

# THE EFFECTS OF GROUP VISIBILITY ON SOCIAL CAPITAL FORMATION IN ENTERPRISE SOCIAL MEDIA

*Research paper*

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## Abstract

*ESM have created new opportunities for groups of individuals to create networks of connections, including previously unknown others inside the same organization. The formation of social capital in the context of ESM is inherently affected by the visibility affordance of these tools, resulting in either visible or invisible groups. As such, ESM offered a unique opportunity to assess the effects of visibility on group processes, specifically in the context of social capital formation. Given that past research has had a strong positivity bias with respect to the role of visibility on organizational processes, we developed and validated a framework that incorporated both visibility and invisibility and suggested that social capital formation can emerge within both visible and invisible groups, yet, that the exact form of social capital—i.e., bonding or bridging—are shaped by the visibility settings of the group and the level of discussions ongoing in the group. Therefore, as researchers of ESM technologies, we must be cautious in generalizing about the unequivocal effects of visibility and instead must be sensitive to the idiosyncrasies of visible versus invisible groups and their emergent network structures. Implications for theory and practice are discussed.*

*Keywords: Enterprise Social Media, Group Visibility, Social Capital Formation*

# 1 Introduction

Social capital theory has been one of the most widely applied theory in the study of social media (Ellison et al. 2007). Similarly, in the context of Enterprise Social Media (ESM), it has been suggested that the use of ESM tools in organizational settings have important implications for social capital formation processes (DiMicco et al. 2009; DiMicco et al. 2008; Leonardi et al. 2013; Steinfield et al. 2009; Van Osch 2015), yet, the link between ESM use and social capital formation has received limited attention and solely through the use of small-scale, qualitative studies (DiMicco et al. 2009; DiMicco et al. 2008; Van Osch 2015). Recent papers have suggested that social media adoption in organizations outpace the empirical understanding of their actual use as well as our theorizing about their implications for core organizational processes, such as social capital formation (Aral et al. 2013; Gibbs et al. 2013; Leonardi et al. 2013; Raeth et al. 2009; Treem and Leonardi 2013).

Within the embryonic literature exploring the positive impacts of the use of ESM in organizations, the primary focus has been on the value potential of the visibility affordance of these tools. This affordance refers to the visibility of the communicative actions of others—including the content of one's messages to others, the user's communication network, and the outcomes of the communication—all of which were largely invisible before the advent of ESM (Leonardi et al. 2013; Treem and Leonardi 2013). Visibility is therefore tied to the amount of effort people must invest to locate and retrieve information (Treem and Leonardi 2013). This visibility affordance has been highlighted as the single most distinctive trait of ESM—setting it apart from other forms of computer-mediated workplace communication—and the one with the greatest potential for improving workplace learning, knowledge sharing and collaboration (Leonardi et al. 2013), creating a highly positive view regarding the openness that comes with the use of such systems.

Furthermore, the literature has also failed to assess whether groups varying in visibility develop different interaction patterns. It is this last topic which we aim to address through the lens of social capital theory, a structural view of interactions (Nahapiet and Ghoshal 1998). We built on social capital theory to explain how ESM may foster the formation of social capital (Leonardi et al. 2013) and extend extant theorizing to examine the possibility that visibility and invisibility result in the emerge of distinct forms of social capital in groups. Thus, our research questions ask:

- *What is the effect of the visibility affordance of ESM on the social capital formation processes of ESM groups; that is, do different group visibility settings result in distinct forms of social capital?*
- *What is the role of group discussions on the relationship between the visibility affordance of ESM and the social capital formation processes; that is, do higher levels of group discussions accentuate the effect of group visibility on group social capital formation?*

In order to answer these research questions, we collected data from a large multinational product development corporation—WorkPlace Furnitures (a pseudonym, as are all names in this article)—that uses an ESM—called DiaLog for supporting employee communication and collaboration.

Using the integration of social capital and affordance theory, we develop a set of hypotheses for examining the effect of visibility on social capital formation. We test, and find support, for our hypotheses on 656 ESM groups, equally split between visible and invisible groups, within WorkPlace Furnitures. By addressing these questions, we are able to contribute to the literature on ESM and social capital formation through highlighting the idiosyncracies of social capital formation in visible and invisible groups respectively.

In the next section, we discuss the theoretical underpinnings of this study and propose a research model regarding the relations between group visibility and social capital formation. We then discuss the case company in more detail as well as our methodological approach to data collection and analysis. Subsequently, we present the findings from our study and discuss implications for theory, practice, and future research.

