WHO STAYS AND WHO LEAVES?

SOCIAL DYNAMICS SURROUNDING EMPLOYEE TURNOVER

by

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My dissertation consists of two essays that examine employee turnover as an independent and a dependent variable. In my first essay I examine the relationship between job-related attitudes, such as job satisfaction and organizational commitment, and employee turnover behavior. In a sample of over 6,000 teachers in 200 public elementary schools, I found significant variability across employee and organizational characteristics in the strength of the relationship between job attitude ratings and turnover. I attribute this variability to two sources: (a) systematic differences in attitude thresholds, i.e. the minimum acceptable level of a job attitude necessary to remain with the organization; and (b) systematic response biases in attitude ratings. I develop a model to determine which characteristics relate to significant differences in attitude thresholds and/or response biasing factors and found that both individual and organizational attributes are distinguishing factors.

In my second essay I present findings from three inter-related studies investigating human and social capital as mechanisms that may determine whether and why employee retention is associated with organizational performance. In a sample of public schools I found a linear relationship between employee retention and organizational performance. Further, this positive association is fully mediated by human capital and partially mediated by social capital. In addition, I examined human and social capital at the individual level of employees who remain with the organization versus those who leave. I found that organizational performance suffers most when the employees who leave have high levels of both human and social capital. Finally, I distinguished human and social capital losses based on their specificity: organization-specific versus task-specific. As predicted, the losses of task-specific human and social capital were more deleterious to organizational performance than the losses of organization-specific forms of capital.

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Finally, it is my time to put the last words into my dissertation and move forward to a new stage in my life and career. While only my name appears on the title of this document, it would never become a final product without the support, guidance, and mentorship of many people. I would like to use this moment to express my genuine gratitude and appreciation to all the people who took part in my development as a researcher.

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1.0 INTRODUCTION

Personnel turnover is a phenomenon that all organizations experience at some level. For example, in the 2008's "100 Best Companies to Work For" (Fortune, 2008) voluntary turnover rates range from as low as 2% (S.C. Johnson & Son) to 29% (eBay). Employee turnover has attracted research attention for more than a hundred years (Dalton & Todor, 1979; Mobley, 1982). The importance of studying this major organizational phenomenon is widely recognized as it is a "relatively clear-cut act of behavior that has potentially critical consequences for both the person and the organization" (Porter & Steers, 1973: 151). Practitioners also acknowledge employee turnover as a major concern. According to a recent survey, more than two-thirds of HR managers stated that retaining and recruiting employees was their highest priority (Express Personnel Services, 2006).

Theoretical discussions recognize multiple pathways from employee turnover to organizational performance implying that turnover may have both positive and negative consequences (e.g., Dalton & Todor, 1979; Dess & Shaw, 2001; Mobley, 1982; Staw, 1980). Dalton and colleagues (Dalton, Krackhardt, & Porter, 1981; Dalton & Todor, 1979; Dalton, Todor, & Krackhardt, 1982) distinguish among functional and dysfunctional voluntary turnover. Functional turnover is believed to be beneficial to the organization as it refers to the voluntary separation of individuals who are negatively evaluated by the organization. Conversely, dysfunctional turnover is seen as negative since it refers to the voluntary separation of individuals who are valued by the organization. Other researchers (e.g., Abelson & Baysinger, 1984) search for optimal turnover rates by comparing turnover versus retention costs, reasoning that the lack of turnover may lead to the increased retention costs through such factors as higher compensation based on tenure. Finally, some employee turnover may initiate the inflow of "new blood" (Grusky, 1960), promote creativity in work groups through newcomer innovations (Levine, Choi, & Moreland, 2003), and increase organization's adaptability to changes in the environment (March, 1992; Staw, 1980).

The predominant theoretical approaches to organizational-level consequences of employee turnover, however, emphasize the detrimental effects of turnover as it negatively influences organizational accumulations of intangible assets. Particularly, human capital embedded into employees is generally associated with better organizational performance (Hitt, Bierman, Shimizu, & Kochhar, 2001; Huselid, 1995; Penning, Lee, & van Witteloostuijn, 1998; Pfeffer, 1994; Wright, Smart, & McMahon, 1995). Moreover, human capital theory (Becker, 1964; Strober, 1990) stresses the importance of firm-specific human capital accumulations. While valuable, human capital, however, is not appropriable by the organization; employees, when leaving, take their knowledge, skills, and abilities with them (Coff, 1997). Thus, one way in which personnel turnover threatens organizational performance is by diminishing organizational accumulations of human capital (Osterman, 1987).

In addition to reducing the available stocks of organization-specific knowledge and skills, turnover induces disruptions to the fabric of social relations within the organization. Social capital, embedded into the connections between organizational members, is credited with a number of potential benefits including the amount and quality of information flows within the organization (Edmondson, 1999; Krackhardt & Hanson, 1993; Zander & Kogut, 1995); increased cooperation and reduced need for formal control mechanisms (Coleman, 1990); and enhanced organizational citizenship behavior and beneficial extra-role behavior (Adler & Kwon, 2002; Shaw, Duffy, Johnson, & Lockhart, 2005). Turnover breaks some of the existing links in the communication network among employees and disrupts existing social capital. As personnel turnover diminishes organizational accumulations of social capital, it weakens the benefits derived from such accumulations.

Relatedly, turnover poses a threat to the efficiency of organizational transactive memory systems (Moreland, 1999). Transactive memory systems reflect a shared awareness among organizational members of who knows what. Such shared awareness allows better coordination (Murnighan & Conlon, 1991; Wittenbaum, Vaughan, & Stasser, 1998), quicker and more efficient problem solving (Moreland & Levine, 1992), and overall higher productivity (Moreland & Argote, 2003). Turnover, in turn, involves changes in organizational membership and, consequently, produces disruptions to organizational transactive memory systems since the departure of old members and the arrival of new members change the distribution of task-specific knowledge and responsibilities within a group (Moreland, 1999) and can make it difficult to follow who really knows what.

