

# The Ebb and Flow of Social Network Ties Between District Leaders Under High-Stakes Accountability

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*Recent scholarship suggests the importance of school district offices in supporting reform. These studies provide strategies for building relations between central offices and sites in order to improve change efforts. However, what is frequently overlooked is that organizational reform efforts are socially constructed. Therefore, examining the underlying reform-related social networks may provide insight into how relational structures support or constrain efforts at reform. This longitudinal case study draws upon social network analysis and interviews to examine the reform-related knowledge, advice, and innovation network structures of central office and site leaders in a district facing sanction for underperformance and engaging a districtwide reform. Findings indicate that over time, the networks increased the number of superficial interactions, and more frequent exchanges remained unchanged, resulting in a centralized network structure.*

**KEYWORDS:** organization theory/change, educational reform, networking, leadership

A core and hotly contested aspect of the No Child Left Behind (NCLB) act of 2001 is the adequate yearly progress (AYP) benchmark that establishes goals for district and school performance. Failure to meet these targets results in designation as “in need of improvement” (INI), leading to

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progressive sanctions for districts and schools. Important to this policy context is the fact that the number of schools in INI is growing. During the 2004–2005 school year alone, individual states identified more than 9,000 schools in INI, representing a nearly 50% increase over the previous year (Stullich, Eisner, McCrary, & Roney, 2006). In this article, we argue that the increase in the numbers of districts and schools in INI may be due in part to an overreliance on reforms focused on technical compliance and a lack of attention to the social relations and informal networks that mediate school and district improvement under NCLB. Furthermore, we posit that the high stakes involved may result in changes in network structures over time that limit—rather than facilitate—the complex changes necessary to bring about district turnaround.

In California, where this study takes place, 2,796 schools serving over 1 million students were designated as INI during 2009–2010, representing nearly 45% of all the schools in the state receiving federal funding (California Department of Education [CDE], 2009). The number of local education agencies (LEAs) is also increasing, with 298 districts in INI for the 2009–2010 school year, representing 47% of all districts in the state receiving federal funds. Nearly 60% of districts have been in INI for multiple years (CDE, 2009). Moreover, despite numerous efforts at reform (Mintrop, 2004; Mintrop & Trujillo, 2007), only 1% of LEAs improved enough to be removed from INI status (CDE, 2009). Ironically, under NCLB, students who have been traditionally “left behind,” and for whom presumably the law was enacted, are now educated in systems that disproportionately suffer the effects of sanctions (Stullich et al., 2006; Sunderman, Kim, & Orfield, 2005). This worsening situation has been described as one of the most pressing social justice–civil rights issues facing the United States (Sunderman et al., 2005).

Educational leaders in underperforming systems have been increasingly tasked with and held responsible for developing and implementing reforms at the district and school levels (Mintrop & Trujillo, 2005, 2007). Typically, their efforts focus on implementing formal structures, processes, and accountability levers to improve performance (Daly, 2009; Finnigan & Stewart, in press). While these approaches are important, they have resulted in inconsistent improvement and have led districts and schools to remain on, and progress toward, more intense sanctions (Mintrop & Trujillo, 2007).

Recent research suggests that in addition to these structures and processes, attention to the relational linkages through which reform flows within low-performing districts may be critical to school improvement (Coburn & Russell, 2008; Daly & Finnigan, 2009; Daly, Moolenaar, Bolivar, & Burke, in press; Penuel, Riel, Krause, & Frank, 2009). Furthermore, an in-depth exploration of these networks or linkages would enable better understanding of the limitations of organizational change within these contexts. While the education community has begun to focus on the development of collaborative structures *within* schools (Harris & Chrispeels, 2006; McLaughlin & Talbert, 1993; Newmann & Wehlage, 1995; Stoll & Louis, 2007), improved relations

*between* school site principals and central office administrators within an entire district, which we refer to collectively as a district's leadership team, may be necessary to support complex, districtwide reform (Copland & Knapp, 2006; Daly & Finnigan, 2009). This study builds on recent scholarship suggesting the importance of leadership networks in the support of organizational change (Balkundi & Kilduff, 2005; Bartol & Zhang, 2007; Kilduff & Krackhardt, 2008; Mehra, Dixon, Brass, & Robertson, 2006).

Our study examines the underlying social networks of a district leadership team over time as it engages in systemwide change in response to accountability sanctions. Our exploratory case study takes place in the La Estasis School District,<sup>1</sup> an urban fringe district in California in its 4th year in INI. We draw on social network analysis, a systemic approach that involves quantifying and graphically displaying the ties and overall structure of informal networks (Scott, 2000; Wasserman & Faust, 1998), as well as qualitative interviews to answer the following research questions: In what ways have reform-related social networks between district and site leaders evolved over a 2-year period? How do district and school leaders perceive the evolution of the social networks and its effect on the exchange of reform-related resources within the district?

Despite calls in the policy literature for better understanding the structure of social relations in district reform (Honig, 2008; Smylie & Evans, 2006), limited empirical work has examined the underlying social networks between school and district leaders.<sup>2</sup> Three studies have examined these linkages (see Daly & Finnigan, 2009; Hite, Williams, & Baugh, 2005; Hite, Williams, Hilton, & Baugh, 2006), and no published studies exist on the evolution of these networks in districts under sanction. Our study builds upon prior research related to accountability policies, district reform, and network relationships while making a unique contribution by analyzing the evolution of reform-related networks in a low-performing district under sanction. Given the increasing number of districts in INI, there is an urgency to understand the complex relations within these organizations and the ways in which the leadership network facilitates or inhibits efforts at meeting organizational goals.

## **Background**

In building the foundation for the study, we provide a review of the challenges facing schools and districts under sanction as well as the limited signs of improvement despite repeated efforts at change. We then explore the critical role of district offices in supporting reform and connect those efforts to the largely unexplored importance of relational linkages between districts and schools that may facilitate or constrain the implementation of reform in an accountability context. In bringing together these literatures, we argue that improvement under sanction will require closer attention to the informal relations between and among school and central office staff as they undergo district turnaround in response to NCLB.

Given the pressure to achieve at increasingly high levels or risk facing progressive sanctions under NCLB, educators have ratcheted up the number of improvement efforts under way in an effort to exit INI (Mintrop, 2004; Mintrop & Trujillo, 2005). However, these efforts have resulted in inconsistent performance and, in most cases, an inability of schools to significantly improve (Mintrop & Sunderman, 2009). Underperforming schools are typically staffed with new and often uncredentialed teachers and are increasingly more highly regulated and inflexible as they move further into INI (Sunderman et al., 2005). Moreover, these school climates tend to be turbulent with high staff turnover, multiple and changing reforms, and an intensification of pressure to improve (Mintrop, 2004) as well as challenges related to leadership (Daly, 2009; Finnigan & Stewart, *in press*) and teacher motivation (Finnigan & Gross, 2007). These turbulent environments make low-performing schools less attractive workplaces that tend to be staffed with insufficiently trained teachers with low levels of commitment (Lankford, Loeb, & Wyckoff, 2002).

Malen, Croninger, Muncey, and Jones (2002) and Mintrop and Truillo (2007) have found that increasing sanctions may negatively affect the professional environment by limiting collaboration, professional interaction, and the exchange of instructional practices. Evidence from schools that have improved suggest that if school climates are more trusting, interactive, and collaborative, then educators may be able to successfully negotiate sanctions and increase student improvement (Bryk & Schneider, 2002; Mintrop, 2004; Mintrop & Trujillo, 2007; O'Day, 2004). Taken on balance, this scholarship suggests the importance of attending not only to the technical core of improvement but also to relational linkages related to change.

Improving INI schools is complex and difficult work that requires attention to the broader system in which schools reside. Many scholars have shifted from examining the school site as the unit of reform to exploring linkages between central offices and sites in engendering change (Hightower, Knapp, Marsh, & McLaughlin, 2002; Honig, 2006; Honig & Coburn, 2008; Hubbard, Mehan, & Stein, 2006; Marsh, 2002; McLaughlin & Talbert, 2003; Rorrer, Skrla, & Scheurich, 2008; Togneri & Anderson, 2003). This line of inquiry suggests the importance of a systemwide approach to improvement (Marsh et al., 2005) as district administrators reorient organizational structures and processes to align with reform goals (Rorrer et al., 2008).

Furthermore, researchers have suggested that explicit, shared theories of action, mutual "sensemaking," and clear consistent communication around change efforts between central office administrators and site leaders results in greater systemic coherence and goal attainment (Agullard & Goughnour, 2006). As central office leaders are strategically positioned to "broker" resources, research evidence, knowledge, and ideas across the district (Burch & Spillane, 2004; Honig, 2006, 2008), these leaders play an important role in district- and school-level reform. Absent school-central offices connections, successful efforts at reform appear remote (Leithwood, Louis, Anderson, &

Wahlstrom, 2004). As Honig (2003, 2006) identifies, central office administrators' "boundary-spanning" activities enable local implementation at the school site by sharing information and resources but are often short-lived because of other demands as well as a lack of clear parameters about how to support schools in improvement.

