Strategic Management Journal
Strat. Mgmt. J., **36**: 177–196 (2015)
Published online EarlyView 2 January 2014 in Wiley Online Library (wileyonlinelibrary.com) DOI: 10.1002/smj.2209
Received 7 September 2012; *Final revision received 29 October 2013*

GEOGRAPHY AND POWER IN AN ORGANIZATIONAL FORUM: EVIDENCE FROM THE U.S. SENATE CHAMBER

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We examine the role that geography plays in structuring interactions within an organizational setting designed to promote broad patterns of interaction: the organizational forum. We propose that, within a forum, an individual's location structures his or her access to peer support, but individuals with power (i.e., those who control the flow of organizational resources) can transcend these geographic constraints. We examine these propositions with data collected on strategic actors in the U.S. Senate Chamber. Using a dyad fixed effects approach, time-varying controls, selection-on-observables estimation, and quasi-exogenous shocks to seating arrangements, we find support for our propositions. These results contribute to our understanding of strategic interaction patterns, with an emphasis on the geographic scaffold upon which strategic actions are constructed.

INTRODUCTION

A manager's ability to gather support for his or her policy initiatives is of critical interest to the literature on strategy and organizations. Without peer support, a manager often lacks the ability to gather relevant information (Hansen, 1999) or to make and implement strategic decisions (Eisenhardt and Zbaracki, 1992). As such, one of the central roles of an organization is to foster interactions and support (Thompson, 1967). Indeed, inducing interaction patterns are a cornerstone of literatures ranging from team structure (Reagans and McEvily, 2003), the distribution of power (Pfeffer, 1981), and organization design (van de Ven, Ganco, and Hinings, 2013), to name a few prominent strands of literature.

In this paper, we examine the role geographic locations play in structuring interactions within an organizational setting specifically designed to promote emergent patterns of interaction: the organizational forum. Our interest in organizational forums is twofold. First, we are drawn to study forums because, in our opinion, they provide a particularly transparent window into intraorganizational interactions through their clarity of purpose: the organic exchange of information across its constituent members. As a consequence, the role, if any, of geographic locations in structuring interactions within an organizational forum may be conservative, serving as a lower bound within the broader context of the organization. Second, forums are physical locations.[1] By examining the effects of drawing a multitude of individuals to a discrete location, specifically designed to foster interaction, we answer Pfeffer's (1982) call to

Keywords: spatial networks; propinquity; power; forums; U.S. Senate
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[1] We set aside forums or message boards that do not require physical interaction (e.g., Fleming and Waguespack, 2007).

consider organizations as physical structures (see also Gieryn, 2000).

This paper merges the literature on geographic strategy with the literature on power to develop predictions concerning when geographic distance is, or is not, salient to a focal actor's ability to garner support within an organizational forum. We first argue that an individual's forum location structures his or her access to peer support. We then consider contingencies that serve to weaken—or even counteract—the constraints imposed by geographic locations. We suggest that powerful individuals (i.e., those with the authority to allocate resources within the organization) induce their peers to travel to them, reducing, or even eliminating, the relevance of geographic distance. Individuals with little power are more reliant upon location-based opportunities for attention and peer support.

Our setting is the U.S. Senate Chamber—an organizational design element of the U.S. Senate. Like other forums within business organizations, such as executive lunchrooms, the explicit goal of the Senate Chamber is to provide a semi-structured venue for interactions between the organization's coterie of elites. Moreover, the Senate Chamber affords an unparalleled window into an organization at work. Within the Senate, senators actively recruit support for their initiatives (i.e., bills) by acquiring co-sponsors, and thus we equate bill co-sponsorship patterns within the U.S. Senate to the accrual of coalitional support for policy initiatives within a for-profit firm (March, 1962). The noteworthy aspect of this setting is that it allows us to collect a complete, observable record of each individual's support for one another's policy initiatives within the organization, which is difficult to collect in other organizational settings.

Furthermore, the Senate allows us to establish a causal link between peer support and geographic locations within an organizational forum. First, seating locations in the Chamber are rearranged regularly, allowing us to use a within-dyad estimator to link changes in the spatial topography of the Chamber to changes in patterns of co-support. Second, this setting allows us to include a number of time-varying control variables (e.g., ideology, tenure, etc.), to implement a selection-on-observables framework, as well as to exploit a number of quasi-exogenous shocks (i.e., natural experiments) to locational rearrangements. Lastly, the institutionalized nature of this body politic provides an objective, time-varying measure of an individual's power (i.e., the extent to which an individual controls the legislative process) within the organization.

Finally, we are drawn to our setting because the U.S. Senate contains highly instrumental actors: as elite politicians, senators are particularly astute at understanding the strategic benefits of relationships and network positions. As a consequence, this is a setting where geographic strategy is least likely to matter, and one might therefore expect our results to serve as a lower bound. For other settings comprising less strategic actors, one might expect the salience of our results to be higher. More broadly, we believe our geographic strategy arguments may be pertinent to an array of strategic actions within organizations, such as organizational search and learning (Chakrabarti and Mitchell, 2013), the post-merger integration between firms (Allatta and Singh, 2011), and the integration of distributed work (Srikanth and Puranam, 2011), to list a recent set among myriad examples.

The contributions in this paper are threefold. First, we introduce the notion of an organizational forum: a setting specifically designed to promote interactions among organizational constituents. Second, we advance our understanding of intraorganizational actions by illustrating the robust role of geographic locations in structuring strategic actions within an organizational forum. This empirical beachhead allows us to also make a conceptual contribution: we theorize that the effects of geographic distance are contingent on the power held by an individual. For individuals who wield significant power within the organization, forum locations are not relevant. Taken together, we believe that this paper contributes to the literature on strategic interaction patterns by returning attention to the contingent geographic topologies upon which strategic actions are constructed.

THEORY AND HYPOTHESES

The central purpose of an organization is to coordinate action (Thompson, 1967). While this literature is large, at its heart it purports that organizations are designed to facilitate interactions between its members, especially those that are functionally interdependent. As Selznick (1957) noted more than fifty years ago, "The task of leadership is not

DOI: 10.1002/smj

only to make policy but to build it into the organization's social structure" (Selznick, 1957: 62–63). Interpersonal interactions enable individuals to gather information, learn about the organizational initiatives of others, and establish joint support. Regardless of whether interactions are deliberate or unplanned, interpersonal contact mediates the flow of information. Existing interaction patterns facilitate the transfer of tacit, nuanced knowledge (Hansen, 1999), and contact may allow the establishment of commonalities and trust between two individuals (McEvily, Perrone, and Zaheer, 2003) or serve to focus the attention of time-starved managers (Cho and Hambrick, 2006). Irrespective of the mechanisms, organizational decisions often emerge as a (by)product of its membership's myriad patterns of interpersonal contacts, and one of the primary purposes of the organization is to foster these contacts.

The character of these interactions is influenced by the organization's structure. Consider two of the ideal organizational types that Mintzberg (1979, 1983) described as particularly pertinent to knowledge work. Within professional bureaucracies (e.g., hospitals or accounting firms), individuals with high expertise work independently of one another and are largely uninfluenced by direct hierarchical control. Rather, the organization depends on the training and skill of the experts to ensure quality outcomes, and the power tends to rest with the experts themselves. By contrast, adhocracies fluidly and informally assign specialists to multidisciplinary teams, bringing together relevant actors in an ever-changing array of affiliations. Coordination privileges and power are distributed widely, with strategy formulation as an emergent process (e.g., Mintzberg and McHugh, 1985). As one example, to foster strategic emergence at Oticon, a large hearing aid manufacturer, Lovas and Ghoshal (2000) describe how members affiliate with transient project teams rather than positions in the organization chart.

However, two factors serve to limit the ability of organizations—especially those that depend on more organic forms of interactions—to coordinate action among their members through organizational design elements. First is an issue of increasing scale and scope. As companies increase in size, time constraints make it impossible for the organization to foster contacts among all relevant members. As a consequence, managers are increasingly distant from others within the company and, thus, privy to less-direct channels of information. Moreover, horizontal increases in company scope across diverse product lines (Rumelt, 1982) and national borders (Ghoshal, 1987) result in difficulties for coordinated action within the modern corporation. Even with dramatic decreases in communication costs, the itinerant executive globetrotting across continent-based divisions and elements of the value chain persists.

A second factor limiting coordination is the difficulty in predicting, *ex ante*, which sets of interactions are likely to be useful in the future. For example, it has recently been noted that complex landscapes of interdependencies across organizational subunits (e.g., Siggelkow and Levinthal, 2003), conflicting internal and external demands (Foss, 2003), and the often emergent nature of strategic decisions render the coordination needs of organizational members opaque (reviewed in van de Ven *et al.*, 2013). This is increasingly pertinent to modern business organizations, which are embedded in dynamic, rapidly changing environments (Brown and Eisenhardt, 1997). As a consequence, requisite interaction patterns are broadly distributed across the firm, and interactions between relevant decision makers are emergent, requiring mutual adjustment over time (Mintzberg, 1979). In short, managers often know they need to consult with a diverse array of their colleagues, but who their interaction partners should be is not only murky, but also tends to shift quickly over time.

In recognition of their fluid needs, many organizations have established semi-structured settings to mediate the dynamic flow of interactions among relevant members. For example, company towns (Agrawal, Cockburn, and Rosell, 2010), headquarters (Kleinbaum and Stuart, 2013), or a corporate campus (Becker, Sims, and Schoss, 2003) allow for the collocation of key business organizational members. At a more micro-level, office layouts (Allen, 1977; Liu, 2013; Oldham and Brass, 1979), lunchrooms (Sommer, 1959), or even the placement of a restroom within a building (Pfeffer, 1992) is often sufficient to induce focused settings for the organic exchange of information (Feld, 1981). Within any complex organization, the design and implementation of strategic initiatives requires the engagement and support of multiple individuals in multiple constituencies (Brass, 1984; Pettigrew, 1973), and collocation often serves as the lens through which interactions and joint support is focused.

