individuals—such as motivation and expertise (Amabile, 1988)—or the work environment (Amabile et al., 1996), but has overlooked the nature of conversations that may help us to distinguish different types of creative dialogues that occur within groups and form the first step in the development of novel products and solutions (Majchrzak et al., 2012).

Like knowledge creation, which stems from dialogue and the management of conversations (Nonaka & Takeuchi, 1995, p. 86), conversations and interpretive sensemaking are at the heart of creativity and innovation (c.f., Brown & Duguid, 2000) in organizational groups. Hence, we focus on creative dialogues as proxies for group creativity and explore different forms of creative dialogues as a promising direction for theoretical progress (Christensen & Carlile, 2009) by reconciling the conundrums surrounding the roles of transparency and privacy (Bernstein, 2012) and structural holes vs. network cohesion (Ahuja, 2000; Sutanto et al., 2021).

### 2.1 Two Forms of Creative Dialogues in ESM Groups: Expansion vs. Reframing

In the knowledge creation literature, distinct forms of productive dialogues have been distinguished, specifically conceptual combination, expansion, and reframing (Tsoukas, 2009). Conceptual combination involves the creation of new concepts through amalgamation, synthesis, fusion, blending, or integrating of existing ideas or concepts (Tsoukas, 2009), such as “affordable luxury” (Wisniewski, 1997, p. 54).

Conceptual expansion involves extending, expanding, or broadening an existing concept beyond its core use to match a new situation, domain, or context—often through the use of near analogies (Tsoukas, 2009). The classic example as described by Barrett et al. (1995)

involves the introduction of total quality management (TQM) concepts, such as “empowerment,” “participation,” and “continuous improvement” in a division of the US Navy and shows how, over time, these concepts were extended to refer not only to TQM-related but also to broader organizational culture issues. However, since both conceptual combination and conceptual expansion entail novelty stemming from *existing* concepts, either by combining them or applying them in new contexts or domains, we use the term expansion to represent creative dialogues that involve the combination and/or expansion of existing concepts. This approach seems to be in line with other classifications of creativity that will be discussed further below. Illustrative voicing that is indicative of creative dialogues focusing on expansion include such phrases as: “Let’s merge A and B,” “Why don’t we combine Ideas 1 and 2,” “Let’s apply our existing concept for the new client,” and “Why don’t we use the solution we developed for Problem X and apply it to Problem Y and see if that solves it”

In contrast, reframing involves creative dialogues that reclassify, with or without the use of metaphors, an object or concept so that a new view of the object emerges (Bartunek, 1988; Bateson, 1972, pp. 186-189). Reframing frequently involves some form of creative destruction (Schumpeter, 1934; van Osch, 2012), i.e., destroying or disrupting existing concepts and frameworks, and thus is associated with higher risk. The classic example of reframing, as described by Schön (1993), involves the metaphorical reclassification or reframing of a paintbrush as a “pump” (i.e., bristles as channels through which paint can flow) by a group of researchers, which makes possible the drawing of novel distinctions and applying relations obtained in the latter to the former (Schön, 1993). Reframing thus represents a new way of understanding what an idea is (Harvey, 2014; Tsoukas, 2009). Illustrative voicing indicative of creative dialogues that reconceptualize or reframe include such phrases as: “Let’s rethink this,” “Could we invent a new perspective on the issue?,” and “I’ve been thinking of a new way to approach this problem.” Groups who engage in such dialogues are devoting conversational attention and effort in a more generative manner than groups who simply adopt existing methods, solutions, and problem definitions.

The distinction between expansion and reframing is analogous to other classifications of creativity. For instance, Cropley (2006) distinguished convergent creativity from divergent creativity, where convergent creativity involves manipulating existing knowledge to generate something new and divergent creativity involves generating multiplicity, possibility, difference, and originality. Similarly, Avital and

Te’eni (2009) and Van Osch (2012) distinguished two forms of generativity termed *reconfiguring*—combining or extending existing concepts—and *reframing*—challenging the normative status quo or establishing novel understandings.

Although some have suggested that the distinctions between expansion and reframing (as well as convergent vs. divergent creativity) parallel the distinction between incremental and radical (Cropley, 2006; Guilford, 1950, 1957), convergent thinking is not effortless or evolutionary but rather effortful and knowledge inducing (Cropley, 2006; Guilford, 1950, 1957). Indeed, examples of product innovation that stem from combination (e.g., the development of the first smartphone, which involves combining existing technologies from mobile telephony with computing capabilities) or expansion (e.g., Siri—the first commercial intelligent personal assistant—which involved the expansion of a voice-enabled intelligent assistant from a defense setting to consumer context) may be equally radical as those stemming from reframing (e.g., the concept of carpooling as a solution to road congestion and harmful emissions). Nonetheless, it has been argued that whereas expansion may emerge in isolated moments of creative breakthroughs, reframing is more likely to manifest in the continuous or repeated production of breakthrough ideas over time (Harvey, 2014).

These different forms of creative dialogues—expansion and reframing (see summary in Table 1)—are expressed in the content of the communication, i.e., the nature of the concepts and ideas exchanged within the group (Tsoukas, 2009). This is particularly true in ESM, as well as other forms of computer-mediated communication (North, 2007), where all exchanges are textually co-constructed. Conversations in ESM consist of contributions made to discussion boards or blogs, which can be organized by groups, each with its own purpose or objective. These interactions often revolve around a particular topic or discipline (Boland & Tenkasi, 1995) involving problem-solving on an impromptu task or capturing interactions on a project. Group members use ESM to share updates or ideas, collectively define problems, identify different perspectives on the problem, coordinate their activities, establish decision-making processes if needed, and collectively develop solutions. As group members contribute to the discussions, their dialogues can be more, or less, focused on creativity, depending on the extent to which they result in something novel or useful (Amabile, 1988). Indeed, the implementation of ESM is intended, by many organizations, to foster idea generation by enabling conversations among employees who do not normally talk to each other (Leonardi, 2014; Leonardi et al., 2013).

**Table 1. Two Forms of Creative Dialogues and Illustrative Voicing in Enterprise Social Media**

Form of creative dialogue	<b>Expansion-focused:</b> Creative dialogues that involve either the combination and/or expansion of existing concepts.	<b>Reframing-focused:</b> Creative dialogues that reclassify, with or without the use of metaphors, an object or concept so that a new view of the object emerges.
<b>Illustrative voicing</b>	<i>Let's merge A and B</i> <i>"Why don't we use the solution we developed for problem X and apply it to problem Y to see if it solves it."</i>	<i>Let's rethink this</i> <i>"Could we invent a new perspective on the issue?"</i> <i>"I've been thinking of a new way to approach this problem."</i>

## 2.2 Transparency vs. Privacy of ESM Groups

The ability to maximize transparency has been proposed as the most foundational and distinctive feature of ESM (Gibbs et al., 2013; Leonardi & Treem, 2012). Transparency—generally defined as the observability of activities, behaviors, and performance (Bernstein, 2012)—in the context of ESM refers to the ability of other users to observe, join, or participate in the activities or interactions of individuals and groups with whom no direct ties are maintained (Gibbs et al., 2013). Transparency not only makes exchanges between employees visible to third parties (Hampton et al., 2011), but also opens up the content of those exchanges (Leonardi, 2015), enabling a situation of “hypervisibility” (Leonardi, 2014).

At the group level, ESM enable the creators of groups to select a transparency setting when creating a place to host team posts. This critical feature of ESM has been largely overlooked due to the focus on the individual user. However, this feature enables a unique situation; when users establish groups in ESM, they are prompted to select the privacy level of their group, a binary choice to make the group transparent to the entire ESM community or to make it private and thus shield the group from nonmembers (Van Osch & Steinfield, 2018).

A *transparent group* is one in which the existence of the group, its members (i.e., who), and the content of the exchanges between its members (i.e., what) can be observed by any user of the ESM across the organization. Because the group is transparent, those outside the group are not only aware of the group’s existence, ongoing activities, and interactions, but can also join in without an invitation or without becoming a member. Although users can read the group’s content and contribute without being a member, they may still decide to join the group to receive updates on activities and content through member notifications rather than through manual search or as a mechanism to signal affiliation or engagement with the group, which may be particularly important in workplace settings (Bulgurcu et al., 2018).

Inversely, *private groups* are closed, meaning the existence of the group, its members (i.e., who) and the content of the exchanges between its members (i.e., what) are unknown to nonmembers. Thus, those outside the group are unaware of its existence, purpose, stage of development, and members. Non-group members can receive an invitation to join from existing group members but are unable to view, join in, or contribute serendipitously.

Existing management research has produced extensive evidence highlighting the positive effects of transparency in organizations, specifically vis-à-vis organizational learning, knowledge sharing, and ultimately creativity (Adler & Clark, 1991; Argote et al., 2000; Bechky, 2003; Hansen, 1999). In line with these positive effects, organizational research on interpersonal relationships has further shown that, inversely, the unobservability of activities may undermine interpersonal trust (Cramton et al., 2007), coordination (Dey & de Guzman, 2006), product and process innovation (Leonardi, 2014; Majchrzak et al., 2004) and may thus result in work duplication (Lapré & Van Wassenhove, 2001). Similarly, recent literature on ESM has largely emphasized the positive effects for vicarious learning, knowledge sharing, and innovation (Leonardi, 2014) that result from rendering communication more transparent or “naked” (Tapscott & Ticoll, 2003).

At the same time, the management literature also contains evidence suggesting the opposite—that transparency to non-group members may harm group-member interactions. Greater transparency may result in less effective brainstorming (Paulus et al., 1995; Paulus & Yang, 2000) and blind conformity (Asch, 1956; Asch & Guetzkow, 1951), which may undermine idea generation in groups. Bernstein (2012, p.193) refers to this as a “reverse Hawthorne effect” that results in the activation of dominant, practiced responses over experimental, riskier, learning responses. For instance, factory floor research in management science has shown how observability encourages hiding behaviors among organizational members (Burawoy, 1979; Hamper, 2008) resulting in the appearance of enhanced learning but without real benefits for organizational productivity and performance (Bernstein, 2012). Furthermore, as

suggested by Goffman (1959), increasing the audience that can observe a certain behavior will increase its dramaturgical nature and undermine its sincerity. Existing social media research has demonstrated similar self-presentation and self-promotion behaviors resulting from the increased visibility afforded by social media (Bulgurcu et al., 2018; Leidner & Tona, 2020). Leidner and Tona (2020) refer to the often nonauthentic self-presentation prominent in social media as the “showing-self,” and Bulgurcu et al. (2018) show how self-presentation in ESM creates an illusion of a vibrant knowledge community.

Inversely, privacy—i.e., unobservability or lack of transparency—creates opportunities for idea incubation and elaboration, results in greater productivity, enables safe experimentation with new knowledge, and safeguards workers from negative interruptions (Bernstein, 2012). Indeed, the psychological safety (Edmondson, 1999) that emerges from being shielded (i.e., private) from the rest of the organization enables groups to develop breakthrough ideas, products, and solutions (Delizonna, 2017). Thus, the implications of transparency and privacy for group activities remain controversial and surprisingly unstudied (Bernstein, 2012)—in particular, in relation to creativity (see Table 2).

### 2.3 Social Capital in ESM Groups: Structural Holes vs. Network Cohesion

Research on productive dialogues suggests that the nature of relations—i.e., whom the group interacts with and in what ways—will affect how productive a dialogue becomes (Hargadon & Bechky, 2006; Majchrzak et al., 2012; Tsoukas, 2009). That is, whether a dialogue centers on expansion or reframing is affected by the relational aspect of communication (Robichaud et al., 2004, p. 622), also referred to as a “tacit property of the dialogical situation” (Tsoukas, 2009). This relational dimension of groups may include the *structural* configuration of social relationships—i.e., how group members are related to each other and/or outsiders—(Bateson, 1972; Hargadon & Bechky, 2006; Robichaud et al., 2004; Tsoukas, 2009).