Successful reform efforts, therefore, may require a shift in the way that change strategies are conceptualized and enacted within a district. This shift entails a move from a singular focus on individualized segments of the organization to engaging the entire system in a network of connections. The balance of this work suggests the need for a more interconnected systems approach to organizational change and the movement of information and knowledge (Fullan, 2005; Hargreaves & Fink, 2006; McLaughlin & Talbert, 2003), requiring that district and site leaders "think systemically about schools and their development and see educational organizations in terms of their interdependent parts" (Smylie, Wenzel, & Fendt, 2003, p. 155). Studies of successful districts that applied systemic approaches to change suggest a range of specific strategies that schools and districts can take in building stronger intraorganizational ties (Chrispeels, 2004; Honig, 2004; Togneri & Anderson, 2003). These strategies include creating structures for increased collaboration between central offices and sites (McLaughlin & Talbert, 2003), developing learning partnerships (Copland & Knapp, 2006), enhancing communication (Agullard & Goughnour, 2006), distributing leadership (Leithwood et al., 2007; Spillane, 2006), offering targeted support (Massell, 2000; Massell & Goertz, 1999), and providing input on decisions (Brazer & Keller, 2006).

In addition, research outside of education suggests that systemwide improvement is closely linked to the quality of relations within and across the organization (McGrath & Krackhardt, 2003; Tenkasi & Chesmore, 2003), as the structure of social relations supports or constrains opportunities for information transfer and the development of new knowledge between individuals, levels, and units (Ahuja, 2000; Tsai & Ghoshal, 1998). Frequent ties between leaders are important to a coordinated reform effort, as they support the transfer of tacit, nonroutine, and complex knowledge allowing for joint problem solving and systemwide solutions (Hansen, 1999; Reagans & McEvily, 2003; Uzzi, 1997). In effect, while a reform may prescribe particular ways of responding, it is ultimately the social ties between individuals that determines the shape, diffusion, and success of any change strategy (Spillane, Reiser, & Gomez, 2006). Therefore, the creation of strategic ties that enhance resource transfer will increase the district's ability to generate and diffuse knowledge.

We know that the numbers of districts and schools facing progressive sanction under NCLB is growing, with a disproportionate impact on educational systems that serve students who are traditionally left behind. This lack of performance is due to a host of complex issues, one of which includes the

traditional orientation of district offices toward school-level reform. Typically, in regard to reform, district offices have played a more tangential compliance-oriented role and, as such, have not provided for the systemic coherence and alignment around focused improvement efforts. Recent scholarship suggests the need for a systematic, consistent, and collaborative approach to reform with the district office playing a key role in creating alignment, communication, and clear focus. Despite the research suggesting the key role of districts, and the importance of collaborative work toward shared goals, there remains a gap in the literature in terms of understanding how informal social networks may support or constrain efforts in district turnaround.

### **Theoretical Framework**

As we focus our attention on the role of social ties and informal networks in the implementation of districtwide reform under accountability policy sanctions, we utilize a broad network lens to help frame our work. We begin this line of inquiry by discussing the link between networks and organizational improvement. We then ground our work in social capital theories to further delineate the relational ties within organizations and how these are understood in the literature. Finally, we discuss social network theory, including both the ties and structure of networks within an organization (such as a school district) as well as the research base related to the evolution of network relations over time and the ways in which network structures facilitate or inhibit change.

From a network perspective, the work of an organization is captured well by Hubbard and colleagues (2006), who define an organization as existing “in the interrelationships between activities of individuals” (p. 263). It is the interactions between and among individuals that compose the culture and structure of an organization. The assumption that undergirds this definition is that reform efforts are socially constructed (Hubbard et al., 2006). Therefore, attempts to modify formal structures in support of reforms often require changes in existing social relationships (Bartunek, 2001; Borgatti & Foster, 2003; Stevenson, Bartunek, & Borgatti, 2003). As we discuss in this section, it is the organizational interdependence of action (Giddens, 1979), reflecting a network of ties, that may ultimately moderate, influence, and even determine the direction, speed, and depth of a planned change (Krackhardt, 2001; Mohrman, Tenkasi, & Mohrman, 2003). As Mohrman et al. (2003) contends, “Lasting change does not result from plans, blueprints, and events, rather change occurs through the interaction of participants” (p. 321).

The concept of social capital is one of the basic foundations of social network theory. A number of theorists have written on social capital, each foregrounding a different aspect and offering a nuanced understanding of this concept (see, e.g., Bourdieu, 1986; Burt, 1992; Coleman, 1988; Lin, 2001). However, Lin (2001)

contends that the common denominator across these different theorists is the understanding that social capital consists of “the resources embedded in social relations and social structure which can be mobilized when an actor wishes to increase the likelihood of success in purposive action” (p. 24). Social capital is therefore a return on investment in a system’s social relations through which the resources of other individuals may be accessed, borrowed, or leveraged. This differentiates social capital from human capital, which refers to investments in training and development, or physical capital, which is contained in infrastructure and equipment (Bourdieu, 1986; Coleman, 1988; Dika & Singh, 2002; Lin, 2001).

Social capital is concerned with the resources that exist in relations *between* individuals, often referred to as “ties,” as opposed to the resources of an individual. In essence, social capital theory suggests that it is the ties between individuals in a system that creates a structure that ultimately determines access to resources (Burt, 1992; Coleman, 1988, 1990; Granovetter, 1973, 1982; Lin, 2001; Putnam, 1995). Social capital has been associated with a variety of positive outcomes, including access to information, power, and knowledge (Lin, 2001). In education, social capital has been linked to higher educational attainment (Dyk & Wilson, 1999), elevated aspirations (Stanton-Salazar & Dornbusch, 1995), and increased home-school connections (Horvat, Weininger, & Laureau, 2003).

Although the effects of social capital are generally positive, research has identified negative consequences, as social ties constrain actors within maladaptive situations or facilitate undesirable behavior (Portes & Sensenbrenner, 1993; Putnam, 1995; Volker & Flap, 2001). Maintaining social bonds, though providing an actor access to resources, may contain obligations that in turn hinder access to additional resources (Gargiulo & Bernassi, 1999; Uzzi, 1997). For example, a central office leader may support the work of a site administrator in securing resources but then may expect that the support be reciprocated. Therefore, while ties between actors facilitate access to resources, those same ties may constrain individuals from making additional ties or changing the nature of the existing relationship, creating a type of relational stability.

In the following pages, we discuss social network theory, including ties and network structure, to help the reader understand the theoretical underpinnings and type of analyses that is entailed in our study of La Estasis. Next, we focus on a few of the key mechanisms underlying network change and offer the concept of structural inertia as a way to contextualize the high-stakes accountability environment in which INI districts operate.

### **Social Network Theory: Ties and Structure**

The transfer of resources in any organization may be influenced by the quality of ties between actors. The content of the network flows through ties,

creating a structure that defines the purpose of the network and in turn how well the resources flow between actors (Scott, 2000; Wasserman & Faust, 1998). In this work, *resources* does not refer to the more common definition, which is associated with financial or monetary resources, but instead is defined as relational elements related to reform that flow through underlying social networks, including knowledge, advice, and innovation. Strong ties, often measured by quantity (frequency of interaction) or quality (how “good” is the interaction; Marsden & Campbell, 1984), have been found to support the transfer of tacit, nonroutine, or complex knowledge (Hansen, 2002; Reagans & McEvily, 2003; Uzzi, 1996), joint problem solving (Uzzi, 1997), and the development of coordinated and innovative solutions (Uzzi, 1997). In contrast, weak ties allow brokering opportunities between actors (Burt, 1997) and access to nonredundant, novel information (Granovetter, 1973). Scholars suggest that both strong and weak ties are necessary within a network, as they facilitate access to different kinds of information (Haythornthwaite, 2001; Tenkasi & Chesmore, 2003).

The number of connections between actors, referred to as density, which is the ratio of existing ties divided by possible ties between actors within a system, forms an overall network structure (Wasserman & Faust, 1998). Dense networks, meaning networks with a high percentage of ties, move complex resources more quickly than networks with fewer ties (Scott, 2000), provide increased opportunities for meeting collective goals (Balkundi & Harrison, 2006), and offer stable redundant relations through which knowledge, cooperative relationships, and innovation flow (Ghoshal, Korine, & Szulanski, 1994; Song, Nerur, & Teng, 2007; Tsai & Ghoshal, 1998).