DOI: 10.1002/smj

The overarching purpose of these semi-structured settings is to mediate contact and enable the coordination activities that stem from that contact. In this paper, we introduce one type of venue specifically designed to foster an organic set of interactions: the organizational forum. Forums, physical spaces set aside for the exchange of goods and ideas, date back at least to the *Forum Romanum* in the sixth century BC (Ammerman, 1990). Within organizations, an archetypal forum would be Baker's (1984) description of a securities and exchange trading floor. On the floor of the exchange, buyers and sellers come together to interact, haggle, and set prices. Thus, this forum mediates the physical collocation of exchange partners, enabling interactions that would be more difficult, or costly, outside the purview of the exchange. Although not focused on the explicit exchange of goods, Ingram and Morris's (2007) description of a mixer, where social actors aggregate with the desire to foster (new) interactions, is also analogous to an organizational forum. Within this setting, individuals who only knew a minority of forum participants beforehand gathered with the express purpose of interacting with potential, new contacts.

Although organizational forums are explicitly designed to promote fluid, organic sets of interactions, intermingling is not without friction. Within the securities trading floor, social relationships and reciprocity remained a critical component of exchange relationships (Baker, 1984). Although individuals did meet new contacts at mixers, networkers spent much of their time talking to (and reinforcing) prior relationships (Ingram and Morris, 2007). Moreover, physical locations within forums often serve as constraints on action. Whether this is in a hospital lunchroom (Sommer, 1959), desks at a bureaucratic organization (Blau, 1963), or a non-territorial office (Allen, 1977), geographic locations are known to structure patterns of interaction (Festinger, Schachter, and Back, 1950). Given the central role that geographic locations play in structuring contact, and the outcomes that stem from that contact, we propose the following hypothesis:

Hypothesis 1: Within an organizational forum, increasing geographic distance between two members decreases the likelihood of their joint support.

Our first hypothesis suggests that the geographic distance between two forum members shapes their provision of support for one another's initiatives. However, individuals have interests, and their patterns of interactions have been suggested to reflect their entrepreneurial inclinations, their aspirations, and their instrumentality (Baum *et al.*, 2005; Burt, 2005). Forum members are not wholly passive actors, waiting quietly for interaction opportunities to cross their paths. Consistent with this notion, a large literature on strategic decision making within organizations views interaction patterns as the outcome of calculated decisions enacted by strategic, political actors (cf. Eisenhardt and Zbaracki, 1992).

For example, we know that an organization's set of relationships are distributed unevenly, contingent upon the desirability of an individual as an interaction partner. Individuals who have greater knowledge stocks are more able to move into central positions within technical workflows (Tushman and Scanlan, 1981). Furthermore, actors with high status may disproportionately attract interaction partners (Stuart, 1998), as do actors who are centrally positioned within organizational networks (Tsai, 2000). Moreover, actors that have high aspirations (Baum *et al.*, 2005), are self-monitoring (Sasovova *et al.*, 2010), and participate in syndicates (Sorenson and Stuart, 2001) or fads (Sorenson and Stuart, 2008) are known to be able to transcend proximity and access distant relationship partners. As resources commonly flow through relationships and networks, individuals with a greater stock of resources (e.g., status, knowledge, power) have a greater likelihood of interacting broadly, regardless of whether they initiate the interaction or are sought out.

In this paper, we focus on one attribute of individuals that shapes their pattern of relationships: the power they wield within the organization. Within any complex organization, there are differences in the degree to which any one individual wields power and authority. As Pfeffer (1981) states, "Power is seen as deriving from the division of labor that occurs as task specialization is implemented in organizations." Within an organization, we suggest that powerful individuals, those who have the ability to shape the allocation of organizational resources and attention, have a greater likelihood of being sought out. These desirable relationship partners need not depend on geographically proximate partners as others will

DOI: 10.1002/smj

deliberately travel to them. Moreover, powerful managers are more centrally located within the organizational network, and their broad relationship patterns guide them away from proximate geographic locales. Therefore, we propose that for these powerful actors the salience of geographic proximity as a mechanism through which they garner support from other actors is attenuated.

By contrast, forum members with less power may be more reliant upon location-based opportunities (i.e., geographic proximity) for peer support. These individuals have fewer resources to contribute to their interaction partners, and thus we suggest that the role of geographic proximity may be more salient for less powerful individuals as they try to acquire support from other actors within the organizational forum. Thus, we propose our second hypothesis:

> *Hypothesis 2: Within an organizational forum, the effect of geographic distance on the likelihood of joint support between two members decreases in magnitude as the members wield more power within the organization*.

SETTING: THE UNITED STATES SENATE

To test these hypotheses, we examine geographic interaction patterns within the Senate Chamber, an organizational forum within the broader context of the U.S. Senate. The Senate is the upper house of the national legislature of the United States. Each of the fifty U.S. states is allocated two senators and, relative to the House of Representatives, the U.S. Senate has fewer members and longer terms of service, resulting in a legislative body that is more prestigious, deliberative, and, at times, collegial. Each senator is tasked with representing his or her state's interests primarily through sponsoring and shaping legislation (i.e., policy initiatives), and voting on polished bills. Thus, like professional bureaucracies, each senator can be considered an independent entity within the Senate, supported by a large, expert staff versed in the needs of each senator's constituency. Simultaneously, like an adhocracy, senators require the support—and potentially the resources—of an ever-changing array of their peers. Although any senator can propose legislation, each senator depends upon the cooperation and support of his or her colleagues to forward their personal legislative agenda, consistent with the view of strategic decisions as the outcome of a coalition-building process (e.g., Ouchi, 1980).

The advantage of a quantitative case study within the U.S. Senate is that it provides a deep empirical window into an organization at work. Most pertinent to a study of organizational forums is the presence of the Senate Chamber. Serving an organizational function equivalent to executive lunchrooms or corporate retreats, the Senate Chamber is a venue exclusively designed to foment debate. Similar to a number of corporate venues, entrance to the Chamber is limited to senators (i.e., the most senior members of the organization), with individual staff members only granted access through unanimous consent. Moreover, a senator's location within the Senate Chamber is observable over time: each senator chooses a desk at a fixed location within the Chamber and every two years, after an election, Chamber desks are rearranged to reflect changes in party demographics. As each senator serves six-year terms, we have the ability to observe the interaction patterns of even single-term senators at multiple locations within the Chamber.

DATA AND METHODS

Bill co-sponsorship data

To examine bilateral support patterns between senators, we collected data on bill co-sponsorships from the 96th (1979) to the 106th Congresses (2001) (Fowler, 2006a, 2006b), where each Congress represents a two-year session of the U.S. Legislature. In a typical Congress, approximately 7,500 bills (i.e., legislative proposals) are introduced. If no objection is heard, the bill is then referred to the appropriate (sub)committee, which gathers information, holds hearings, and revises the bill. Most bills fail at the committee stage and are never voted on in the Senate Chamber. For example, if the committee chairman dislikes the bill, he or she can neglect to bring it up for consideration. Typically, only 10 percent of introduced bills emerge from the committee stage, and these pieces of legislation are then debated, amended, and voted on by the senators in the Senate Chamber. The Senate ultimately passes about 7 percent of the bills initially drafted, though in our sample, this ranges from 4 percent to almost 17 percent of bills within any given Congress.

DOI: 10.1002/smj

The senator who introduces a bill is its authoring sponsor. For a bill's authoring sponsor, gaining additional co-sponsors (i.e., support) for his or her bill is an important step for ensuring the bill gets passed (Browne, 1985). Fowler (2006b) discusses two kinds of co-sponsorship: active co-sponsors who help draft and promote the legislation and passive co-sponsors who merely formally indicate their support. Both of these types of co-sponsors can make important allies for an authoring senator, and our dataset does not distinguish between the two. In fact, getting a powerful or popular senator to co-sponsor a bill, regardless of the type, can almost guarantee that it will get passed. As a testament to the importance of co-sponsorship, senators often refer to the co-sponsorships they've received in debates in the Senate Chamber (Fowler, 2006b).

Why do senators choose to co-sponsor bills? On one hand, bill co-sponsorship has often been construed as a low-effort, inexpensive, credit-taking exercise aimed at a senator's external constituents (Mayhew, 1974). But even with this potentially low cost of co-sponsoring, the vast majority of bills receive, at most, a handful of sponsors. In examining the paucity of co-sponsorship patterns, Campbell (1982) suggests that "co-sponsorships, if offered too freely, lose some of their impact and value." Moreover, co-sponsorship is often a strategic component of legislative action, serving as either a signal to their fellow legislators (Kessler and Krehbiel, 1996) or as a means to gain influence. Indeed, Fenno's (1989) case study of the Republican Senator Dan Quayle's Job Training Bill suggests "the decision to travel the bipartisan route and to solicit the help [and co-sponsorship] of Edward Kennedy was his [Quayle's] earliest strategic decision." As expected, co-sponsorship is more likely to occur when individuals share similar ideologies (Harward and Moffett, 2010).

