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TURNOVER, SOCIAL CAPITAL LOSSES, AND PERFORMANCE

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A theory of turnover, social capital losses, and store performance was developed and tested in 38 locations of a restaurant chain. We assessed the ability of social capital losses to predict variance in store-level performance above and beyond that predicted by overall turnover rate and in-role performance losses from turnover. We further predicted that turnover rate and network density would moderate the curvilinear relationship between social capital losses and performance. Results strongly supported turnover rate's moderation of social capital losses: performance declines from network disruptions were more apparent when overall turnover was low. The network density interaction prediction was not supported.

The relationship between turnover and organizational performance is viewed historically either through human capital theory or cost-based lenses. In recent years, however, researchers have begun to take a broader view of the turnover-performance relationship—one that encompasses the impact of turnover on people's social relations with organizations (Dess & Shaw, 2001). This theoretical shift is a function of the increasing value researchers and organizations place on the development and retention of social capital, which can be broadly defined as assets embedded in relationships (Leana & Van Buren, 1999). The implication is that turnover not only erodes performance by depleting organizational skill banks but, perhaps more dramatically, by altering the social structure and fabric of an organization. Dess and Shaw (2001) argued that the downside risk exposure of social capital losses is significant, especially in settings where communication and resource leveraging are at a premium, such as service- and knowledge-based organizations. In such cases, the loss of key organization members can severely damage an organization's social fabric and perhaps eradicate its social capital altogether (Leana & Van Buren, 1999). To date, no formal theory-based predictions or empirical evidence have been available to either confirm or refute these positions. To take steps in this direction we (1) reviewed existing evidence that links turnover rates to organizational performance, (2) extended Dess and Shaw's (2001) initial organizational social capital–based conceptualization of the turnover-performance relationship, (3) and tested our theory at 38 locations of an upscale, dinner-oriented restaurant chain where high-quality service and high food quality were deemed critical factors for unit success.

The following boundary conditions apply to our study. We derive macrolevel predictions concerning turnover, social capital losses, and performance without addressing implications of turnover for the social capital accumulations of individuals; that is, we take a public-good view of social capital and a macrolevel view of performance. Sacrificing some external validity but minimizing sources of error, our study is confined to a sample of facilities in a single restaurant chain (see Glebbeek and Bax [2004] for a similar approach). Doing so diminished the possibility that differences in consumer preferences, competition, and labor market conditions could explain our results. The restaurants included in this study tend to be located in very similar areas (generally suburban shopping centers) and very near clusters of similar restaurant chains. Third, in our theory and tests we assumed that turnover

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is an exogenous variable, although an alternative perspective is that levels of performance cause fluctuations in turnover. We acknowledge that there are reciprocal effects, but direct (Glebbeek & Bax, 2004) and indirect (Shaw, Gupta, & Delery, 2005) evidence suggests that the turnover→ performance relationship is stronger than the reverse. Fourth, we focus on a single network (communication) and a structural aspect of social capital loss (loss of "structural hole bridges" through turnover), although other networks (e.g., friendship) and aspects of social capital losses (e.g., trust) may be relevant.

BACKGROUND AND THEORY

Traditional Views of Turnover Rates and Performance

Osterman (1987) concluded that there was a reasonably strong, negative relationship between turnover and productivity and argued that the findings supported human capital theory. Human capital accumulations (firm-specific "KSAs") in the aggregate increase the ability of a workforce to perform effectively; that is, higher levels of in-role performance are the outcome of human capital accumulations. Turnover creates aggregate firm-specific in-role performance deficits and therefore negatively relates to performance, according to the human capital view (e.g., Batt, 2002). Beyond these effects, higher turnover is part of a more generic problem of organizational control (Alexander, Bloom, & Nuchols, 1994). High turnover causes organizations to neglect the activities necessary to produce basic output and redirect energy and resources away from maintenance and safety concerns, lowering in-role performance in the process (Price, 1977; Shaw et al., 2005). Although there is some debate on the form of the negative relationship between turnover and performance (i.e., linear or curvilinear), the few macrolevel empirical studies in the pertinent literature show generally detrimental effects on efficiency (Alexander et al., 1994), productivity (Brown & Medoff, 1978), sales growth (Batt, 2002), and safety (Shaw et al., 2005). Thus, the traditional view of the turnover-performance relationship is that turnover rates and organizational performance are negatively related and that in-role performance losses in a workforce account for much of—that is, mediate—this relationship. Thus:

Hypothesis 1. There is a negative relationship between a store's overall turnover rate and store performance.

Hypothesis 2. In-role performance losses mediate the relationship between overall turnover rate and store performance.

A Social Capital Theory of Turnover Rates and Performance

Social capital theory was developed to explain the value in social relationships inherent in networks. Broadly defined as an asset embedded in relationships (Leana & Van Buren, 1999), social capital is developed when relationships facilitate instrumental action among people (Coleman, 1988). Social capital can benefit individuals (a private-good view) by, among other things, increasing their probability of promotion and career success (Burt, 1992; Seibert et al., 2001), but it can also benefit organizations (a public-good view) by increasing communication efficiency, "associability," and employee trust (e.g., Leana & Van Buren, 1999). These authors further argue that organizational social capital can increase performance by enhancing commitment, increasing flexibility, and fostering intellectual capital.