Given that creative dialogues in the context of ESM are textually co-constructed (North, 2007) and thus embedded in the network of relationships of ESM users and groups, social capital theory lends itself particularly well to developing an understanding of how the nature of the relationships that develop in ESM influences the ability of groups to engage in creative dialogues (Burt, 2004; Fleming et al., 2007; Obstfeld, 2005; Perry-Smith, 2006; Sutanto et al., 2021). Indeed, the social capital literature has brought both theoretical (Perry-Smith & Shalley, 2003) and empirical (Burt, 2004; Perry-Smith,

2006) insights for understanding the enabling and enhancing effects of relationships on the ability of individuals, groups, and organizations to attain their goals, including creative ones (Gargiulo & Benassi, 2000). Underlying these enabling effects is the notion that relationships can both facilitate access to information, ideas, and resources (Granovetter, 1973) and help actors coordinate critical task interdependencies and overcome cooperation challenges (Pfeffer & Salancik, 1978). Despite this apparent convergence, the social capital literature has produced two conflicting perspectives (Table 3) of how social networks produce such benefits, namely a traditional view that stresses the positive effects of network closure—i.e., the presence of cohesive ties (Coleman, 1988, 1990)—and a secondary view based on structural hole theory (Burt, 1992) that emphasizes the benefits stemming from brokerage opportunities created by disperse ties (Gargiulo & Benassi, 2000).

The first or traditional view of social capital (Coleman, 1988, 1990) emphasizes the positive effects of network closure or cohesion on the production of social norms and sanctions that facilitate trust and cooperation. In this view, a closely knit network benefits idea generation, creativity, and knowledge exchange through the governance benefits it provides in terms of trust, norms of reciprocity, and shared identity (Coleman, 1988; Obstfeld, 2005; Reagans & Zuckerman, 2001), which facilitate collaboration (Granovetter, 1973; Coleman, 1988) and diminish the risk of opportunism (Granovetter, 1985). These benefits increase a risk-sharing attitude and facilitate easy resource mobilization, allowing for the transfer of fine-grained information and knowledge (Uzzi, 1997; Hansen, 1999). Nonetheless, closed networks may isolate groups from the organization (Uzzi, 1997) and hinder their ability to explore novel perspectives or knowledge (Burt, 1992) resulting in possible groupthink (Sosa, 2011).

An alternative view is based on structural holes theory (Burt 1992, 1997), which claims that the benefits of social capital result from the diversity and nonredundancy of information and perspectives that stem from occupying a brokerage position between loosely connected clusters. Most scholars in the social network and social capital literatures that have focused on idea generation, creativity, and knowledge exchange have built on this or similar lines of reasoning (Burt, 2004; Perry-Smith & Shalley, 2003). This perspective emphasizes the external structure of relationships as well as the importance of disconnecting heterogeneous entities to facilitate access to unique perspectives and efficient knowledge search as a means through which creativity can emerge (Adler & Kwon, 2002). Nevertheless, structural holes may impede the intense interactions that are necessary to foster deep understanding, the exchange of (tacit) knowledge, and the ability to effectively exploit novel perspectives (Obstfeld, 2005).

**Table 2. Summary of Conundrum Regarding the Effects of Transparency vs. Privacy on Group Activities**

	<b>Transparency (in groups)</b>	<b>Privacy (in groups):</b>	<b>References</b>
<b>Definition</b>	Groups whose existence, ongoing activities, interactions, and conversations can be seen by any user of the ESM across the organization.	Groups whose existence, ongoing activities, interactions, and conversations are unknown to nonmembers and known only to invited group members.	N/A
<b>Advantages</b>	<ul style="list-style-type: none"> <li>- Improves access to the expertise of other groups (Hansen, 1999)</li> <li>- Increases quantity and quality of knowledge sharing</li> <li>- Accelerates organizational learning</li> <li>- Supports network relationships that may become conduits for knowledge exchange</li> </ul>	<ul style="list-style-type: none"> <li>- Creates opportunities for idea incubation and elaboration</li> <li>- Results in greater productivity</li> <li>- Enables safe experimentation with new knowledge (and ideas)</li> <li>- Safeguards workers from negative (external) interruptions</li> <li>- Facilitates greater psychological safety, which is a critical conduit for breakthrough innovation</li> </ul>	E.g., Hansen, 1999; Argote et al., 2000; Bechky, 2003; Adler & Clark, 1991; Pisano, 1994; Bernstein, 2012; Edmonson, 1999; Delizonna, 2017
<b>Disadvantages</b>	<ul style="list-style-type: none"> <li>- Causes dramaturgical action, strategic self-presentation, and self-promotion</li> <li>- Reverse Hawthorne effect, which results in less effective brainstorming and blind conformity</li> <li>- Leads to the appearance of enhanced learning without actual benefits to productivity and performance</li> </ul>	<ul style="list-style-type: none"> <li>- Undermines coordination and possibly interpersonal trust</li> <li>- Hinders produce and process innovation</li> <li>- Results in work duplication and lower efficiency of innovation</li> </ul>	Bernstein, 2012; Paulus et al., 1995; Asch, 1956; Goffman, 1959; Bulgurcu et al., 2018; Leidner and Tona, 2020

**Table 3. Summary of Conundrum Regarding the Effects of Structural Holes vs. Cohesion on Group Activities**

	<b>Structural holes</b>	<b>Network cohesion</b>	<b>References</b>
<b>Definition</b>	Empty space (hole) between individuals in a network, meaning there is infrequent contact between them and each has access to different flows of information	Strong connectedness between individuals in a network, i.e., a close-knit network where all or most individuals are connected to all or most others	Sutanto et al. 2021; Ahuja, 2000
<b>Advantages</b>	<ul style="list-style-type: none"> <li>- Diversity and non-redundancy of (i.e., unique) information and perspectives</li> <li>- Connects heterogeneous entities</li> <li>- Enables efficient information search</li> </ul>	<ul style="list-style-type: none"> <li>- Produces trust, cooperative norms, and a shared identity</li> <li>- Effective problem-solving, (tacit) knowledge sharing, and collaboration</li> <li>- Reduces risk of opportunism</li> <li>- Fosters risk-sharing attitude</li> <li>- Motivates members to engage in innovation</li> </ul>	(Burt, 2004; Coleman, 1988; Granovetter, 1973; Hansen, 1999; Hargadon & Sutton, 1997; Uzzi, 1997)
<b>Disadvantages</b>	<ul style="list-style-type: none"> <li>- Impede intense frequent interactions</li> <li>- Results in poor understanding of knowledge and poor reconciliation of opposing views</li> <li>- Reduces innovation performance, coordination, and production</li> </ul>	<ul style="list-style-type: none"> <li>- Redundant knowledge flows</li> <li>- Costly maintenance of relationship</li> <li>- Group closure (limited exploration of new/external perspectives)</li> <li>- Groupthink</li> </ul>	(Ahuja, 2000; Burt, 1992; Obstfeld, 2005; Sosa, 2011; Uzzi, 1997)

### 3 Theory and Hypothesis Development

#### 3.1 Transparency, Structural Holes, and Expansion-Focused Creative Dialogues

There is a significant body of literature supporting the importance of heterogeneous perspectives as a critical basis for creativity and innovation. Rooted in evolutionary theory and the notion of cognitive

variation (Campbell, 1960; Simonton, 1999; Staw, 2009), the small group literature has repeatedly demonstrated that the probability of developing a novel idea increases when group members are interacting with diverse sources enabling them to access and leverage ideas and creative inputs from other individuals or groups. Diverse creative sources that may be adopted and adapted cause divergent thinking and alternative ways to conceptualize a problem or define the solution space through an evolutionary process of problem-solving and idea evaluation (Miura & Hida, 2004; Staw, 2009; Watson et al., 1993).

This central hypothesis is in line with structural holes theory, which posits that the spanning of structural holes to other individuals and teams within the organization provides access to diverse and original information, perspectives, and knowledge from outside the group (Harrison & Klein, 2007; Harrison et al., 1998; Harrison & Sin, 2006). Hence, group members focus their efforts on building open relations to others outside the group to ensure access to diverse and nonredundant information and perspectives (Sutanto et al., 2021).

In line with the dominant evolutionary perspective of creativity, cognitive variation has been theorized as the key mechanism underpinning the production of breakthrough creative ideas (Amabile, 1988; Harvey, 2014; Paulus & Yang, 2000; West, 2002). It has been argued that the diversity of the environmental resources available to group members (Tortoriello & Krackhardt, 2010; Tsai et al., 2012)—i.e., groups high in structural holes—helps to generate variety in input, which in turn produces variety in output (Harvey, 2014). Thus, creativity is fostered by the influx of heterogeneous perspectives and information (Boland & Tenkasi, 1995; Dougherty, 1992), enabled by the multitude of weak ties, which can be combined or expanded in novel ways (Uzzi, 1997). In other words, structural holes—by bringing together people from different backgrounds with diverse perspectives—enable the free flow of information, ideas, and knowledge and facilitate creativity through novel (re)combinations or the transfer of ideas from one context to another (Burt, 1992; Hargadon & Sutton, 1997; Sutanto et al., 2021). Thus, greater structural holes provide the variety of concepts and perspectives needed for expansion-focused dialogues and effective recombinant innovation to occur (Harvey, 2014; Leonardi, 2014; Van de Ven & Poole, 1995).

We further theorize that the positive effect of structural holes for *expansion-focused creative dialogues* holds in transparent groups only—and thus not in private groups. This is in line with the general consensus in the ESM literature that the communication leaks that happen as a result of transparency make it easier for employees to establish new and serendipitous social connections with previously unknown others in the organization (Brzozowski, 2009) and to maintain and leverage them over time (Fulk & Yuan, 2013). We have three rationales for this theorization: First, transparency increases the likelihood of nonmembers contributing ideas and solutions to the group, thereby further enhancing the group's ability to leverage its structural holes by readily enabling the influx of ideas and perspectives from outside (Reagans & McEvily, 2003, 2008; Tortoriello et al., 2012). Second, when groups openly share their problem-solving journey, messages are likely to be written in such a way that they can be understood and responded to by a diverse audience, thereby increasing the likelihood of serendipitous feedback, ideas, and suggestions by nonmembers and thus further aiding the diversity of

perspectives that “leak” into the group (Leonardi et al., 2013). For instance, Majchrzak et al. (2013) found that in wikis, open interactions allow project members to identify gaps in their expertise where external contributions are helpful. The use of ESM may have a similar effect and make it easier for outside users to self-identify their contributions as relevant and hence may increase the likelihood of such contributions. Third, a group's transparency enables a certain level of self-selection into the group, i.e., other employees may become aware of and subsequently join the group. Self-selection, as opposed to selection by a group leader (as is the case in private groups), is likely to enhance the diversity of the perspectives and relationships of a group because new members are selected from an already existing set of connections (Kane et al., 2014). When contributors are drawn from different pools of resources, they are more likely to deliver diverse viewpoints (Harrison & Klein, 2007; Jackson et al., 1995).

In contrast, when groups are characterized by structural holes but lack transparency, their ability to use heterogeneous inputs is limited to those they have personally developed outside of the group—i.e., a history of past connectedness—without the benefit of the serendipity of new inputs from nonmembers. Moreover, since no unexpected new input will occur in private groups, members spanning structural holes must become gatekeepers or boundary spanners for all input from existing connections outside the group (Lysonski, 1985; Singh & Rhoads, 1991), which can cause a significant cognitive burden that undermines their ability to effectively leverage diversity (Lysonski, 1985; Singh et al., 1996). Thus, it is the transparency of groups that helps to realize the positive effects of structural holes on the ability of groups to attract and surface divergent ideas and subsequently evaluate, refine, and possibly implement these ideas (Harvey, 2014) through expansion. Indeed, Burt emphasizes that the brokerage opportunities and social structural advantages of structural holes are enforced by an open network structure (Burt, 1992; Ahuja, 2000). Therefore, we hypothesize that:

**H1:** The extent of structural holes is positively associated with the amount of expansion-focused creative dialogues produced in *transparent* groups. This relationship does *not* hold for *private* groups.