Following other scholars, we consider bill co-sponsorship to be a trace of the joint support between two senators, and we use these co-sponsorships to construct our pattern of joint support among U.S. senators (Fowler, 2006b). As both the authoring and co-sponsoring senators can actively recruit new co-sponsors up until the bill moves out from the committee, we do not discriminate between initial and subsequent sponsors. To generate our dependent variable, we count the total number of bills that two senators co-sponsor in a given Congress t. We construct this measure for each of the 53,955 senator dyads in our sample, thereby creating a senator-by-senator one-mode adjacency matrix. Alternatively, we considered including only directed ties where senator i is the initial sponsor and senator j is a co-sponsor. While this construction did not substantively change our results (and is included for robustness), we opted for nondirected ties as (1) many co-sponsors, not just the initial sponsor, actively promote the bill, and (2) the literature on political networks uses nondirected co-sponsorship ties.

Senate Chamber architecture

We examine geography and patterns of intraorganizational support in the context of the U.S. Senate Chamber. Our research builds upon a burgeoning body of literature that examines voting behavior within legislative chambers (cf. Patterson and Mughan, 2001). The Senate Chamber is a large, 16×26 m meeting room where each senator is assigned a desk. Each desk is bolted to the floor in a half-circle facing the rostrum, where the Presiding Officer and members of the Senate staff sit. It is in this Chamber that senators debate legislation, work to build consensus, and vote on bills.

Every two years, after each election, the Chamber map is redrawn and Chamber desks are unbolted from the floor, moved, and rebolted to reflect new party-membership counts. By tradition, Democrats and Republicans are each apportioned half of the Chamber floor. For the years included in our dataset, each Chamber half has been partitioned into four rows and three sections. We transposed each senator's Chamber desk location into Cartesian space (see Figure 1) and used these coordinates to construct Chamber distance between two senators' desks with great precision. This measure is our key independent variable.

At the beginning of a Congress, each senator sequentially chooses a Chamber seat (i.e., a desk), with senior senators within each party selecting first. Given the opportunity, most senators choose to sit front and center in the Chamber. The most junior senators sit toward the periphery, predominantly because they are the last to choose seats. However, this correlation is noisy: not all senior senators prefer to sit at the "center" of the Chamber (see Figure 2).

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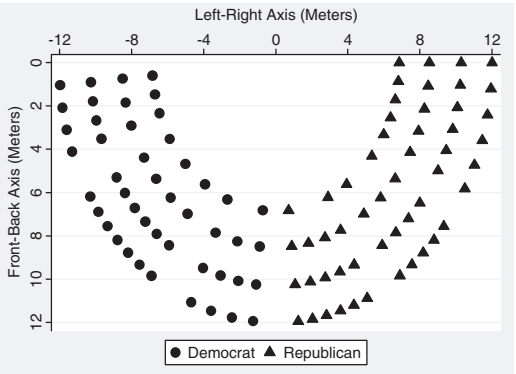

Figure 1. U.S. Senate Chamber Cartesian representation. Figure represents Senate Chamber seating for the 99th Congress (1985). The Chamber measures approximately 16×26 m. Republicans are seated on the right side of the Chamber and Democrats are seated to the left. Senate Chamber seat locations were estimated using scale drawings of the Senate Chamber. Measurement error appears to be negligible

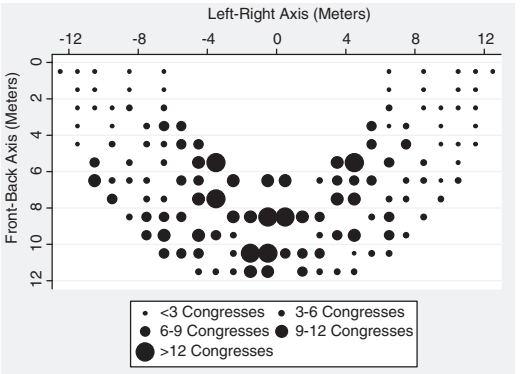

Figure 2. Average senator tenure by location in Senate Chamber. The data comprises 1,100 senator-Congress observations. To generate this figure, the Senate Chamber floor was first segmented into 351 sections measuring 1×1 m. Each senator-Congress observation was assigned to a section based on the location of the senator's seat in that specific Congress. For each of these sections, the average senator tenure was then calculated based on all of the senators assigned to that section over time, considering each senator's tenure during the specific Congress in which they were seated in that section. Tenure is the number of Congresses a senator has served in his or her career to date. Larger dots indicate locations that tend to have higher-tenure senators, while smaller dots indicate locations that tend to have lower-tenure senators

For the selection-on-observables regressions, we constructed a series of indicator variables to account for a senator's seat choice. Specifically, we set an indicator variable equal to 1 if the senator's new seat in Congress t is in the same row, section, row and section, is the same exact seat, or is at a similar angle from the center aisle as was their last seat in the previous Congress.

Senator power

A senator's power is tightly correlated with his or her ability to control the legislative agenda, and, by tradition, this ability is primarily determined by seniority. Senior senators are awarded preferential assignment to their selected committees; the most senior majority-party member of each committee is designated as the chairman while the most senior minority-party member is designated the ranking minority member. Both of these committee leadership roles have significant sway over which bills are debated and voted on within the committee and therefore wield considerable control over the legislative agenda (Deering and Smith, 1997). As a result, support from senior members is essential to the passage of a bill. We proxy for a senator's seniority in two ways: first, we count the total number of Congresses a senator has served to date; second, for each Congress, we identify whether a senator holds a committee leadership position (e.g., chairman or ranking minority member).

Other senator data

We also collected a number of control variables. For many issues (e.g., gun control, abortion rights, minimum wage), a senator's political *ideology* tends to be "liberal" or "conservative." Depending upon where two senators lie on this ideological spectrum, they may have greater (or lesser) propensities to jointly sponsor bills (Burkett, 1997). We control for ideology using Poole and Rosenthal's (2007) widely used ideological index called DW-NOMINATE—a dynamic model that accounts for all senators' ideologies in a common space, even if two senators did not serve during the same Congress. This approach reduces each senator's ideology to a single point in a two-dimensional space, using voting patterns over time. The primary dimension captures liberal vs. conservative leanings while the second dimension predominantly captures regional diversity. DW-NOMINATE scores have historically accounted for between 85 and 90 percent of all voting decisions.

We also counted the total number of *committee co-memberships* two senators shared within

DOI: 10.1002/smj

Table 1. Descriptive statistics

	Mean	*SD*	Min	Max
Panel A: Senator characteristics ($N = 221$)[a]				
Female	0.063	0.244	0.00	1.00
Democrat	0.493	0.501	0.00	1.00
Republican	0.502	0.501	0.00	1.00
Changed parties	0.005	0.067	0.00	1.00
First Congress	97.06	6.140	78.0	106
Last Congress	104.9	5.380	96.0	112
Tenure (in Congresses)	8.783	5.030	1.00	26.0
Tenure gap	0.023	0.149	0.00	1.00
Bill sponsorship[b]	301.5	127.7	10.0	694
Panel B: Senator-dyad characteristics ($N = 53{,}955$)[c]				
Same gender	0.921	0.270	0.00	1.00
Same state	0.010	0.100	0.00	1.00
Same party	0.499	0.500	0.00	1.00
Ideological distance	0.567	0.302	0.00	1.72
Same cohort	0.091	0.287	0.00	1.00
Both freshman	0.014	0.119	0.00	1.00
Number of Congresses co-served	5.216	2.744	1.00	11.0
Bill co-sponsorship	80.76	50.10	3.00	396
Committee co-membership (count)	0.533	0.685	0.00	5.00
Same office building	0.411	0.492	0.00	1.00
Same office building floor	0.100	0.300	0.00	1.00
Chamber distance (m)	9.992	5.588	0.64	24.0

[a] Sample includes the 221 senators who served in Congresses 96–106 inclusive. Female, Democrat, Republican, and changed parties are indicator variables set to 1 if the senator is female, a Democrat, a Republican or has changed parties, and are set to 0 otherwise. First (last) Congress indicates the senator's first (last) Congress as a member of the Senate. Tenure refers to the number of Congresses a senator has served (where a Congress comprises two years of service). Similarly, tenure gap indicates that a senator has served in the senate multiple times with gaps in between. Bill sponsorship refers to the number of bills senator *i* co-sponsored with any other senator within a Congress.

[b] $N = 1{,}113$ senator-Congress observations.

[c] Sample includes senator *ij* dyads occurring in Congresses 96–106 inclusive. Same party, state, gender, cohort, both freshman, office building and office building floor variables are equal to 1 if senators *i* and *j* are similar across each of these variables, and 0 otherwise. Ideological distance (based on DW-NOMINATE methodology) reflects the difference in ideologies between senators *i* and *j*. Number of Congresses co-served reflects the total number of Congresses for which senators *i* and *j* were both senators. Bill co-sponsorship represents the number of bills senator *i* and *j* co-sponsored within a Congress. Committee co-membership reflects the total number of committees on which senator *i* and *j* co-served in a given Congress. Chamber distance reflects the distance (in meters) between two senators in the Senate Chamber for a given Congress.

a Congress (Nelson, 2011; Stewart and Woon, 2011). In addition, we collected data on each senator's *office location* in the Russell, Dirksen or Hart Senate office buildings using the Congressional Directory. We construct measures that indicate whether two senators have offices in the same building, or offices on the same building floor. Lastly, we collected biographical data on a senator's *gender*, *state*, and *cohort* (see Table 1 for descriptive statistics).

EMPIRICAL STRATEGY

The goal of this paper seems straightforward: to what extent does geographic distance within an organizational forum affect two individual's likelihood of joint support, and how is this geographic effect moderated by the individual's power within the organization? However, an individual's location is almost always the product of organizational and individual choices, leading to difficulties in deriving a causal relationship between geographic distance and joint support.