With few exceptions (e.g., Greebbeek & Bax, 2004; Harris, Tang, & Tsend, 2006; Koys, 2001), empirical findings point to the negative association that employee turnover has with indicators of organizational performance such as productivity (Guthrie, 2001), efficiency (Alexander, Bloom, & Nuchols, 1994; Arthur, 1994), safety (Shaw, Gupta, & Delery, 2005), and sales growth (Batt, 2002; Shaw et al., 2005).

The idea that employee turnover has predominantly negative consequences to significant organizational outcomes has spurred a vast research interest concerning antecedents of turnover (see Griffeth, Hom, & Gaertner, 2000; Hom & Griffeth, 1995; Maertz & Campion, 1998, for qualitative and quantitative literature reviews). Most research attention is focused at the individual level of analysis and is devoted to determining individual correlates of employee turnover (Greebbeek & Bax, 2004) since it is believed that effective retention strategies require reliable knowledge about prospective leavers (Judge, 1993; Trevor, Gerhart, & Boudreau, 1997).

While understanding the determinants of employee turnover is critical to the creation of effective retention strategies, it is also important to understand and assess the potential costs and organizational consequences of turnover (Mobley, 1982). Not all employees possess knowledge, skills or connections that are of equal strategic importance to organizational objectives (Lepak & Snell, 1999). Similarly, not all employees demonstrate equally high performance levels (Dalton et al., 1982). Consequently, retention strategies are more efficient if they are targeted at employees who have the greatest impact on core activities within the organization.

This dissertation takes a position that retention strategies need to target employees who are most likely to leave and employees who possess the greatest value to the organization's objectives. In this dissertation, I treat employee turnover as both an independent and a dependent variable. More specifically, I pursue two major objectives. The first one is to more closely examine the situated nature of the relationship between employee attitudes and employee turnover. While theoretically job attitudes are core factors influencing employee turnover decisions (e.g. March & Simon, 1958; Mobley, 1977; Mobley, Griffeth, Hand, & Meglino, 1979; Steers & Mowday, 1981), quantitative reviews have reported that job attitudes have only modestly predicted actual turnover behaviors (Griffeth et al., 2000; Mathieu & Zajac, 1990; Tett & Meyer, 1993). To explore this issue I investigate a "threshold effect" – a critically low level of job attitude that, once reached, is likely to result in a decision to quit. I argue that there is a systematic variation in threshold levels of job attitudes based on differences among employees in their demographic and work characteristics. In addition I investigate a "response bias" – systematic differences in the observed relationship between attitudes and turnover based on the tendency of certain employee groups to under- or over-report their true attitudes. I argue that these effects partially account for the moderate strength of the relationship between job attitudes and employee turnover.

The second goal of this dissertation is to examine the consequences of turnover for the organization. More specifically, I examine one important path that employee retention may take in impacting organizational performance: to preserve and develop intangible organizational resources, such as human and social capital. High retention rates mean that the majority of an organization's employees stay with the organization and fewer newcomers need to acclimate to the requirements of a new job and organizational culture. As members of a stable community, employees have many opportunities to develop a wide network of connections, build closer relationships, and understand the transactive memory of the organization. These firm-specific human assets (Coff, 1997) can be instrumental to organizational effectiveness, and can lead to a sustained competitive advantage (Barney, 1991). Based on this reasoning, is it correct to conclude that those organizations unable to retain their human and social capital through employee retention will under-perform? If so, what is the relative impact of each form of capital and to what extent are they substitutable resources?

The first essay of this dissertation focuses at the relationship between job-related attitudes and actual turnover behavior. Job attitudes are core elements of most turnover theories (March & Simon, 1958; Mobley, 1977; Mobley et al., 1979; Steers & Mowday, 1981). These theories specify a strong and negative relationship between job-related attitudes and employee turnover such that dissatisfied and less committed employees are more likely to leave. However, poor job satisfaction and organizational commitment do not necessarily result in subsequent turnover. In addition, most empirical studies report only a moderate association between work attitudes and turnover (e.g., Griffeth et al., 2000; Mathieu & Zajac, 1990; Tett & Meyer, 1993). Guided by this moderate association, I take a closer look at the differences among employees in the relationship between their attitudes toward their jobs (e.g., job satisfaction, organizational commitment) and their actual behavior (i.e., turnover).

The literature on attitudes suggests generally that "the way the attitude is manifested depends upon certain situational pressures" (Wicker, 1969: 44). As such, the situational threshold leading to expressions of negative feeling (e.g., job dissatisfaction) may be lower than the threshold of actually quitting the job (Campbell, 1963). In addition to situational thresholds, employees may systematically differ in their tendency to under- or over-report true job attitudes. Such tendencies would eventually bias the true attitude-turnover links. By identifying systematic attitude thresholds and response biases attributable to observable employee profiles, this essay develops a model that explains systematic variability in the attitude-turnover link. I find that turnover rates for employees having higher attitude thresholds will be systematically greater than for employees having lower thresholds at identical attitude levels. Using hierarchical linear modeling I analyze how observable employee- and organization-related characteristics such as gender, tenure, age, education, ability, school size, school socio-economic status, and location are associated with systematic differences in teacher attitude thresholds and response biases in a sample of over 6,000 teachers in a large urban school district. The findings of the study point to gender, tenure, ability, and school socio-economic status as significant determinants of threshold effects; and to ability, assignment to mandatory testing grades, and school environment as significant determinants of response biases.

My second essay examines the role of human and social capital as mechanisms that may explain whether and why employee retention is associated with organizational performance. I argue that organizations with high turnover rates are likely to underperform because of their inability to accumulate substantial stocks of organization-specific human and social capital. In organizations with low turnover rates the majority of employees stay longer, thus having greater opportunities to develop: (a) organization-specific human capital through extended exposure to organizational problems and routines; and (b) stronger and better-informed relationships with their colleagues at work (i.e., social capital). Thus, through retention, organizations can accumulate stocks of human and social capital that comprise an idiosyncratic set of capabilities which, because of their uniqueness, can yield superior returns (Barney, 1991).

In addition to examining the accumulations of these forms of intangible capital, I also look at their losses due to turnover. Particularly, I investigate both main and interactive effects of such losses on performance. I ask whether these two forms of capital are at least partially substitutable resources. Finally, I argue that the more closely the form of capital resembles the performance outcome of interest, the greater will be its ability to explain the effects of turnover on performance. Thus, I expect that task-specific forms of capital have more powerful effects on performance than do more general (i.e., organization-specific) forms.