We take the latter view here, looking at social capital at the collective level. Adler and Kwon referred to collective social capital as "a bonding form" of social capital comprising "internal ties within collectivities" (2002: 19). If social capital at the *collective* level is created when relationships facilitate instrumental action among people (Coleman, 1988), it is also lost when these relationships among people are dissolved. Burt argued that the withdrawal of involved parties from a "connection dissolves with it whatever social capital it contained" (1992: 58). Of particular interest here is retention of intraorganizational communication network links that allow information to flow freely and efficiently throughout a network. These connections, which are commonly referred to as *structural hole bridges* (Burt, 1992, 2000), allow organization members to exchange resources and manage knowledge effectively (Tsai & Ghoshal, 1998). With regard to turnover and performance at the organizational level, these types of connections are more important than the absolute size of employees' networks because structural hole bridges are nonredundant links (Burt, 1992). Our view of social capital at the collective level concerns the number of structural holes that are bridged rather than the absolute number of links that employees have. In terms of information flow and efficiency, the loss through turnover of employees with many redundant communication links in a network should not be as damaging to overall organizational performance as the loss of employees who happen to

bridge many otherwise open communication links in the network.

Although the structural hole bridge concept is typically viewed from a private-goods perspective, its parallel value at the aggregate level is also clear. Structural hole bridges provide advantages to the collective by increasing the efficiency and effectiveness of communication flow and information exchange (Burt, 2000). A structural hole bridge links previously unconnected individuals in a network, increasing information flow in the network in toto as well as its operational efficiency. Burt labeled these increases the "performance effect" of organizational social capital (2000: 411). Tsai and Ghoshal (1998), for example, found that structural hole bridges were positively correlated with product innovations in business units.

Thus, if social capital can be construed as a property of intraorganizational networks (Adler & Kwon, 2002), if social capital is also a value created by instrumental relationships among people (Coleman, 1988), and if the more critical links in networks are nonredundant or bridging ones (Burt, 1992), turnover among individuals who occupy these network positions should be more damaging to organizational performance than turnover among individuals who occupy less central network positions. This theory of social capital losses should be viewed as a supplementing, rather than competing with, the existing perspective on the turnover-performance relationship. As such, incurred social capital losses from turnover should go over and above the losses organizations experience in realtion to in-role performance (human capital losses) or other inefficiencies as a predictor of performance. Dess and Shaw (2001) provided the example of an organization losing a group of long-tenured employees under the traditional and social capital perspectives. Under existing approaches, the losses to the organization would amount to the in-role performance deficits of the departed and replacement employees as well as administrative inefficiencies. The criticality of the network positions of departed employees is argued to explain variation in performance above and beyond the performance variation explained by traditional approaches.

Dess and Shaw (2001) further stated that the relationship between social capital losses and organizational performance is curvilinear, but they did not clearly specify the curvilinear relationship. We propose that the relationship will take the form of an attenuated "U." Performance decline should be more severe for organizations with moderate social capital losses from turnover than for those with high social capital losses, and it should be the most severe for organizations with no social capital losses from turnover. The effects of the loss of structural hole bridges should be more pronounced when turnover creates the first communication gaps in a network than after numerous communication gaps have been created.

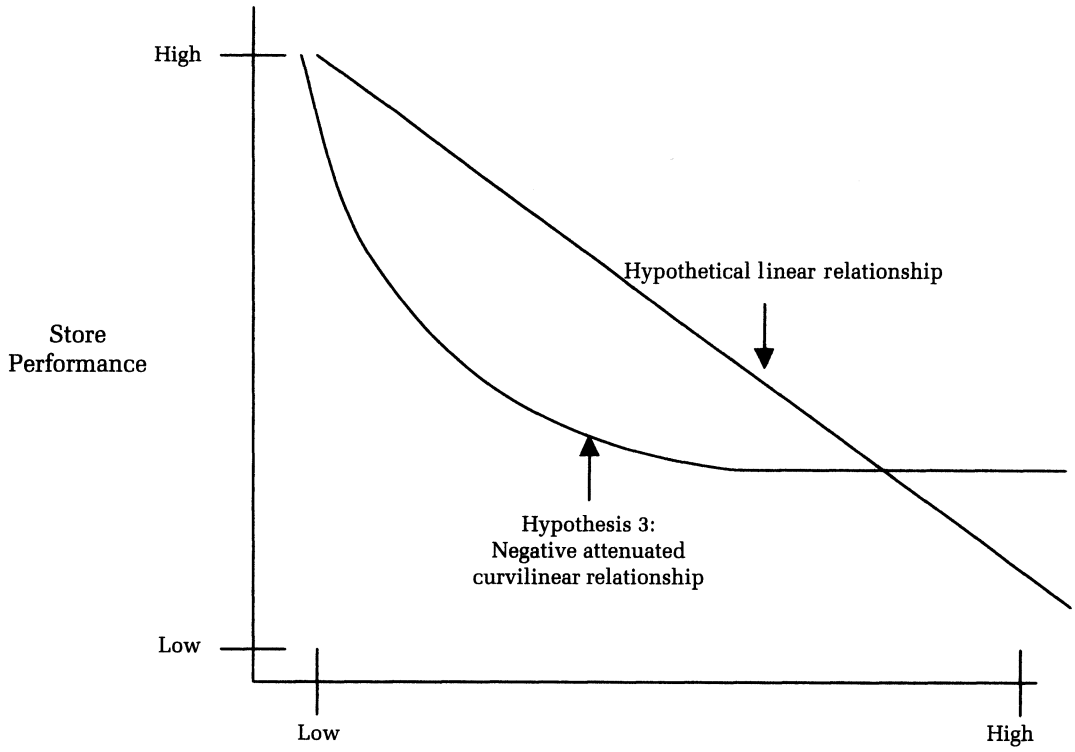
It is useful to compare this formulation to a linear or monotonic negative relationship. Assume that we are observing performance decline in two pairs of organizations. The first paired comparison (A) is of an organization with very low social capital losses from turnover (two standard deviations below the mean; -2 s.d.) to an organization with -1 s.d. social capital losses. The second comparison (B) includes an organization with $+1$ s.d. social capital losses and one with $+2$ s.d. social capital losses. In the linear formulation, the predicted performance decline between the organizations in situation A and situation B would be identical—that is, the incremental effect on organizational performance remains constant over the range of social capital loss. The curvilinear formulation suggests that the decline in performance will be much greater in situation A, where social capital losses create the first gaps in the communication network, than in situation B, where many structural hole bridges have been lost in both cases. Comparing zero to moderate social capital losses across organizations, a linear formulation would underestimate the effect of such losses on performance. Comparing moderate to high social capital losses across organizations, the linear formulation would overestimate their effect. Figure 1 shows the slopes for both a linear relationship and our hypothesized curvilinear relationship. Formally:

Hypothesis 3. Social capital losses and store performance have a curvilinear relationship that is strongly negative initially but attenuated at higher levels of social capital loss.

Turnover and Density Moderators

We expected two variables—overall turnover rate and communication network density—to moderate the curvilinear relationship of social capital losses and store performance. With regard to overall turnover, we expected the relationship between social capital losses and performance to be more pronounced when overall turnover rates are low than when they are high. Social capital accumulates in intraorganizational networks over time. Individuals in long-standing groups develop "transactive" and "external" memory (e.g., Wegner, 1987) and norms of reciprocity that reduce opportunistic behavior (Coleman, 1990). Although individuals

FIGURE 1
Social Capital Losses and Store Performance: Negative Attenuated and Linear Relationships



may eagerly bridge structural holes both when "voluntary turnover" is low and when it is high, the loss of such boundary spanners should have more of an impact when turnover is low—and thus, transactive memory and reciprocity norms are well-established—than when turnover is high, and so key network relationships have not been steadily maintained. High turnover can disrupt social systems to the point at which it is difficult to effectively stabilize social exchanges (Coleman, 1990). As a result, losses of bridging ties in organizations where turnover is high may be less damaging than the same losses in organizations where turnover is low. As Dess and Shaw pointed out, "Organizations suffer disproportionate losses when individuals who are successful in creating social capital via the maintenance and augmentation of network relationships throughout the organization leave the organization" (2001: 451). To summarize, we expected an interaction between social capital losses and overall turnover in predicting store performance. Thus:

Hypothesis 4. Social capital losses and overall turnover rate interact in predicting store performance: the curvilinear relationship between social capital losses and performance is stronger when the turnover rate is low.

The density of a communication network should also moderate the relationship between social capital losses and store performance. Scott (2000) defined *density* as the number of relationships in a group relative to the number of possible relationships. At the sociological level, density provides an estimate of the number of redundant relationships in a network. Organizations may reap some advantages from dense communication networks. For example, Sparrowe, Liden, Wayne, and Kraimer (2001) argued that groups should realize greater cooperation, information sharing, and accountability in dense networks. In the case of our study, while density might relate positively to store performance, we also expected it to buffer the negative effects of social capital losses on store performance. Key links lost through turnover should lower performance across the board, but a surfeit of redundant contacts should ameliorate these negative effects. Density increases information sharing accountability, which heightens the probability that employees are aware of each other's roles in an organization (Sparrowe et al., 2001). Accumulated knowledge of the roles that other employees are playing increases flexibility and adaptability, and it should increase the speed at which organizations respond to structural holes created by turnover. At

the interorganizational level, Wiewel and Hunter (1985) found that density was related to adaptability and the ability to generate new resources. In the case of social capital losses, not only will knowledgeable individuals be able to respond to network disruptions, but also, the abundance of redundant relationships in a dense network should allow changes to be made without a spiral of communication gaps. In contrast is the effect of social capital losses in a network with few redundant relationships. Under these conditions, the effect of social capital losses on performance should be more pronounced; the losses should create an additional strain on scarce communication links and may begin a chain reaction of communication problems throughout the network. Thus:

Hypothesis 5. Social capital losses and network density interact in predicting store performance: the curvilinear relationship between social capital losses and performance is stronger when density is low.

METHODS

Sample

The data for this study were obtained from 70 domestic store locations of an international restaurant chain. The restaurants are relatively upscale, dinner-oriented establishments that tend to be located in very similar commercial settings (near other, similar restaurants and shopping establishments) across the United States. High standardization across the units and the placement of the units in very similar commercial settings help to minimize the effects of consumer preferences and other local market differences that could have biased the results. Unlike fast-food restaurants, which compete using systematic and technological approaches to food service and in which the importance of social and human capital is low, our setting was appropriate for examining social and human capital issues in the context of turnover and performance. The setting, however, made for a somewhat tough test of the theory because social and human capital losses are likely less problematic in this setting than parallel losses in settings characterized by very high skill levels or knowledge intensivity (e.g., communities of scientists, product development or software design teams, etc.). Findings in support of our theory in this setting may suggest greater effects in stronger settings (Prentice & Miller, 1992).