## 2 Theoretical Background

We first offer a conceptualization of group social capital and present two different forms of group social capital, namely bonding and bridging. We then discuss the visibility affordance of ESM and hypothesize its dual role in group social capital formation, followed by a discussion of the moderating effect of the level of group discussions on the relationship between group (in)visibility and group social capital.

### 2.1 Group Social Capital: Bonding and Bridging

A widespread framework for understanding interactions and the resources that reside within them is social capital theory (Bourdieu 1986; Burt 2004; Coleman 1988). Of particular relevance to the explanation of group behavior is the construct of group social capital (Oh et al. 2004; Oh et al. 2006).

Group social capital refers to the ability of groups to access and absorb diverse information and innovative resources (Portes and Sensenbrenner 1993) stemming from the configuration of social relationships of the group, members, and the larger organization. We proceed with a theoretical focus on this more refined concept of group social capital.

One of the recurring findings from social capital research is that social capital has a multi-dimensional nature, combining the structural, cognitive, and relational components of social interaction ties, shared vision and trust, respectively (Tsai and Ghoshal 1998). Previous studies have shown the positive role of this multi-dimensional nature of social capital, including group members having both within- and between-group relationships to draw from for knowledge creation (Avital and Te'eni 2009; Nahapiet and Ghoshal 1998; Tsai and Ghoshal 1998).

This positive role of group social capital has been extended to suggest two different profiles of social capital—each of which have a positive but different effect on knowledge creation; the two are bonding and bridging (Adler and Kwon 2002; Ellison et al. 2007; Putnam 2000).

Bonding in a group refers to the extent to which the group attains full connectedness or maximum network density such that each group member bidirectionally interacts with each other member in the group (Adler and Kwon 2002; Kim, Jarvenpaa and Gu, 2018; Putnam 2000). Bonding social capital emphasizes the internal structure of a group—i.e., the linkages among individuals within the group and specifically those features that give the group cohesion (Adler and Kwon 2002). The dense network of the group has been examined as indicative of strong and informal social ties (Zhang and Venkatesh 2013), greater solidarity, trust, and reciprocity norms, and diminished display of opportunistic behaviors (Granovetter 1985; Inglehart 1997; Krackhardt 1999). Cognitive benefits accruing to bonded group members include shared understandings, the pursuit of collective goals, as well as the facilitation of coordination and cooperation for mutual benefit (Adler and Kwon 2002; Putnam 1995; Seers 1989; Tsai and Ghoshal 1998; Uzzi 1997). Beyond these cognitive benefits, informal socializing ties also bring expressive benefits (Oh et al. 2004), sometimes referred to as relational benefits (Tsai and Ghoshal 1998).

A complementary group social capital form is bridging. In contrast to bonding, bridging emphasizes the importance of ties connecting group members to heterogeneous people, primarily outside of the group (Adler and Kwon 2002; Kim, Jarvenpaa and Gu, 2018). Bridging social capital thus centers on the external structure of relationships of a group—i.e., the linkages to others outside the group—as conduits to critical resources (Burt 2002) and thus focuses on the benefits associated with occupying a bridging or brokerage position. Because of the diversity of the external parties, cognitive benefits stemming from these weak ties (Granovetter 1973) include access to diverse and original information, perspectives, and knowledge (Hansen 1999).

In what follows, we explore the link between ESM visibility and group social capital formation.

### 2.2 ESM Visibility and Group Social Capital Formation

In the context of ESM, visibility has been proposed as the most foundational affordance of this new class of enterprise technologies (Treem and Leonardi 2013; Van Osch and Steinfield, 2018). Visibility



refers to the relative ease with which an ESM user can locate relevant information and individuals within the organization. ESM make regular exchanges between employees visible to those not directly involved in the interaction (Hampton et al. 2011) which not only provides visibility of the content of interactions between others but also visibility into the communication partners with whom coworkers interact (Kietzmann et al. 2011). This so-called “hypervisibility” enabled by ESM (Leonardi 2014) makes it easy for anyone to see what any other person said and to whom (Keen 2012).

At the group-level, a common feature in most ESM is the ability to select a visibility setting when creating a place to host team posts (e.g. blogs or discussions). This is a critical, but largely overlooked feature in the ESM literature, in that the same visibility affordance may encourage both visibility and invisibility. That is, when users establish groups in ESM, they are prompted to select the visibility level of their group, which could be either to open up the group to the entire enterprise or to limit the visibility to a select number of members (i.e. to only those invited to join the ESM group).