To address these issues, I collected archival and survey data to examine retention among public school teachers and conducted three sets of analyses. Studies 1 and 2 show a linear positive relationship between teacher retention and school performance that is fully mediated by organization-specific human capital and partially mediated by organization-specific social capital. Study 3 examines the individual human and social capital of employees who remain with the organization versus those who leave. I find that losses of task-specific human and social capital are more deleterious to organizational performance than are losses of more general (i.e. organizational) forms of capital. Taken together, the findings described in the second essay suggest that employee retention is instrumental to organizational performance because it facilitates the development and maintenance of human and social capital. At the same time, the more specific such capital is to the work itself (i.e., task-specific), the stronger is its effect on performance.

The findings from both essays of my dissertation provide important contributions to the two streams of research in the turnover literature: (a) research about the antecedents of turnover; and (b) research about the consequences of turnover. The first essay offers a framework that allows a closer examination of the link between job-related attitudes and actual turnover behavior. The second essay investigates the path from employee retention to organizational performance through organizational intangible assets such as human and social capital. A detailed discussion of specific contributions of each essay to the organizational literature are provided in the corresponding sections.

Next, I present my first essay entitled “Job Attitudes as Predictors of Employee Turnover: Systematic Threshold Effects and Response Biases”. Following is the second essay entitled “Employee Retention and Organizational Performance: the Mediating Role of Organization- and Task-Specific Forms of Human and Social Capital”. Finally, I conclude with a discussion of the collective contributions and implications of findings presented in two essays.

2.0 ESSAY 1: JOB ATTITUDES AS PREDICTORS OF EMPLOYEE TURNOVER: SYSTEMATIC THRESHOLD EFFECTS AND RESPONSE BIASES

Work attitudes, including job satisfaction and organizational commitment, have been recognized as important predictors of employee voluntary turnover in many theoretical models and empirical studies (Lee & Mitchell, 1994; Lee, Mitchell, Holtom, McDaniel, & Hill, 1999; March & Simon, 1958; Mobley, 1977; Mobley, Griffeth, Hand, & Meglino, 1979; Steers & Mowday, 1981). To illustrate, a recent meta-analysis on turnover by Griffeth, Hom and Gaertner (2000) incorporated 67 samples that included measures of job satisfaction, organizational commitment, and turnover. Theoretically, such attitudes should strongly predict employee turnover. Job dissatisfaction signals unhappiness with the status quo and the desirability of movement. According to a long tradition in the turnover literature, it should result in the employee quitting the organization when a reasonable alternative is present (March & Simon, 1958). Organizational commitment is viewed as a binding force that links an individual to the organization (Meyer & Herscovitch, 2001), and should thereby also reduce the likelihood of turnover.

Despite these strong theoretical arguments, quantitative reviews of the literature (Griffeth et al., 2000; Hom & Griffeth, 1995; Mathieu & Zajac, 1990; Tett & Meyer, 1993) show that job satisfaction and organizational commitment are only moderately related to actual turnover behavior. In individual studies, the relationship of job satisfaction and organizational commitment with turnover ranges from moderate (Blau & Boal, 1989; Mitchell, Holtom, Lee, Sablynski, & Erez, 2001; van Breukelen, van der Vlist, & Steensma, 2004), to low (Lee, Mitchell, Sablynski, Burton, & Holtom, 2004), to statistically non-significant (Cohen, 2000; Taylor, Audia, & Gupta, 1996). Clearly, there is variability among employees in actual turnover behavior even when they report very similar attitudes toward their jobs and organizations.

In this paper I suggest that the strength of the observed link between job attitudes and turnover may systematically vary across employee groups with different characteristics. For some employees, self-reported attitudes are strongly related to subsequent turnover, while for others such attitudes are weakly associated with turnover. I propose two sources of systematic variability in the attitude-turnover link: (1) different attitude thresholds; and (2) systematic response biases. First, attitude measures may fail to account for underlying differences in the threshold beyond which employees actually leave their jobs. Employees may vary in their tolerance of low job satisfaction and organizational commitment. Thus, as explained in more details below, turnover rates for employees having higher thresholds, i.e., less tolerable of low attitudes, will be systematically greater than for employees having lower thresholds, i.e., more tolerable of low job satisfaction and organizational commitment, at identical attitude levels. Second, there may be systematic differences among employees in how accurately the measures of job satisfaction and commitment reflect true, underlying attitudes. Because of these, weaker attitude-turnover links will be observed overall.

In this paper I report results from an analysis of attitudes and turnover of over 6,000 teachers in a large urban school district. I focus on observable employee characteristics and how they might be associated with systematic differences in employee attitude thresholds and response biases. My basic premise is that understanding systematic differences among employees in how their attitude ratings translate into actual turnover may explain inconsistencies in previous research findings, and allow researchers to better model the relationship between attitudes and turnover in future studies. At the same time, the ability to identify differences in response patterns is important to management practice. Identifying employee groups whose relevant job attitude will more strongly predict turnover allows managers to focus on targeted rather than generalized interventions, which should be more effective.

2.1 THEORY

Decision making about turnover is an inherently complex process (Lee & Mitchell, 1994), and the ultimate choice to stay or to leave is an interplay of many factors in addition to job attitudes. These include the future expected utility of turnover, normative pressures, moral and continuous attachment, psychological contracts, and the number and quality of perceived alternative opportunities (Maertz & Campion, 1998). Given this complexity, research has naturally sought to identify conditions under which the link between work attitudes and turnover is systematically enhanced or mitigated. For example, previous research has reported that job dissatisfaction predicts actual turnover more strongly in periods of economic prosperity when unemployment rates are low (Hom, Caranikas-Walker, Prussia, & Griffeth, 1992). Similarly, job dissatisfaction is a better predictor of quitting for employees with higher human capital (i.e. more educated both generally and occupation-specific) and higher cognitive ability (Trevor, 2001). Organizational commitment, in turn, has been found to be a stronger predictor of actual retention among younger rather than older employees (Cohen 1991, 1993).