Thus, our empirical strategy unfolds in two steps. First, we use an array of parallel approaches to examine how Senate Chamber distance affects the likelihood that two senators co-sponsor bills (see Tables 2, 3 and 4). Each of these approaches, as with all regression methodologies, is predicated upon a set of nontestable assumptions (e.g., the exclusion restriction in an instrumental variable

DOI: 10.1002/smj

approach). By choosing different methodologies built upon orthogonal assumptions, our results, taken in combination, complement one another and may be especially persuasive. Only after we are confident that geographic effects are present do we examine the extent to which intraorganizational power shifts our baseline estimates (see Table 5).

A natural entry point to examining the correlation between micro-geographic distance and joint support within the U.S. Senate is to examine changes in bill co-sponsorship patterns as Chamber seating is rearranged. Formally, our linear regression model is as follows:

$$E\left[y_{ijt}|X_{ijt}\right] = \beta_0 + \beta_1 \text{CHAMBER\_DISTANCE}_{ijt} + \beta_2 X_{ijt} + \delta_t + \gamma_{ij} + \epsilon_{ijt}, \quad (1)$$

where y is a count of the bills co-sponsored by i and j in Congress t, CHAMBER_DISTANCE is the geographic distance between senators i and j in meters in Congress t, X is a vector of control variables, the δs represent Congress indicator variables, and the γs correspond to a full set of dyad fixed effects. We run linear regressions, with errors clustered by dyad, due to the high level of co-sponsorship activity (Figure 3). Using Poisson or other count models does not materially change our results. When possible, we use a within-dyad estimator (i.e., dyad fixed effects) to examine how changes "within" *ij* senator combinations, such as changes in Senate Chamber distance, will correlate with a change in the dyad's likelihood of co-sponsoring bills.[2] In this model, all characteristics of the *ij* senator combination (e.g., party affiliation, gender, cohort effects, personality, etc.) that are time invariant will be netted out. We also include Congress fixed effects to account for time trends. To control for the effects of seniority, we include the sum and absolute difference of *ij* tenure in the majority of our regressions. For robustness, we tested multiple alternative measures of *ij* tenure with no change in our results. Although this baseline specification is appealing, causal inference remains problematic.

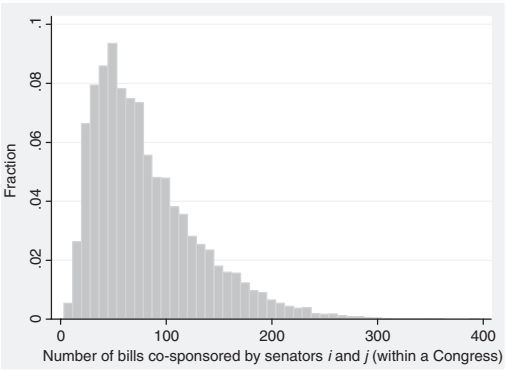

Figure 3. Histogram of bill co-sponsorship-*ij* dyad. Only bills that have more than one sponsor, representing approximately 45 percent of all bills, are shown

The specification above correlates positive (or negative) changes in the micro-geographic distance between i and j's seats with i and j's likelihood of co-sponsoring bills. However, the choice of senator seating is endogenous, and the question remains as to why i and j would choose their respective locations. For example, a decrease in the distance between i and j may be purposive with respect to the dependent variable: i and j may move to geographically proximate locations because they have a desire for increased interactions. We address this issue of endogeneity using a variety of strategies.

Determinants of ij distance

To understand the determinants of i and j Chamber distance, we examine a number of correlates to this measure (in Table 2). Homophily suggests that senators will choose to sit with those who are similar to themselves (e.g., from the same party, similar committee memberships, similar ideologies, etc.). Drawing upon this analysis, we then incorporate a number of time-varying controls to our dyad fixed effects regressions (Tables 3). Specifically, we include the ideological distance between i and j, as well as the number of committee co-memberships, to account for shifts in i and j's preferences over time. We also include indicators reflecting whether senators i and j have offices within the same building and same building floor during Congress t. In models that don't include dyad-level fixed effects, we also include the dyad's time-invariant characteristics, which

[2] As we run dyad-level regressions, we also contemplated the inclusion of an *ij* network variable, such as geodesic distance or a count of common third parties, to control for social network effects (e.g., transitivity). We opted not to include these variables because our framework suggests that geographic proximity leads to interactions (i.e., relationships and networks) and, subsequently, joint support. Consistent with this logic, the inclusion of a network variable diminishes, but does not eliminate, the effect of geographic distance.

Table 2. Dyad-level correlates of Chamber distance-meters (OLS)

Dataset	(1) All dyads	(2) All dyads	(3) Same-party dyads	(4) Different-party dyads
Committee co-membership		−0.130**	−0.110**	−0.124**
		(0.021)	(0.026)	(0.029)
Ideological distance		0.525**	0.711**	−0.180+
		(0.078)	(0.092)	(0.108)
Same office building		−0.126**	−0.0244	−0.112**
		(0.032)	(0.038)	(0.043)
Same office building floor		0.0617	0.0360	0.0772
		(0.053)	(0.061)	(0.071)
Same party	−8.241**	−8.010**		
	(0.035)	(0.049)		
Same party—Democrat	0.413**	0.436**	−0.215**	
	(0.040)	(0.040)	(0.036)	
Same state	−0.165	−0.136	−0.204	0.353
	(0.147)	(0.147)	(0.169)	(0.219)
Same cohort	−0.312**	−0.302**	−0.406**	0.124
	(0.059)	(0.059)	(0.064)	(0.079)
Both freshmen	−0.632**	−0.652**	−2.278**	2.171**
	(0.197)	(0.197)	(0.133)	(0.166)
Same gender	−0.326**	−0.350**	−0.0395	−0.569**
	(0.055)	(0.055)	(0.067)	(0.067)
Constant	16.17**	15.89**	5.709**	18.53**
	(0.078)	(0.1000)	(0.102)	(0.129)
Observations	53,955	53,955	26,907	27,048
R-squared	0.641	0.641	0.207	0.503

All models include, but do not show, controls for the sum and absolute difference of senator i and j's tenure, as well as indicators for each Congress. Committee co-membership reflects the total number of committees on which senator i and j co-served in a given Congress. Ideological distance (based on DW-NOMINATE methodology) reflects the difference in ideologies between senators i and j. Same office building (floor) is equal to 1 if senators i and j have offices in the same office building (floor). Same party, same state, and same gender are equal to 1 if senators i and j are from the same party, state, or gender, respectively. Same cohort is equal to 1 if senators i and j started in the Senate in the same year.
Robust standard errors, clustered by dyad, are in parentheses; +significant at 10%; *significant at 5%; **significant at 1%.

indicate whether the two senators are in the same party, are both Democrats, are from the same state, belong to the same cohort, are both freshman, and have the same gender.

Selection-on-observables models

In our next approach, we address the fact that a senator's Chamber seat—and consequently the distance between two senators—is a choice. To do so, we adapt a selection-on-observables approach that considers seat choice to be the outcome of a matching process (Dehejia and Wahba, 2002). We use an inverse probability of exposure weighted (IPEW) estimation (Azoulay, Liu, and Stuart, 2009), which considers the seat assignment process to be an instance of a sample selection problem where we observe only actual seat selections, but not those that did not—but could have—occurred. In the first stage, we predict the matching behavior (i.e., senator i's propensity to choose seat s from the universe of possible seat choices). In the second stage, we use these predicted probabilities to (1) calculate the likelihood that i and j choose their observed seats and, hence, the Chamber distance between i and j; and (2) weight these observed seat choices by the inverse probability of their (predicted) occurrence. Thus, we run the second-stage regression on a quasi-random sample that accounts for the matching between senators and their chosen seats.

Specifically, in the first stage, we estimate a probit model with all potential combinations, observed and unobserved, of senator i and seat s in Congress t:

$$SenatorSeatMatch_{ist} = I\,(a_0 + a_1 Z_{ist} + \mu_i + \pi_s + \delta_t + \epsilon_{ist} > 0) \quad (2)$$

where $SenatorSeatMatch = 1$ if senator i chooses seat s in Congress t and is equal to 0 otherwise. Z

DOI: 10.1002/smj

is a vector of senator *i's* seat level covariates that predicts senator *i*'s seat choice in Congress *t*. We include senator and seat fixed effects to control for time invariant characteristics of each senator and each seat, as well as Congress fixed effects to control for time trends. The estimates from Equation 2 are used to compute the likelihood of each senator-seat match observed in the data. Once the first stage estimation is complete, the fabricated counterfactuals are eliminated from the dataset, leaving only observed senator-seat combinations. To move from the senator-seat (*i-s*) level to the senator-senator (*i-j*) dyad level, we weight each *ij* observation in Equation 1 by the inverse joint probability that senator *i* and senator *j* match to their observed seats. To summarize, "typical" *ij* locations are de-emphasized, while atypical ones are accentuated, netting out the (observable) propensities that underlie seat selection in the two-stage model.

Quasi-exogenous shifts in senator seating

Third, we exploit the institutional characteristics of the Senate to examine quasi-exogenous shifts in Senate Chamber seating arrangements, in methods akin to natural experiments. First-term senators choose their desks last, and thus they are often relegated to the distal wings of the Senate Chamber (see Figure 2). A new senator's ability to relocate (from their first to second Congress) depends upon the occurrence of empty seats that can arise from either turnover within his or her party or winning a seat from the other party. As more senior colleagues depart, either voluntarily (through retirement) or involuntarily (through a lost election), desks are released for redistribution in a mechanism reminiscent of vacancy chains (Chase, 1991). As within-party turnover is largely outside the control of first-term senators (i.e., senior retirements and election outcomes are exogenous to the freshman), we run our baseline linear regression as above, but only including dyads where at least one of the senators is in his or her first or second Congress. For this regression, only changes in Chamber floor locations between an individual's first and second Congresses will be associated with a change in bill co-sponsorship.