Organizations with dense informal network structures within and between units generally achieve at higher levels of performance than those with sparse connections (Reagans & Zuckerman, 2001). However, those same densely connected networks may also inhibit performance due to the stability of ties, which may limit the introduction of novel information (Szulanski, 1996), reduce flexible organizational response, and primarily move redundant information (Burt, 1992; Hannan & Freeman, 1984).<sup>3</sup> In our study, we are interested in the density of ties in the network, given that dense relationships are often associated with the diffusion of complex relational resources that may be necessary in reforming INI districts.

In contrast, sparsely connected networks, in which members do not interact with many other actors, have been associated with access to novel information through nonredundant ties (Burt, 1992; Granovetter, 1973) and the opportunities for actors to “broker” information between disconnected parts of the network (Burt, 1992). However, in these networks, there is a tendency for actors to be unable to exchange vital ideas and tacit knowledge (Hansen, 1999). Sparse networks must, by implication, rely on a few members to act as brokers. Brokering occurs, for example, when a central office or school principal serves as a bridge between these groups. While



brokers move new resources, they also may filter, distort, or hoard resources, which inhibits overall organizational performance (Baker & Iyer, 1992; Burt, 1992).

Actors within a network, such as leaders within a district, may be more or less central in the network structure, depending on their ties. Centrality is considered actor “activity” in the network, referring to how many ties an actor initiates or receives (Freeman, 1979; Wasserman & Faust, 1998). Highly central actors have increased influence over the network due to access to multiple resources and the potential to create new linkages that may enhance social capital (Stuart, 1998; Tsai, 2001). Those who are less central receive less information and do not have opportunities to benefit from the resources held by those in more central positions. Moreover, less central individuals usually receive only the resources deemed necessary by those in centralized positions (Burt, 2000), thus restricting their perspective of the overall organization. Centrality can be considered a point of intersection in which the person in the center disproportionately amasses resources, thus providing greater influence over the network (Raider & Krackhardt, 2001).

Highly centralized networks form a structure referred to as core-periphery (CP; Borgatti & Everett, 1999). This structure is important to organizational change, as it involves individuals who are noncentral (or at the periphery) and central (or at the core). A CP structure limits the contribution of peripheral actors while simultaneously accentuating the influence of central actors (Egelhoff, 1988; Tsai, 2002). Highly centralized network structures are effective for the diffusion of routine noncomplex knowledge and information (Cummings & Cross, 2003), such as schedules, but impede the effectiveness of groups engaged in complex tasks, such as high-level communication (Borgatti & Cross, 2003), intraorganizational knowledge sharing (Tsai, 2000), and systemic change (Cummings & Cross, 2003; Kilduff & Tsai, 2003; Tenkasi & Chesmore, 2003).

In sum, ties, and the structures they form, are important to understanding districtwide reform, as they facilitate the transfer of resources if the necessary relationships are in place and are accessible, but they constrain resource exchanges if the ties do not have sufficient quality and connectivity to move resources (Daly & Finnigan, 2009; Hite et al., 2005). The underlying social structure determines the access and flow of resources to actors in the network, leading some scholars to suggest that the old adage “It is not what you know, but who you know” is more accurately “Who you know defines what you know” (Cross, Baker, & Parker, 2003).

### **Network Evolution: Choices and Structure**

There have been consistent calls to examine how networks evolve over time, as much of the social network research represents a single relational snapshot (Brass, 1995; Kilduff & Tsai, 2003; Krackhardt, 1994; Monge &

Eisenberg, 1987; Snijders, Steglich, & Schweinberger, 2007), yet a dearth of empirical literature exists on network evolution. Relations between actors are not brief events but, rather, can be conceptualized as states that have a tendency to endure over time (Snijders, Steglich, & Van de Bunt, 2010). Each individual actor has the opportunity to change their relations from one time period to the next, and these choices across a network create a structure that ultimately influences the choices and opportunities available to actors (Snijders et al., 2007). As applied to a reform effort, if individuals make choices to interact with other actors from across the system with a different knowledge base, there is an increased likelihood in the development and diffusion of novel information. In contrast, when actors interact with the same individuals in similar ways over time, they tend to replicate existing knowledge, thereby inhibiting change.

Research on the evolution of networks suggests that relationships and, subsequently, network structures tend toward balance (Heider, 1958). Balance theory (Heider, 1958), or transitivity (Wasserman & Faust, 1998), explains the creation, maintenance, and dissolution of ties on the basis of cognitive dissonance. Actors are more likely to create new strong direct ties with friends of friends and discontinue weaker relations with friends of enemies and enemies of friends (Wasserman & Faust, 1998). To the extent that ties between individuals are accompanied by a positive effect, balance theory will lead to closed triadic structures. Actors' choices over time tend toward triadic closure, creating directly connected "neighborhoods" of strong ties, making the "local" network stable despite fluctuations over the entire network (Kossinets & Watts, 2006).

Another key principle important to understanding the evolution of organizational ties is homophily. Homophily, colloquially described as "birds of a feather flocking together," proposes that actors sharing similar attributes will form ties over time at higher rates than dissimilar individuals (Kossinets & Watts, 2006; McPherson, Smith-Lovin, & Cook, 2001). Studies of homophily suggest that resources flowing through a network tend to be localized around a specific attribute. Therefore, the more similar individuals are on a specific attribute, such as people who serve in similar positions in the district or are veterans (versus newcomers), the more quickly resources flow between these actors. The converse is also true, with actors who are "distant" (different) on a specific attribute being more distant in the network (McPherson et al., 2001). Finally, research suggests that actors are likely to maintain and build ties with those for whom they have workflow relations (Brass, 1981; McPhee & Corman, 1995), including the exchange of resources, such as the knowledge necessary to complete tasks (Brass, 1981). For example, a principal and the special education director in the district may have an important workflow relation, as each is reliant on the other for task completion. This mutual dependency, if perceived as valuable and reliable, will increase the likelihood that actors will maintain a tie (Monge

& Contractor, 2003). However, if the relations are not considered valuable in meeting task demands, the relation is likely to be diminished.

In making tie choices, actors tend to reduce uncertainty (Albrecht & Bach, 1997). As a relationship between two actors develops, the level of uncertainty as to how the other will react in different situations will decline and the strength of the relationship will increase. Actors, therefore, form ties with those with whom they perceive less uncertainty in the interaction and are better able to predict response (Albrecht & Bach, 1997; Brass, 1984). Moreover, actors tend to seek reciprocal as opposed to asymmetric relations, as those ties provide mutual benefit to the actors, creating a reinforcing effect (Lin, 2001). Taken together, this suggests that actors tend to develop relations with others who provide predictable reciprocated responses, which may provide access to established resources but also may reinforce existing values and approaches, limiting the development of novel information and change.

Understanding the mechanisms of network change in INI districts requires understanding contextual pressures (Brass, Galaskiewicz, Greve, & Tsai, 2004), as networks are embedded in larger contexts (Granovetter, 1985). Although network structures may change to better meet organizational goals in response to changes in contextual pressures, those structures may also remain stable and not adapt or evolve to meet external demands; this is referred to as “structural inertia” (Hannan & Freeman, 1984). Structural inertia results from established, perhaps successful, network structures developed to meet previous organizational goals that now inhibit current change efforts (Hannan & Freeman, 1984; Hannan, Polos, & Carroll, 2004; Kim, Oh, & Swaminathan, 2006). Networks may become stable over time as existing relations, structures, and routines become intricately woven into the fabric of the organization. These tightly linked relations inhibit efforts at change and, ultimately, organizational performance (Hannan et al., 2004; Hannan & Freeman, 1984; Kim et al., 2006; Schwarz & Shulman, 2007), creating a “liability of newness” as new connections, approaches, routines, and structures may expose the organization to a higher risk of failure, and therefore are less appealing to organizational members (Hannan & Freeman, 1984). Organizations with long-term intraorganizational ties are more likely to experience structural inertia, especially if they operate in high-stakes contexts (Kim et al., 2006; Schwarz & Shulman, 2007).

When faced with significant threat, as INI districts are in the current accountability policy context, organizations restrict information flow, engage in poor decision making, and limit divergent views, thereby essentially “protecting” the organization from perceived attack (Staw, Sandelands, & Dutton, 1981). The rigidity that is produced in the system in response to a threat is referred to as the “threat-rigidity thesis” (Staw et al., 1981). Simulations by Krackhardt and Stern (1988) support this thesis, suggesting that underperceived threat networks become more closed to outside ties and internally focused, thus limiting the way organizations negotiate external pressures.

The tension between maintaining existing organizational structures and enacting new reforms in a highly uncertain environment, such as a district facing sanction, may result in a form of organizational homeostasis in which the system skews toward continuity or the continuation of existing approaches or strategies. Thus, structural changes over time are less likely, or at least significantly reduced, given well-established patterns of interactions between actors within the system and the need to protect the organization. Using social network analysis as an analytic tool offers a unique contribution to the literature on districtwide reform under accountability policy sanctions, as network structure is closely linked to the ability of the organization, such as a district, to meet goals and performance targets (Guzzo & Shea, 1992).