The visibility of an ESM group is likely to affect which of the two social capital profiles emerges in the group. An invisible group is one in which conversations between the members will not be seen by non-group members. Because the group is invisible, those outside the group are unaware of the group’s existence, purpose, stage of development, and members. Non-group members may still receive an invitation to join from existing group members, but the serendipitous identification of the group as well as the disruption of the evolving relationship-building in the group is highly unlikely. Furthermore, because the group is invisible, members have a reasonable expectation that their conversations are held privately among the members only. As a result, group members may be less reticent about sharing content which may lead to peppering their professional conversations with personal information, greater direct reciprocity in sharing knowledge, and the development of interpersonal relationships (Leonardi et al. 2013; van Osch et al. 2015). By having relatively more stable relationships and uninterrupted interactions within the group, group members begin to identify similarities (Koestler 1964) and build on them to evolve a strong social connectedness (Edmondson 2002) as well as trust and mutual respect (Harvey 2014). Such a context of invisibility may be more likely to lead to a bonded group social capital profile than a bridging social capital profile. Therefore, we propose:

*Hypothesis 1a: Invisible groups, when compared to visible groups, will display greater bonding social capital.*

Inversely, a visible group is one in which conversations between the members can be seen by any user of the ESM. Because the group is visible, those outside the group are not only aware of the group’s existence, purpose, and members, but can also participate in the group’s interactions without necessarily becoming a member of the group and do not require a request or invitation to join the group. By opening the content of a group to non-members and allowing non-members to freely participate or join the group, visible groups allow for greater serendipity and a likelihood of non-members interacting with members of the group, thereby resulting in the fostering of more external yet weaker ties. Although the majority of theorizing about the impact of visibility on social capital formation has been focused on the individual user, general consensus exists that the communication leaks that happen as a result of visibility make it easier for employees to establish new social connections with previously unknown others in the organization (Brzozowski 2009) as well as maintain and leverage those relationships over time (Fulk and Yuan 2013). These same advantages are likely to extend to ESM groups given the fact that non-members have access to the content of visible groups and thus are afforded the opportunity to establish knowledge and common ground as a basis for future interactions (Leonardi et al. 2013). Thus, we propose:

*Hypothesis 1b: Visible groups, compared to invisible groups, will display greater bridging social capital.*

### **2.3 The Amount of Group Discussions as Moderator of the Relationship between Visibility and Group Social Capital Formation**

While the visibility of a group is a critical antecedent of group social capital formation, the level of group discussions that take place within a visible versus invisible group may also serve to accentuate

the relationship between group (in)visibility and group social capital formation. Given that the relationship between visibility and group social capital was the focus of the first set of hypotheses; the role of the level of group discussions—i.e., the extent to which a group is active—is the focus here.

When groups are invisible, the likelihood of the development of strong bonding relationships has been attributed to the extent to which the group—due to the lack of interruptions from outside the group—is able to develop strong social connectedness (Edmondson 2002) as well as trust and mutual respect (Harvey 2014). However, for such strong social connectedness, norms, trust, and mutual respect to develop, the members of the group need to engage with one another interactively in order for shared understandings to develop (Bartunek 1984; Benson 1977).

The level of discussion that takes place in a group can thus accentuate the effect of invisibility on bonding social capital. By engaging intensely with the other members of the group, diverse individuals in the group can engage in a process of perspective taking (Boland Jr et al. 1994; Dougherty 1992; Fleck 2012) that allows them to recognize the positions of another group member and develop shared understandings. For a group to merely remain invisible to the rest of the organization without engaging in extensive discussions among the members would merely serve to isolate the group from the organization rather than to create a dense network of strong and informal social ties (Zhang and Venkatesh 2013). Therefore, we propose that:

*Hypothesis 2a: The level of discussions a group engages in will moderate the relationship between a group's invisibility and the formation of group bonding social capital such that as the level of discussions increases the relationship between group invisibility and the formation of group bonding social capital also increases.*

When groups are visible, the likelihood of the development of strong bridging relationships has been attributed to the opening up of the content of the group to non-members and allowing non-members to freely participate and join the group. However, for non-members to engage with the group, there needs to be a certain level of discussion ongoing in the group to make it worthwhile their effort and time to contribute (Wasko and Faraj 2005), e.g., answering a question asked by a member of the visible group.