Next, we turn our attention from freshman senators to those more senior and examine floor distances to senators who have stabilized in idiosyncratic Chamber locations. Although there is a penchant for senior senators to occupy desks near the center of the Chamber, some senators deviate from this pattern (see Figure 2). For example, Senator Edward Kennedy (D-MA) had chronic back pain and, as a result, chose to sit at the rear of the Chamber in order to have ease of access from the cloakroom to his desk (Don Ritchie, Senate Historian, personal communication). We define individuals like Senator Kennedy as "iconoclasts" and suggest that the Chamber distance between these senators and other senators is largely nonpurposive. For example, senator *j* may "flow" past iconoclast *i* as she is presented with opportunities to move toward the most popular seats near the front of the Chamber. This movement would cause *i* and *j*'s distance to change erratically. Specifically, we identified 102 iconoclasts as senators who are (1) in the most senior tenure quartile, (2) have a stable desk location for two or more Congresses, and (3) are more than 4 m from the geographic center of the Chamber floor. For robustness, we also examine alternate definitions for iconoclasts with no change in our results. We then restrict a regression to dyads between *i* iconoclasts and all other *j* senators on the Chamber floor. In both of these approaches, which capitalize on quasi-exogenous shocks to Chamber seating, a negative coefficient on Chamber distance would indicate support for Hypothesis 1.

Testing the mechanism

Lastly, our proposed mechanism for a positive relationship between Chamber proximity and bill co-sponsorship is an increase in opportunities for interaction, leading to joint support. To examine this proposed mechanism, we turn to a specific institutional characteristic of the U.S. Senate: the senatorial election cycle. Within any given Congress, one out of three senators faces an impending election. Campaigning senators spend a greater amount of time in their home district, away from the Senate Chamber floor (Fenno, 2002). As a result of campaign-induced absences, we believe that the Chamber floor micro-geographic effect on co-sponsorship, if any, will be less salient for dyads that contain one or more campaigning senators. By contrast, we would expect any geographic effects to be amplified for non-campaigning senators as these individuals spend more time in Washington, DC, and have greater opportunities to interact in the Senate Chamber.

DOI: 10.1002/smj

Power and distance

Our second hypothesis suggests that more powerful partners rely less on the location-based opportunities for interaction provided by proximity on the Chamber floor. Senior senators and those with committee leadership positions have greater influence over the legislative agenda and, thus, wield disproportionate power with the Senate. Therefore, we use either a senator's (senior) tenure or his or her role as a committee leader as proxies for the senator's power and also their desirability as a bill co-sponsor. To test our second hypothesis, we generate a series of dichotomous variables to indicate whether dyads have (a) neither, (b) one, or (c) both senators with high tenure, or (a) neither, (b) one, or (c) both senators with committee leadership positions. We then interact each of these indicator variables with Chamber distance to examine conditions where locations are more (or less) salient. Based on Hypothesis 2, we expect to find that the salience of Chamber distance decreases in magnitude as dyads contain more individuals with high tenure or committee leaders.

RESULTS

Descriptive statistics

We begin with a set of descriptive statistics. Table 1, Panel A reports characteristics of the 221 U.S. senators in our sample, as well as their bill co-sponsorship patterns. The typical U.S. senator is male and has served a total of 17.5 years (or 8.8 Congresses) as a senator. Female senators are rare: there are only 14 in our entire dataset. Senators have been evenly distributed between the two major political parties, and the longest serving senator in our dataset was in his 26th Congress, having served for over fifty years. On average, 13 new senators enter each Congress, although this number ranges widely from 6 to 21 in our sample. Typically, two senators will have co-served in the Senate for five Congresses, have a 43 percent chance of serving on a committee together, a 41 percent chance of having offices in the same building, a 10 percent chance of having an office on the same building floor, and a 9 percent chance of starting in the same Congress (Table 1, Panel B).

Senate bills serve as our trace of joint support within this organization. The average bill acquires 4.5 co-sponsors (including the author), but the majority of bills (over 55%) do not receive any co-sponsors. Of the 45 percent of bills that do have co-sponsors, the median accrues 9.2 co-sponsors in total (including the author), although this number is highly skewed (see Figure 3). The typical senator co-sponsors 302 bills (4% of all bills) within a given Congress. The typical pair of senators will co-sponsor 81 bills per Congress, with this number increasing to 90 for same-party dyads. If we consider only author/co-sponsor dyads (i.e., directed ties), then the number of co-sponsorships drops to 2.7 bills per Congress.

To examine the geographic determinants of bill co-sponsorship, we transposed the geographic coordinates of each senator desk into Cartesian space (Figure 1). The typical floor distance is 10 m between any two senators. As Democrat and Republican seating is segregated, average interparty distance is 14 m, 8 m more than the average intraparty distance. Between Congresses, the average senator will move 1.7 m, with 50 percent of senators moving no more than half a meter. As a senator's congressional tenure increases, the senator typically settles into a fixed location on the Senate floor. After his or her fifth Congress, the median senator moves only 0.16 m between Congresses (Figure 4). Given the

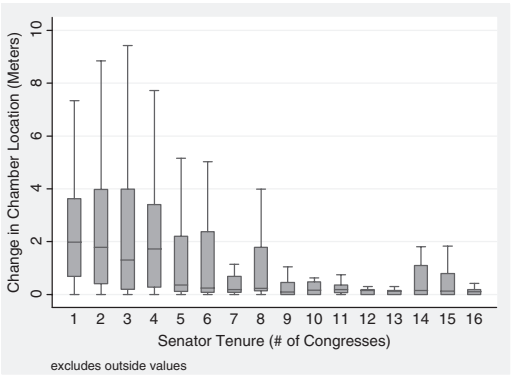

Figure 4. Senator tenure and senator Chamber relocation. The data comprises 972 observations, encompassing 190 senators and 11 Congresses (96th–106th). Senator tenure is the number of Congresses a senator has served in his or her career to date. The change in Chamber location is the distance (in meters) between a senator's seat location from one Congress ($t-1$) to the next (t). This distance is calculated without a consideration for rows or aisles. A box plot outlines the 25th, 50th, and 75th percentiles as a shaded region, with the 5th and 95th percentiles as bars. Values outside this range, and 21 observations of 8 senators with tenure greater than 16 Congresses, are not shown

DOI: 10.1002/smj

granularity of our location measure, senators may move in the Chamber due to changes in seating density after an election, without a change in their seat location.

Regression results

We examine the correlates of Chamber distance in Table 2. Unsurprisingly, Model 1 suggests that party affiliation and cohort (i.e., tenure) are the most salient determinants of geographic distance. Senators in the same cohort are 0.3 m closer, as are those of the same gender. We also find evidence that senators with offices in the same building collocate in the Senate Chamber. Surprisingly, we do not see increased collocation by U.S. state. Individuals who have similar interests tend to collocate: members of the same committee are seated closer to each other, and senators who share similar ideologies are also collocated (Model 2). However, ideological collocation only occurs for individuals within the same party (Model 3), and we see no evidence that ideological moderates cluster along the center aisle (Model 4). For different-party dyads, freshmen are geographically distant, consistent with their relegation to the

Table 3. Impact of Chamber distance on bill co-sponsorship (OLS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dataset	All dyads	All dyads	All dyads	All dyads	First and second Congress dyads (i)	Iconoclastic senator dyads (i)	All dyads (election cycle)	Directed ties
Chamber distance (m)		−0.575**		−0.486**	−0.684**	−0.717**	−0.697**	−0.0348**
		(0.071)		(0.075)	(0.117)	(0.270)	(0.073)	(0.007)
i and/or j in election cycle (indicator)							0.837	
							(0.537)	
Chamber distance × i and/or j in election cycle							0.274**	
							(0.045)	
Committee co-membership	3.909**	3.835**	2.225**	2.160**	2.019**	1.756	3.797**	0.238**
	(0.389)	(0.389)	(0.397)	(0.396)	(0.499)	(1.276)	(0.389)	(0.028)
Ideological distance	−53.27**	−52.97**	−44.68**	−47.38**	−142.0**	−32.93+	−52.97**	−2.922**
	(1.447)	(1.446)	(5.043)	(5.035)	(13.97)	(17.67)	(1.448)	(0.329)
Same office building	−1.346*	−1.418*	−0.696	−0.707	−0.352	1.724	−1.444*	0.108**
	(0.591)	(0.591)	(0.564)	(0.564)	(0.567)	(1.937)	(0.591)	(0.034)
Same office building floor	−0.849	−0.814	−0.724	−0.711	−0.495	5.532*	−0.825	0.0111
	(0.807)	(0.806)	(0.703)	(0.704)	(0.816)	(2.300)	(0.806)	(0.046)
Constant	68.92**	78.05**	73.60**	79.59**	118.0**	−17.82	77.37**	3.740**
	(1.488)	(1.895)	(12.33)	(12.60)	(8.261)	(22.07)	(1.900)	(1.341)
Observations	53,955	53,955	53,955	53,955	18,280	9,557	53,955	107,910
R-squared	0.485	0.486	0.568	0.569	0.471	0.583	0.487	0.075
Number of dyads	15,506	15,506	15,506	15,506	9,140	3,794	15,506	31,012
Dyad fixed effects	No	No	Yes	Yes	Yes	Yes	No	Yes
Congress fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

All models include, but do not show, controls for the sum and absolute difference of senator i and j's tenure, as well as Congress fixed effects. Models with dyad-level fixed effects are indicated, and models without fixed effects include, but do not show, the covariates for same party, both Democrats, same state, same cohort, both freshmen, and same gender. Chamber distance reflects the distance (in meters) between two senators in the Senate Chamber for a given Congress. Committee co-membership reflects the total number of shared committees between senator i and j for a given Congress. Ideological distance (based on DW-NOMINATE methodology) reflects the difference in ideologies between senators i and j. Same office building (floor) is equal to 1 if senators i and j have offices in the same office building (floor). Model 5 includes only dyads where at least one senator is either in their first or second Congress. Model 6 includes only dyads where at least one senator is very senior (i.e., tenure is in top 75th percentile within the Congress) and has stably seated him or herself in an unorthodox position (i.e., not front and center in the Senate Chamber). Model 7 includes an indicator variable, i and/or j in election cycle, which is equal to 1 if either senator i, senator j, or both, are in an election cycle; the model also includes an interaction between this election cycle indicator and floor distance. Model 8 includes directed ties where senator i is the bill author and senator j is a co-sponsor; there are twice as many observations as both ij and ji dyads are represented. Similar results are obtained when we use Poisson regression models.
Robust standard errors, clustered by dyad, are in parentheses; +significant at 10%; *significant at 5%; **significant at 1%.