Data sources were collected or obtained from four sources: employee surveys, supervisor performance evaluations, turnover records, and store sales records. All employees in the 70 facilities were provided a questionnaire to complete during work time, guaranteed confidentiality, and assured that their participation was voluntary. The questionnaire included attitudinal and demographic information as well as sociometric forms for the network variables. Each employee received a numbered roster of all current store employees that matched a sociometric form inside the questionnaire. At the same time, supervisors completed a short employee evaluation form provided by the research team for all employees in the store. Turnover information was provided by store managers using store records six months following the collection of the survey data. Store sales data were provided by corporate headquarters for the four fiscal-year quarters preceding and following the turnover data collection.

In all, 3,290 employees in these 70 stores completed questionnaires, for an overall response rate of 66.2 percent. Response rates across stores ranged from a low of 21 percent to a high of 100 percent. Because social network calculations require high response rates, it was necessary to eliminate stores with lower response rates. We attempted to maintain an acceptable average response rate (typically suggested in the literature to be 80 percent or more) and also to look for a natural break point in the response rates. Using these related criteria, we eliminated from the analysis sample all stores with lower than 65 percent response rates, as there was a substantial drop in response rates below the cutoff, and this cutoff yielded an average response rate of 80 percent. The analysis sample includes 38 stores and responses from 2,198 employees. The average age of the analysis sample members was 24 years; the average tenure was 2 years; and the modal education level was "graduated from high school or G.E.D." The sample contained 73 percent "white non-Hispanic" individuals, 13.7 percent "Hispanic," and 7 percent "black non-Hispanic." Sixty-two percent of the sample worked in the front of the restaurant (e.g., as servers, hosts, or bartenders); 32 percent worked in the kitchen; and 6 percent held managerial jobs.

Measures

Turnover rates. We operationalized turnover rate as the number of individuals who left a store divided by the total number of employees in the store. The average turnover rate for the six-month collection period was 46 percent (a 92 percent rate, if annualized), and the range was 26 percent to 70 percent. Turnover rates were approximately 49 percent for "front-of-house" and kitchen employees

during the six-month period and approximately 40 percent for managers.

In-role performance losses. We calculated this variable using the aggregated in-role performance measure completed by store managers. The four items were adapted to the restaurant context from the supervisor evaluation measure in a publication of the Survey Research Center (1977). The items were, "How good is the quality of this employee's performance?", "How efficiently does this employee do his or her work?", "When changes are made to procedures, schedules, and menus, how quickly does this employee adjust to them?", and "How well does this employee cope with situations that demand flexibility?" The items had 11 response options with bipolar anchors (e.g., "very poor quality"/"very good quality," "very inefficiently"/"very efficiently," "very slowly"/"very quickly," and "very poorly"/"very well"). The internal consistently reliability of this measure was .94. The in-role performance level of all employees in the store and the performance level of departed employees were mean-aggregated to the store level. To account for baseline performance differences among stores and to standardize this measure for cross-store comparison, we used a ratio: the average in-role performance of leavers divided by the average in-role performance of all employees in a store.

Social capital losses. We used Freeman's (1979) "betweenness centrality" as a measure of the extent to which individuals occupied structurally advantageous positions in a store's communication network—that is, bridged structural holes. We chose this operationalization over constraint formulas because use of betweenness allows one to take both direct and indirect ties into account when determining the value of an individual's position. We symmetrized the communication matrices using the "max-of" rule; that is, a pair was considered to have a communication tie if either member of the dyad indicated a communication tie existed. Using the roster and the sociometric form, employees indicated whether or not they communicated with other employees "at least several times a week." As with the in-role performance loss measure, we aggregated the betweenness scores to the store level for the entire employee group and for leavers. We divided the betweenness scores for the leavers by the betweenness score for the entire employee group in order to standardize the measure for cross-store analyses. Thus, the ratio of the two (average betweenness of leavers divided by the average betweenness centrality in a store) was the measurement.

Density. We used the formula provided by Scott (2000) for this variable: the number of communication ties in a network divided by $n \times (n - 1)$, where n is the number of employees in the network.

Store performance. We measured store performance in three different ways. First, we calculated the productivity metric that is common in sales and other service organizations: sales per employee (e.g., Huselid, 1995; Shaw et al., 2005). The measurement was average quarterly sales for the four fiscal-year quarters following the turnover measurement divided by the number of employees in a store. Following Batt (2002), we also included two performance change measurements, change in productivity and change in sales, as dependent variables. Change in productivity was average quarterly sales per employee for the year following the turnover measurement minus average quarterly sales per employee in the year preceding the study. Change in sales was actual dollar change in sales during these same time periods.

Our choice of dependent variables was based on several theoretical, contextual, and pragmatic concerns. Our theory concerning turnover and social capital losses should relate not only to static levels of performance, but also to changes in performance levels in the periods immediately following the losses. Thus, it was important not only to assess productivity levels in the time period following the collection of the independent variables, but also to assess performance changes over time. We chose to focus on sales or revenue (as opposed to costs or profits) for theoretical and contextual reasons. Sales is a critical performance outcome in service industries and high-customer-contact settings (Batt, 2002), as well as in highly competitive environments such as the restaurant industry. The units of the restaurant chain examined here competed on the basis of food and service quality in their market niche—that is, it was not a fast-food chain. Sales were the basis for performance evaluations at the unit level as well as for performance comparisons of stores at the corporate level. To emphasize its importance and centrality in the culture, corporate management repeatedly requested that all store-level feedback from the research team to store and corporate officials be expressed in terms of quarterly sales. Moreover, costs were relatively invariant across the chain owing to high standardization in distribution, and they varied nearly perfectly with store size. Thus, expressing variation in sales over time as a function of differences in sales performance was, in our judgment, a legitimate approach. We decided to use total employees as the denominator in the productivity calculation because of total employees' prevalence in the literature and because of availability. Alternative measures of store size (e.g., square feet per store) were

not available to the research team. Corporate management, however, assured us that square footage and other size assessments varied almost perfectly with employees per store.