The level of discussion in a group can thus accentuate the effect of visibility on bridging social capital. In order for non-members to contribute to a visible group, they must think that their contributions will generate value for themselves in addition to being worth their effort. Since high levels of discussions by members of the group are a sign of prior relationships (Krackhardt et al. 2003), this will increase the extent to which contributing is worth their effort (Wasko and Faraj 2005). Furthermore, non-members are more likely to contribute when they anticipate reciprocity (Constant et al. 1996) and social rewards, such as approval, status, respect, and reputation (Blau 1964). High levels of discussions in the group will not only increase the expectation of reciprocity—as high levels of past activity are a better predictor of high levels of future activity—but also the anticipation that the group content—and thus the non-member's contribution—will receive higher organization-wide visibility. Therefore, we propose that:

*Hypothesis 2b: The level of discussions a group engages in will moderate the relationship between a group's visibility and the formation of group bridging social capital such that as the level of discussions increases the relationship between group visibility and the formation of group bridging social capital also increases.*

## 2.4 Research Model

Our research model (see Figure 1) summarizes our arguments about the relationship between the two-sided use of the visibility affordance of ESM by organizational groups and the two forms of social capital—bonding and bridging—that are formed by these groups.



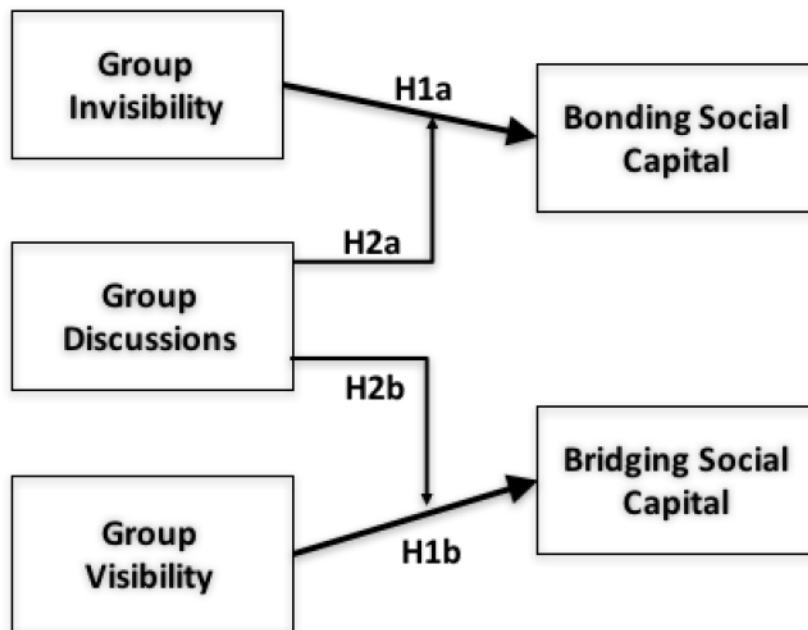


Figure 1. Proposed Research Model

In what follows, we will discuss details about the corporate setting in which we collected data to answer our research question and test the hypotheses presented above and summarized in the proposed research model.

### 3 Research Setting and Approach

In order to address a central research question of what the effect is of the visibility affordance of ESM on the social capital formation processes of ESM groups, we collected data from an ESM of a multinational corporation—WorkPlace Furnitures (a pseudonym, as are all names in this article)—that provides technology products, furnishings, as well as research and consulting services to corporate offices worldwide under various brands. The company is headquartered in the US and has over 11,000 employees around the globe, who are located in over 80 locations across 40 countries in the Americas, Europe, Asia, Africa, Australia, and the Middle East.

The company's ESM—DiaLog—is built on the Jive platform<sup>1</sup>; one of the largest providers of corporate social technologies with an extensive customer base, including Nike, Hewlett-Packard, T-Mobile, Price Waterhouse Coopers, and the World Bank. The key motivation for the implementation of the system was offering an umbrella tool that supports employees' communication and collaboration activities as well as their business connections by providing built-in functionalities that are typical to most social media. Following its global launch, adoption and use of DiaLog grew quickly. At the time of the data collection, there had been a stable base of users for five years, totaling over 10,000 of the 11,000 employees. From the 10,000 unique users in DiaLog, 91% (i.e., over 9,000 unique users) are members of groups and thus participate in group discussions and activities in DiaLog.