### 3.2 Privacy, Network Cohesion, and Reframing-Focused Creative Dialogues

A recent body of literature rooted in a dialectical perspective has demonstrated that the probability of reframing increases when groups collectively attend not to compromises and negotiations but to an iterative process of building strong similarities, shared meanings, and understandings (Harvey, 2014; Majchrzak et al., 2012; Tsoukas, 2009). In this model,

group relations and interactions revolve around creative synthesis—that is, a unique and shared understanding of what a problem or task is, which acts like a theory for producing breakthrough ideas (Harvey, 2014). Creative synthesis not only helps to establish shared understandings and intersubjective meaning but also fosters a transactive memory system, strong coordination norms, shared identity and understandings, and psychological safety (Argote et al., 2003; Edmondson, 2002; Nahapiet & Ghoshal, 1998), all of which are critical antecedents to successful reframing dialogues (Harvey, 2014).

This central hypothesis underpinning the dialectical synthesis perspective of creativity is in line with the social capital perspective emphasizing the benefits of network cohesion. Network cohesion has been shown to be indicative of strong and informal social ties characterized by trust, support, coordinated action, and clear expectations (Coleman, 1988; Obstfeld, 2005; Reagans & Zuckerman, 2001). These characteristics of the relationships within the group facilitate the sharing of unique ideas (Chua et al., 2012; Tortoriello & Krackhardt, 2010), diminish opportunistic behaviors, and reduce concerns about ideas being criticized or rejected (McEvily et al., 2003; Tortoriello et al., 2012).

By promoting the development of strong norms of reciprocity within the group (Adler & Kwon, 2002; Seers, 1989; Tsai & Ghoshal, 1998; Uzzi, 1997), network cohesion further increases the motivation of members to display cooperative behaviors toward one another (Reagans & McEvily, 2003), creating a sense of shared ownership and mutual understanding (Fleming et al., 2007) and generating social pressure to help one other (Coleman, 1988; Granovetter, 1973, 1985). Furthermore, close, dense relationships are associated with emotional support (Sosa, 2011; Stobbeleir et al., 2011), which makes creators feel like it is more psychologically safe to disclose ideas, including counter-normative perspectives, without filtering or changing them (Zhang & Zhou, 2014; Zhou & George, 2001). This thus allows for the sharing of the types of disruptive ideas that characterize reframing.

Reframing-focused creative dialogues revolve around intersubjective meaning—group understandings that are not reflective of the world as is but constitutive of future alternate states (Tsoukas, 1998; van Osch & Avital, 2010). Greater network cohesion—as well as the trust, support, and norms of reciprocity associated with it—enable the shared mental models required for the deep-changing understandings and radical rethinking (Bartunek, 1984b; Benson, 1977) that characterizes reframing (Harvey, 2014). Furthermore, unlike recombinant innovation, reframing requires deep engagement within the group and with the creative task at hand (Gilson & Shalley, 2004; Harvey, 2014). Strong social cohesion enabled by ongoing

interactions that occur within the group allows actors to engage with one another continuously and therefore change their understandings in order to allow new ideas to emerge and develop (Bartunek, 1984b; Benson, 1977). Furthermore, network cohesion establishes the trust needed for the effective exchange of the rich tacit knowledge and joint problem solving (Ahuja, 2000; Uzzi, 1997) required for successful reframing to occur.

Nonetheless, it is important to acknowledge that the groups characterized by dense, cliquish network structures can also be associated with “groupthink” (Janis, 1982) and information redundancy (Burt, 1992) which may undermine a group’s ability to generate ideas. However, the extent literature emphasizes that groupthink is more likely to stem from the “controlling” (i.e., surveillance) characteristics of cohesion than the “enabling” (i.e., supportive) characteristics of cohesion (Sosa, 2011). The controlling characteristics of cohesion seem to be more prominent in offline than in online groups. Indeed, as the literature on computer-mediated communication (CMC) has shown, virtual settings enable users to behave in a way that is “relatively uninhibited” and less subject to social and status cues (Seers, 1989) and controlling characteristics (Sosa, 2011). Thus, given the virtual and voluntary nature of ESM groups, we anticipate that network cohesion reinforces the enabling characteristics for reframing-focused creative dialogues (Bartunek, 1984a; Benson, 1977; Smith & Lewis, 2011).

We further theorize that the positive effect of this interaction on reframing-focused creative dialogues holds only in private groups. We have three rationales for this theorization: First, privacy—by restricting the ability of external employees to interact with the group and its members—will increase the need and likelihood of group members to interact with each other resulting in greater closeness and bonding (Adler & Kwon, 2002; Reagans & McEvily, 2003, 2008). Second, by having limited interruptions by outsiders, group members can identify similarities (Koestler, 1964) and build on them, which further facilitates the emergence of cohesion (Edmondson, 2002), trust, and mutual respect (Harvey, 2014). Finally, the trust and respect that emerges from continuous close relations among group members—in the presence of limited external interruptions—will further enable group members to focus their collective attention on the group task rather than on managing external inputs (Harvey, 2014). Thus, in private groups displaying cohesion and equal engagement, creative dialogues are more likely to be characterized by the dialectical creation of new shared understandings that emerge when groups circle familiar ground (Tsoukas, 2009), resulting in reframing.

The fact that the effect of cohesion only occurs in private groups emphasizes that strong bonding alone may not be sufficient for reframing to occur. Indeed, openness—which allows for outsiders to join in or provide input—would be disruptive to the ability to leverage the strong connectedness and psychological safety of the group and would undermine members' willingness to take the risks of offering breakthrough ideas (Argote et al., 2003; Edmondson, 1999; Nahapiet & Ghoshal, 1998; Wang et al., 2014) that have been identified as critical conduits for reframing (Harvey, 2014). This is in line with recent research that has shown that disruptions from outside impair creativity (Wang et al., 2014) and that safeguarding people from such interruptions helps to improve idea incubation and elaboration (Bernstein, 2012). It would furthermore be disruptive to the trust that facilitates risk-taking behaviors and joint problem solving (Ahuja, 2000; Coleman, 1988; Uzzi, 1997). Indeed, Coleman (1988) emphasizes that dense, cohesive networks are advantageous to the extent that networks are closed (Ahuja, 2000; Walker et al., 1997). Therefore, we hypothesize that:

**H2:** The extent of network cohesion is positively associated with the amount of reframing-focused creative dialogues produced in *private* groups. This relationship does *not* hold for *transparent* groups.

## 4 Research Setting and Methodology

We captured content and interactions by using the system log and content data of the identified enterprise social medium (hereafter referred to as WeShare: a pseudonym, as are all names in this article). A total of approximately 6500 discussion threads (ranging in size from 1 to >50 posts), 2000 blog posts, 800 documents, and 1500 ideas were collected from across 109 visible and 106 invisible groups for a total of 28,083 written interactions produced by members of these 215 groups combined. The management of the case organization strongly encouraged these groups to leverage WeShare for creativity purposes, for instance by organizing innovation jams through WeShare. The measurements for the constructs are derived from the organizational records embedded in WeShare. For the operationalization of the dependent variables—expansion-focused and reframing-focused creative dialogues—we employed a machine learning algorithm to automatically delineate the types of creative dialogues that groups engaged in, and for the independent variables we calculated basic structural variables (i.e., bridging and bonding) by using ESM log data, as explained below.

### 4.1 The Case Organization

Our case organization (hereafter referred to as GlobalOffice) conducts research and consulting in the domain of human-computer interaction with a focus on the development of technology and furnishing products and services for corporate offices as well as healthcare and educational institutions. GlobalOffice is headquartered in the United States but has over 80 locations in the Americas, Europe, Asia, Africa, and Australia and over 11,000 employees worldwide.

In the Spring of 2012, GlobalOffice launched a popular ESM tool, called WeShare, for supporting business connections, communications, and collaborations among employees. WeShare offers built-in support for group chat, blogging, social bookmarking, and telephony integration. ESM like WeShare—similar to public social media platforms such as Facebook and Twitter—provide networking features and content creation functions. Additionally, to better serve organizational users, these systems provide knowledge management and productivity tools that can facilitate collaborative and other work activities, unlike public social media. Examples of ESMs include Salesforce's Chatter, Yammer, IBM Connections, Jive. These tools include functionalities such as microblogging, social networking, discussion forums, blogs, wikis, and IM under one unified user interface and typically allow organizations to further customize the software based on their specific needs. ESM focus on internal communications (i.e., between employees) inside the organization and can only be accessed via an organization's intranet.

Following its global launch in 2012, the adoption and use of WeShare have grown substantially, with a total user base of over 10,000 users (as of the summer of 2015). The average network size of individual users within WeShare is 38 followers. The following behavior in WeShare is directional, meaning that one user is the initiator of the behavior and the other user is the receiver. User A following User B does not necessarily mean that User B will also follow User A. Of the 10,000 unique users in WeShare, 91% (i.e., over 9,000 unique users) are members of groups and thus participate in group discussions and activities in WeShare. Many users are members of multiple groups; the number of groups that WeShare users belong to is shown in a histogram in Appendix A. Furthermore, the employees of GlobalOffice belong to an average of 1.9 transparent and 1.7 private groups.

Across all groups in WeShare, the average entropy score of geographic dispersion is 0.72 for transparent groups and 0.54 for private groups, both of which are well above 0. Hence, groups in WeShare tend to be

distributed in nature (i.e., have a relatively high level of geographic diversity). Transparent groups can be found through the simple search functionality in the system and require no request to join; however, these groups are nevertheless visible to employees only (i.e., members of the organization). Private groups, in contrast, are secret—they are even closed to the community manager and are not displayed to other employees who are not invited members of the group. The only way to join a private group is to receive an invitation from someone who is already a member of the group. Data from the WeShare platform at GlobalOffice shows that about 80% of all interactions taking place through WeShare are work-related and about 20% of all conversations are social (e.g., sharing family, vacation, other personal stories and images, etc.).

## 4.2 Data Collection and Sample

To test our hypotheses, we collected data over a period of five years, resulting in a total dataset of 28,083 written interactions. There were initially 711 groups in the dataset—i.e., this was the total number of created groups. At the start of our analysis, we examined if any of the groups were particularly larger than others and found 55 groups that were either all-department or all-division groups, serving more as bulletin boards of events and general questions and answers. Of the remaining 656 groups retained for preliminary analysis, we explored the groups' activity patterns to ensure that the groups were indeed active. As in any ESM, many groups are created but not all of them have consistent activities over time (e.g., some groups might just be created for a one-off exchange). Considering that our data captures a five-year period, we plotted activity plots for all 656 groups and retained only those groups that showed high levels of activity for a minimum of one year during the five-year period. Applying this activity threshold resulted in a subsample of 262 groups. In Appendix B, we provide sample activity count plots for transparent and private groups that were included and excluded (due to sporadic activity).

Next, we examined the 262 groups to ensure they were all work related. We conducted a manual content analysis of the group names and descriptions provided in WeShare and found that 47 groups were social groups—including groups focused on knitting, cycling, and gardening. We removed these groups, resulting in a final sample of 215 groups, of which 109 were transparent and 106 were private (see representative subset of group descriptors in Appendix C). Note that we included work-focused groups only, rather than groups focused explicitly on creativity, as our aim was to understand when different creative dialogues develop regardless of whether or not the

purpose of the group is explicit innovation. We believe instances of creative dialogues can occur in all kinds of work-oriented groups, whether focused on new product development, IT service provision, project realization, or strategic development.

We then conducted a comparative analysis of transparent and private groups in terms of a set of quantitative and qualitative criteria to establish invariance. Table 4 captures these differences and shows that except for group size—which is controlled for in our further analysis—there were no systematic differences between transparent and private groups in quantitative terms. Note that due to the fact that these variables are not normally distributed, we conducted nonparametric tests (Wilcoxon signed-rank tests) for more robust results.

In terms of qualitative assessment, we conducted a manual content analysis of group purpose descriptors (see a representative subset in Appendix C) and found no systematic differences between transparent and private groups in terms of their group purpose. The lack of systematic differences discerned through manual content analysis was further confirmed through automated topic analysis, which revealed that the top 12 keywords discussed in transparent groups were *share, GlobalOffice, group, information, team, work, support, ideas, global, best practices, sales, business, discuss*, and the top keywords in private groups were *group, team, share, GlobalOffice, place, information, projects, ideas, knowledge, sharing, global, business*. Hence, the focal keywords across the two group types appear highly similar.