### **Study Design**

We used a longitudinal case study to examine and explore the evolution of the networks related to a districtwide reform in the La Estasis School District.<sup>4</sup> An exploratory case study approach is most appropriate when the phenomenon of interest has a level of complexity that requires multiple data sources and methods to gain an in-depth understanding (Yin, 2003). In order to capture the complexity of the case, we employed a mixed-methods sequential design (Caracelli & Greene, 1993; Creswell, 2003; Tashakkori & Teddlie, 2003) with the 2 years of quantitative network data as the dominant data source and interviews as a supplemental data source. In the first phase, we collected network survey data, which provided details regarding ties, informal position of actors, and structure of the network over time. In the second phase, we collected qualitative interview data from a limited number of respondents to better understand and elaborate on the quality of ties and factors related to the network evolution. The combination of survey and interview methods provided for a more nuanced analysis than we would have acquired through just one of these types of data (Tashakkori & Teddlie, 2003).

La Estasis serves students in kindergarten through eighth grade in 18 schools located in a rapidly growing and changing “urban fringe” area near Los Angeles, California. Over the past 10 years, the district has moved from serving students from a relatively homogenous population in terms of ethnic, linguistic, and socioeconomic status to reflecting the diversity found in many schools across California and in urban settings across the United States. The student population of the district is 40% Latino, 30% African American, 27% White, 66% low socioeconomic status, and 15% English language learners.

Over that same 10-year period, La Estasis went from being a consistently high-performing district with a number of sites federally designated as “Blue Ribbon” schools to being a district in its 4th year in INI under NCLB. As of the 1st year of the study, 14 out of the 18 schools in La Estasis were in INI, and in 2008, 17 of the 18 were under sanction. We selected La Estasis as it typifies

many of the districts across California that serve primarily students of color from low socioeconomic communities, has a pattern of underperformance, and is engaging in an intentional districtwide reform in an effort to exit INI. In addition, this case provides an opportunity for study that is particularly relevant, as the reform involved the creation of opportunities for central office and site leaders to work in partnership through joint leadership meetings focused on the literacy reform. The case therefore provides a clear emphasis on structural changes to improve the sharing of resources through greater communication and collaboration across the district. Despite this systemwide focus, after 3 full years of reform, the district and majority of schools remain in INI due to flat performance on state and federal performance indices and faces increasing sanctions from continued failure to meet AYP. Our selection of La Estasis as an exploratory case is an important contribution, as it allows us to uncover the limitations emphasizing structural changes (e.g., joint leadership meetings) without attending to underlying social relationships.

### **Data Collection**

*Social network data.* In order to assess the social networks in La Estasis, we developed an online survey that included social network relations and demographic questions. In developing and validating the social network questions, we drew upon the literature regarding district reform processes (see, e.g., Chrispeels, 2004; Coburn & Russell, 2008; Honig, 2006; Spillane, 2000; Supovitz, 2006; Togneri & Anderson, 2003) and previous network studies (Cross, Borgatti, & Parker, 2002; Cross & Parker, 2004; Daly & Finnigan, 2009; Hite et al., 2005). We piloted those relational questions with practicing administrators to better hone the format and narrow the final roster of items to focus on three reform-related networks: knowledge, advice, and innovation. In addition, we conducted a series of quadratic assignment procedure (QAP) correlations that indicated that the networks were targeting different aspects of the reform, as discussed below.

For each network question, we asked respondents to quantitatively assess their relationships with other administrators (school and central office) on a 5-point interaction scale ranging from 1 (*no interaction*) to 5 (*1 to 2 times a week*). For the knowledge network, we asked administrators to respond to the prompt, "Please select the administrators in the La Estasis network that you go to for knowledge related to the [literacy] reform effort . . . and at what frequency?" The advice network was taken from the prompt, "Please select the administrators in the La Estasis network to whom you go to for advice related to implementation of the [literacy] reform effort . . . and at what frequency?" The innovation network was derived from the prompt, "Please select the administrators in the La Estasis network to whom you turn to for innovative practice related to the [literacy] reform effort . . . and at what frequency?" In addition, based upon our pilot, we provided a short

prompt that preceded each relational question that further oriented the respondents toward specific relations.

Our study involved those in formal leadership positions in the district, including the superintendent, assistant superintendents, directors, and supervisors from the central office and principals and assistant principals at the school sites. For this study, we focused only on administrators, rather than teachers, in an effort to understand the central office–site leadership networks, given the research that identifies the importance of these linkages (Copland & Knapp, 2006; Hightower et al., 2002; Honig, 2006; Honig & Coburn, 2008; McLaughlin & Talbert, 2003; Rorrer et al., 2008; Togneri & Anderson, 2003). Recent scholarship points to the role of leaders in mediating reform resources between district and site (Honig, 2006; Honig & Coburn, 2008) and developing and sustaining change in underperforming systems (Murphy & Meyers, 2008).

We used a bounded-saturated approach (Lin, 1999; Scott, 2000), meaning that we included all the members of the La Estasis leadership team (central office and site administrators), because this strategy, coupled with high response rates, provides a more complete picture of the network and more valid results (Lin, 1999; Scott, 2000). We provided respondents with a list of leadership team members and asked them to respond to each relationship and the frequency of their interaction. We collected the first round of social network data at the end of 2007 (the 1st year of the reform effort), resulting in a 98% response rate and comprising a network of 55 administrators, 23 from central office and 32 from the schools. At the end of 2008 (the 2nd full year of the reform), we had a 100% response rate of 54 administrators, 22 from central office and 32 from schools. Over the duration of the study, there were only six administrative changes to the network in terms of retirees and new hires. In order to ensure an accurate comparison, we created a matched data set consisting of the actors that completed both surveys, resulting in a final network of 49 leaders, 19 from central office and 30 from schools. Table 1 provides the overall demographics of the matched sample of respondents. The length of time in the district and as educators stands out, with 46% of La Estasis administrators having been in the district for 15 or more years and more than 60% having been educators for 15-plus years (with 26% of that total in education for more than 25 years).

*Interviews.* We conducted eight 45-minute interviews. While a limited number, these interviews allowed us to better understand network findings as well as explore the underlying social networks and factors affecting these in depth. We were interested in the perspectives of individuals in different formal positions, such as leaders whose primary workplace was at the central office or school. In addition, we wanted the perspective of administrators who were in different “positions” in the informal network structure. We used the knowledge network to determine centrality, dividing the centrality

*Table 1*  
**Demographics of La Estasis Leadership Network (in percentages)**

Variable	%
Primary work location	
District	39
Site	61
Gender	
Female	57
Male	42
Ethnicity	
African American	14
Asian	4
Latino	6
White	73
Other	2
Age	
30 to 34	10
35 to 39	6
40 to 49	40
50 to 59	37
60 and older	6
Years as an educator	
5 to 9	10
10 to 14	27
15 to 19	18
20 to 25	19
More than 25	26
Years in administration	
Less than 4	34
5 to 9	22
10 to 14	10
15 to 19	19
20 to 25	10
More than 25	5
Years in La Estasis administration	
Less than 4	21
5 to 9	19
10 to 14	14
15 to 19	20
20 to 25	13
More than 25	13

*Note.*  $N = 49$ .

scores of the knowledge network into quartiles and selecting individuals from the first (least central) and fourth (most central) quartiles. We used a semistructured interview guide (Patton, 1990; Spradley, 1980), which

was designed to explore perspectives on the reform networks over time as well as probe suggestions for improving the district's networks to better support reform. The interviews were audio recorded and transcribed verbatim.

## Data Analysis

We analyzed the network and qualitative data individually, and upon completion of these analyses, we examined the ways in which the network results could be better understood and validated through the limited qualitative interview data (Creswell, 2003). We briefly describe our analysis procedures for each type of data in the following paragraphs.

*Social network analysis.* Our analysis of the social network data is guided by the theoretical framework previously described and focused on the analytical measures that are useful in understanding complex organizational change. We analyzed the network data using the class of stochastic actor-oriented statistical models for network evolution using the Simulation Investigation for Empirical Network Analysis software package (SIENA) Version 3.17 (Snijders et al., 2010; Snijders, Steglich, Schweinberger, & Huisman, 2008). SIENA provides models of tie change and parameter estimates between discrete points in time, allowing a more nuanced exploration of actor characteristics and their impact on the larger network structure (Snijders et al., 2007; Steglich, Snijders, & West, 2006). Significant parameter estimates indicate the presence of either a dyadic or network influence on tie development. We modeled network parameters discussed previously, such as density, reciprocity (mutual ties), homophily (similar ties), triadic closure (direct ties), and centrality (active ties), all of which are typical network measures used in longitudinal studies (Burk, Steglich, & Snijders, 2007; Snijders et al., 2010).