Apart from factors like these that logically affect the strength of the relationship between attitudes and turnover, some methodological artifacts may also influence the observed magnitude of the relationship. For instance, organizational commitment was found to be a stronger predictor of turnover in studies with smaller samples and when the time that elapsed between measurement points was shorter (Griffeth et al., 2000). Similarly, job attitude-turnover correlations are sensitive to the choice of the attitude scale used (Cohen 1993; Griffeth et al., 2000**;** Tett & Meyer, 1993).

When attitude data are collected through surveys, the respondents themselves can be an important source of methodological bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Specifically, respondents' ratings may not fully and accurately capture their underlying attitudes. As summarized by Fazio and Zanna (1978, p. 399), "the underlying attitudes of two individuals with identical scale scores may differ in many other respects that may affect the relation of the attitude score to the behavior manifested by those individuals." Two individuals with identical job attitude scores may have different rates of actual turnover behavior for two reasons. First, both employees may report their true job attitudes on the scale. However, for one of them, the reported level of the attitude is unacceptably low and he leaves the organization, while for the other, the same reported level of job attitude is quite acceptable and she stays. Thus, employees may accurately use the scale point to describe themselves as "dissatisfied" with their jobs, but not all of them will act on this dissatisfaction by quitting. This situation results from a difference in what I call *job attitude thresholds*, i.e. the minimum level of job satisfaction or organizational commitment that is acceptable to an employee in order to stay with the organization.

Second, attitude scores may imperfectly reflect true underlying attitudes. The actual job behavior – turnover – should be based on true attitudes (and not necessarily those reported). However, employees with identical attitude scores may have different rates of turnover because of systematic response bias, i.e., systematic over- or under-reporting of the underlying job attitude. For example, Arnold, Feldman and Purbhoo (1985) observed that social desirability bias attenuated the strength of the observed relationship between job attitudes and turnover.

In the case of a single individual, it would be difficult to determine which of the two factors just described above may be at play: threshold differences or response biases in reported scores. However, if employees with similar characteristics (e.g., gender, work experience) demonstrate similar patterns in thresholds and/or in response bias, then in aggregate one can infer the expected strength of the job attitude-turnover relationship for particular employee groups. For example, if women tend to provide more biased job satisfaction scores and are more tolerant of job dissatisfaction compared to men, then we would observe a weaker relationship between satisfaction and turnover for them (because of response biases), and lower turnover rates overall (because of threshold effects). I elaborate on each of these phenomena, i.e. thresholds and response biases, below.

2.1.1 Work Attitudes and Turnover: Attitude Threshold Effects

At its core, turnover is observed and modeled as an individual binary choice to stay with or to quit the current organization. Using job attitudes as predictors of turnover implicitly assumes the existence of individual threshold levels that, once reached, result in the employee leaving the organization. In other words, when the organizational commitment or job satisfaction falls below some threshold level, then an individual considers quitting. For example, modeling the employee turnover process using catastrophe theory, Sheridan and Abelson (1983) observed that when a continuous decrease in commitment or satisfaction for a retained employee was no longer possible, i.e., reached some critical level, the employee would move abruptly to a termination state. Similarly, intermediate linkage models (Mobley, 1977; Mobley et al., 1979) approach the turnover decision as a step-by-step process in which a decrease in job-related attitudes (i.e., job satisfaction and organizational commitment) results in withdrawal behaviors (e.g., search for alternatives), which in turn might result in actual turnover. For an employee to initiate such a step-by-step process, however, utility theory (Louviere, Hensher, & Swait, 2000) suggests that there has to be some critical level of commitment to motivate withdrawal cognitions. The unfolding model of employee turnover (Lee & Mitchell, 1994; Lee et al., 1999) describes multiple paths to employee turnover, including those that are driven by external events (shocks) or are influenced by affect. With the exception of turnover decisions that are made impulsively, job attitudes play a significant role in turnover decisions in this model. Whether motivated by a single event or just the passage of time, employees reassess their basic attachment to the current job and organization and, if this reassessed attachment does not pass some acceptability threshold, the unfolding model predicts that the employee will leave. Finally, social psychology literature on socialization too acknowledges the existence of a divergence criterion that serves as a benchmark for a group member in relabeling his or her own position with respect to the group (Moreland & Levine, 1982). In particular, once commitment to the group falls below such a divergence criterion, a person will relabel himself or herself as a marginal member.

Each individual may have a unique threshold based on her combination of circumstances (e.g., level of human capital; attachment to co-workers). Nevertheless, patterns in the threshold may be expected for employees with similar characteristics. For example, Evetts (1992) suggests that individuals from different birth cohorts could have different professional and employment preferences since their work-related values were formed under different social and economic conditions. As such, one may expect differences across age groups in job attachment and willingness to change organizations (Finegold, Mohrman, & Spreitzer, 2002). Similarly, to the extent that highly skilled workers can find alternative employment relatively more easily, they may have higher expectations and requirements for their current jobs and, consequently, higher attitude thresholds.

The observed measures may not account for differences in the underlying attitude thresholds across employees having different characteristics. As illustrated in Figure 2-1, the observed turnover rates would be higher for employees with higher thresholds compared to those with lower thresholds, even when both groups provide identical attitude ratings on the scale. Failure to adjust attitude-turnover relationship for such threshold differences would result in an underestimated turnover probability for high-threshold employees and an overestimated turnover probability for low-threshold employee.

2.1.2 Work Attitudes and Turnover: Response Biases

Work attitudes are typically measured using respondents' self-reports of their true internal states. Such self-reports are error-prone measures of a person's underlying attitude for several reasons. First, people usually have less true self-knowledge than is typically believed (Hufnagel & Conca, 1994; Nisbett & Wilson, 1977). Second, the process of how people generate responses to questions is a complex one that involves several stages, each of which itself is subject to various biases (Podsakoff et al., 2003). For example, mood can affect the retrieval stage of the response process, which involves the recall of relevant information from long-term memory (Tourangeau & Rasinski, 1988). Implicit theories may be used by individuals to infer missing information from their memory on the basis of what typically happens. In the response selection stage, some people may be hesitant to provide strong responses such as “always” or “never” (Tourangeau & Rasinski, 1988). Finally, people tend to edit their responses before reporting them. At this stage such biases as social desirability bias, consistency bias, and acquiescence bias may interfere (Tourangeau & Rasinski, 1988). As a result, observed attitude ratings often either overestimate or underestimate true attitudes. Indeed, Cote and Buckley (1987) showed that, on average, only 30 percent of variance in attitude measures is attributed to the “true” trait variance, compared to 70 percent of variance being attributed to various sources of error. Figure 2-2 illustrates the relationship between true and observed attitudes for “easy” (who tend to over-report) and “harsh” (who tend to under-report) respondents (Mittal & Kamakura, 2001).