In addition to the comparison across all groups, we repeated the keyword analysis for critical cases (i.e., groups high in reframing vs. expansion). We discovered that—similar to the overall keyword analysis—the top keywords across these groups were identical (*think, product, work, people, time, business, idea, team, question, space, meeting, make and thing*). However, in this analysis, some interesting distinctions were discerned, providing greater confidence in the content labeling underpinning our dependent variable. Specifically, for groups high in reframing, unique words were *new* and *could*, underscoring that this class of conversation may be associated with producing relatively greater novelty (*new*, in line with the definition of reframing as creating a new view of an object) and with envisioning future alternative states (*could*, in line with the focus on developing alternative possibilities). On the other hand, for groups high in expansion, unique words included *customer* and *help*, underscoring that expansion often involves helping new customers by applying concepts, ideas, or solutions developed for already existing customers (or contexts).

**Table 4. Comparison of Transparent and Private Groups**

Comparison criteria	Results	Median	Significance
Sample size for transparent and private groups	$N$ for transparent groups = 109 $N$ for private groups = 106	N/A	N/A
Overall content created within a group	$W$ -value = 5636 $p$ -value = 0.76	Transparent = 8 Private = 6	Not significant
The number of creative dialogues	$W$ -value = 5970 $p$ -value = 0.64	Transparent = 0 Private = 0	Not significant
Group size	$W$ -value = 4422 $p$ -value < 0.001	Transparent = 6 Private = 3	Significant

### 4.3 Operationalization of Variables

The measurements for our key theoretical constructs are derived from the organizational records embedded in the ESM and all are at the group level. For the operationalization of the dependent variable (i.e., creative dialogues) we developed a machine-learning algorithm preceded by human coding, explained in detail below. The independent variables, including the structural and compositional variables, were computed using ESM log data.

**Types of creative dialogues:** The types and number of creative dialogues were derived from the content of the interactions (i.e., conversations). We examined two types of creative dialogues—expansion-focused and reframing-focused—as the main dependent variables, both of which were operationalized as count variables at the group level. Expansion refers to the number of instances in which dialogues involved either the combination of existing concepts into a new one or the expansion of an existing concept to a new setting or application area (Tsoukas, 2009). The variable thus measures the total count of instances of expansion-focused creative dialogues across all content types generated by the group, potentially including posts on group blogs or discussion forums. Reframing refers to the number of instances in which dialogues involve the reclassification, disruption, or destruction of an object or concept so that a new view or understanding emerges (Tsoukas, 2009). The variable thus measures the total count of instances of reframing-focused creative dialogues across all group posts.

As discussed above, to ensure that there was no confounding between our core variable of interest (i.e., group type) and dependent variables (i.e., creative dialogues), we first examined the topics discussed to determine whether substantial differences existed between transparent and private groups. We did not discern any differences. Topics discussed in both group types included product design, (changing of) design processes, organizational issues, and social media (see Appendix C). The numbers of both types of creative dialogues were operationalized as count variables at the group level.

The variable was computed through a machine-learning algorithm, which involved various stages of development. In the first stage of algorithm development, two graduate students were trained to perform manual coding of a subset (14%) of all content data from the 215 groups to ensure the reliable development of the machine-learning algorithm. The students were asked to assign the various posts to one of multiple categories, i.e., posts containing instances of expansion or reframing—where the coding manual provided definitions and examples of the different types (see Appendix D)—or neither (i.e., no creativity was observed).

Coding was preceded by an elaborate training session to familiarize the coders with the coding manual and coding scheme. Following the training, the coders were supervised in the independent coding of 14% of the content to compute interrater agreement. An initial interrater agreement of 89.6% with a corresponding 0.71 Cohen's kappa (i.e., substantial agreement; cf., Landis & Koch, 1977) provided confirmation of coding scheme validity and coding process reliability. The main source of disagreement emerged from longer posts, which contained multiple instances of creative dialogues that included, at times, both expansion- and reframing-focused creative dialogues. Coders were encouraged to pick the most dominant category in the post. A subsequent meeting was held to reconcile differences, resolve ambiguous cases, and obtain full agreement and a clean coded dataset.

Within the next stage, the manually coded data served as a training sample to create an algorithm for automated text classification. The problem of text data classification belongs to the area of natural language processing, which is one of the most popular applications of machine learning. Compared to machine-learning problems that deal with numerical data, text data mining and classification are more tedious. We used a neural network algorithm to develop the prediction model. The neural network algorithm is a supervised learning algorithm. The idea of this algorithm is based on a collection of connected units or nodes called artificial neurons—a set of units form a layer and one neural network consists of several layers. The simplest network has at least three layers—the input layer, hidden layer, and output layer. Layers can

transmit signals to neighboring layers. With the rapid development of deep learning, the neural network has been demonstrated to be very powerful in solving natural language processing problems (Lopez & Kalita, 2017), such as text classification in our study. The input features are words and 2-gram phrases extracted from content and selected by gini-index equations (Aggarwal & Zhai, 2012) using a threshold of 0.2.

The neural network algorithm converts text into vectors and the “understanding” process is completed by calculating optimal parameters and setting mathematical boundaries among different classes—in our case, expansion- vs. reframing-focused creative dialogues—based on a discriminative score. Although the algorithm decides between classes based on an objective standard applied across all the samples, a bias may emerge from differences between training samples and test samples. To reduce this bias, we randomly selected samples for training and made sure the samples covered the full spectrum of the domain vocabulary. The training set is considered sufficient if the model provides satisfactory prediction accuracy. After several rounds of hyperparameter optimization, the overall prediction accuracy of the algorithm reached 81.9%. Other metrics showcasing the high performance of the algorithm included a precision score of 0.92 (ratio of correctly predicted positive observations, indicating a very low false positive rate), a recall of 0.81 (ratio of correctly predicted positive observation to all observations in the actual class, indicating a low false negative rate), and an F-1 score of .86 (weighted average of precision and recall, taking both false positive and false negatives into consideration).

For each group, a score for each dependent variable—expansion and reframing—was created by taking the sum of all occurrences across all the content associated with that group. Table 5 presents the keywords and examples generated by the machine learning algorithm distinguishing expansion from reframing (and posts with no creative dialogues).

**Group transparency vs. privacy:** Transparency is a dichotomous variable reflecting the existing privacy settings of the group afforded to users by the system. The ESM has inherent mechanisms for controlling group transparency. Transparent groups allow anyone to join, contribute, and consume content, regardless of group membership status. For private groups, not only is reading or writing the sole prerogative of members, but these groups are also unsearchable in the system, meaning their existence is unknown to anyone who has not been invited to the group. The system log data revealed that group transparency or privacy is manually determined by the group creator upon the creation of the group space (i.e., there is no default setting) and not altered afterward.

**Group social capital—Structural holes and network cohesion:** Both constructs are operationalized using network measures adapted from Kim et al. (2018) and computed using data from the ESM; hence, they reflect the level of structural holes and the network cohesion of the ESM-based network of a group. To calculate the number of *structural holes* that characterize a group (rather than an individual’s network), we used Kim et al.’s (2018) community external bridging measure, which is an adaptation of Burt’s structural holes measure. The connection between two groups was determined by the number of their shared group members. Thus  $1 - C_{it}$  is the measure of the bridging of focal group  $I$  on date  $t$ , with a value ranging from 0 to 1.  $C_{it}$  is calculated by Function [1], where  $n$  is the total number of groups and  $c_{ijt}$  (calculated by [2]) is the measure of focal group  $i$ ’s connection to group  $j$  in on date  $t$ .

$$c_{it} = \sum_{j=1}^n c_{ijt}, i \neq j \quad [1]$$

$$c_{ijt} = \left( p_{ijt} + \sum_{q=1}^n p_{iqt} p_{qjt} \right)^2, i \neq q \neq j \quad [2]$$

In Formula [2],  $p_{ijt}$  is the proportional strength of the connection that focal group  $i$  had with group  $j$  among its connections with other groups on date  $t$ . To summarize,  $p_{ijt}$  measures the direct connection between focal group  $i$  and  $j$ , and  $(\sum_{q=1}^n p_{iqt} p_{qjt})$  measures the indirect connections.

We also followed Burt’s (1992) suggestion and calculated the proportional strength rather than the absolute strength of the connection as indicated by Function [3], where  $Z_{ijt}$  was calculated by summing the number of shared group members between groups  $I$  and  $j$  on date  $t$ .

$$p_{ijt} = \frac{z_{ijt} + z_{jti}}{\sum_{k=1}^n (z_{ikt} + z_{kit})}, \quad i \neq k \quad [3]$$

To calculate the *network cohesion* that characterizes a group, we used network density as an indicator. In line with established practices in IS research examining the internal cohesion of open source development groups (c.f., Kim et al., 2018), network density was used to measure the level of cohesion within an ESM group, i.e., the extent to which members of the group were strongly connected to one another. Density is one of the most commonly used measures of cohesion in network research (Borgatti et al., 2013) and is computed by taking the sum of ties divided by the number of possible ties. Given the asymmetrical nature of tie formation inside the ESM, a tie was determined to exist in any of the following three scenarios: A follows B, B follows A, and A and B follow each other. Network density as a social network proxy for cohesion is appropriate for group-level research since it represents the average strength of ties actually present across all possible ties in the focal ESM group.

Table 5. Examples of Different Types of Creative Dialogues

Types of dialogues	Expansion-focused creative dialogues	Reframing-focused creative dialogues	Noncreative dialogues
<b>Distribution</b>	21.12%	14.08%	64.8%
<b>Example</b>	<p><i>Example 1: "This is a <b>modification</b> of the SpaceWise<sup>1</sup> tool that is used in the CoLab workshop space"</i></p> <p><i>Example 2: "This is a great innovation; the Posture Chair is <b>adapted</b> to support the user as he/she is reclining."</i></p> <p><i>Example 3: "There has been some consideration for how techniques from online gaming could be <b>applied to</b> our new integration of social media technology to boost engagement?"</i></p> <p><i>Example 4: That question then makes me ask whether there are <b>proxies</b> for the 'diplomat' idea that we see elsewhere in the company. Do we have <b>examples</b> of where we've used a <b>similar model</b> successfully?</i></p> <p><i>Example 5: This was a topic of discussion years <b>ago with [client]</b> I believe where there was discussion of merging providers with [...] etc and then showing the value of the whole vs the parts. With everyone leaning out today and showing value to the enterprise, this topic <b>may have come back</b>.</i></p>	<p><i>Example 1: "If we want to <b>reinvent</b> ourselves over and over and stay ahead of "any" curve, shouldn't we have a special look into how to move from ideas into new products and services?"</i></p> <p><i>Example 2: Your thought about the organizational 'diplomat' makes me wonder a few things. One is how to know whether we need to take that step and make this a specialized role vs. <b>challenging</b> each of us to <b>rethink</b> how we work, how we leverage the network of advisors, etc. in order to get to the same place.</i></p> <p><i>Example 3: What do we mean when we say we want to be a global company. The <b>mindset and attitude changes</b> (...) are all good ways to help us make progress on this journey, (...) to <b>push our insights</b> and innovation in a way that extends beyond a NA-centric view.</i></p> <p><i>Example 4: For collective learning, [we need to] share these experiences back in the safety of your team home-base, where you can <b>collectively</b> think through the <b>challenge</b> and learn from each other's struggles. There needs to be a feedback loop that shows what <b>challenges</b> the advisor placed, and how that has <b>changed the thinking or approach</b> on the project.</i></p>	<i>Excluded from further analysis</i>

**Control variables:** *Functional diversity* is a continuous variable that is calculated using an entropy metric to capture the composition of differences in functional specialization among group members as measured through entropy. The attribute can take any value (category) between 0-1, where 0 indicates a group with no functional diversity (i.e., all members belong to the same functional department) and 1 indicates a group with maximum functional diversity (i.e., each member of the group belongs to a distinct functional department), where department affiliation was determined from the system log data (i.e., user profile).