DOI: 10.1002/smj

periphery of the Chamber floor (Figure 2). We remind the reader that all time-invariant (e.g., party affiliation, state, cohort, and gender) correlates of Chamber distance will be controlled for in our within-dyad regressions.

We present our core results in Table 3. The baseline linear regression model (Model 1) indicates that, as expected, two senators who share committee memberships and ideology have a greater likelihood of bill co-sponsorship. These results are

Table 4. Impact of Chamber distance on bill co-sponsorship (selection-on-observables models)

Model	(1a) First stage: probit	(1b) Second stage: weighted OLS
Dataset	Senator-seat	All dyads
Dependent variable	Seat selected by senator (0/1)	Bill co-sponsorship
Chamber distance		−0.511**
		(0.105)
Committee co-membership		3.923**
		(0.538)
Ideological distance		−51.66**
		(2.125)
Same office building		−1.222
		(0.869)
Same office building floor		0.0926
		(1.252)
Constant		−0.511**
		(0.105)
Selection model		
Seat in same row as prior Congress	-0.0308	
	(0.054)	
Seat in same section as prior Congress	0.0602	
	(0.045)	
Seat in same section and row as prior Congress	0.714**	
	(0.070)	
Seat is same exact seat as prior Congress	1.381**	
	(0.085)	
Seat is similar angle from center aisle as prior Congress	0.456**	
	(0.053)	
Constant	−2.147**	
	(0.385)	
Observations	55,606	53,955
R-squared		0.525
Pseudo R-squared	0.273	
Dyad fixed effects	No	No
Congress fixed effects	Yes	Yes
Senator fixed effects	Yes	No
Seat fixed effects	Yes	No

The dependent variable for Model 1b is the count of a dyad's bill co-sponsorships. The dependent variable used in Model 1a is an indicator, set to 1, if the senator chose seat s during Congress t and is set to 0 otherwise. Model 1a only considers seats in the senator's party's half of the Senate Chamber. Chamber distance reflects the distance (in meters) between two senators in the Senate Chamber for a given Congress. Committee co-membership reflects the total number of shared committees between senator i and j for a given Congress. Ideological distance (based on DW-NOMINATE methodology) reflects the difference in ideologies between senators i and j. Same office building (floor) is equal to 1 if senators i and j have offices in the same office building (floor). The senator-seat selection Model 1a includes indicator variables, which equal 1 if the senator's new seat in Congress t is in the same row, section, row and section, is the same exact seat, or is at a similar angle from the center aisle as their last seat in Congress $t - 1$. Model 1b includes, but does not show, the covariates for same party, both Democrats, same state, same cohort, both freshmen, and same gender as well as controls for the sum and difference of the senators' tenures. All models include Congress fixed effects; Model 1a also includes senator and seat fixed effects; none of the models include dyad fixed effects. Model 1a has more observations because it includes all the combinations of senators and their potential within-party seats.
Robust standard errors are in parentheses; for model 1a, the standard errors are clustered by senator; for model 1b the standard errors are clustered by dyad. +significant at 10%; *significant at 5%; **significant at 1%.

DOI: 10.1002/smj

robust to the inclusion of our main independent variable, Chamber distance (Model 2), as well as the inclusion of dyad-level fixed effects (Models 3 and 4). The absence of robust same-office effects, perhaps due to large congressional staffs, is consistent with a study on the House of Representatives (Rogowski and Sinclair, 2012).

Two senators who are closer to each other in the Senate Chamber have a greater likelihood of co-sponsoring bills (Model 2), providing support for Hypothesis 1. This effect is robust to the inclusion of dyad fixed effects (Model 4). Using estimates from Model 4, a dyad with a Chamber distance one standard deviation below the average sponsors 7.0 percent more bills than a dyad whose senators are one standard deviation above the average Chamber distance. These results hold—and in fact strengthen—when we include directed co-sponsorship ties (Model 8) and when we restrict our dependent variable to bills with fewer co-sponsors (results not shown).

To address potential endogeneity issues, we present selection-on-observables results in Table 4. We first model a senator's likelihood of choosing a Chamber seat (Model 1a) and find strong spatial inertia in seat choice. We then use the first-stage estimates as (inverse) weights in the second stage ordinary least squares (OLS) regression (Model 1b). Our results are comparable to our baseline model with no fixed effects (Table 3, Model 2). Thus, after correcting for senator matching to particular seats, we see that Chamber distance affects the likelihood of co-support between two senators.

Moreover, we use two strategies—one focused on freshmen and the other focused on senior iconoclasts—to exploit quasi-exogenous movement of senators. Each one of these strategies may be considered a natural experiment within the Senate Chamber. In Figure 5, we present evidence that a freshman senator's ability to relocate on the Chamber floor is contingent on the results of the *subsequent* election. High turnover within the freshman's party (or the gain of seats previously held by the opposing party) provides opportunities for the freshman senator to change their seat. Figure 5 suggests that a one-standard-deviation increase in the same-party turnover (i.e., 10 new same-party members) increases a freshman's Chamber mobility by 2.6 m. Under the logic that subsequent election results, and the Chamber relocations that follow these results, are outside

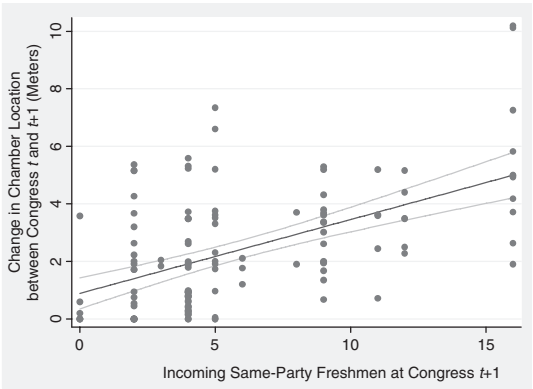

Figure 5. Senator Chamber relocation and same-party turnover. The data comprises 125 observations of freshman senators. The change in Chamber location is the distance (in meters) between a senator's seat location from their first Congress (t) to their second Congress ($t+1$). Incoming same-party freshmen at $t+1$ measures the number of freshmen entering a senator's party in Congress ($t+1$). Freshmen entries are created either by the loss of a same-party incumbent or by winning seats from the other party. Fitted values, as well as 95 percent confidence intervals, are shown

the freshman's control, we restrict our sample to dyads that contain a freshman senator in their first or second Congress (Table 3, Model 5). For these observations, a dyad with a Chamber distance one standard deviation below the average sponsors 8.4 percent more bills than a dyad whose senators are one standard deviation above the average Chamber distance.

By contrast, senior senators have a greater array of location choices within the Senate Chamber. Although most senior senators choose to sit near the center, we identified 102 individuals who deviated from this norm at some point in time. Building on the assumption that distances between all other senators and these iconoclastic senators are unplanned, we restrict our sample to dyads that contain at least one iconoclast. For these observations, dyads whose distance is one standard deviation below the average co-sponsor 14.1 percent more bills than do those dyads whose distance is one standard deviation above the average (Table 3, Model 6).

We suggest that an individual's location on the Senate Chamber floor structures their interaction patterns. To examine the plausibility of this mechanism, we surmised that senators actively campaigning in their home district had less physical presence on the Chamber floor. For these

DOI: 10.1002/smj

models, we do not use a within-dyad estimator, as this specification would lead to gaps in time between observations, as dyad members cycle in and out of election campaigns. Our results indicate that the effect of geographic distance was 43 percent weaker (in magnitude) for dyads with one or more senators in the midst of an election cycle, compared to dyads where neither party was campaigning for election (Table 3, Model 7). Note that a dyad simply having senator *i* and/or *j* in an election cycle does not affect their rate of co-sponsorship; rather, the effect of the election is visible only in the interaction term.