We conducted a series of QAP correlations using UCINET software (Borgatti, Everett, & Freeman, 2002) to determine the similarity between the three reform networks. QAP correlations must be used to run correlational analysis on social networks, as relations between individuals are nested and embedded within the same network. QAP results indicated that the relations from 2007 to 2008 were highly correlated with themselves ( $r = .81$  and greater); therefore, we used only 2008 network data to run the between-network correlations. Results between relationships yielded a weak-moderate correlation between knowledge and advice ( $r = .35$ ) and a weak correlation between knowledge and innovation ( $r = .19$ ) and between advice and innovation ( $r = .21$ ). While the social network questions examined reform-related interactions between leaders, the weak-moderate correlation between knowledge and advice suggests a separate, and multiplex, relation (DeLange, Agneessens, & Waeye, 2004), indicating that while the knowledge and advice questions tap into separate underlying dimensions, leaders with knowledge ties were also likely to have advice relations. The weak correlations between both knowledge and advice and innovation indicate limited overlap in the relations.



As we examined the knowledge network more specifically, we conducted a series of general network measures on the knowledge network using the UCINET software, including density, as the ratio of existing ties to possible ties; centrality, as a measure of an actor sending and receiving ties; external-internal (E-I) index, as a measure of inter- and intraunit ties; and CP, representing a measure of overall network structure. We focused our analysis on the knowledge network for the following reasons: (a) Shared knowledge about reform efforts is frequently reported in the literature as important, (b) knowledge is foundational to enacting this particular reform, and (c) knowledge networks are considered to be more established given the short (2-year) duration of the reform.

It should be noted that with the exception of changes in ties from Time 1 ( $T_1$ ) to Time 2 ( $T_2$ ), our analysis focused on the most frequent interaction patterns within each of the networks because respondents are more accurate at identifying ongoing patterns than at determining occasional interactions (Carley & Krackhardt, 1999), and these represent stable structural patterns (Krackhardt, 2001). Frequent connections, meaning those representing an interaction once every 2 weeks to a couple of times a week (4 and 5 on the rating scale) represented on average a stable 15% of the reform knowledge ties, 8% of implementation advice ties, and 13% of innovative practices ties.

*Interview data analysis.* All interviews were taped, transcribed verbatim, and coded with the aid of Nvivo, a qualitative data analysis software package. We began with thematic areas from our theoretical framework while also allowing themes to emerge out of the data inductively as we developed a coding scheme to guide our analysis (Miles & Huberman, 1994; Patton, 1990). Throughout the process, we analyzed the interview data using the constant comparative analysis method (Boeije, 2002; Glaser & Strauss, 1967) as well as by checking and rechecking emerging themes (Miles & Huberman, 1994). Once an initial set of themes was developed for coding, two researchers worked independently to identify evidence for a particular code. The large general themes, such as fidelity to the reform, maintenance and strengthening of within-level (district-site) interactions, and limited cross-level ties, were then reexamined and organized into categories that would allow better understanding of network findings. Next, we grouped themes related to the type and overall density of interactions, social structure of leaders, and perception of network relations. In order to ensure trustworthiness, member-checking procedures were used as emerging themes developed and were shared with participants to ensure accuracy in our analysis (Miles & Huberman, 1994).

## Results

Our findings indicate that the network ties within La Estasis changed between  $T_1$  and  $T_2$ , with an increase in infrequent tie activity and no change

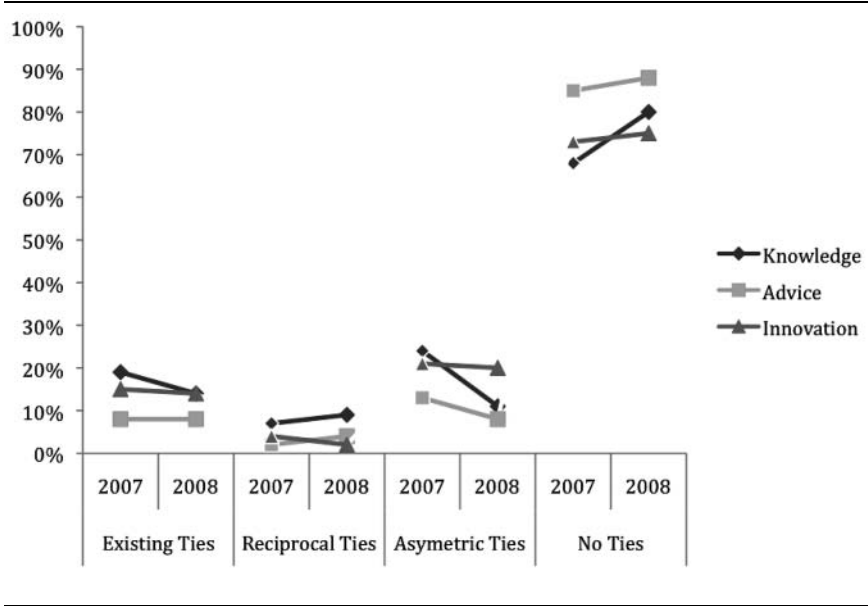


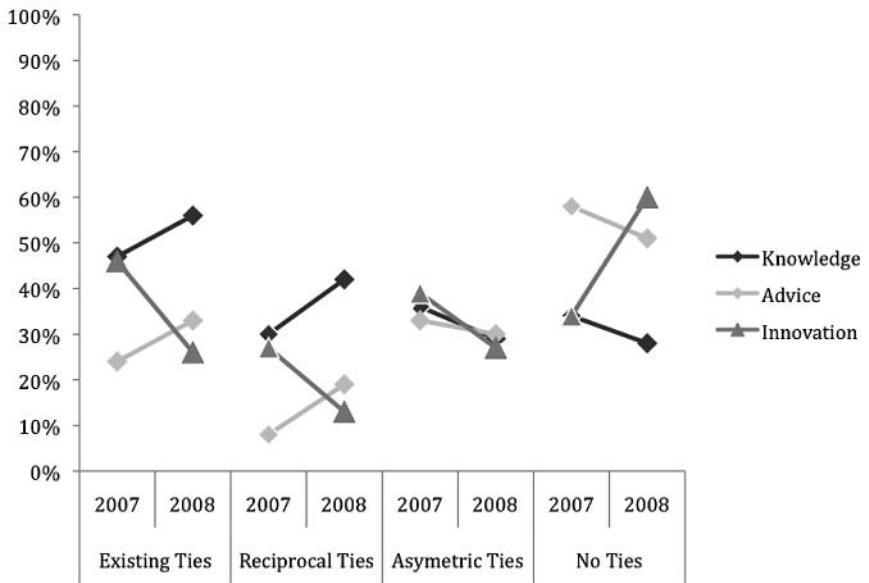
Chart 1. Tie type by relationship: All existing interactions, 2007-2008.

in more frequent ties. In addition, we found that over time, network structures resulted in closed, reciprocated relations within work locations (school vs. central office) but little interaction across these groups. Finally, results indicate that the knowledge network became more centralized over time, with site administrators on the periphery and central office administrators composing the core. For each of the major findings, we discuss our social network data as well as the themes that emerged from our interviews.

Interactions Around Reform: Infrequent, and Increasing, Ties

Our data suggest that administrators in La Estasis became more connected to one other over time around reform-related knowledge and advice, but these connections were infrequent. On the other hand, the ties associated with innovation became less frequent over time. This finding suggests that while leaders increased their infrequent interactions around the reform, they interacted less frequently around innovative practices. Furthermore, the frequent stable interactions around knowledge, advice, and innovation demonstrated little change over time. The following paragraphs provide the data for these larger findings.

Charts 1 and 2 provide a detailed picture of the change in ties in the knowledge, advice, and innovation networks. Chart 1 illustrates the existence of all ties between leaders across all three relations. *Existing ties* refers



**Chart 2. Tie type by relationship: Most frequent interactions, 2007-2008.**

to the *density* of the network, which is the total number of ties in existence divided by the total possible number of ties (in each of the networks, there were 49 actors representing a total of 2,352 possible ties). For each of the relationships, we found a statistically significant difference in the densities ( $p < .05$ ) from  $T_1$  to  $T_2$ . The percentage of ties in the knowledge and advice networks increased significantly by 9%, while ties related to innovative practice decreased significantly by 20%. In other words, for both knowledge and advice networks, a total of 212 new ties were created among individuals, and for innovation, a total of 470 ties were lost of the 2,352 possible ties between leaders. Thus, leaders were increasing their connections around knowledge and advice while decreasing their interactions around innovative practices.