Our indicator of *equal engagement* is participation equality, which is a continuous variable that is operationalized as a ratio of the number of unique members in the group who actively contributed to the discussion as a function of the total group size—i.e., it is computed by dividing the number of active

contributors in the group by the total membership. It thus measures the composition of groups in terms of the ratio of active members. In this context, an active contribution requires a member to contribute novel content—for instance, in the form of a blog post, discussion post, or comment on an existing post. Equal engagement can take any value larger than 0 since no groups in our dataset had zero discussions; 1 indicates a group where all members contribute to the discussion equally.

*Group size* is a continuous variable measuring the total number of members in the group. *Group content creation* is a continuous variable measuring the total number of unique pieces of content (e.g., individual text posts, such as discussion boards, blogs, documents, and ideas) created by members of the group. Table 6 summarizes the operationalization of the variables, including control variables, and Table 7 shows important descriptive statistics and correlations.

**Table 6. Summary of Operationalization of Dependent and Independent Variables**

Variable	Type	Definition
Expansion-focused dialogues	Count	The number of instances of expansion-focused creative dialogues in a group.
Reframing-focused dialogues	Count	The number of instances of reframing-focused creative dialogues in a group.
Group transparency vs privacy	Dichotomous	The observability (or lack thereof) of a group and its activities, routines, behaviors, output, and performance within the ESM. Whether non-group members can observe, join, or participate in a group's activities and interactions (0 = transparent, 1 = private) as determined upon the creation of the group and observed from the ESM log data.
Structural holes	Continuous	External bridging, an adaptation of Burt's structural holes measure, is used as a proxy and calculated by measuring the extent to which an ESM group is directly and indirectly connected to other groups (i.e., spans structural holes) through mutual membership. Measured at the start of the group's one-year activity period.
Network cohesion	Continuous	Network density is used as a social network proxy for network cohesion and calculated by measuring the sum of ties divided by the number of possible ties (i.e., the average strength of ties that are actually present across all possible ties within the ESM group) measuring the extent to which each member of a group maintains connections to all other members of the group. Measured at the start of the group's one-year activity period.
Functional diversity ( <i>control</i> )	Continuous	The composition of group differences in functional specialization among group members as measured through entropy. The attribute can take any value between 0-1.
Equal engagement ( <i>control</i> )	Continuous	The composition of group in terms of the ratio of active members; specifically, the extent to which each member of the group contributes to the group activity as a function of the size of the group. The value is calculated by dividing the number of contributing group members by the group size.
Group size ( <i>control</i> )	Continuous	The total number of members in the group.
Content creation ( <i>control</i> )	Continuous	The total number of unique pieces of content (including individual text posts, such as discussion boards, blogs, documents, and ideas) created by members of the group

**Table 7. Descriptive Statistics and Correlations of Dependent and Independent Variables**

Variable	Mean	SD	Correlation							
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Expansion	1.02	2.69								
(2) Reframing	1.89	6.16	0.60							
(3) Bridging	0.88	0.07	0.15	0.10						
(4) Bonding	0.30	0.25	-0.07	-0.03	-0.27					
(5) Functional diversity	1.79	0.96	0.10	0.12	0.47	-0.34				
(6) Equal engagement	0.08	0.13	0.08	0.07	-0.08	0.11	-0.28			
(7) Group size	8.42	13.03	0.38	0.44	0.27	-0.17	0.30	0.37		
(8) Content creation	33.64	19.86	0.55	0.60	0.14	-0.06	0.17	0.36	0.74	

## 5 Data Analysis and Results

### 5.1 Model Specification and Data Analysis

To conduct data analysis, we entered the data into Excel and then imported it into the “pscl” statistical package in R, which is mainly preferred for its ability to support zero-inflated Poisson regression analysis (Long, 1997). Per our hypotheses, all independent and dependent variables are at the group level. Both of the

dependent variables ( $Y_u$  = total number of creative dialogues by group  $u$ ) are count variables that are heteroscedastic (i.e., the variance is not constant but depends on the value of the estimate itself) and bounded by zero. To remedy this situation, we used zero-inflated Poisson regression and modeled the dependent variable as a Poisson-distributed variable. Additionally, as groups creating more content are more likely to have a higher number of creative dialogues (correlation between content creation and expansion: 0.55,  $p < 0.001$ ; content creation and reframing: 0.6,  $p < 0.001$ ), we set content creation as an offset in the

model to account for the high correlation. In other words, we modeled the rate of creative dialogues, which is the number of expansion-focused or reframing-focused dialogues divided by the amount of content creation. Moreover, the zero-inflated Poisson model has two parts, a regular Poisson model and the zero-inflated model for predicting excess zeros. In the zero-inflated part, we used group size as a predictor, as larger groups are less likely to have zeros in content creation as well as creative dialogues.

## 5.2 Results for Hypothesis 1: The Effect of Bridging on Expansion-Focused Creative Dialogues in Transparent and Private Groups

To examine Hypothesis 1, we split the data based on group type and conducted the same analysis twice by using the two datasets from transparent and private groups. The results show that the positive effect of bridging on expansion-focused creative dialogues is significant in transparent groups ( $\beta = 20.19; p = 0.002$ ; pseudo- $R^2 = 0.28$ ) but not in private groups ( $\beta = 2.73; p = 0.23$ ; pseudo- $R^2 = 0.35$ ), validating H1. More specifically, a transparent group with a higher level of bridging is more likely to have a greater number of expansion-focused dialogues. For the control

variables, functional diversity is significant in both transparent ( $\beta = -0.91; p < 0.001$ ) and private groups ( $\beta = -0.27; p = 0.04$ ) and group size is significant only in transparent groups ( $\beta = -0.03; p < 0.001$ ). Thus, in transparent groups, a lower level of functional diversity or a smaller group size is associated with a greater number of expansion-focused dialogues. Meanwhile, for the zero-inflated model, the group size is significantly negative in transparent groups ( $\beta = -0.13; p = 0.02$ ), suggesting that larger groups tend to create more posts and are thus less likely to have zero expansion-focused dialogue. Table 8 presents the summary of the results for H1.

Furthermore, to assess model fit, we used log-likelihood ratio tests to compare the full model and the baseline model (which includes only control variables and excludes the key variables of interest, i.e., structural holes and network cohesion). Appendix F includes the baseline model results. In regard to transparent groups, the log-likelihood of the full model is significantly higher (chi-sq statistic = 10.15,  $df = 1, p < 0.01$ ), suggesting that the full model has a better model fit than the baseline model. In private groups, the test is not significant (chi-sq statistic = 1.35,  $df = 1, p = 0.24$ ) providing further support that the effect of structural holes on expansion exists only in transparent groups.

**Table 8. Results for H1 by using the Transparent and Private Group Datasets**

DV: Expansion-focused creative dialogues Dataset: Transparent groups ( $N = 109$ ) (Theorized to be significant)	$\beta$	SE	Significance
<i>Poisson model</i>			
Intercept	-18.21	5.63	0.001 **
Structural holes	20.19	6.45	0.002 **
Functional diversity	-0.91	0.21	< 0.001 ***
Group size	-0.03	0.01	< 0.001 ***
<i>Zero-inflated model</i>			
Intercept	1.18	0.54	0.03 *
Group size	-0.13	0.06	0.02 *
<b>Pseudo-<math>R^2 = 0.28</math></b>			
DV: Expansion-focused creative dialogues Dataset: Private groups ( $N = 106$ ) (Theorized to be nonsignificant)	$\beta$	SE	Significance
<i>Poisson model</i>			
Intercept	-4.58	1.98	0.02 *
Structural holes	2.73	2.27	0.23
Functional diversity	-0.27	0.13	0.04 *
Group size	-0.01	0.01	0.26
<i>Zero-inflated model</i>			
Intercept	-0.05	0.64	0.94
Group Size	-0.12	0.09	0.18
<b>Pseudo-<math>R^2 = 0.35</math></b>			
<i>Note:</i> *** = 0.0001; ** = 0.001; * = 0.01			

### 5.3 Results for Hypothesis 2: The Effect of Bonding on Reframing-focused Creative Dialogues in Transparent and Private Groups

For Hypothesis 2, we examined whether the proposed effect of bonding holds true solely for private groups. Thus, we conducted the same analysis twice by using the split datasets from transparent and private groups. The results show that the positive effect of bonding on reframing-focused creative dialogues is significant in private groups ( $\beta = 2.1$ ;  $p < 0.001$ ; pseudo- $R^2 = 0.50$ ) but not in transparent groups ( $\beta = 0.48$ ;  $p = 0.81$ ; pseudo- $R^2 = 0.23$ ), validating the proposed relationship. More specifically, a private group with a higher level of bonding is more likely to have a higher number of reframing-focused dialogues. For control variables, equal engagement ( $\beta = -4.23$ ;  $p < 0.001$ ) and group size ( $\beta = 0.02$ ;  $p < 0.001$ ) are both significant in private groups. Hence, in private groups, a lower level of equal engagement or a larger

group size, is associated with a greater amount of reframing. Again, for the zero-inflated model, group size is significantly negative in transparent groups ( $\beta = -0.17$ ;  $p < 0.01$ ), suggesting that a larger group is less likely to have zero reframing-focused dialogues. Table 9 presents the summary of the results for H2 by using the split datasets from transparent and private groups. Again, log-likelihood ratio tests were employed to assess model fit (see Appendix F). For private groups, the log-likelihood of the full model is significantly higher (chi-sq statistic = 43.93,  $df = 1$ ,  $p < 0.001$ ), suggesting that the full model has a better model fit. In transparent groups, the test is not significant (chi-sq statistic = 0.54,  $df = 1$ ,  $p = 0.46$ ).

Additionally, we conducted the same analysis with the full dataset without splitting it based on group type. We used private groups as the reference group; thus, the main effects pertain to the effects in the private groups, while the interaction effects are related to those in the transparent groups. The results of the combined data are in line with the ones of the split data analysis and are presented in full in Appendix E.

**Table 9. Results for H2 by using the Transparent and Private Group Datasets**

DV: Reframing-focused dialogues Dataset: Private groups ( $N = 106$ ) (Theorized to be <i>significant</i> )	$\beta$	SE	Significance
<b>Poisson model</b>			
Intercept	-2.34	0.19	< 0.001 ***
Network cohesion	2.10	0.31	< 0.001 ***
Equal engagement	-4.23	0.92	< 0.001 ***
Group size	0.02	0.0034	< 0.001 ***
<b>Zero-inflated model</b>			
Intercept	1.04	0.467	0.03 *
Group size	-0.17	0.067	0.009 **
<b>Pseudo-<math>R^2 = 0.50</math></b>			
DV: Reframing-focused dialogues Dataset: Transparent groups ( $N = 109$ ) (Theorized to be <i>nonsignificant</i> )	$\beta$	SE	Significance
<b>Poisson model</b>			
Intercept	-2.19	0.43	< 0.001 ***
Network cohesion	0.48	1.96	0.81
Equal engagement	-2.02	1.96	0.30
Group size	-0.01	0.02	0.69
<b>Zero-inflated model</b>			
Intercept	0.87	1.41	0.54
Group size	-0.09	0.15	0.54
<b>Pseudo <math>R^2 = 0.23</math></b>			
<i>Note:</i> *** = 0.0001; ** = 0.001; * = 0.01			

## 6 Discussion

This study was motivated by two theoretical conundrums and their implications for fostering creative dialogues in ESM groups. First, there is a conundrum in the literature, with some studies suggesting that group transparency increases the likelihood of creative dialogues, and other studies suggesting that privacy increases the likelihood of creative dialogues. Second, there is a similar debate over whether structural holes or network cohesion result in greater creativity. These two debates provided the impetus for this empirical investigation. The empirical findings and conclusions of this study help to offer some resolution for both conundrums by validating our contingency hypotheses that distinct groups—transparent vs. private—display different types of creative dialogues—expansion-focused vs. reframing-focused—but only when these groups are characterized by distinct forms of social capital—i.e., focused on structural holes vs. network cohesion, respectively.