We test our second hypothesis in Table 5, Models 1 and 2. We predict that geographic effects within the organizational forum matter less for individuals who wield greater power within the organization. In the U.S. Senate, the critical correlate of an individual's power is their seniority within the legislative body. To examine this

Table 5. Effects of power on Chamber distance and bill co-sponsorship (OLS)

Measure of Power	(1) High tenure	(2) Committee leadership
Chamber distance (m)	−0.502**	−0.568**
	(0.087)	(0.081)
i OR *j* high tenure (indicator)	1.268	
	(1.237)	
i AND *j* high tenure (indicator)	−3.105+	
	(1.629)	
Chamber distance × *i* OR *j* high tenure	0.0608	
	(0.091)	
Chamber distance × *i* AND *j* high tenure	0.378**	
	(0.136)	
i OR *j* committee leader (indicator)		−0.392
		(1.081)
i AND *j* committee leader (indicator)		−2.218
		(1.572)
Chamber distance × *i* OR *j* committee leader		0.188*
		(0.085)
Chamber distance × *i* AND *j* committee leader		0.504**
		(0.149)
Committee co-membership	2.108**	2.130**
	(0.396)	(0.396)
Ideological distance	−48.61**	−49.16**
	(5.084)	(5.066)
Same office building	−0.711	−0.712
	(0.564)	(0.564)
Same office building floor	−0.700	−0.733
	(0.704)	(0.704)
Constant	78.60**	80.65**
	(12.78)	(12.77)
Observations	53,955	53,955
R-squared	0.570	0.569
Number of dyads	15,506	15,506
Dyad fixed effects	Yes	Yes
Congress fixed effects	Yes	Yes

All models include, but do not show, controls for the sum and absolute difference of senator *i* and *j*'s tenure, as well as dyad and Congress fixed effects. Chamber distance reflects the distance (in meters) between two senators in the Senate Chamber for a given Congress. Committee co-membership reflects the total number of shared committees between senator *i* and *j* for a given *C*ongress. Ideological distance (based on DW-NOMINATE methodology) reflects the difference in ideologies between senators *i* and *j*. Same office building (floor) is equal to 1 if senators *i* and *j* have offices in the same office building (floor). Model 1 includes an indicator variable, set to 1, if *i* or *j* is in the top 50th percentile of the tenure distribution, as well as an indicator variable if both *i* and *j* are in the top 50th percentile. Model 1 also includes interaction terms between these tenure distribution indicators and Chamber distance. Model 2 includes an indicator variable, set to 1, if *i* or *j* has a committee leadership position: either the chairman or the ranking minority member of a Senate standing committee. Model 2 also includes an indicator if both *i* and *j* are committee leaders, as well as interaction terms between these committee leadership indicators and Chamber distance. Similar results are obtained when we use Poisson regression models, or a split sample approach, rather than interaction terms.
Robust standard errors, clustered by dyad, are in parentheses; +significant at 10%; *significant at 5%; **significant at 1%.

DOI: 10.1002/smj

hypothesis, we first generated indicator variables for dyads that contain zero, one, or two senators in the top 50th percentile of the tenure distribution, and then interacted these indicator variables with Chamber distance. We excluded the indicator for dyads containing no high-tenure individuals as a reference group. Our results (Table 5, Model 1) suggest that Chamber distance matters 77 percent less for dyads with two high-tenure senators than for dyads with no high-tenure senators. In a parallel approach (Table 5, Model 2), we observe that Chamber distance matters 89 percent less for dyads with two committee leaders than for dyads with no committee leaders. Lastly, we observe that Chamber distance has an intermediate effect, 35 percent less, on dyads with only one committee leader relative to dyads with no committee leaders. These findings support Hypothesis 2 and provide evidence that powerful individuals within an organizational forum do not depend as heavily on geographically mediated interactions to garner joint support.

DISCUSSION AND CONCLUSION

This paper has examined the contingent role of micro-geographic distance in structuring the bill co-sponsorship patterns among U.S. senators seated in an organizational forum. We build upon a singularly rich dataset, including precise measurements of geographic relocation, to suggest that an individual's location within the forum structures his or her interactions and, hence, their ability to garner joint support. We use a selection-on-observables methodology, as well as shocks to seating rearrangements, to account for alternative mechanisms that may underlie these interactions. Furthermore, we find that the effect of micro-geographic distance is highly attenuated for the most powerful individuals, suggesting that actors with less appeal depend more on the opportunities afforded by their local environment. These results speak to research on the geographic determinants of interaction patterns and strategic actions in the workplace, and we believe that our focus on a population of strategic elites in an organizational forum may serve as a lower bound on geographically mediated workplace interactions.

The findings in this study serve as a counterpoint to those from research examining friendship formation among students in dormitory settings (Festinger *et al.*, 1950; Marmaros and Sacerdote, 2006). New dormitory residents have limited social capital, with strong incentives to form relationships. Thus, the magnitude of effects in studies linking micro-geographic distance with friendship in dormitory settings may be disproportionately large. By direct contrast, the link we observe between micro-geographic distance and support patterns in the U.S. Senate Chamber may be disproportionately small. Taken together, we expect the role of micro-geography in shaping interactions at the workplace to lie between these two distal estimates.

But, this study is not without concerns. First, an actor's forum location remains the endogenous choice of individuals, organizations, or both, and this fact has complicated the analysis of geographic effects, even for settings where archival datasets are incredibly rich (Cowgill, Wolfers, and Zitzewitz, 2009; Kleinbaum, Stuart, and Tushman, 2008). Although we have brought to bear an array of orthogonal methodologies which, taken together, increase the plausibility of our findings, none is without untestable assumptions. A second concern is the generalizability of our results. U.S. senators are far from prototypical actors, and we make no efforts to suggest that our results are representative for the population at large. Rather, we propose that the characteristics of this group and setting make it a likely lower bound for geographic effects in the broader organizational context. However, our findings may be most easily extended to (sub)populations of strategically oriented or elite individuals. In addition, our findings within an organizational forum are most relevant for complex organizations where coordination is (partially) organic and power is widely distributed. Small organizations with tight, centralized control may serve as a boundary condition for our findings. Taken together, our emphasis on the environmental scaffold underlying interaction patterns and support may be of particular interest to scholars who study strategic decision making (e.g., March, 1991), power within organizations (Mintzberg, 1983; Pfeffer, 1981), and even organizational design (Van de Ven, 1986).

A study of the Senate Chamber draws attention to the role organizational forums play in shaping intraorganizational interactions. A large body of recent research has emphasized the importance of social networks within the organization. We add to

DOI: 10.1002/smj

this growing body of literature by showcasing one class of organizational setting designed to mediate broad, organic sets of relationships. With parallels in corporate retreats, lunchrooms, and mixers, our study reinforces the importance, and limitations, of these organization design elements.

In addition, our research bridges the gap between the literature on ecology and strategic management. Ecologists have long emphasized the critical role of environmental conditions in shaping an actor's survival (Hannan and Freeman, 1984) and competitive structure (Baum and Mezias, 1992). The prominence of external environment in ecological theories has led some to critique that ecological theory leaves little room for strategic action (cf. Dobrev, van Witteloostuijn, and Baum, 2006). Our framework adheres to the ecologist's preoccupation with environmental antecedents to individual action. Concurrently, we embrace the notion that individuals are instrumental, and seek to form relationships that advance their personal goals. This paper begins a reconciliation of these two apparently disparate perspectives by outlining attributes (e.g., intraorganizational power) that may allow (some) individuals to transcend their local environment. To summarize our point of view, individuals may be universally instrumental, but their opportunities to engage in strategic relationships are unevenly distributed across both ecological and sociodemographic space. We envision this paper as the first step in a conversation engaging ecology, networks, and strategy.

At a minimum, we hope that this paper returns attention to the role of geography and environmental conditions on an individual's patterns of interaction. Recently, the literature examining the consequences of relationships and networks has increased exponentially, yet this burgeoning body of literature is fraught with empirical complexities. This paper emphasizes the critical importance of local environments, and conditions that allow (some) individuals to transcend these environments, in shaping strategic actions. We believe that situating strategic actions within an environmental context, with an emphasis on the conditions that allow individuals to transcend their local environment, may be one avenue forward to advance our understanding of strategic interaction patterns within the organization.

ACKNOWLEDGEMENTS

The authors thank Don Ritchie, Senate Historian, for his guidance and assistance. We also thank Will Mitchell, Stefano Breschi, Martin Gargiulo, Sarah Kaplan, Seth Masket, Sameer Srivastava, two anonymous reviewers, as well as numerous participants at the Rotman Strategy Brownbag, Academy of Management, Organization Science Winter Conference, Bocconi University, Wharton People & Organizations, and the 5th Political Networks Conference.

REFERENCES

Agrawal AK, Cockburn I, Rosell C. 2010. Not invented here? Innovation in company towns. *Journal of Urban Economics* **67**(1): 78–89.

Allatta JT, Singh H. 2011. Evolving communication patterns in response to an acquisition event. *Strategic Management Journal* **32**(10): 1099–1118.

Allen TJ. 1977. *Managing the Flow of Technology: Technology Transfer and the Dissemination of Technological Information within the R&D Organization*. MIT Press: Cambridge, MA.

Ammerman AJ. 1990. On the origins of the Forum Romanum. *American Journal of Archaeology* **94**(4): 627–645.

Azoulay P, Liu CC, Stuart T. 2009. Social influence given (partially) deliberate matching: career imprints in the creation of academic entrepreneurs. Working Paper No. 09-136, Harvard Business School Entrepreneurial Management, Boston, MA.

Baker WE. 1984. The social structure of a national securities market. *American Journal of Sociology* **89**(4): 775–811.

Baum JAC, Mezias SJ. 1992. Localized competition and organizational failure in the Manhattan hotel industry, 1898–1990. *Administrative Science Quarterly* **37**(4): 580–604.

Baum JAC, Rowley TJ, Shipilov AV, Chuang YT. 2005. Dancing with strangers: aspiration performance and the search for underwriting syndicate partners. *Administrative Science Quarterly* **50**(4): 536–575.

Becker F, Sims W, Schoss JH. 2003. Interaction, identity and collocation: what value is a corporate campus? *Journal of Corporate Real Estate* **5**(4): 344–365.

Blau PM. 1963. *The Dynamics of Bureaucracy: Study of Interpersonal Relations in Two Government Agencies*. University of Chicago Press: Chicago, IL.