*Reciprocated ties*, those in which actors mutually selected one another, increased significantly by 12% and 11% for the knowledge and advice networks, respectively. The importance of reciprocated ties was also mentioned by a majority of administrators during interviews. For example, one principal related, “I go to others for help and at the same time others come to me, so we can learn together.” Although knowledge and advice ties were increasingly reciprocated, mutual ties around innovative practice fell significantly by 14%. The drop in innovative practice ties also emerged in the interview data, in which leaders described a concerted effort in understanding and implementing the reform with fidelity with minimal deviation from the plan. This

focus on fidelity seemed to increase reform compliance while at the same time decreasing the search for innovative practices. As one principal described, “We are working to do this thing [reform] right, and I am talking to anyone who will listen to me in trying to do a better job in specifically following the plan . . . and not taking risks.”

*Asymmetric ties*, meaning those in which one leader identified another as a source of reform-related knowledge, advice, or innovation without the identified actor responding in kind, dropped for each reform-related network (knowledge, -5%; advice, -3%; and innovation, -12%), suggesting that actors created or maintained more reciprocal (and fewer asymmetric) relationships over time. A complementary trend was noted in the reduction of nonexistent ties between leaders for the knowledge and advice networks, decreasing 6% and 7%, respectively. This suggests that there were fewer leaders who were isolated in these networks. However, during that same period, the reform-related innovation network registered a significant increase in nonexistent (null) ties from 861 in 2007 to 1,411 in 2008, suggesting that over time, administrators reported ties around the seeking of innovative practice from other leaders. Findings from the interview data suggested that the reform networks, despite the intentional focus on bringing together central office and site administrators, were very “local” and that connections across the system were rare. In addition, administrators expressed an unrealized desire to have a clearer understanding of the larger reform goals. A principal captures this overall idea:

We try to work better together, but not all of us are on the same page or playing field. We fly under the radar in and try to improve our own little corner of the world. Better understanding of overall district goals and what is allowed would be helpful.

Chart 2 includes the types of dyadic ties reflecting the most frequent relationships only, representing stable patterns of interactions through which complex resources are likely to flow. Across all the categories and relations, there were no statistically significant differences in the most frequent relations from  $T_1$  to  $T_2$ . This suggests that the ties between leaders in these more stable relationships remained unchanged in relation to the reform networks.

Taken on balance, the knowledge and advice networks became significantly more densely connected over time for all frequencies of interactions as well as registered increases in reciprocal relations. This suggests significant activity related to understanding and communicating the reform throughout the leadership network in La Estasis. However, that activity was not reflected in the most frequent interactions. In essence, most of the reform-related knowledge and advice activity within the district was exchanged on a very infrequent basis, suggesting that while there may be significant reform-related activity overall, the underlying frequent interactions between leaders in La Estasis remained stable and relatively unchanged. Our interview data supported these findings. A

majority of interviewees indicated that they were more likely to continue interacting with those with whom they had historically interacted despite the new systemwide focus. A central office leader described this tension: "I believe that the hope and intent for better performance exists, but bias and history hamper our ability to connect and improve the organization." Similarly, a principal reported, "I pretty much keep my head down and just talk to my friends who I know and who know me."

The patterns related to innovative practice differ from the knowledge and advice networks in important ways. For example, there was a significant decrease in the density and reciprocity in the innovation network for all frequency relationships. Moreover, the innovation network posted the largest increase in nonexistent ties, indicating an overall decrease in seeking others for innovative practices related to the reform. The administrators we interviewed, especially the principals, repeatedly discussed their concerns around engaging in "out-of-the-box" thinking and action, which ultimately may have inhibited both seeking and sending resources related to innovative practices. As a representative quote by a principal indicates,

Most of us are not willing to take a chance, to go outside the box, but what we really want is someone to show us first and let us know it is ok before we step out on the stage.

### **A Closed Network Structure: Divisions Between Schools and Central Office**

Our analysis suggests that over time, the reform-related social networks between administrators tended toward closed, reciprocated relations within specific work locations. District leaders and long-time administrators in La Estasis had more active roles in the knowledge and advice networks. On the other hand, school leaders who were new to the district tended to be active in the innovation network. We discuss results of the longitudinal network data analysis of the knowledge, advice, and innovation networks in the following paragraphs, highlighting the similarities and differences between these three networks. While we include significant and nonsignificant findings in Table 2, we discuss only statistically significant findings in the paragraphs that follow.

*Knowledge.* For the reform-related knowledge network, a significant negative outdegree  $t$  ratio, as shown in Table 2, indicates that leaders tended to be "intentional," as opposed to random, in seeking out other leaders and sharing reform-related knowledge. Over time, La Estasis leaders favored reciprocal relationships in the knowledge network over asymmetric ties. A statistically significant negative finding indicates that over time, the network shifted toward network closure, reflecting a leader's increased likelihood to favor actors with whom they have a direct connection as opposed to seeking

Table 2  
Longitudinal Network Model: Most Frequent Relations

	Knowledge	Advice	Innovation
Relationship	Parameter (SE)	Parameter (SE)	Parameter (SE)
Outdegree	-1.663 (0.212)**	-1.949 (0.187)**	-1.859 (0.110)**
Reciprocity	1.486 (0.164)**	1.531 (0.1984)**	0.420 (0.160)*
Closure	-0.409 (0.071)**	-0.595 (0.114)**	-0.383 (0.060)**
Indegree popularity	-0.707 (1.951)	0.398 (1.981)	3.342 (0.361)**
Outdegree popularity	0.239 (0.108)*	6.001 (2.233)*	1.400 (0.702)*
District/Site alter	0.264 (0.127)*	0.588 (0.168)**	0.002 (0.086)
District/Site ego	0.239 (0.108)*	0.053 (0.161)	0.201 (0.085)*
District/Site similarity	0.506 (0.097)**	0.537 (0.135)**	0.260 (0.090)*
Years in La Estasis administration alter	0.069 (0.031)*	0.075 (0.044)	-0.052 (0.024)*
Years in La Estasis administration ego	0.024 (0.032)	0.137 (0.045)**	-0.013 (0.022)
Years in La Estasis administration similarity	-0.027 (0.183)	-0.189 (0.2461)	-0.064 (0.180)

Note. *T* ratios were obtained by dividing parameter estimate by standard error.  
\**p* < .05. \*\**p* < .01.

out or sharing knowledge with indirectly connected actors. In other words, the network over time tended toward triadic closure, with leaders forming ties with “friends of friends.”

Leaders over time also tended to interact with those with whom they had previously interacted, seldom extending beyond their established social sphere. A principal representing this common emergent theme offered her perspective on the joint leadership reform work: “I see and talk to the same people at every meeting. We sit together, and in a sense have our own little club.” Building on the theme, a central office administrator also described the joint work: “We try, but at the end of the day we work in our own settings doing our own jobs.” The longitudinal network data coupled with the reports of interviewees suggest a localized “neighborhood” homophilus approach to the seeking and sharing of reform-related knowledge rather than a more expansive districtwide engagement, as was intended in the reform. Outdegree popularity, a measure of an amount of ties an actor “sends,” was also statistically significant for the knowledge network, suggesting a tendency over time for administrators to develop ties with those leaders who sent more knowledge ties. In this sense, leaders who actively sent ties in the system developed more ties, and ultimately, their “take” on reform-related knowledge was influential over the larger system (Raider & Krackhardt, 2001).

Over time, district leaders in the knowledge network were selected more frequently than site administrators, suggesting a high level of activity related to reform knowledge between and among district administrators.

These data indicate that district administrators not only became central in the knowledge network but also were afforded more influence over the knowledge resources related to the reform due to their increasing activity. However, despite a highly active district office, leaders in La Estasis generally preferred to seek and share reform-related knowledge primarily with those who worked in the same location (district or site). Analysis of the qualitative data yielded a similar finding of primarily within-work-level interaction. A principal sums up this common theme:

There is a clear division between the district office and the sites. There continues to be a lack of concern and respect for each one's responsibilities by the other. There are exceptions but it generally comes down to what always has been and that is looking out for number one above all other concerns.

Years of administrative experience in the district was also significant, with leaders who possessed more administrative experience in La Estasis, many of whom were district office administrators, increasingly sought out in terms of reform-related knowledge. Consistent with these data, our interviews suggested that site leaders perceived a somewhat impermeable boundary around the central office through which they could only periodically pass, suggesting a lack of brokering. As one principal said, "Although we try to connect, there is a wide gap between us [principals] and them [district office]. Another principal added, "The central office cabinet is essentially a bastion of keeping certain people in the loop and others outside of it as a means of control."