Our results show that expansion-focused creative dialogues—those rooted in combining or expanding existing ideas in new ways—are likely to occur in transparent groups with a focus on spanning structural holes, which provides access to diverse and nonredundant information, perspectives, and knowledge from outside the group (Harrison & Klein, 2007; Harrison et al., 1998; Harrison & Sin, 2006). Thus, heterogeneity and cognitive variation form the critical basis for creative dialogues in transparent groups (Campbell, 1960; Simonton, 1999; Staw, 2009). On the other hand, reframing-focused creative dialogues—those based on fundamentally challenging and reenvisioning existing concepts and frameworks—are likely to occur in private groups with a focus on fostering strong network cohesion between group members, which results in trust, strong reciprocity norms, mutual understanding, and a sense of shared ownership. Thus, a psychologically safe environment (Zhang & Zhou, 2014; Zhou & George, 2001) forms the ideal circumstances for disruptive ideas to emerge (Harvey, 2014).

Providing even stronger support for the proposed contingency hypothesis, our empirical findings reveal that if the opposite occurs—private groups span structural holes and transparent groups have strong network cohesion—the ability to engage in expansion or reframing dialogues, respectively, is not significant, underscoring that it is only specific social capital types combined with specific group privacy settings that produce distinct types of creative dialogues. These latter findings beg the question of why. With regard to the first, a possible theoretical explanation as to why private groups that span structural holes may be at a disadvantage regarding expansion could include the fact that even though private groups can still search for and seize information from outside that is shared publicly by other groups, their closed nature blocks them from the

serendipitous, broader involvement of others (DiMicco et al., 2009; 2008; Leonardi et al., 2013; Steinfield et al., 2009) that provides the diversity of input and resources for the effective combination, integration, and transfer of ideas from one context to another (Perry-Smith & Mannucci, 2017). Similarly, transparent groups that display strong cohesion have a disadvantage with respect to reframing-focused creative dialogues. Here, a possible theoretical explanation could include the fact that when transparent groups focus their time and efforts on building strong internal ties, they undermine their unique aptitude for fostering a climate of multiplicity through external ties and the ability of diverse members to join in freely (Workman, 2001). Another possible explanation could be related to the fact that the external intervention that is an inevitable result of the inherent public nature of the group makes it impossible to foster the kinds of safe harbors that are necessary for risk taking (Delizonna, 2017; Edmondson, 1999). Hence, transparent groups that develop network cohesion may instead foster the kinds of strong ties that lead to the sharing of mostly redundant knowledge and information (Granovetter, 1973). These might be associated with low levels of risk and vulnerability (Uzzi, 1997) and can therefore be publicly shared but may lack the kinds of novelty and disruption needed for reframing (Harvey, 2014). Such theorization requires validation in future studies.

Furthermore, our theorizing suggests that there might be a causal order between ESM implementation, group social capital types, and subsequent types of creative dialogues. Specifically, the social capital type and the nature of creative dialogues that groups engage in may be influenced by the way that groups use the privacy setting of the ESM. Yet there is likely to be a more complex relationship among these variables that may play out dynamically over time. One possible unfolding could be that groups intending to have a dense, cohesive network choose to be private in anticipation of the likelihood of these types of relationships developing (Van Osch & Steinfield, 2018). Similarly, they may start out as a dense network offline, having idea generation in a mode similar to an old boys' network, with the privacy of the ESM only serving to reinforce the offline nature of the group. Thus, our theorizing opens avenues for exploring the strategic choices underpinning the use of specific ESM features and the fostering of different social capital types. If group leaders establish a group as private, their choice may be made pursuant to a different work objective or social capital type than a group leader establishing a group as transparent. Indeed, Sutanto et al. (2021), in their study of open-source software communities, found that OSS projects may strategically aim to have many structural holes to gain popularity or strategically aim to be cohesive to advance knowledge creation—two distinct strategic outcomes associated with different network structures. Generic ESM features such as openness thus need to be considered in light of the strategic work objectives of groups in workplace settings (Van Osch & Steinfield, 2018).

## 6.1 Theoretical Implications

Theoretically, this study contributes to a deeper understanding of how technology features, such as the ability of ESM groups to choose to be transparent or private, may positively affect the occurrence of creative dialogues once we consider the nature of these dialogues. This further highlights the importance of examining multiple and opposing outcomes simultaneously.

These findings offer four important insights for the extant literature. First, by using the literature on productive dialogues that identifies different forms of creative dialogues—expansion-focused vs. reframing-focused—we offer a theoretical lens that helps to solve the conundrum regarding the effects of transparency and privacy on creativity. Indeed, adopting this finer categorization of creative dialogues into expansion vs. reframing enables the reconciliation of contradictions in the literature on group transparency and privacy as well as the development of a theoretical framework that incorporates both sides of the debate.

Second, by applying a social capital perspective, we offer a theoretical lens for explaining the link between group transparency and creative dialogues by showing that transparent vs. private groups tend to develop distinct types of social capital focused on either structural holes or network cohesion. Our theory, then, provides an extension to the literature by studying not only the *nature* of social capital but also its fit for specific group *contexts* (i.e., group transparency or privacy) and its relation to the *content* of the creative dialogues by focusing on either combining or expanding existing concepts or challenging and fundamentally rethinking ideas. Thus, employing a finer-grained classification of creative dialogues as expansion vs. reframing allows us to also solve the inconsistency in the social capital literature regarding whether structural holes or network cohesion is more beneficial.

Third, by revealing not only a variety of antecedents but also the specific contingencies of antecedents that result in distinct forms of creative dialogues, our findings contribute rich insights by integrating the group social capital and technology features underpinning a group's creative dialogues into a single theoretical model. We thus highlight the importance of understanding technology characteristics and the need for IS researchers to be attentive to how the same technology feature—in the context of this study the transparency feature—may be leveraged differently by distinct groups toward positive group outcomes but only when the right type of social capital—structural holes or network cohesion—develops.

Finally, this study contributes to a deeper understanding of how ESMs might transform workplace interactions by exploring the occurrence of

distinct types of creative dialogues enacted by ESM groups. Although the ESM literature has argued that the use of ESM broadens the possibilities for collaboration and involvement (Bebensee et al., 2012; Von Krogh, 2012) by attracting many and diverse users, (Brzozowski, 2009), this study is among the first to empirically and systematically examine whether and how creativity occurs in ESM groups. We contribute not only an understanding of whether creative dialogues occur in ESM groups but also advance insights about the boundary conditions that allow such conversations to occur by highlighting the joint role of group social capital and privacy settings. Doing so further elaborates theorizing about creative dialogues in virtual settings.

## 6.2 Management Implications

Beyond implications for theory, our empirical investigation provides notable implications for practitioners who view ESM platforms as a possible solution for evoking or improving creative dialogues in organizational teams. Organizations invest significant resources into adopting ESM platforms to improve collaboration and ultimately creativity. With the COVID-19 pandemic, the adoption and usage of ESM adoption have become even more widespread. Because ESM facilitate knowledge sharing between distributed coworkers (Van Osch & Steinfield, 2018), which may foster new ideas (Teigland & Wasko, 2003), ESM have been hailed as a promising mechanism to improve creativity in organizations (Leonardi, 2014). However, prior work has been largely anecdotal, thereby limiting the ability to explain the link between ESM use and creativity and propose mechanisms that fall within the control of ESM designers or administrators. In contrast, the choice between group transparency or privacy that is at the heart of the current analysis is widely available on all ESM platforms, and our findings thus provide valuable and actionable insights to both administrators and system designers.

For administrators, our findings highlight that promoting greater openness may not be the (only) key to improved creativity. The recognition that different groups—as distinguished by their transparency or privacy—enact distinct creative dialogues discourages a “one size fits all” approach to innovation. By showing that distinct social capital properties culminate in diverse creative dialogues—ranging from expansion to reframing—our insights can help organizations prioritize the level of transparency that is best aligned with their overall strategic objectives. Hence, our findings highlight the possible strategic nature of the choice to be transparent or private in terms of fostering a particular social capital type and a consequent type of creative dialogue. Consequently, system administrators might take on a more active role

in nudging the nature of social capital development in transparent and private groups, respectively.

Second, for system designers and developers, there are two sets of implications. On the one hand, designers should provide not only the mechanism to create transparent and private groups but perhaps afford users a greater understanding of the potential consequences on the nature of the relationships and creative dialogues that develop in the group. On the other hand, because of the importance of matching transparency or privacy with the specific structural characteristics of the group, built-in mechanisms could be designed that prompt users to foster the types of social capital that are more useful given the nature of the group—transparent or private—that they belong to or the creative goal—expansion or reframing—they are trying to achieve.

Third, our insights that reframing dialogues happen in private groups pose inherent challenges in terms of making these dialogues and the knowledge and ideas embedded within them available to the broader organization. Given that these dialogues are the source of arguably more disruptive ideas, their primary occurrence in private groups undermines the desire for cross-pollination that has inspired the implementation of ESM tools in many organizations. Not only does this finding contrast with the popular opinion that it is chiefly openness of communication and serendipity of discovery in ESM that promote creativity, it also highlights that the creators of these private groups need to take on an active boundary-spanning role to disseminate the relevant ideas and knowledge embedded within these creative dialogues that they feel comfortable sharing to the broader organization.

Finally, although we focused on transparency and privacy as afforded by ESM technologies, whether the transparency of groups is due to physical space (e.g., the design of modern-day facilities that emphasizes transparency through open floor plans and glass cubicles) (c.f., Bernstein, 2012) or digital tools (e.g., ESM that emphasizes the benefits of open information flows) (Leonardi, 2014; Treem & Leonardi, 2013) may be tangential to the exploration of the effect of transparency on creative dialogues. Thus, the findings from this study potentially offer a broader critical reflection into practical attempts pertaining to the physical design and digital restructuring of organizations aiming to increase transparency.

### 6.3 Challenges and Future Research

Although our findings show that different types of creative dialogues are more likely to occur in different types of groups (c.f., Anderson & Tushman, 1990; Madjar et al., 2011; Unsworth, 2001; Van de Ven & Poole, 1995), in this specific study, we measured the

content of creative dialogues of groups—expansion vs. reframing—as a proxy for their creative output. However, future research could extend these efforts by discerning the nature of the creative output—for instance, as being incremental vs. radical—to explore whether different types of creative dialogues are more likely to result in incremental or radical creative outputs, respectively. Indeed, Harvey (2014) suggests that the evolutionary modes of creativity—i.e., those focused on heterogeneity through structural holes—may result in isolated moments of creative breakthroughs, whereas dialectical modes of idea generation—i.e., those leveraging network cohesion—are more likely to result in the continuous or repeated production of breakthrough ideas over time (Harvey, 2014) because they trigger relatively more radical novelty (Bartunek, 1984b; Van de Ven & Poole, 1995). Hence, there may be inherent causal links between expansion and incremental innovation as well as reframing and radical innovation.

From an organizational perspective, future research should move beyond studying whether transparency and privacy are desirable from the perspective of a group's strategic objectives—i.e., expansion- or reframing-focused creative dialogues—to explore the question at a macrolevel by investigating how many transparent or private groups are optimal for a company at large. In this context, understanding important organizational- and industry-level characteristics may be critical to discerning the unique assemblage of transparent and private groups that is required for the best performance of the company as a whole. This, in turn, raises new questions for management theorists with respect to the optimal structures and techniques for managing such distinctive assemblages of transparent and private groups.

In addition, as groups may shift the orientation of their discussions from one type of creativity to the other, future research could perform longitudinal analyses to examine changes in the nature of creative dialogues over time. Such an investigation could shed light on understanding how creative dialogues are formed within different types of groups and what the factors driving changes in these dialogues might be. For instance, since reframing-focused dialogues require groups to have developed a certain level of common ground and norms for cooperation, a longitudinal perspective could explore group tenure as a factor influencing the number of reframing dialogues, with the expectation that such dialogues become more prevalent in groups with greater tenure. Other group factors to explore include the level of geographic dispersion of the members of the group. Although our current dataset included groups that were all relatively dispersed, future research could explore other organizational settings with groups that are co-located to see if the benefits of virtuality—which allow users to behave relatively uninhibited and voice radical ideas and nonconforming perspectives—are limited and the nature of creative dialogues is thereby impacted.