Control variable. We controlled for store size (number of employees) in all analyses. Store size relates to the density of store networks and bridging ties (Scott, 2000), turnover (Shaw, Delery, Jenkins, & Gupta, 1998), and sales.

Analysis

We used hierarchical regression analyses to test our hypotheses. We entered store size, turnover rates, in-role performance losses, and density in step 1, social capital losses in step 2, the quadratic social capital loss variable (social capital losses squared) in step 3, and the interactions (social capital losses with turnover rates and social capital losses with density, respectively) in the final step. Unstandardized regression coefficients and changes in explained variance were examined. To reduce nonessential collinearity, we standardized the variables (turnover, social capital losses, and density) prior to creating the product terms (Cohen, Cohen, West, & Aiken, 2003). Checks for the violations of the assumption of our regression analyses yielded no substantive violations.

RESULTS

Table 1 shows the descriptive statistics for, and correlations among, the study variables. The top panel in Table 2 includes the regression results when productivity (sales per employee) is the dependent variable. In model 1, the turnover rate is significantly and negatively related to productivity ($b = -1{,}464$, $p < .01$), but in-role performance losses are not significantly related ($b = -134$, n.s.). Thus, Hypothesis 1 is supported. There is no support for the mediating role of in-role performance losses stated in Hypothesis 2, as they are not significantly associated with the turnover rate (Table 1, $r = .09$, n.s.) or productivity (Table 2, $b = -134$, n.s.). Thus, neither of the critical conditions for mediation is met. In model 3, the squared social capital losses variable is significant in the expected direction ($b = 396$, $p < .05$), but support for Hypothesis 3 is qualified by the higher-order interaction involving the quadratic social capital loss term ($b = -1{,}152$, $p < .01$) in model 4 (Cohen et al., 2003). The two interaction terms in model 4 explain an additional 13 percent of the variance in productivity.

Recall that Hypothesis 4 states that the negative curvilinear relationship between social capital losses and store performance is more pronounced when turnover is low. The curvilinear relationship is predicted to be such that as social capital losses increase from low to average levels, the slope of the line becomes steeper than that of a predicted linear relationship, but this steepness attenuates as social capital losses increase beyond mean levels. We used the unstandardized coefficients to plot the relationships and to assess the level of support for Hypothesis 4. Figure 2 shows this relationship. As expected, the highest level of performance is observed when social capital losses and turnover are at their lowest levels. Moreover, the figure shows strong support for Hypothesis 4 when turnover is low. With low turnover, the relationship between social capital losses and performance is strongly negative as the first losses in social capital occur across organizations, but it is attenuated at higher loss levels. To illustrate, the predicted productivity when social capital losses are −1.5 s.d. from the mean is $17,653 generated per employee per quarter, but the predicted level is $13,970 per employee at −1 s.d., a predicted 26.3 percent drop in productivity. The predicted reduction in productivity decline between −1 s.d. and −.5 s.d. is 24 percent, and the decline attenuates to 19 percent between −.5

TABLE 1
Correlations and Descriptive Statistics[a]

Variables	Mean	s.d.	1	2	3	4	5	6	7
1. Store size	77.63	11.92							
2. Network density	0.90	0.19	−.21						
3. Turnover rate	0.46	0.10	.25	.08					
4. In-role performance losses	0.97	0.04	.16	−.02	.09				
5. Social capital losses	0.97	0.16	−.22	.10	−.03	.08			
6. Productivity	10,762	2,091	−.42**	.35**	−.32**	−.20	.24		
7. Change in productivity	1,452	2,043	−.23	−.13	−.25	.08	.36**	.50**	
8. Change in sales	105,944	145,562	−.18	−.14	−.20	.15	.40**	.51**	.89**