*Advice.* The advice relationship shares many of the same significant elements as the knowledge network, including a significant negative outdegree  $t$  ratio, indicating an intentionality of leaders with whom they seek and offer reform-related advice. Leaders preferred reciprocal advice relationships in this network, which like the knowledge network tended toward triadic closure. Outdegree popularity was statistically significant, indicating a tendency over time for actors to seek more ties with active leaders in the advice network. Perhaps these more active leaders, meaning those who go to others for advice, are seen as "safe" to approach as they, too, seek advice around reform implementation. However, it is possible that those leaders who frequently seek advice, and then are highly sought out by other actors, are not as well versed in the implementation of the reform (hence the seeking behavior) or well positioned to provide informed advice. An emergent theme in our interview data provided qualified support for this finding. In multiple instances, administrators noted that while they consistently seek one another for within-work-level implementation advice, they often received inconsistent and, at times, inaccurate input from colleagues. Capturing this theme, a principal reported, "I like to ask other principals

about what to do with the reform, but to be honest I often get a range of contradictory answers.”

Just as in the knowledge network, leaders tended to select district administrators for advice more frequently than site leaders, yet overall, these leaders interacted with colleagues who were similar in terms of work setting (district or site). Leaders with more years of leadership experience in the district were more likely to be selected for reform-related advice than new arrivals. The interview data validated this finding, with a recently hired principal noting, “I know if I want something I get in touch with an ‘old-timer’ that can point me in the right direction.” A central office leader supporting the theme reported, “I generally have a ‘go-to’ person who has been here forever. He always seems to know what’s up and how to get things done.” Another key finding from the interview data was an overreliance on veteran administrators for advice, which appeared to lead to the replication of existing practices and routines rather than accessing novel approaches. A principal echoed this theme: “The longevity of individual habits and doing things the ‘La Estasis’ way halts progress; some people need to retire already.” A central office leader added, “We have been doing things the same way expecting new results for a long time.”

*Innovation.* The innovation network had many similar predictive network elements as the previous relationships, including statistically significant negative outdegree  $t$  ratio, reciprocity, closure, and outdegree popularity. However, unlike the other relationships, leaders were significantly more likely to select those individuals who were nominated by others as innovators. Over time, leaders tended to create ties with actors who were frequently identified as resources for innovative practices. This may have to do with the potentially high-profile nature of innovation in a context in which leaders report being acutely focused on following the reform with fidelity.

Over time, there was a tendency to select others within work level as a resource for innovative practices. However, despite the within-level preferences, district office administrators also created additional ties to site administrators for innovative practices as compared to connecting with other district office leaders. Taken together, these findings suggest that site administrators were more actively engaged in and sought out for innovative practice in comparison to district administrators. The high amount of district office activity in the knowledge and advice networks, and the finding that most innovation is associated with site administrators, suggests that diffusing any new knowledge generated through reform-related innovative network may be difficult. Moreover, those with less time in leadership positions within La Estasis were sought out more than others in terms of innovative practices related to the reform; perhaps these newcomers engaged in innovative practices more often because they did not feel constrained by existing



relations, structures, or routines, or perhaps they brought new practices from their previous settings.

Across all of the relationships, the data suggest that district office and site leaders favored closed, reciprocated relationships within their own group (district or site). Years in the district also had significant impact, with long-term leaders favored for knowledge and advice and newcomers selected as resources for innovative practices. In addition, the limited interview data suggested few cross-level interactions, meaning that important reform-related resources generated at the sites and district offices were not being shared across different levels of the system. Furthermore, the knowledge and advice of newcomers were not systematically accessed. Given that innovative practices were engaged by leaders with less time in the district and on the periphery of the network (discussed below), the district is not likely benefitting from these generative activities.

### **Increasing Network Centralization Over Time**

Our in-depth analyses around the knowledge network in La Estasis indicate changes in network structure over time, with the network becoming significantly more centralized and focused on specific work location despite the intent to increase cross-group (district-site) interaction. Furthermore, our data suggest that site administrators were more likely to be on the periphery of the network, with central office administrators composing the core.

Results from measures of degree centrality on the 2007 knowledge network yielded a mean score of 8.3 (standard deviation of 6.8; range from 1 to 32 degrees), indicating that the average leader is connected to 8 other administrators out of 49 actors. In 2008, the same network had a mean of 6.5 (standard deviation of 5.9; range of 1 to 28), representing a significant decrease in overall ties over time. Furthermore, district leaders represented the top 5% of degree centrality scores in 2007 and the top 10% in 2008, meaning district leaders were becoming significantly more central. Overall, these data indicate an increased centralization of the network around reform-related knowledge, with fewer ties between district and site leaders over time. Site administrators who reported difficulty in connecting with central office leaders noted this division. As one principal stated, "We are constrained by the cultural practices in the central office with those leaders behaving like an elitist club." This division is triangulated by previous results as well as findings from the E-I index, which ranges from  $-1$ , completely internal (meaning within work location) ties, to  $+1$ , completely external (between work locations) connections, and was run on an actor's primary work location (central office or site). In 2007, the E-I index was  $-0.492$  ( $p < .01$ ) for the knowledge network; in 2008, this index became even more within-level focused, with an overall index of  $-0.684$  ( $p < .01$ ). Our qualitative findings support this result, with interviewees reporting that

a within-level orientation constrained the relational network and, ultimately, innovative practices. A central office leader reflecting on leadership team meetings captured this emerging theme:

Findings from centrality measures, the E-I index, longitudinal network analysis, and interviews triangulate the finding that the reform knowledge network in La Estasis has become significantly more centralized and “closed,” with a focus on maintaining previous within-level local relations, with most knowledge flowing into and around the central office rather than out to and between the school sites. The data also suggest that leaders in La Estasis are becoming more homophilus in their interaction patterns over time around work location.

Figure 1 represents the knowledge network in 2007, and Figure 2, the same actors in 2008. The lighter color nodes represent the district office,



We are growing every year as an organization, but sometimes we forget to acknowledge one another.

In order to leverage existing talent and improve relations between leaders, several principals called for increased transparency and an assessment of the district's strengths and weaknesses to promote improvement in the current context. As one principal noted,

We need to keep a focus on the reform and work that all members engage in ongoing, open, honest discussion of our strengths and weaknesses so that we can make the entire organization stronger and improve our performance. This is going to take a while in this environment.

In building those relationships, leaders overwhelmingly reported the high-stakes nature of their work and the pressure they are under to improve. A principal captured this emergent finding:

We need more opportunities for interaction and activities that support trust and respect. While the plan is very important and will, I believe, ultimately support our vision, right now, in these difficult times with so much riding on our work it is difficult to focus outside of the day-to-day survivor mode in which we find ourselves.

## Discussion

Through this longitudinal exploratory case study, we have examined the evolution of reform-related networks in a district enacting a districtwide reform to exit improvement status under NCLB. Our analysis suggests three key findings: (a) Over time, there was a significant increase in infrequent tie activity, with frequent ties remaining unchanged within the networks of knowledge, advice, and innovation; (b) reform-related networks tended toward closed, reciprocated relations that primarily occurred within specific work locales (district or site); and (c) the knowledge network became more centralized and internally focused over time, with district office leaders playing a central role and site leaders residing on the periphery. In this section, we discuss these findings in relation to the literature on accountability policies, district reform, and social networks. Our findings suggest limitations on the transfer of knowledge, advice, and innovation throughout this INI district, given the structure and evolution of these networks.

### Network Ties and Structure: The Limits of Centralized Leadership

The creation of strategic ties that enhance resource transfer between actors will increase the social capital in the district in terms of generating and diffusing knowledge. In La Estasis, however, the reform networks evolved into more centralized structures, with dense ties between district leaders

and few interactions between site administrators. These types of structures may impede the effectiveness of groups, such as La Estasis, that may be engaged in nonroutine, complex tasks. The network structures found in La Estasis typifies those necessary for the diffusion of routine knowledge and information, suggesting from the outset the unlikelihood that La Estasis would be able to bring about the large-scale, complex changes required to exit INI.

Significant levels of centralization around a few core actors with others remaining on the periphery, as found in this study, is a clear example of the CP structure. As discussed previously, the CP structure limits the contribution and access to knowledge by marginalizing individuals at the periphery, ultimately having a negative impact on knowledge sharing throughout an organization. In La Estasis, the marginalized actors were site administrators, who existed on the periphery of the network with little interaction between one another or district leaders. Over time, site administrators became increasingly disconnected from other principals and the core of central office administrators, and yet these leaders were identified as resources for innovative practices. This type of disconnected system limits district coherence and the ability of central office and school leaders to develop meaningful partnerships as they had intended through this districtwide reform. Furthermore, this structure may inhibit the district's ability to effectively develop shared theories of action (Agullard & Goughnour, 2006), develop learning partnerships (Copeland & Knapp, 2006), and effectively broker resources (Honig, 2006; Knapp, Copland, & Talbert, 2003).