Relatedly, our manual analysis of creative dialogues—as the input for the algorithmic and computational measurement thereof—centered on a binary classification of creative dialogues as expansion vs. reframing and thus resulted in the loss of nuances, especially for posts that may contain elements of both. Capturing the degree of expansion or reframing in a post could provide a more realistic view of creative dialogues in organizational groups; however, this is likely to come at the expense of interrater agreement. Future research analyzing the content of group dialogues, especially studies taking a more qualitative approach, could focus on capturing the subtleties with which groups engage in diverse forms of creative dialogues in a single post. Furthermore, novel advancements in machine learning and natural language processing may offer reliable ways to reflect such nuances in the algorithmic measurement of creative dialogues. However, considering that this work represents a first attempt at measuring the nature of creative dialogues to solve the conundrums surrounding the effects of transparency and different social capital types, we laid the foundation for such efforts in future research.

Furthermore, linking our findings to the broader literature on online communities, a few interesting avenues for future research emerge. With respect to the link between social capital and the success of a group's activities, the literature on consumer social media has suggested that given the decreased effort of forming and maintaining relationships, groups can simultaneously sustain both forms of social capital (Faraj & Johnson, 2011). For instance, Kim et al. (2018) found that the community responsiveness of online communities increases when communities have structures characterized by a combination of bridging and bonding. This combination helps to provide both the resources and the motivation for greater community responsiveness. However, our dataset consists of groups with either strong structural holes or network cohesion. Therefore, future research should explore if there is a substantial difference between consumer social media (or online communities) and ESM, where the former allows for the simultaneous development and maintenance of both types of social capital but the latter appear to foster groups that develop one or the other. Furthermore, if on other ESM platforms (or organizations) groups do exist that maintain high levels of structural holes and network cohesion, it would be worth exploring whether this has a positive effect on both expansion and reframing.

Relatedly, existing research has suggested that network cohesion becomes detrimental to creative dialogues when it exceeds average levels (Sosa, 2011); however, this research has not studied the role of technology platforms such as ESM. It is thus worth exploring if the virtual nature of group interactions in ESM prevents the negative consequences associated with network

cohesion by possibly limiting the levels of network cohesion that can be achieved due to the virtual (and inherently dispersed) nature of group interactions. As discussed above, existing literature has attributed the negative consequences to the “controlling” characteristics of cohesion, which may be more prominent in offline than online groups (Sosa, 2011). The unique virtual dynamics of technology platforms such as ESM thus open interesting avenues for investigating the idiosyncrasies of the relation between network cohesion and group creativity.

## 6.4 Conclusion

Transparency has become a panacea in the field of management (Bernstein, 2012), and recent advances in workplace technologies—such as enterprise social media (Leonardi, 2014)—attempt to make communication even more “naked” (Tapscott & Ticoll, 2003). However, past research had been equivocal about the performance benefits, such as enhanced creativity, associated with transparency. Similarly, past research has been ambiguous about the effect of distinct social capital types—structural holes vs. network cohesion—on creativity. To solve these two conundrums and generate theoretical progress, we developed and validated a contingency hypothesis incorporating both sides of the debate and leveraging the unique empirical setting offered by ESM, which enables groups to establish themselves as either transparent or private within the same organization and develop distinct social capital types—characterized by either structural holes or network cohesion. We show that creative dialogues exist in different forms—expansion or reframing—which emerge in different groups: expansion happens when transparent groups are characterized by structural holes, and reframing occurs when private groups are characterized by network cohesion. Therefore, we must be cautious in generalizing about the unequivocal positive effects of transparency. Instead, we encourage management scholars to be sensitive to the idiosyncrasies of transparent and private groups and engage in novel theorizing of group interactions and dialogues in organizational contexts characterized by simultaneous conditions of hypervisibility and inconspicuousness.

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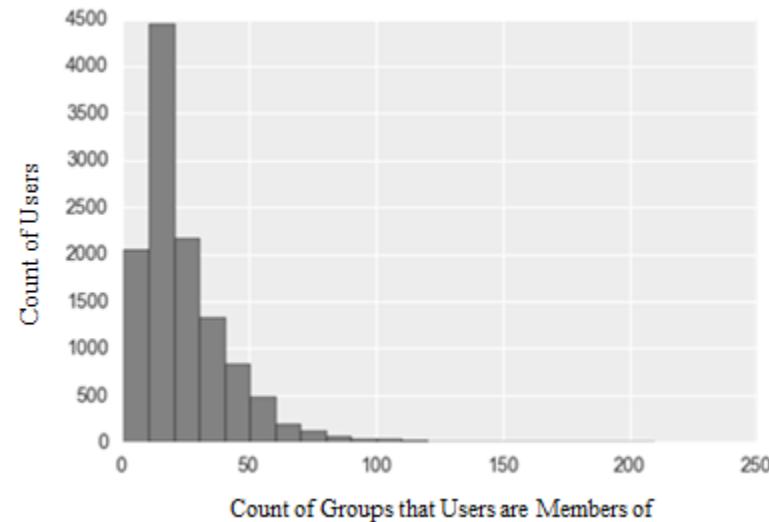
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## Appendix A: Number of Group Memberships per User



**Figure A1. Number of Group Memberships per User**

## Appendix B: Sample Activity Plots

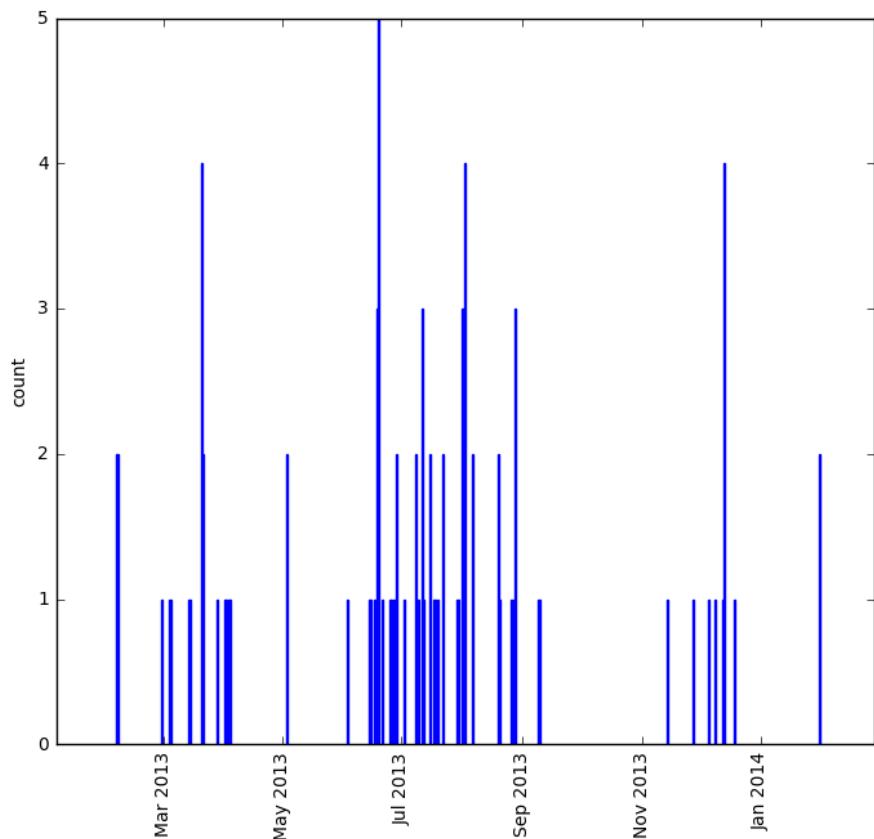


Figure B1a. A Sample Activity Plot for an *Open Group* That Was Included in the Study

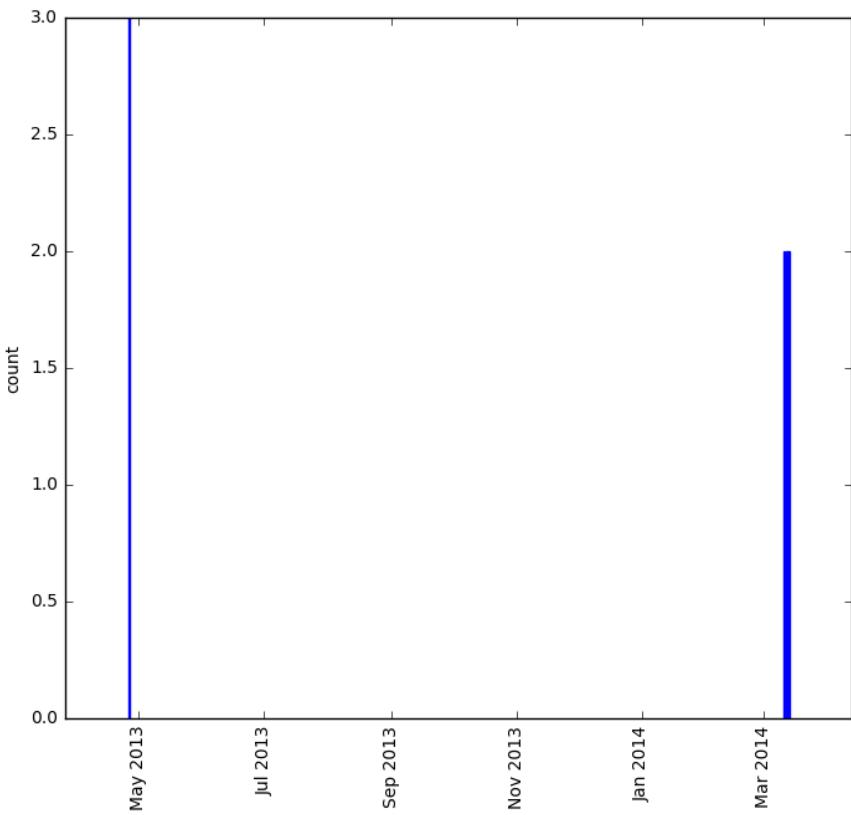


Figure B1b. A Sample Activity Plot for an *Open Group* That Was *Excluded* from the Study

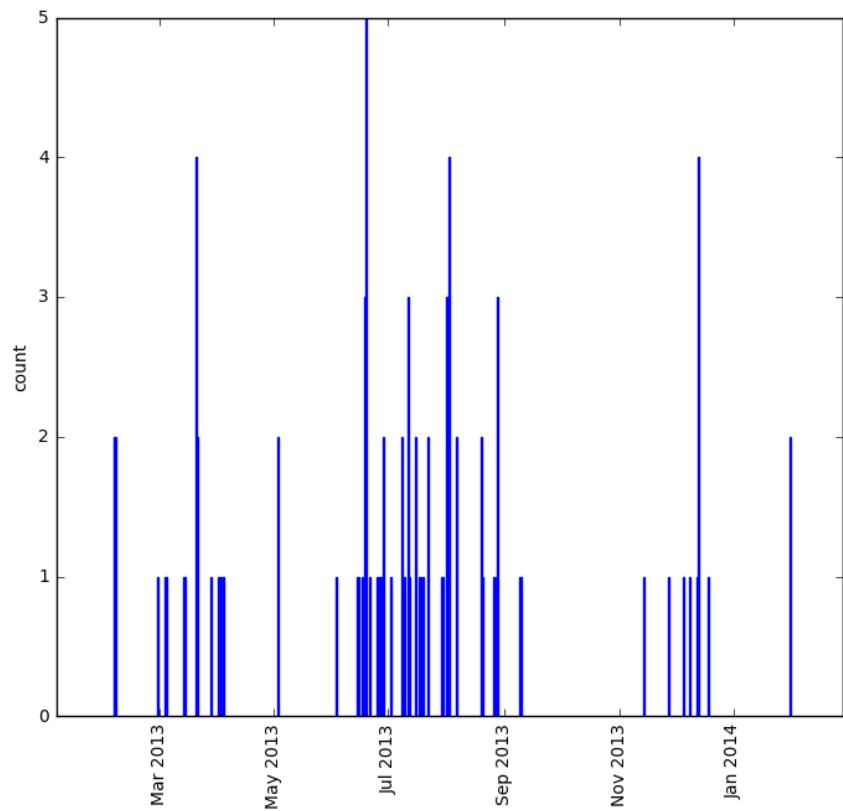


Figure B1c. A Sample Activity Plot for a *Closed Group* That Was *Included* in the Study