#### 3.1 Data Collection, Sample and Analysis

To test our hypotheses, we obtained 5-year of log data of all interactions produced by all groups. There were initially 711 groups in the dataset; i.e., these were 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 which were either all-department or all-division groups, serving more as bulletin boards of events

<sup>1</sup> Developed by [jivesoftware.com](http://jivesoftware.com)

and general questions and answers; or non-active groups. From the 656 groups retained for analysis, 301 groups were visible and 355 groups were invisible.

Variable	Variable Type	Definition	Descriptive Measures
DV1: Group's Bridging Social Capital Profile	Continuous	Sum of each individual's centrality within his or her own social network. For each member, a betweenness centrality metric was computed as the # of individuals from other groups the person interacted with. This was averaged across all individuals in the group.	Ave: 0.497 Std. dev: 0.431 Min: 0 Max: 2.058
DV2: Group's Bonding Social Capital Profile	Continuous	Sum of each individual's interactions with other group members outside of group work determined by number of ESM-recorded interactions with other group members conducted by chat or blogs outside of the ESM group discussion thread.	Ave: 0.318 Std. dev: 0.29 Min: 0 Max: 1
IV1: Group Visibility	Dichotomous	Whether the group content is visible or invisible to non-members (0=visible 1=invisible) as set at the beginning of the 5-year period.	Visible Count: 301 Invisible Count: 355
IV2: Group Discussions	Continuous	The amount of discussion threads the group has created.	Ave: 18.30 Std. Dev: 81 Min: 1 Max: 1261

Table 1. Variables of Interest to Specify the Research Model

**Group Visibility.** Visibility is operationalized as a dichotomous variable reflecting the existing visibility settings of the group. We validated using the system log data that group visibility settings are determined upon the creation of the group space and are not altered afterwards confirming that group visibility precedes both the process characteristics as well as content of the group interactions.

**Group Discussions.** Group discussions is a continuous variable that is operationalized as the number of discussion threads the group has created using the system log data.

**Group Bridging Social Capital Profile.** Bridging interactions are operationalized as a continuous variable using the network measure of the average of the external betweenness centrality scores of all individual members of the group. An individual member's betweenness score was computed based on his or her active connections (i.e., connections that have involved at least one information exchange in the five-year period) to non-member individuals associated with other organizational groups. Greater betweenness scores at the group level indicate groups where members have greater bridging connections to organizational members residing outside the group.

**Group Bonding Social Capital Profile.** Bonding interactions are operationalized as the sum of each individual's interactions with other group members. We limited these interactions to those that occurred outside of group work to ensure that we were measuring social density, rather than work density, and to ensure that we were not conflating our dependent variable—the amount of generativity in interactions—within this variable. This measure was computed as the number of ESM-recorded interactions with other group members conducted by chat or blogs outside of the ESM group discussion thread. The fact that we have not included emailed, face-to-face, or telephone-based communications in this measure is mentioned in the Limitations Section.

In order to test our hypotheses regarding the relation between group visibility and social capital formation as well as the moderating role of group discussions, we ran univariate regressions in the LME4 statistical package in R.

## 4 Findings

In what follows, we discuss the findings of our hypotheses testing with respect to the main effects of group visibility on social capital formation as well as the moderating role of group discussions in this relationship.

### 4.1 The Relation between Group Visibility and Social Capital Formation

For the test of H1a—invisible groups display greater bonding social capital compared to visible groups—we ran a one-way analysis of variance. Our results, as shown in Table 2 indicate support for the hypothesis ( $F = 47.17$ ;  $p = 0.000$ ).

The test of H1b—visible groups display greater bridging social capital compared to invisible groups—was similarly tested with a one-way analysis of variance. Our results, as shown in Table 2, indicate support for the hypothesis ( $F = 63.64$ ;  $p = 0.000$ ).

	Mean (Visible/ Invisible)	Std. Dev. (Visible/ Invisible)	F	df	Sig.
Bonding Interactions	.236 .387	.201 .334	47.171	1	.000
Bridging Interactions	.637 .379	.413 .412	63.640	1	.000

Table 2. Results of ANOVAs for H1a and H1b

### 4.2 Moderation of Group Discussions on the Relationship between Group Visibility and Group Social Capital

For the test of H2a—invisible groups display greater bonding social capital when displaying high amounts of group discussions—we ran a univariate regression. Our results, as shown in Table 3 indicate support for the hypothesis ( $F = 6.75$ ;  $p = 0.010$ ).

The test of H2b—visible groups display greater bridging social capital when displaying high amounts of group discussions—was similarly tested with a univariate regression. Our results, as shown in Table 3, indicate support for the hypothesis ( $F = 4.29$ ;  $p = 0.039$ ).