[a] $n = 38$.
** $p < .01$

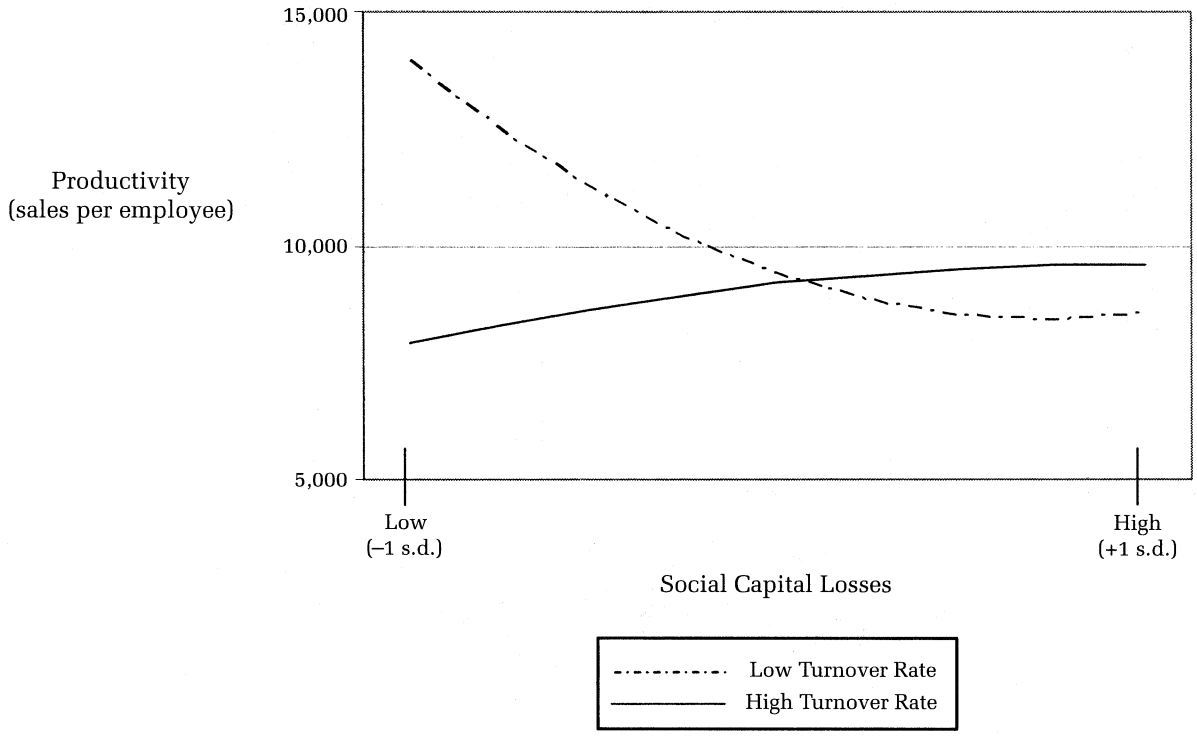
TABLE 2
Results of Regression Analyses[a]

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Productivity[b]					
Store size	−487 (328)	−420 (33)	−263 (332)	−544 (317)	−294 (347)
Network density	54,988** (22,304)	54,338* (22,285)	68,808** (22,801)	79,923** (21,132)	70,299** (25,270)
Turnover rate	−1,464* (−703)	−1,448* (703)	−1,178* (690)	−105 (777)	−1,113 (762)
In-role performance losses	−134 (328)	−158 (329)	−193 (316)	−54 (299)	−147 (33)
Social capital losses		−321 (311)	−80 (371)	−931* (479)	−3,818 (4,167)
Social capital losses squared			396* (217)	710** (232)	995 (3,911)
Social capital losses × turnover rate				1,780* (794)	
Social capital losses squared × turnover rate				−1,152** (424)	
Social capital losses × network density					32,625 (34,784)
Social capital losses squared × network density					4,958 (32,316)
Total R^2 (ΔR^2 for step)	.37** (.37**)	.40** (.05)	.46** (.07*)	.60** (.13*)	.48** (.02)
Change in productivity					
Store size	−534 (373)	−358 (346)	−174 (338)	−411 (282)	−208 (325)
Network density	−22,234 (25,396)	−23,938 (23,110)	−7,129 (23,256)	−2,008 (18,821)	3,105 (26,630)
Turnover rate	−953 (801)	−911 (729)	−596 (704)	−863 (692)	−337 (713)
In-role performance losses	285 (374)	223 (341)	181 (322)	400 (266)	154 (308)
Social capital losses		−844** (322)	−376 (378)	−89 (427)	−759* (389)
Social capital losses squared			460* (221)	637** (207)	−584 (365)
Social capital losses × turnover rate				623 (707)	
Social capital losses squared × turnover rate				−1,413** (377)	
Social capital losses × network density					−6,701 (4,852)
Social capital losses squared × network density					−5,218 (4,022)
Total R^2 (ΔR^2 for step)	.14 (.14)	.31* (.17*)	.41** (.10*)	.66** (.25**)	.51** (.10)
Change in sales					
Store size	−30,559 (26,941)	−19,848 (25,874)	−6,511 (25,391)	−26,091 (21,521)	−8,794 (24,611)
Network density	−1,402,646 (1,830,927)	−1,506,355 (1,725,619)	−283,115 (1,743,739)	219,101 (1,434,573)	439,783 (1,789,041)
Turnover rate	−57,106 (57,770)	−54,525 (54,439)	−31,661 (52,811)	−82,021 (52,777)	−13,410 (54,014)
In-role performance losses	30,900 (26,996)	27,132 (25,494)	24,126 (24,202)	42,006 (20,349)	22,054 (23,369)
Social capital losses		−51,383 (24,097)	−17,357 (28,380)	−25,792 (32,581)	−55,106 (29,504)
Social capital losses squared			33,506* (16,599)	49,757** (15,811)	41,558 (27,692)
Social capital losses × turnover rate				67,846 (53,910)	
Social capital losses squared × turnover rate				−108,620** (28,789)	
Social capital losses × network density					−483,378 (286,256)
Social capital losses squared × network density					−371,584 (228,782)
Total R^2 (ΔR^2 for step)	.12 (.12)	.25 (.13*)	.35* (.10*)	.61** (.26**)	.45* (.10)

[a] Unstandardized regression coefficients expressed in whole dollar amounts are shown. Standard errors are in parentheses.
[b] Sales per employee.
* $p < .05$
** $p < .01$

and the mean level of social capital loss (0 s.d). Beyond mean levels, there is virtually no relationship between social capital losses and productivity. Indeed, the predicted quarterly productivity at the mean social-capital-loss level ($9,397) and +1.5 s.d ($9,520) is only $123. Thus, as predicted in Hy-

FIGURE 2
Interaction between Social Capital Losses and Turnover Predicting Store Productivity



pothesis 4, the curvilinear relationship between social capital losses and store performance is sharply negative as these losses move from low levels, but it becomes attenuated as these losses increase beyond mean levels. Also as expected, the relationship between social capital loss and store performance is not as pronounced when turnover is high; that is, there is a slightly positive, but not significant, relationship across the range of social capital losses. Thus, Hypothesis 4 receives considerable support in the productivity equation. Hypothesis 5 is not supported. Neither of the interaction terms containing network density and social-capital-loss variables (see model 5) was significant.