Statistically, individual response bias should not be of any concern if the bias occurs randomly in a given sample of respondents. However, if individual response bias varies systematically, the findings would be skewed. Figure 2-3 illustrates the effect of such systematic biases on the attitude-turnover relationships. For “easy” raters, higher scores would be systematically associated with higher turnover rates than would be expected based on the true attitude-turnover relationship (represented by the solid line on Figure 2-3). The opposite is true for “harsh” raters. Since such raters under-report their true attitude level in the survey, their turnover rates associated with lower scores would be lower than otherwise expected (Arnold et al., 1985). To understand the relationship between work attitudes and turnover, such biased estimates are not only less informative but also misleading since they underestimate the true effects of changes in attitude on the probability of actual turnover behavior.

Researchers have documented many types of response biases in a variety of measures of attitudes and traits (Harrison & McLaughlin, 1993), some of which are more typical for certain respondent populations. For example, age, education, race (Winkler, Kanouse & Ware, 1982) and personality characteristics (Couch & Keniston, 1960) have been found to be related to the propensity for acquiescence bias (yea- or nay-saying). There is a significant gender difference in negative affectivity (Smith & Reise, 1998), which, in turn, is related to response biases (Podsakoff et al, 2003). Different cognitive forces may lead to inaccuracies in reported ratings (Morgeson & Campion, 1997). Limitations in information processing, which are especially prevalent under stressful conditions or information overload, may result in relying on simplifying heuristics or careless judgments (Kulik & Perry, 1994). As a result, there may be a weaker observed link between attitudes and turnover for employees with more stressful or demanding jobs. All of these are potential sources of systematic response biases in reported attitudes that may affect the strength of the relationship between work attitudes and turnover.

2.2 MODEL DEVELOPMENT

To explore potential threshold effects and response biases, I develop a model that links true and measured work attitudes, turnover, and observable employee characteristics. The model draws on work by Mittal and Kamakura (2001) who modeled the relationship between customer satisfaction ratings and repurchase behavior. In their research, however, they treat the customer population as a one-level data pool, i.e., they assume that all customers buy the same class/brand of product. In an examination of job attitudes and turnover, such an approach could be used if the sample is drawn from employees from a single organization. However, many studies in organizational behavior – particularly those on turnover – draw their samples from multiple organizations. To account for potential organization-level effects, I include them in my model as potential sources of bias. I test my model with a sample of over 6,000 teachers drawn from 200 different public elementary schools. I will continue the discussion referring specifically to teachers (employees) and schools (organizations).

Turnover is modeled as a decision that has two outcomes: to continue employment at the current organization, or to leave. According to theory previously reviewed, employees who are guided by work attitudes in their turnover decisions will remain with an employing organization until a drop in attitudes reaches a critical level. Once such a critical level is reached, an employee is likely to leave. The probability that a teacher *i* from a school *j* with a true work attitude of A_{ij} will leave is:

(1) $$P[Y_{ij} = leave] = P[A_{ij} < u_{ij}] .$$

Here u_{ij} represents an unobservable, latent threshold level that, once reached from the above, i.e. drop in job satisfaction and/or organizational commitment, will result in quitting an organization. Although such a threshold is unique for each individual, I can expect systematic similarities among employees with similar characteristics. Therefore, a threshold level itself can be expressed as a function of *K* employee characteristics (Z_{ijk}):

(2) $$u_{ij} = \gamma_{0j} + \sum_{k=1}^{K} \gamma_k Z_{ijk} + \eta_{ij} ,$$

where η_{ij} is a random error distributed normally with zero mean and σ_η^2 variance. Note that γ_{0j} is a school average threshold level. Consistent with the turnover literature that acknowledges the important role of organizational conditions in affecting employee turnover (Hom & Griffeth, 1995; Kalleberg & Mastekaasa, 1998; Mueller & Price, 1990), I expect mean thresholds for teachers to vary across schools. For example, teacher turnover rates tend to be higher in public schools with student populations that are economically disadvantaged (low SES) (Darling-Hammong & Green, 1994). Also, Ingersoll (2001) reports that teachers depart at higher rates in smaller schools compared to larger ones. As such, I define a teacher's threshold level of a work attitude as determined not only by individual characteristics (Equation 2), but also by *M* school characteristics (W_{jm}):

(3) $$u_{ij} = attitude\ threshold\ level = \gamma_{00} + \sum_{k=1}^{K} \gamma_k Z_{ijk} + \sum_{m=1}^{M} \theta_m W_{jm} + \eta_{ij} + r_{0j}\ .$$

Here, γ_{00} is a grand mean threshold, i.e. average threshold across teacher population, and r_{0j} – school-level random error distributed normally with zero mean and τ_{00} variance.