Interaction plots for both sets of interaction effects are shown in Figure 2 below.

	Mean (Visible/ Invisible)	Std. Dev. (Visible/ Invisible)	F	df	Sig.
Bonding Interactions	.236 .387	.201 .334	6.754	1	.010
Bridging Interactions	.637 .379	.413 .412	4.285	1	.039

Table 3. Results of Univariate Regression for H2a and H2b



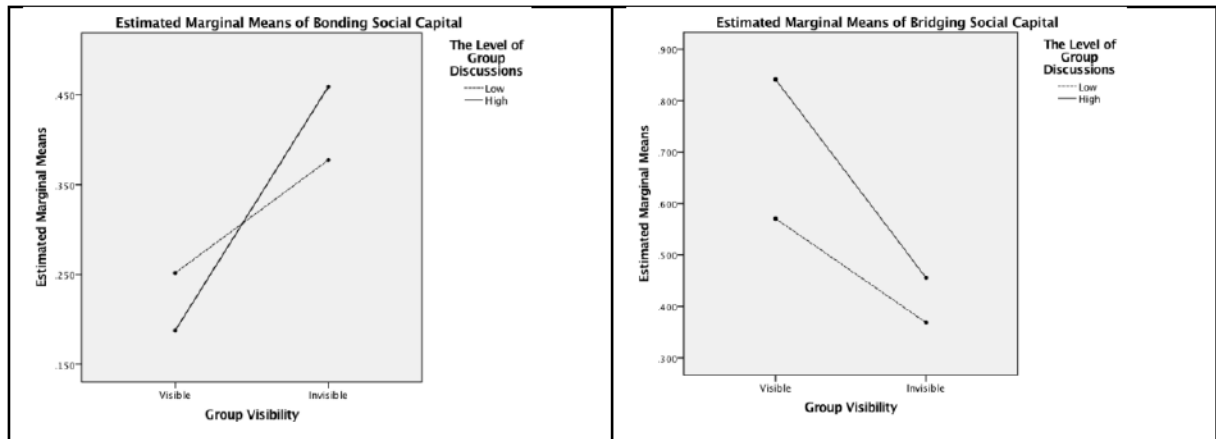


Figure 2. Interaction Plots for Bonding Interactions (Left) and Bridging Interactions (Right)

### 4.3 Summary of Findings and Validated Research Model

In summary, our findings indicate that visible groups display greater bridging social capital; whereas invisible groups form greater bonding social capital. Furthermore, the effect of group (in)visibility on social capital formation is accentuated by high levels of group discussions. Our findings are also summarized in Figure 3 below.

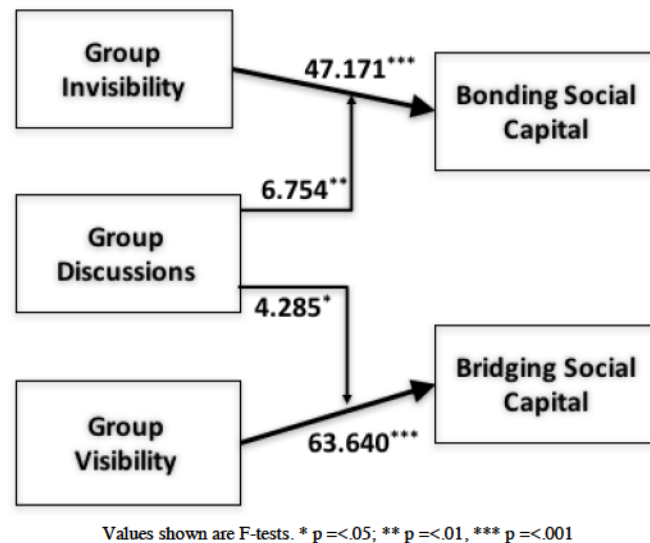


Figure 3. Validated Research Model

In the next section, we discuss the implications of these findings for theory, practice, and future research.

## 5 Discussion

The proliferation of ESM technologies, their anticipated benefits for social capital formation, as well as the equivocality regarding the effects of visibility in the workplace provided the impetus for this empirical investigation. The following discusses a set of limitations as well as theoretical and managerial implications associated with our findings.