The middle and lower panels in Table 2 include the regression coefficients that result when change in productivity and change in sales are the dependent variables, respectively. These analyses offer no support for Hypotheses 1 and 2 as neither the turnover rate nor in-role performance losses are significantly related to the change outcomes in model 1. In both cases, the quadratic term for the social capital loss term in model 3 is significantly related to the change outcomes, indicating the curvilinear relationship predicted in Hypothesis 3, but this support is again qualified by the higher-order interactions involving the quadratic social capital loss terms in model 4 (Cohen et al., 2003).

In the productivity change equation, the model 4 interaction step explains an additional 25 percent ($p < .01$) of the variation. Importantly, the interaction between the quadratic social capital loss term and turnover is significant, with a sign in the expected direction ($b = -1{,}413$, $p < .01$). In the change in sales equation, the interaction step explains an additional 26 percent ($p < .01$) of the variation and the sign on the significant quadratic social capital loss by turnover rate interaction, again in the expected direction ($b = -108{,}620$, $p < .01$). Plots of these relationships reveal patterns similar to that found in Figure 1. The most positive performance changes are observed when social capital losses and turnover are both low. When turnover is low, the attenuated relationship between social capital losses and performance changes in such a way that the most dramatic performance decrements occur when social capital losses increase from low to moderate levels. When turnover is high, the relationship between social capital losses and performance changes is insignificant in both equations. It should also be noted that when turnover rates are high, performance changes are negative—there is a net loss in dollars—over the entire range of social capital losses.

DISCUSSION

Prior theoretical and empirical research on the consequences of voluntary turnover focuses either on the human capital losses associated with turnover or simply weighs its costs and benefits as in an accounting exercise. Building on earlier essays (e.g., Dess & Shaw, 2001), we developed and tested a theory with these elements: social capital losses explain variation in store performance that exceeds variation attributable to turnover and in-role performance losses; the relationship between social capital losses and turnover is curvilinear; and turnover and communication network density moderate that curvilinear relationship. The results of this study are very encouraging with respect to the role that social capital losses play in the performance of organizations.

The data show that turnover rates and in-role performance losses were not consistent predictors of performance at the macro level. In the most directly comparable study in the literature, Batt (2002) found that a one-unit increase in turnover was associated with a 17 percent reduction in sales in a sample of call centers. In our results, turnover was significantly related only to sales per employee, with a one-unit increase in turnover associated with a $1,464 loss in quarterly sales per employee. This result, however, should be interpreted with caution because of the nonsignificant results in the change-in-sales and change-in-productivity equations as well as the significant higher-order interactions with social capital losses. Contrary to our expectations, the relationship between in-role performance losses and store performance was not significant, and there was no evidence that in-role performance losses mediated the relationship between turnover and performance. The restaurant industry generally experiences high turnover, and it is possible that human capital is more interchangeable in this context than in other contexts. This factor may render the relatively high losses of in-role performance, on balance, to be less predictive than the turnover rate and other factors (e.g., social capital) in this context. Dess and Shaw (2001) argued that as the focus of an industry changes from the allocation of labor and physical capital to the leveraging of intellectual and informational processes, relationships and social capital take on greater importance. Our sample of service firms provides some initial evidence to substantiate this argument.

The primary feature of our theory and empirical tests was examination of whether social capital losses could go over and above turnover and in-role performance losses in explaining variation in store performance. We found, as expected, that the relationship between social capital losses and store performance was curvilinear and also that turnover moderated it. When turnover was high, store performance was low across the board. When turnover was low, the social capital loss→performance relationship was sharply negative initially, but it grew attenuated as social capital losses increased. We conceptualized and measured social capital losses at the level of the collective, viewing social capital as created when relationships facilitate instrumental action among people (Coleman, 1988) and lost when turnover disrupts communication networks and hinders instrumental action. Our results show that when turnover and social capital losses are low, store performance is high, but as these losses increase, the impact on store performance is marked. Yet the incremental negative effect of social capital losses grows less pronounced as these losses increase. These findings provide a new direction for macrolevel turnover research. They suggest that turnover not only increases inefficiencies in organizations and costs them in terms of human capital deficits, but also that turnover costs organizations in terms of lost relationships among people (Burt, 1992). Estimating the turnover-performance association is not simply an accounting exercise, but also a function of the embedded communication networks in organizations and, especially, a function of the individuals who hold critical bridging positions in them. In large part, network researchers have focused on the consequences of intact social networks or the creation of certain network patterns; few have examined the consequences of network disruptions. Moreover, the few studies that have done so (e.g., Krackhardt & Porter, 1986; Shah, 2000) have looked at individual-level outcomes rather than consequences for organizational performance. Our study is among the first to examine how losses of individuals in key network positions can negatively impact the performance of organizations. It should also be noted that our research context could be considered a weak situation for the tests of these hypotheses. Coleman (1988), among others, has argued that social capital takes a significant amount of time to accumulate, and Dess and Shaw (2001) argued that it is most important in knowledge-intensive industries. Although the focal units here compete on the basis of food and service quality, the importance of network connections is likely more important in other industrial contexts (e.g., product development or design teams, top or upper-echelon management teams, etc.). In addition, that we observed strong social capital loss effects among units that were experiencing an annualized turnover rate of about 90 percent may

also speak to the possibility of very powerful social capital loss effects in stronger settings.