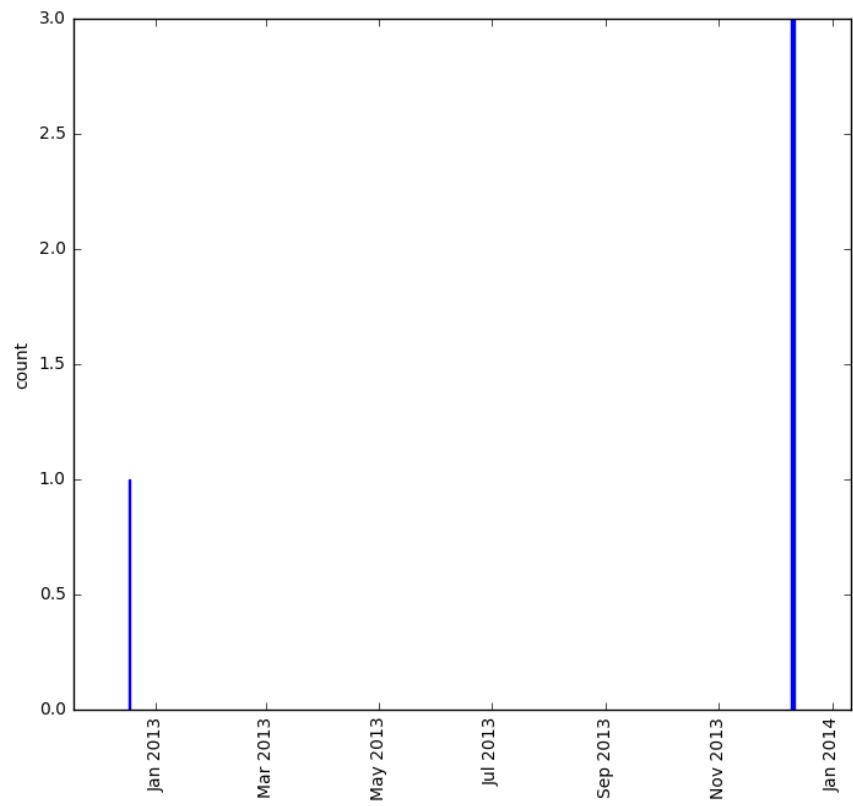


Figure B1d. A Sample Activity Plot for a *Closed Group* That Was *Excluded* from the Study

## Appendix C: ESM Group Descriptives

This table includes a subset (16 out of 215) of groups along with their descriptions extracted from the ESM and important descriptive statistics. Note that all names have been replaced with pseudonyms. Please contact the corresponding author for the complete table for all 215 groups, which cannot be published due to confidential information about the case company, its employees, and its clients.

Group ID	Creation date	Group privacy	Activity start	Activity End	Group name	Group description	Group size
1062	2/6/12	Trans-parent	8/17/12	8/17/13	Futures Group	A place for us to connect about topics, resources, ideas and related foolishness surrounding the topic of the future of work, workers and workplace.	26
1079	2/8/12	Private	5/1/13	5/1/14	Global Strategy, Research and New Business Innovation	Our organization's place to explore ideas, ask questions, share news, and stay connected	53
1164	2/28/12	Trans-parent	2/12/13	2/12/14	Innovation Management Office	The Innovation Management Office (IMO) identifies the highest impact IT challenges and opportunities, then provides the structured research, design and prototyping support needed to resolve them.	84
1424	5/8/12	Trans-parent	4/17/13	4/17/14	Material Innovation Exploration (MIE)	GlobalOffice was born from a user insight that was answered using material innovation. Over our history, materials and their processing have always been a key ingredient of our success. Many of those material innovations came from someone, somewhere, asking "what if?" This OPEN group provides a forum to ask that same question today and share ideas about material innovation through a broad network of users and enthusiasts.	53
1875	10/31/12	Private	1/30/13	1/30/14	Project Moneyball "Think" Group	The Strategic Projects Team exists to help win the company's most important projects, with the right resources at the right time. One key initiative for our team is creating a system of tracking what strategies, tactics, Plays, Applications, or products (i.e., the cards we play to win) help us win more frequently in the field. We're calling the idea Project Moneyball, a system of measuring and repeating success. So, we're trying to quantify and socialize this. But we need your help, as you've each got great skills and experiences in tracking success. Check out the "Project Moneyball Manifesto" here & chip in with ideas in the conversation thread. Soon, I'll post 2 additional docs. Then, we'll see what we "know" and "wonder"—and refine the Central Question we'd drafted last year. Thanks! Brian	65
1938	11/29/12	Trans-parent	10/1/13	10/1/14	New York Showroom	GlobalOffice Worklife Center, 4 Columbus Circle 7th fl, New York, NY 10019. The purpose of this group is to increase awareness within GlobalOffice about the NY/NJ news, events, and resources. This will hopefully generate new ideas in our region and in others globally.	44
2029	1/11/13	Private	6/6/13	6/6/14	SPT Applications - WorkCafe Content	A place to share content and ideas on the WorkCafe for the purposes of educating GlobalOffice sales, dealer design and clients.	29

2031	1/14/13	Private	9/24/13	9/24/14	Insight Inspired Designs, SAL603: Facilitator Materials	Insight Inspired Designs, SAL603 A place to store facilitator content and materials for delivering SAL603.	23
2086	2/7/13	Private	8/1/13	8/1/14	Smart Space Concepts	Group space for sharing ideas and links that support the Smart Space Concepts.	5
2187	3/25/13	Trans-parent	4/11/13	4/11/14	GlobalOffice Worktools (formerly: Details-Brand)	A place for Details employees to keep in touch and post updates relating to product / project and general brand news. i.e. Quality issues, Design changes, Product culling, Marketing changes, Sales news, Employee changes etc.	21
2438	7/17/13	Trans-parent	10/20/14	10/20/15	South Central Region	This a place for our region to share news, ideas, best practices, etc. It is specifically related to our market.	42
2450	7/26/13	Private	6/11/14	6/11/15	YP Core Team	Pillar leads can discuss ideas here and house any information that isn't meant for the larger YP population, including meeting notes, survey results, etc.	15
2590	10/17/13	Private	4/1/14	4/1/15	THINK Tank	A meeting place for THINK tools, project examples, and design thinking inspiration.	18
2678	12/3/13	Trans-parent	12/18/14	12/18/15	3D Printing	This is a group for anyone involved in 3D printing to discuss and share their ideas and learnings.	22
2697	12/13/13	Trans-parent	1/11/14	1/11/15	Circular Economy	Due to the level of interest going around the company, I've created this group to bring together like minded individuals to share ideas/thought starters around the principals of the Circular Economy.	15
2744	1/22/14	Private	2/14/14	2/14/15	TrendShark	The TrendShark page is a place for our team to share ideas and content with each other prior to releasing a POV to a broader audience on the AM+A Trends page.	11

## Appendix D: Coding Manual for Manual Coding of Training Data for the Dependent Variables (Reframing-Focused and Expansion-Focused Creative Dialogues)

### Combination (1= yes; 0 = no):

Posts focusing on developing a new concept by combining two or more existing concepts.

Conceptual combination occurs primarily because novel combinations create new categories to describe or bring about changes in something familiar or existing (e.g., “Zionist Christians,” “affordable luxury,” “natural selection”). This may involve combining elements of two existing products and thereby creating a new one (e.g., merging the base of an existing desk with the counter of a meeting table to produce a meeting room table that can also be used as office space).

**Real example post:** *“I have a couple thoughts rolling around for you to bash or build on for our “new” manager program: Aspiring leaders; Next Gen Leader; Emerging leaders”*

### Expansion (1= yes; 0 = no):

Posts focusing on extending the use of a concept beyond its core use to match a new situation. This may involve taking concepts developed for one context (healthcare) and adapt it to another context (education).

Concepts like empowerment were further extended to refer not only to strictly TQM- related issues but also to broader issues of organizational culture.

**Real example post:** *“There has been some consideration for how techniques from online gaming could be applied to our new integration of social media technology to boost engagement”?*

**Note:** Expansion-focused creative dialogues include both combination and expansion as both forms of creative dialogues produce something novel from existing concepts through combining them in new ways or expanding their use to new contexts or situations.

### Reframing (1= yes; 0 = no):

Reframing means reclassifying an object so that a new view of it emerges.

Reframing can be nonmetaphoric or metaphoric.

Reframing usually involves arguing for the need to rethink the problem so a new view emerges or challenging the concept altogether by envisioning an alternate future state or otherwise alternative.

**Real example post:** *“One of the things I started to think about after reading all of your thoughts was how augmented reality glasses might impact the social dimension of work positively or negatively. I couldn’t help but think of WALL-E and the people that spent all day interacting with one another through screens and never directly. I found that a profoundly disturbing vision of the future, especially for a children’s movie! One alternative to the WALL-E scenario would be the future state in which augmented reality glasses are used for specific tasks or activities that require a high degree of information process but relatively little social interaction...and thus far, most of the applications of augmented reality that I’m familiar with follow this pattern (flying a fighter jet, driving a car). A different future state might be one in which the information displayed via the glasses is designed to augment social interactions, and if that augmentation were done skillfully, the enhancements to interaction might be beneficial enough as to outweigh any perceived negative impact on the texture of the human interaction.”*

## Appendix E: Zero-inflated Poisson Models for the Combined Sample

Combined sample (N = 215)			
DV: Expansion	$\beta$	SE	Significance
<i>Poisson model</i>			
Intercept	-7.74	1.68	< 0.001 ***
Bridging	2.44	1.91	0.20
Group type (transparent)	-13.64	5.86	0.02 *
Functional diversity	-0.22	0.13	0.08
Group size	0.00	0.01	0.53
Group type $\times$ Bridging	17.75	6.72	< 0.001 ***
<i>Zero-inflated model</i>			
Intercept	1.18	0.54	0.03 *
Group size	-0.13	0.06	0.02 *
Group type (transparent)	-1.23	0.84	0.15
DV: Reframing	$\beta$	SE	Significance
<i>Poisson model</i>			
Intercept	-2.34	0.19	< 0.001 ***
Bonding	2.10	0.31	< 0.001 ***
Group type (transparent)	0.15	0.47	0.75
Equal engagement	-4.23	0.92	< 0.001 ***
Group size	0.02	0.00	< 0.001 ***
Group type $\times$ Bonding	-1.62	1.98	0.41
<i>Zero-inflated model</i>			
Intercept	0.87	1.40	0.54
Group size	-0.09	0.15	0.54
Group type (transparent)	0.17	1.48	0.91

## Appendix F: Baseline Models

Transparent groups (N = 109)			
DV: Expansion	$\beta$	SE	Significance
<i>Poisson model</i>			
Intercept	-0.61	0.37	0.1
Functional diversity	-0.42	0.15	< 0.001 ***
Group size	-0.03	0.01	< 0.001 ***
<i>Zero-inflated model</i>			
Intercept	1.32	0.51	0.01 **
Group size	-0.11	0.05	0.02 *
DV: Reframing	$\beta$	SE	Significance
<i>Poisson model</i>			
Intercept	-2.09	0.20	< 0.001 ***
Equal engagement	-1.42	1.00	0.15
Group size	-0.01	0.01	0.10
<i>Zero-inflated model</i>			
Intercept	1.61	0.73	0.03 *
Group size	-0.19	0.08	0.03 *

Private groups (N = 106)			
DV: Expansion	$\beta$	SE	Significance
<i>Poisson model</i>			
Intercept	-2.21	0.29	< 0.001 ***
Functional diversity	-0.25	0.13	0.06
Group size	-0.01	0.01	0.38
<i>Zero-inflated model</i>			
Intercept	0.08	0.61	0.90
Group size	-0.12	0.09	0.17
DV: reframing	$B$	SE	Significance
<i>Poisson model</i>			
Intercept	-1.60	0.13	< 0.001 ***
Equal engagement	-2.91	0.77	< 0.001 ***
Group size	0.01	0.00	0.01 **
<i>Zero-inflated model</i>			
Intercept	1.04	0.50	0.04 *
Group size	-0.18	0.08	0.02 *

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