## 5.1 Limitations

Although this study is the first to validate that the visibility affordance of ESM affects group social capital profiles, there are several important limitations associated with this study. We did not differentiate ESM groups based on task type to explore if task type influences the nature of social capital formation. For instance, groups focusing on complex problem-solving may benefit from strong bonding ties whereas a group engaged in preliminary brainstorming may benefit from broad bridging ties. We also do not know why groups selected the assigned visibility setting for their groups; it could have been done strategically, by default, or without obvious thought.

Our network analyses are based exclusively on ESM interactions rather than all the interactions individuals may have during the course of their work, thus the social capital forms distinguished reflect only the ESM network, not the sets of relationships the groups maintain through other modes of (mediated) communications.

Finally, the use of univariate methods of analysis have clear drawbacks. For instance, univariate analysis is mostly used for description purposes rather than in an explanatory way. We tried to remedy this by using group discussions as a possibly explanatory mechanism for the relationship between group visibility and social capital formation. Furthermore, univariate models are less comprehensive; specifically in this study we look at the effects of visibility—which is only a single ESM affordance—on group social capital formation. Future studies should explore multivariate models that look at the complex relationships between multiple affordances in addition to multiple forms of social capital.

## 5.2 Theoretical Contributions

We offer two main contributions to the literature on the impact of ESM on workplace interactions: a) explaining how ESM can affect processes of social capital formation and the importance of the role of visibility and group discussions; and b) providing a more nuanced understanding of the role of the visibility affordance of ESM in the context of social capital formation processes.

Theoretically, this study contributes to a deeper understanding of how ESMs might transform workplace interactions by measuring the nature of social capital formation in ESM. Although the ESM literature had argued that the use of ESM facilitates social capital formation (DiMicco et al. 2009; DiMicco et al. 2008; Leonardi et al. 2013), this study is the first to examine the link between ESM use and two distinct forms of social capital—bonding and bridging—at the group level, using an unobtrusive, quantitative dataset of 656 groups.

We then provide a more nuanced understanding that the use of ESM can have positive effects on both the formation of bonding and bridging ties, specifically by examining the relationship between group visibility and social capital formation. Our findings help move beyond the one-sided focus on visibility that has characterized the literature on ESM visibility (Gibbs et al. 2013) and further assesses the nature of invisible groups in terms of social capital formation.

Our theory, then, provides an extension to the existing ESM literature by examining the nature of the interactions themselves and the contexts in which those interactions are located. When examined in light of social capital networks, groups become conceptualized not in terms of the nodes but in terms of the relationships between the nodes. In this manner, effects of ESM are then viewed not as technology objects deterministically affecting a workplace interaction, but rather as a new context in which new and existing relationships are developed, strengthened or changed.

By showing that the interaction profile—bridging—that emerges in visible groups is substantially different from the profile that emerges in invisible groups—bonding—this study contributes to the growing body of literature on emergent structures (Bateman et al. 2011; Boland Jr et al. 1994; Carlile 2002; Dougherty 1992; Faraj et al. 2011; Schrage 1995; Tsoukas 2009). In this context, we contribute the importance of understanding technology affordances, such as the visibility affordance from ESM. Indeed, our findings reveal how the same ESM affordance may result in both greater group visibility bridging social capital as well as greater group invisibility and bonding social capital. This dual effect of the visibility affordance of ESM depending on the emergence of distinct social capital

configurations—bridging versus bonding—underscores the need to look at configurations of social structures and technology affordances, rather than either one alone.

### 5.3 Future Research Directions

The following outlines several directions for future research that emerge from our findings. First, our theorizing suggests that there is a causal order between ESM implementation and social capital formation. Although our dataset did not include groups that displayed both high levels of bonding and bridging social capital, the literature on ESM and social media, more broadly, has suggested that given the decreased effort of forming and maintaining relationships, groups can simultaneously sustain bridging and bonding ties (Ellison et al. 2007). Therefore, future research should explore if within other platforms or organizations, groups exist that maintain both profiles of social capital simultaneously and if this results in even greater amounts of generative conversations. Similarly, it would be interesting to examine if groups exist that have very low levels of both bonding and bridging to observe if this negatively impacts their generative conversations.

Relatedly, our research has suggested that social capital formation follows from the level of visibility selected by a group, given that this is determined upon the creation of the group and the network of relationships in ESM follows only a posteriori. Yet, there is likely to be a much more complex relationship among these variables, one that may play out dynamically over time. One possible unfolding could be that groups intending to have a dense network characterized by strong bonding ties choose to be invisible. They may start out as a dense network in a mode similar to an old boy network at a private club, letting only those people in the club who are already densely connected with at least a few of the existing members. As such, then, ESM are doing no more than allowing employees to reify and strengthen a pre-existing set of relationships. The implications of such a causal flow are significant since it would suggest, theoretically, that the use of the visibility affordance is strategic and indicative of already existing interaction patterns inside the organization.