Brass DJ. 1984. Being in the right place: a structural analysis of individual influence in an organization. *Administrative Science Quarterly* **29**(4): 518–539.

Brown SL, Eisenhardt KM. 1997. The art of continuous change: linking complexity theory and time-paced evolution in relentlessly shifting organizations. *Administrative Science Quarterly* **42**(1): 1–34.

Browne WP. 1985. Multiple sponsorship and bill success in US state legislatures. *Legislative Studies Quarterly* **10**(4): 483–488.

Burkett T. 1997. Cosponsorship in the United States Senate: a nework analysis of Senate communication and leadership, 1973–1900. Dissertation. University of South Carolina: Columbia, SC.

Burt RS. 2005. *Brokerage and Closure: An Introduction to Social Capital*. Oxford University Press: New York.

Campbell JE. 1982. Cosponsoring legislation in the US congress. *Legislative Studies Quarterly* **7**(3): 415–422.

Chakrabarti A, Mitchell W. 2013. The persistent effect of geographic distance in acquisition target selection. *Organization Science* **24**(6): 1805–1826.

Chase ID. 1991. Vacancy chains. *Annual Review of Sociology* **17**: 133–154.

Cho TS, Hambrick DC. 2006. Attention as the mediator between top management team characteristics and strategic change: the case of airline deregulation. *Organization Science* **17**(4): 453–469.

Cowgill B, Wolfers J, Zitzewitz E. 2009. Using prediction markets to track information flows: evidence from Google. Working Paper, Department of Economics, Dartmouth College, Hanover, NH.

Deering CJ, Smith SS. 1997. *Committees in Congress*. CQ Press: Washington, DC.

Dehejia RH, Wahba S. 2002. Propensity score-matching methods for nonexperimental causal studies. *Review of Economics and Statistics* **84**(1): 151–161.

Dobrev SD, van Witteloostuijn A, Baum JAC. 2006. Introduction: ecology versus strategy or strategy and ecology?. In *Ecology and Strategy — Advances in Strategic Management* (Volume **23**), Baum JAC, Dobrev SD, van Witteloostuijn A (eds). Emerald Group Publishing Limited: Bingley, UK.

Eisenhardt KM, Zbaracki MJ. 1992. Strategic decision making. *Strategic Management Journal* **13**: 17–37.

Feld SL. 1981. The focused organization of social ties. *American Journal of Sociology* **86**(5): 1015–1035.

Fenno RF. 1989. *The Making of a Senator: Dan Quayle*. CQ Press: Washington, DC.

Fenno RF. 2002. *Home Style: House Members in Their Districts*. Longman Publishing Group: Boston, MA.

Festinger L, Schachter S, Back K. 1950. *Social pressure in informal groups*. Stanford University Press: Palo Alto, CA.

Fleming L, Waguespack DM. 2007. Brokerage, boundary spanning, and leadership in open innovation communities. *Organization Science* **18**(2): 165–180.

Foss NJ. 2003. Selective intervention and internal hybrids: interpreting and learning from the rise and decline of the Oticon spaghetti organization. *Organization Science* **14**(3): 331–349.

Fowler JH. 2006a. Connecting the congress: a study of cosponsorship networks. *Political Analysis* **14**(4): 456–487.

Fowler JH. 2006b. Legislative cosponsorship networks in the US House and Senate. *Social Networks* **28**(4): 454–465.

Ghoshal S. 1987. Global strategy: an organizing framework. *Strategic Management Journal* **8**(5): 425–440.

Gieryn TF. 2000. A space for place in sociology. *Annual Review of Sociology* **26**: 463–496.

Hannan MT, Freeman J. 1984. Structural inertia and organizational change. *American Sociological Review* **4**(2): 149–164.

Hansen MT. 1999. The search-transfer problem: the role of weak ties in sharing knowledge across organization subunits. *Administrative Science Quarterly* **44**(1): 82–111.

Harward BM, Moffett KW. 2010. The calculus of cosponsorship in the US Senate. *Legislative Studies Quarterly* **35**(1): 117–143.

Ingram P, Morris MW. 2007. Do people mix at mixers? Structure, homophily, and the "life of the party". *Administrative Science Quarterly* **52**(4): 558–585.

Kessler D, Krehbiel K. 1996. Dynamics of cosponsorship. *American Political Science Review* **90**(3): 555–566.

Kleinbaum AM, Stuart T. 2013. Inside the black box of the corporate staff: social networks and the implementation of corporate strategy. *Strategic Management Journal* **24**(5): 1316–1336.

Kleinbaum AM, Stuart T, Tushman M. 2008. Communication (and coordination?) in a modern, complex organization. Working Paper 2009-04, Harvard Business School, Boston, MA.

Liu CC. 2013. Brokerage by design: formal structure, geography, and crosscutting ties. Working Paper, Rotman School of Management, University of Toronto, Ontario, Canada.

Lovas B, Ghoshal S. 2000. Strategy as guided evolution. *Strategic Management Journal* **21**(9): 875–896.

March JG. 1962. The business firm as a political coalition. *Journal of Politics* **24**(04): 662–678.

March JG. 1991. Exploration and exploitation in organizational learning. *Organization Science* **2**(1): 71–87.

Marmaros D, Sacerdote B. 2006. How do friendships form? *Quarterly Journal of Economics* **121**(1): 79–119.

Mayhew D. 1974. *Congress: The Electoral Connection*. Yale University Press: New Haven.

McEvily B, Perrone V, Zaheer A. 2003. Trust as an organizing principle. *Organization Science* **14**(1): 91–103.

Mintzberg H. 1979. *The Structuring of Organizations: A Synthesis of the Research*. Prentice-Hall: Englewood Cliffs, NJ.

Mintzberg H. 1983. *Power In and Around Organizations*. Prentice-Hall: Englewood Cliffs, NJ.

Mintzberg H, McHugh A. 1985. Strategy formation in an adhocracy. *Administrative Science Quarterly* **30**(2): 160–197.

Nelson G. 2011. Committees in the U.S. Congress, 1947–1992, Senate.

Oldham GR, Brass DJ. 1979. Employee reactions to an open-plan office: a naturally occurring quasi-experiment. *Administrative Science Quarterly* **24**(2): 267–284.

Ouchi WG. 1980. Markets, bureaucracies, and clans. *Administrative Science Quarterly* **25**(1): 129–141.

Patterson SC, Mughan A. 2001. Fundamentals of institutional design: the functions and powers of parliamentary second chambers. *Journal of Legislative Studies* **7**(1): 39–60.

Pettigrew AM. 1973. *The Politics of Organizational Decision-Making*. Tavistock: London, UK.

Pfeffer J. 1981. *Power In Organizations*. Pitman Publishing: Marshfield, MA.

Pfeffer J. 1982. *Organizations and Organization Theory*. Pitman Publishing: Marshfield, MA.

Pfeffer J. 1992. *Managing With Power: Politics and Influence in Organizations*. Harvard Business School Press: Boston, MA.

Poole KT, Rosenthal H. 2007. *Ideology and Congress*. Transaction Publishers: New Brunswick, NJ.

Reagans R, McEvily B. 2003. Network structure and knowledge transfer: the effects of cohesion and range. *Administrative Science Quarterly* **48**(2): 240–267.

Rogowski JC, Sinclair B. 2012. Estimating the causal effects of social interaction with endogenous networks. *Political Analysis* **20**(3): 316–328.

Rumelt RP. 1982. Diversification strategy and profitability. *Strategic Management Journal* **3**(4): 359–369.

Sasovova Z, Mehra A, Borgatti SP, Schippers MC. 2010. Network churn: the effects of self-monitoring personality on brokerage dynamics. *Administrative Science Quarterly* **55**(4): 639–670.

Selznick P. 1957. *Leadership in Administration*. Harper & Row: New York.

Siggelkow N, Levinthal D. 2003. Temporarily divide to conquer: centralized, decentralized, and reintegrated organizational approaches to exploration and adaptation. *Organization Science* **14**(6): 650–669.

Sommer R. 1959. Studies in personal space. *Sociometry* **22**(3): 247–260.

Sorenson O, Stuart TE. 2001. Syndication networks and the spatial distribution of venture capital investments. *American Journal of Sociology* **106**(6): 1546–1588.

Sorenson O, Stuart TE. 2008. Bringing the context back in: settings and the search for syndicate partners in venture capital investment networks. *Administrative Science Quarterly* **53**(2): 266–294.

Srikanth K, Puranam P. 2011. Integrating distributed work: comparing task design, communication, and tacit coordination mechanisms. *Strategic Management Journal* **32**(8): 849–875.

Stewart III C, Woon J. 2011. Congressional Committee Assignments, 103rd to 112th Congresses, 1993–2011, Senate.

Stuart TE. 1998. Network positions and propensities to collaborate: an investigation of strategic alliance formation in a high-technology industry. *Administrative Science Quarterly* **43**(3): 668–698.

Thompson JD. 1967. *Organizations in Action: Social Science Bases of Administrative Theory*. McGraw-Hill: New York.

Tsai W. 2000. Social capital, strategic relatedness and the formation of intraorganizational linkages. *Strategic Management Journal* **21**(7): 925–939.

Tushman ML, Scanlan TJ. 1981. Boundary spanning individuals: their role in information transfer and their antecedents. *Academy of Management Journal* **24**(2): 289–305.

Van de Ven AH. 1986. Central problems in the management of innovation. *Management Science* **32**(5): 590–607.

van de Ven AH, Ganco M, Hinings CR. 2013. Returning to the frontier of contingency theory of organizational and institutional designs. *Academy of Management Annals* **7**(1): 393–440.