### **Network Change: Response to Accountability Sanctions**

Although there was considerable activity around the infrequent knowledge, advice, and innovation networks, these findings suggest that over time, leaders tended toward network closure, meaning that administrators were more likely to interact with those with whom they had previously. In addition, actors strengthened direct "local" ties as opposed to creating new ties with other actors with whom they may share an indirect tie, thus potentially limiting resources to self-contained artificial local spheres and creating internal barriers to broader organizational change. In effect, the new reform that was intended to create greater collaboration between school and central office leaders appears to have reinforced existing ties.

Despite the districtwide intention to connect administrators through this reform, most of the relations across sites (district and school) as well as overall district performance remained unchanged, indicating that the reform had little impact on creating a systemwide network of connections between site and district leaders, as was its focus. The maintenance of existing patterns of network structure within La Estasis, despite significant external contextual pressure from sanction, may be partially explained by structural inertia

(Kim et al., 2006; Schwarz & Shulman, 2007). Our data suggest a number of indicators identified in the inertia literature that converge around La Estasis: (a) previously successful performance, (b) operating in a high-pressure accountability context, (c) continued flat performance, (d) long-term ties as evidenced by demographics, and (e) no change in most stable ties over time. The structural inertia that is suggested in La Estasis is inconsistent with organizational improvement and therefore may constrain La Estasis in exiting INI. Recent scholarship suggests that district offices must redefine their roles as they shift from monitoring to supporting low-performing schools in the current accountability policy context. More explicit attention to the redefined roles of central office administrators and establishment of structures that support additional boundary-spanning roles for both central office and site leaders would provide opportunities for new ties to form through which novel knowledge and innovation may be shared, potentially moving the district out of this state of inertia.

The accountability policy context may also be contributing to this district-wide response, particularly in terms of the marginalization of innovation to the periphery of the organization and the perception of administrators who report being in “survivor mode.” The tension between change and stability in a high-stakes, uncertain environment appears to result in a form of organizational homeostasis, skewing the existing system toward maintenance of structures and networks, thereby stabilizing results over time (Kim et al., 2006). While March (1981) argued that change in organizations depends on stable processes upon which to create change, there seems to be a delicate balance between change and stability that must be achieved for this district under sanction to realize organizational goals, given the lack of improvement to date.

In addition to the relationship between underlying networks and formal structures, external threats to the organization may contribute to systemic rigidity and centralization of communication. Our data suggest that the networks in La Estasis have characteristics associated with a threat-rigid response linked to the pervasive threat of sanction under NCLB. This ongoing threat-rigid response may be reflected in the increased centralization and internal (central office) focus of the district, which in turn limits the flow of information and innovation and “protects” the organization from the external threat. As the district becomes more centralized, the diffusion of reform and related innovative practices is further limited, suggesting that organizational changes are less likely and the continuation of current practices will be maintained.

## **Implications for Policy, Practice, and Research**

### **Practice**

Network data provides insight into which individuals are in the best structural position to move knowledge and practice throughout the system.

Currently, while these are mostly individuals at central office, it will be important over time to intentionally create opportunities for site administrators to play key roles in the diffusion of knowledge and practice, as they are often closest to effective instructional approaches. These well-connected individuals can serve as boundary spanners to lesser-connected actors, perhaps building the social capital of the entire system and supporting efforts at reform, policy implementation, and knowledge exchange (Honig, 2006). Ensuring that highly central actors in the network are provided with the most accurate and up-to-date knowledge may speed communication and increase the accuracy of the information. Additionally, new practices that are being developed at the periphery of the organization by site administrators may provide additional support to reform efforts. Recent work suggests that “disruptive innovations” occur at the margins of an organization but lead to radical changes in performance only when brought into the mainstream of practice (Christensen, Johnson, & Horn, 2008).

The development of dense ties between levels within a system moderates the network’s response to threat (Krackhardt & Stern, 1988; McGrath & Krackhardt, 2003). Thus, while the district did attempt formal cross-group interactions, creating additional opportunities for relations to develop away from *within-unit* ties (central office and school site) to *cross-unit* ties (central office to site and vice versa) may yield benefits. However, it should be noted that changes in ties frequently results in short-term disruption and suboptimal performance by the organization until more functional ties are built and codified (Tai-Young, Oh, & Swaminathan, 2006). A coordinated effort at building ties within groups of administrators and between different levels in the system is critical to enhancing an organization’s overall capacity for change and increases the likelihood of meeting goals.

Finally, creating additional lateral ties between clusters of school site administrators serving similar student populations to generate new knowledge and be responsive to environmental change may facilitate improvement. Lateral connections are critical for the development of complex information and knowledge ties that build social capital as well as support the ability of sites to assimilate and replicate new knowledge (Tsai, 2002). Increasing the amount of intergroup sharing may enhance the overall capacity of the district to increase performance through increased social capital, collective learning, and synergy, thereby making successful change more likely.

## **Policy**

Recent research suggests that under high-stakes accountability, school–central office relations become more bureaucratic and rule bound (Daly, 2009). However, effectively responding to accountability policies may require intentional partnerships among central office and school administrators to allow for the diffusion of knowledge and innovation. In essence, the

historical patterns of principal isolation must be addressed. While some examples exist of principal-principal or superintendent-superintendent networks (Elmore, 2004), strong school administrator–central office administrator networks are rare and hold unrealized potential for district reform. The state-systems-of-support component of NCLB could leverage these changes by requiring that INI districts develop collaborative districtwide leadership teams, including multiple opportunities for school and central office administrators to discuss root causes of failure and identify appropriate solutions. These types of coordinated efforts remain rare and will require experienced technical assistance providers identified by states to work with INI districts.

Districts in INI often invest heavily in strengthening the human capital of the administrators in terms of trainings, programs, and curricula (Center on Education Policy, 2006; Daly, 2009; Finnigan & Stewart, *in press*; Mintrop & Trujillo, 2007). This reliance on the delivery of knowledge through technical means has increasingly been the response of INI districts and schools, and yet as the data indicate, many continue further in INI. Simply providing additional reform-related knowledge is not the only answer. Strategically and intentionally leveraging and moving existing knowledge resources may provide support. It is the interaction of these two important elements—human and social capital—that is necessary as we consider how to improve low-performing districts.

Finally, the high-stakes nature of NCLB coupled with progressive sanctions may create unintended (and counterproductive) consequences in terms of how INI districts respond to increased pressure to improve. Federal and state policymakers have the opportunity in the reauthorization of NCLB and related policies to encourage the search for new ideas and a higher level of risk-tolerant behavior by providing incentives for radical departures from past practices and development of a stronger system of support to districts under sanction. Policymakers must find a balance between human and social capital, innovation and performance, and threat and support to bring about improvements in the lowest-performing districts.

## **Research**

Although an important starting point, our study clearly indicates the need for additional research to better understand the underlying network structure of district staff as they respond to NCLB. Given that our study involves only one district with actors in formal leadership positions, additional research is necessary to examine whether these findings occur in additional district contexts with different sets of actors. For example, future research could examine districts that move out of INI to study whether they have stronger or more decentralized networks over time compared with those that continue to perform at low levels. In addition, as this is one of the first studies to examine the evolution of a leadership network in an INI district,



more research is necessary over a longer time period to understand whether the changes we documented are typical of the beginning point of the reform trajectory. Next, additional studies should include other critical parameters, such as training related to the reform, and could focus on additional types of district leaders beyond those in formal leadership positions. Finally, additional research should include a larger number of interviewees to strengthen the qualitative component.

The numbers of districts and schools across the country in INI is growing at a significant rate. Perhaps more troubling is the fact that very few systems are able to successfully exit improvement status; most continue to face progressive sanctions. Moreover, the districts that educate traditionally underserved students are disproportionately impacted by these sanctions, effectively siphoning off limited resources. The combination of these factors and their impacts on students makes understanding reform in these settings an important social justice issue. Our exploratory study offers a unique contribution by drawing on social network theory as a lens to examine district turnaround. The role of networks in organizational change within INI districts is in its infancy, and we believe is an area ripe for further exploration.

### Notes

<sup>1</sup>Pseudonym.

<sup>2</sup>Social network studies in education, to date, have examined principal networks (Friedkin & Slater, 1994), school and teacher networks (Bakkenes, De Brabander, & Imants, 1999; Coburn & Russell, 2008; Granovetter, 1986; Penuel et al., 2009; Penuel, Frank, & Krause, 2006), teacher professional development networks (Lima, 2007), departmental structures (Lima, 2003, 2004; Spillane, 2006), innovation (Moolenaar, Daly, & Slegers, in press), school-parent networks (Horvat et al., 2003), and between-school networks (Mullen & Kochan, 2000).

<sup>3</sup>It bears noting that there is no published "ideal" density for networks, and given the lack of district studies in education, a base of comparison in the empirical literature has not been established.

<sup>4</sup>We use the term *longitudinal* in reference to our two data collection points, occurring once in the spring of 2007 and again in spring of 2008.

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