To the extent that a latent work attitude is an unobservable construct, any attempt to measure it will be error-prone. I can express the true (unobservable) attitude as a combination of the observed measure (O_{ij}) and measurement error (ε_{ij}):

(4) $$A_{ij} = true\ attitude = \beta_{ij} O_{ij} + \varepsilon_{ij}\ ,$$

where ε_{ij} is a random error distributed normally with zero mean and σ_{ε}^2 variance. Equation 4 indicates that even if adjusted for measurement error, the observed ratings would not correspond directly with the true attitude level due to response biases specific to each individual (β_{ij}). However, if the response biases are similar for employees with similar characteristics (e.g., males; employees under the age of 30) I can partially adjust for their effects by controlling for relevant individual (Z_{ijk}) and organizational (W_{jm}) characteristics:

(5) $$\beta_{ij} = \delta_{00} + \sum_{k=1}^{K} \delta_k Z_{ijk} + \sum_{m=1}^{M} \vartheta_m W_{jm}\ .$$

Combining the formulation of attitude threshold level (Equation 3) with the definition of a true attitude (Equations 4 and 5), the probability that a teacher *i* from a school *j* will leave is expressed as the following:

$$P[Y_{ij} = left] = P\left\{\left[\left(\delta_{00} + \sum_{k=1}^{K}\delta_k Z_{ijk} + \sum_{m=1}^{M}\vartheta_m W_{jm}\right)O_{ij} + \varepsilon_{ij}\right] < \left(\gamma_{00} + \sum_{k=1}^{K}\gamma_k Z_{ijk} + \sum_{m=1}^{M}\theta_m W_{jm} + \eta_{ij} + r_{0j}\right)\right\} \quad (6)$$

$$P[Y_{ij} = left] = P\left\{\varepsilon_{ij} - (\eta_{ij} + r_{0j}) < \left(\gamma_{00} + \sum_{k=1}^{K}\gamma_k Z_{ijk} + \sum_{m=1}^{M}\theta_m W_{jm} - \delta_{00}O_{ij} - \left(\sum_{k=1}^{K}\delta_k Z_{ijk} + \sum_{m=1}^{M}\vartheta_m W_{jm}\right)O_{ij}\right)\right\} \quad (7)$$

Equation 7 represents a binary probit model in which the probability of employee turnover is predicted by individual and organizational characteristics and their interactions with work attitudes, i.e. job satisfaction and organizational commitment.

2.3 RESEARCH SETTING AND METHODS

2.3.1 Sample and Procedure

The data used for this research are part of a larger study that examines teachers' experiences with a new mathematics curriculum, and how those experiences ultimately impact student achievement. The research was conducted in an urban public school district in the northeastern United States. Variables used in my study are drawn from surveys administered to elementary school teachers at two time points: spring 2004 and spring 2005. During the spring

2004 administration, out of 6435 surveys sent to teachers in 202 participating schools, 5963 were returned yielding response rates of 92.7% for teachers and 100% for schools. During the spring 2005 administration, out of 6931 surveys sent to teachers in 204 participating schools, 6535 were returned yielding response rates of 94.3% for teachers and 100% for schools. Teachers who leave their jobs tend to do so between the end of one school year (June) and the beginning of the next (September). Thus, turnover data were obtained from district records six month after the corresponding survey administration.

I also gathered archival information on each school from district records. These data included school characteristics such as total student enrollment (school size), the percentage of students whose family income is below the federal poverty level (school SES), and the percentage of students enrolled in special education (school special education enrollment).

The sample used to test my model is based primarily on observations collected during the second wave of the survey, i.e. spring 2005, and turnover six months later (fall 2005). However, to increase the sample size I augmented the data with observations from the first data collection period, i.e. spring 2004, from those teachers who, for any reason, did not participated in the second round of survey administration. To account for any differences in data collected at the two time points, I included a time dummy variable. In addition, to eliminate from consideration quit instances due to retirement, I restricted my sample to teachers younger than 55 years old. After the deletion of missing observations, the final sample comprised 6080 teachers from 204 schools. This was the sample used in the final analysis.

2.3.2 Measures

Turnover. Turnover was represented by a binary variable with "quits" coded as 1 and "stays" coded as 0. Given this coding, the empirical model estimated the probability of a teacher leaving relative to the base probability of staying.

Organizational commitment. *I* used a measure of organizational commitment developed by Bryk and Schneider (2002) specifically for a school context. Respondents rated four items using 5-point scales (1 = strongly disagree; 5 = strongly agree). The items were: "I wouldn't want to work in any other school than the one I do now," "I would recommend this school to parents seeking a place for their child," "I usually look forward to each working day at this school," and "I feel loyal to this school." Bryk and Schneider (2002) provide detailed information about the scale properties. In brief, the items were calibrated such that a teacher typically provided consistent responses across the four items. In my sample, the four items loaded on a single factor and the reliability estimate (Cronbach's alpha) was .89. This is identical to the .89 reliability reported by Bryk and Schneider (2002). In total, I analyze five measures of organizational commitment: the four items from the scale separately (1-4), and an average of the four items (5).

Job satisfaction. I used a single-item measure of job satisfaction. Respondents were asked to answer the question: "Please indicate to what extent you are satisfied or dissatisfied with your job overall" on a five-point Likert scale (1 = very dissatisfied; 5 = very satisfied). Although many researchers use multi-item scales of job satisfaction to capture attitudes toward different dimensions of work, my purpose here is not to distinguish among, for example, satisfaction with pay and satisfaction with supervision. Instead I am interested in the overall relationship between reported satisfaction and turnover for various categories of employees. In addition, the reliability of a single-item measure of job satisfaction is estimated as close to .70 (Wanous, Reichers, & Hudy, 1997).

Employee and School Characteristics

The goal of this paper is to investigate potential threshold effects and response biases that are typical for certain employee and organization categories. Therefore, I classified employee and school characteristics into categories instead of treating them as continuous ones.

Age. Respondents were asked to select the category that describes their age. Age in this study was dummy-coded to represent four categories: (1) under 25 years old; (2) 25-34 years; (3) 35-44 years; and (4) 45-54 years. The base category is "under 25 years old" and the regression coefficient estimates of other age categories are relative to this group.

Gender. This variable was coded as 0 for females and 1 for males.

Race. Since the majority of teachers in my sample were white (68%) and I did not have large enough sub-samples of other racial groups for the analysis, I dummy coded race into two categories: 0 for non-white and 1 for white.

Education. Education was dummy-coded to define three levels: (1) bachelors degree; (2) masters degree; and (3) credits beyond a master's degree. A bachelor's degree was defined as the base category. The other two levels, i.e. masters degree and beyond master's degree, were coded relative to this base category.

School tenure. This variable was dummy-coded to reflect four categories: one year or less teaching in the school; 2-4 years; 5-10 years; and 11 or more years. The base category was one year or less of school tenure, with the other categories coded relative to it.

Mandatory testing. This variable indicated whether the grade that a teacher taught was subject to mandatory state or city testing of student achievement in mathematics and reading.