Moreover, in this study we treated group visibility as binary by comparing fully visible to fully invisible groups. Future research could explore the effects of intermediate levels. Additional research opportunities stem from the possibility for existing organizational teams to create multiple virtual representations in the context of ESM, hence, resulting in the existence of simultaneous visible and invisible online group presences and therefore both bonding and bridging networks that could be leveraged for different purposes. These are all exciting empirical questions for future research that will require longitudinal analyses of group visibility settings and their evolution over time.

Additionally, our theorizing has emphasized the opportunity for employees to set the visibility of a group as an “affordance” (Ancona 1990; Burt 2002). Such language suggests then that the ESM affordances suggested by Leonardi as persistence, reviewability, and revisability are much more complex. Our theorizing suggests that employees may choose against these affordances (e.g., visibility) or potentially they could choose some of these affordances for different subsets of their peer groups (i.e., maintain visible and invisible groups simultaneously). Thus, research on ESM should be clearer about affordances “for what”. If group leaders are establishing a group to be invisible, their choice of invisibility is made pursuant to a different work objective than a group leader establishing a group to be visible. For instance, Gibbs et al. (2013) have suggested that closing of discussions from others in the organization may improve working relationships by avoiding conflict, help groups to protect risky information or high-risk projects, as well to protect self-interests and confidential or proprietary knowledge (for instance, about clients) and avoid “stealing” opportunities (Olson and Olson 2000). Generic affordances such as reviewability or (in)visibility thus need to be considered in light of the strategic work objectives of groups in a workplace setting.

Finally, our research shows opportunities for employing multi-level research approaches to understand the complex dynamics of individual social network formation versus the formation of social networks for groups. For instance, do the networks of individuals change as a result of their membership with groups and inversely, do individuals show a preference for different groups—distinguished by visibility levels—based on their own individual preferences for building predominantly bridging or bonding ties.



Multi-level research in ESM is rare, although recently Bulgurcu, Van Osch, and Kane (2018) have used multi-level models to explore the relations between individual user behaviors and contribution patterns in ESM groups. Further work in this area would appear promising, specifically in merging perspectives of social capital formation and contribution behaviors.

## 5.4 Managerial Contributions

Beyond implications for theory, our findings have a number of important implications for the role of ESM in organizations that seek to increase workplace interactions, and in turn, collaborative output. First, the recognition that different ESM groups—as distinguished by their visibility and structural properties—enact networks in diverse ways, either by forming bridging interactions with non-members or strong bonding interactions with members, discourages a “one size fits all” approach to forging workplace interactions.

Second, our findings underscore the potential effects of information systems implementation on the nature of group interactions. Our observation that the use of ESM tools, specifically the visibility affordance, has direct implications for the nature of networks that are formed within and between groups can help shape strategic thinking about implementing such tools in the workplace. Specifically, it can help managers assess the anticipated and desired impacts of information systems, such as ESM, when organizations are in the process of implementing tools for enhancing workplace interactions.

Third, our findings partially challenge organizational efforts to enhance contributions to ESM with the assumption that greater visibility will benefit the organization. These findings further imply that designers should not merely focus on designing open information flows, but rather carefully consider various mechanisms—such as the ability to separately control reading, writing, and membership—that help (groups of) users enact their diverse interaction and strategic goals.

## 5.5 Concluding Remarks

ESM have created new opportunities for groups of individuals to create networks of connections, including with previously unknown others inside the same organization (Leonardi et al. 2013; Treem et al. 2015). The formation of social capital in the context of ESM is inherently affected by the visibility affordance of these tools, resulting in either visible or invisible groups. As such, ESM offered a unique opportunity to assess the effects of visibility on group processes, specifically in the context of social capital formation. Given that past research has had a strong positivity bias with respect to the role of visibility on organizational processes, we developed and validated a framework that incorporated both visibility and invisibility and suggested that social capital formation can emerge within both visible and invisible groups, yet, that the exact form of social capital—i.e., bonding or bridging—are shaped by the visibility settings of the group and the level of discussions ongoing in the group. Therefore, as researchers of ESM technologies, we must be cautious in generalizing about the unequivocal effects of visibility and instead must be sensitive to the idiosyncrasies of visible versus invisible groups and their emergent networks of relationships.

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