Several interesting areas for future research are evident. First, taking a collective point of view, we analyzed the disruption associated with losses of individuals who are bridging structural holes in the communication network. Although it is consistent with existing views of social capital at the individual and collective levels, our definition was not intended to be a comprehensive view of network losses. Krackhardt and Porter (1986), for example, found that individuals in structurally equivalent positions were more likely to leave their jobs in clusters. Their focus was not examining consequences of turnover clusters, but rather, predicting them. As such, the impact of structurally equivalent clusters of turnover on organizational performance is still unknown and should be examined in future studies. Second, we analyzed social capital losses in terms of the communication networks in organizations, but social capital may be created and lost in other types of networks (e.g., friendship or advice networks; Shah, 2000; Sparrowe et al., 2001). Shah (2000), for example, found that losses of others from a focal individual's friendship network through downsizing had a greater impact on the individual's attitudes and negative reactions to the downsizing than losses of structural equivalents in the individual's network. In the case of organization-level turnover research, it is possible that losses of structural hole bridges may affect performance directly, but losses of friendship ties may influence collective performance through their impact on individual's attitudes. In the case of service-oriented businesses like the ones examined here, negative attitudes may impact performance by reducing customer service and food quality or by creating a snowball turnover effect. Third, although our predictions regarding interactions of social capital losses and network density were not supported, we encourage future research in this area. In particular, research scholars should explore the alternative ways in which social capital is created and lost in organizations. Coleman (1988) emphasized the role of cohesive ties in facilitating cooperation, while Burt (1992) emphasized the role of structural hole bridging. In support of Coleman's view, we found that density positively related to performance across the board, but in support of Burt's (1992) view, we found that losses of structural hole bridges were damaging to organizational performance, especially under conditions of low turnover. It would be beneficial for future research to explore the conditions under which social capital losses in dense network structures are damaging to organizational performance. These investigations may possibly uncover a substantive reason why network density was a strong "main effect" predictor of performance, but did not buffer the negative relationship between social capital losses and performance. It is possible that the nature of our context—a service-based one where bridging communication links are of the utmost importance—increased their importance and diminished the importance of density as a buffer.

This research should also be evaluated in light of its limitations. We focused on a single context, facilities in a restaurant chain, and while this focus offers advantages in terms of eliminating certain confounds (e.g., identical organizational structures, similar facility sizes, common performance metrics) and eliminates cross-industry confounds, it places limits on the generalizability of the findings. Our analysis sample size was only 38 stores, and while the significant findings may speak to the robustness of the effects, these results should be viewed as only preliminary support for our new theoretical direction. Although our response rates were quite high across the analysis sample (more than 65 and 80 percent overall in our analysis sample), network research is very sensitive to missing responses. It is not possible to estimate whether the variation in response across stores would over- or underestimate the true effect sizes for these relationships. We also examined the overall turnover rate—that is, we did not distinguish among various sources of turnover (quits, discharges, transfers, etc.). There is considerable evidence that the etiologies of quits and discharges differ (Shaw et al., 1998), and the consequences may also be divergent. Our performance measures were limited to variations in store sales and common productivity metrics, and although we would argue that these are appropriate in this context, additional operationalizations would have been useful and interesting. We were unable to obtain additional descriptive information on the stores, such as costs, square feet, and so forth, that would also have added richness to our analyses. In terms of social capital theory, the source of turnover should not matter because key communication linkages can disappear in voluntary quit, involuntary discharge, and transfer situations alike. In terms of human capital theory, it is sometimes argued that workforce performance will increase if poor performers are discharged, but the existing empirical evidence does not support this contention (e.g., McElroy, Morrow, & Rude, 2001). Ameliorating the concern further, we explained variance in in-role performance losses over and above that attributable to overall turnover. In-role performance losses did not have strong predictive power in this study, perhaps because of restriction

of range in the aggregated measure. Finally, in our theoretical approach and tests we assumed a certain causal sequence, although it is possible that performance differences have a causal influence on future turnover levels. Although the existing empirical evidence lends more support to the causal sequence examined here, we encourage future researchers to attempt to disentangle this issue. In particular, we encourage research that examines these issues over time. For example, the causative effects of turnover on performance may be most pronounced in the short term (e.g., in the time frame studied here), as organizations attempt to recover from social and human capital losses. The causative effects of performance on turnover rates may be more pronounced over a longer time window, as the effects of poorer company reputation, organizational climate, and the like begin to have an impact. We also encourage additional studies that include local area data on unemployment rates and business conditions that may have influenced the current results. Readers should interpret our results with these cautionary notes in mind.

To conclude, we developed and tested a social capital theory of the relationship between turnover rates and the performance of organizations. The results contribute to the growing speculation that the value in intraorganizational relationships and, in our case, the loss of value contained in communication networks can explain significant and practical amounts of variation in organizational performance. These results also show the effects of social capital loss through turnover to be more pronounced when overall turnover is low. We encourage future researchers to use this study as a point of departure for more comprehensive theories of workforce stability, social capital, and organizational performance.

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