Tested grades were third, fourth, and fifth. Untested grades were kindergarten, first, and second. Untested grades were coded as 0, while tested grades were coded as 1.

Teaching certification. Teachers holding regular teaching certification were coded as 1, and teachers holding provisional/alternative teaching certification were coded as 0.

Ability. As part of the larger study, I measured teachers' ability to teach mathematics using items developed under the *Learning Mathematics for Teaching Project* at the University of Michigan (Hill, Schilling, & Ball, 2004). Ball and her colleagues have subjected this assessment to extensive analysis (see Hill, et al., 2004 for details) and have demonstrated it to be a valid test of a teacher's objective ability to teach math rather than, for example, a teachers' beliefs or attitudes regarding math. The assessment uses different scenarios and asks teachers to interpret how students might think about math in a given situation (a sample release item is shown in Appendix A). The ability score in my study was constructed as the proportion of correct answers to the total number of questions. I then classified teachers into three categories based on a tertile-split of their ability scores: low, medium, and high ability. Medium and high ability were dummy coded against the base category of low ability.

School size. School size was measured as the total student enrollment as on October 31 of the corresponding year. I used a tertile-split to classify schools into three categories: small, medium, and large in size. Two dummy variables were used to code school size, with small schools as a base category. Medium and large schools were coded relative to this base category.

School socio-economic status (SES). Research in education has consistently demonstrated that students' socio-economic status is a significant predictor of a range of school performance measures (Louis & Marks, 1998). Students whose family income falls below the federal poverty threshold are eligible for government-subsidized lunch at school. Following convention in educational research (Ingersoll, 2001), I measured School SES as the percentage of students in the school eligible for free or reduced-price lunches. Using a tertile-split I divided schools into three categories: low SES, medium SES, and high SES. Schools with low SES were assigned into a base category. Schools with medium and high SES were dummy-coded relative to the base category.

School special education enrollment. In the related research project it was found that schools in which a significant percentage of the student body is enrolled in special education programs were generally thought to be more challenging work environments for teachers. This was attributed to the added complexity posed by students' disabilities and the associated individualized learning plans and class schedules that must be constructed (Ghitulescu, 2006). I measured school special education enrollment as the proportion of students in the school who were enrolled in special education programs. Based on a tertile-split, schools were classified into three categories: low, medium, and high. Two dummy variables, i.e., medium and high proportion of special education enrollment, were coded relative to a base category of low proportion of such enrollment.

School location. Data in my study were collected from schools located in four separate school regions in the same district (Region A, Region B, Region C, and Region D). Regions A through C are urban, while Region D is largely suburban and has relatively higher student achievement and graduation rates. Regions A, B, and C, although similar, display variability in student achievement and graduation rates as well. Thus, to fully capture the differences, each regions was coded as a dummy variable. For this purpose Region A was defined as the base category. Thus, three dummy variables for Regions B, C, and D were coded relative to this base category.

2.3.3 Analytic Approach

Teachers in my sample are nested into schools. Consequently, I examine the independent variables both at the level of the teacher and at the level of the school. Therefore, I used a two-level hierarchical linear model in my analysis (Raudenbush & Bryk, 2002). The dependent variable – turnover – is dichotomous. Thus, the assumption of normality of the Level-1 residuals is not met. Accordingly, I specified a hierarchical generalized linear model (HGLM) based on a Bernoulli distribution (i.e., appropriate for binary outcome variables, Raudenbush & Bryk, 2002). As in logistic regression, the predicted values of the dependent variable correspond to the natural logarithm of the odds that turnover will take on a value of 1 (i.e., a teacher leaves a school) rather than a value of 0 (i.e., a teacher stays at a school).

Job attitudes, teacher characteristics, data collection period, and interactions of job attitudes with teacher characteristics were Level-1 predictors. School characteristics were Level-2 predictors. Since the models specified interaction effects, I mean centered predictors to avoid multicollinearity.

I used HLM 6.0 software (Raudenbush, Bryk, Cheong, & Congdon 2004) to estimate the model.

2.4 RESULTS

2.4.1 Descriptive Results

Tables 2-1 and 2-2 show the distribution of turnover rates, as well as commitment and satisfaction scores, across teacher (Table 2-1) and school (Table 2-2) characteristics used in the analysis. As shown, turnover rates are higher for: male, younger, non-white teachers, those having credits beyond a Masters degree, those showing high ability, those working in tested grades, and those having either few or, on the contrary, many years of school tenure. In addition, the commitment and satisfaction ratings vary across teacher groups. Table 2-3 reports descriptive statistics, and correlations among attitude measures. As expected, commitment ratings are strongly correlated among each other.

Next I performed analyses of variance with commitment and satisfaction ratings as dependent variables and teacher and school characteristics as independent variables. As shown in Tables 2-4 and 2-5, the attitude ratings differed significantly by teacher (Table 2-4) and school (Table 2-5) characteristics.

Tables 2-6 and 2-7 report the results of the HLM analysis with turnover as the dependent variable. I ran six separate models assessing the relationship between work attitudes and turnover. For each model, while teacher and school characteristics were the same, the attitude measure differs. Five out of six models focused on organizational commitment. Specifically, Models 1 to 4 included each of the four items separately from the school commitment scale. For example, Attitude_j in Model 1 represents the item "I wouldn't want to work in any other school than the one I do now." In Model 5 Attitude_j is represented as the average of all four commitment items. Finally, Model 6 is based on the one-item measure of job satisfaction.

I organized Tables 2-6 and 2-7 as follows: the attitude used in the model, denoted by subscript $_j$ is shown in the column heading. For illustration consider Model 4. As seen from the column heading, the job attitude measure analyzed in this models is “I feel loyal to this school” from the commitment scale. Therefore, all estimates in this column will reflect the presence of this particular attitude measure, i.e. “I feel loyal to this school”.

2.4.2 Threshold Effects in the Relationship between Attitudes and Turnover

My theoretical model suggests the presence of threshold effects if turnover rates still vary across employee groups with different characteristics after adjusting for work attitudes. Employees with higher thresholds are less tolerant and therefore more likely to leave for an observed attitude rating. Statistically, thresholds are captured by main effects, such that significant positive coefficients denote higher thresholds for a group coded as 1, while significant negative coefficients imply a higher threshold for a group coded as 0.

There are several significant main effects in my sample, as shown in Tables 2-6 and 2-7. At the teacher level, these are gender, tenure, mandatory testing, and teaching certification. At the school level, these are school size and school location. As Tables 2-6 and 2-7 show, statistically significant estimates of main effects are consistent across job satisfaction and all measures of school commitment. Therefore, to avoid unnecessary repetition, I describe my findings referring to the first commitment item from the scale: “I wouldn’t want to work in any other school than the one I do now.”

Teacher-level threshold effects in the attitude – turnover relationship

Gender: In my sample male teachers demonstrated higher attitude thresholds ($\gamma = .31$, $p < .05$), indicating that for a given attitude rating, they were more likely to leave their jobs than female teachers. Figure 2-4, Panel A depicts the bivariate relationship between attitudes and turnover for these two groups of teachers. As illustrated in the graph, for the same level of attitude ratings, male teachers had higher turnover rates than female teachers.

Tenure. Teachers also differed in their attitude thresholds based on school tenure. In particular, for the same level of attitude ratings teachers who stayed in the school for two to four years (γ = - .32, $p < .01$) or five to ten years (γ = - .25, $p < .05$) had lower turnover rates compared to teachers with school tenure of one year or less. Interestingly, however, teachers who worked at the same school for eleven or more years did not demonstrate different attitude thresholds from those just starting their tenure at a school. To ensure that teachers in early and late tenure stages were similar among themselves in their attitude-turnover relationship, but different from those teachers in middle career stages, I reran my models changing the base category from tenure of one year or less to tenure of eleven years or more. The results were even stronger. The coefficient for the tenure category "one year or less" was non-significant, while for the two categories (covering two to ten years of tenure), the coefficients were statistically different[1]. Such a pattern suggests a non-linear relationship between attitude thresholds and tenure. Specifically, for the same reported level of work attitudes, public school teachers whose tenure was low or high had higher turnover rates than those whose tenure was in the middle range. In addition, I changed school tenure from a categorical to continuous variable and found it to be non-significant. Thus, treating this variable as continuous and linear would mask important differences among employees in their attitude-turnover links.

Other threshold effects. I also found differences in attitude thresholds based on whether the teacher was assigned to a tested or untested grade (γ = .16, $p < .01$), and based on the type of

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[1] Results from the additional analyses are available upon request.

teaching certification held (γ = .18, p < .05). Teachers who were assigned to tested grades or had regular teaching certification had higher attitude thresholds. As such, even when their reported attitudes are identical, turnover rates were higher for them compared to their colleagues teaching in non-tested grades and/or having provisional teaching certification.

School-level thresholds in the relationship between attitudes and turnover

As shown in Table 2-7, school characteristics are also related to attitude threshold effects. In particular, large schools (θ = - .35, p < .01) and those located in Region D (θ = - .32, p < .01; Figure 2-4, Panel B) are found to be statistically significant. Recall that Region D is different from the other three regions in my study in two respects: (1) it is located in a more suburban area; and (2) it serves a less disadvantaged student body (i.e. fewer low income students with higher achievement and graduation rates). Teachers in large schools and those working with less disadvantaged students are more tolerant of lower work attitudes and are less likely to leave than their colleagues working in smaller schools or in school regions with more disadvantaged student populations.

2.4.3 Response Biases in the Relationship between Attitudes and Turnover

As described earlier, a significant interaction between an attitude measure and a teacher characteristic indicates a systematic response bias. Similarly, a significant interaction between an attitude measure and a school characteristic shows that the degree of response bias varies systematically across schools.

As shown in Tables 2-6 and 2-7, several significant interactions were found. At the teacher level these are ability, mandatory testing, and teaching certification. At the school level, these are school special education enrollment and school SES. Recall from Figure 2-3 that on a graph depicting the relationship between an attitude and turnover, flatter slopes correspond to higher response biases. In my estimated model, a statistically significant positive sign for an interaction refers to higher response bias based on a teacher characteristic coded as 1, while a statistically significant negative sign refers to higher response bias based on a teacher characteristic coded as 0.

Unlike the threshold analyses in which the job attitude measures showed similar patterns, there was variability across the six attitude ratings (four individual commitment items; average commitment score; and the job satisfaction item) in the analysis of interactions. Recall that the threshold reflects the critical level of tolerance to lowered job attitudes: i.e., once organizational commitment or job satisfaction fall below such a threshold level, an individual is likely to leave. At the same time, interactions of attitude ratings with employee characteristics point to the response biases that affect attitude ratings for that particular employee group. Consequently, while there were no differences among attitude measures in terms of detecting threshold effects, there are differences among them in terms of susceptibility to response biases. Thus, I will discuss my findings for each rating.

Teacher-level response biases in attitude-turnover relationship

Due to response biases, commitment item #1 ("I wouldn't want to work in any other school than the one I do now") is less likely to predict turnover among teachers with low ability (δ_{medium} = - .19, p < .01; δ_{high} = - .14, p <. 05) or teaching in tested grades (δ = .12, p < .05) compared to those with higher ability or teaching in non-tested grades. As illustrated in Figure 2-5, Panel A, the commitment-turnover relationship for low ability teachers is flatter than for teachers with medium and high levels of ability to teach math. The presence of a response bias in their ratings is especially evident in the middle part of the scale. For teachers who have low ability, turnover rates are almost invariant across ratings of “2,” “3,” and “4,” i.e. “disagree”, “neither agree nor disagree”, and “agree”. In other words, due to response bias a movement from a rating of “2” to a rating of “3” or “4” fails to provide any diagnostic information about the likelihood of turnover.

Commitment item #2 (“I would recommend this school to parents seeking a place for their child”) is less predictive of turnover when the response is provided by a teacher with low ability compared to medium ability ($\delta_{medium} = -.16$, $p < .01$), and when provided by a teacher in a tested grade ($\delta = .17$, $p < .01$). Interestingly, teachers with high ability were not significantly different ($\delta_{high} = -.12$, n.s.) than those with low ability in their commitment-turnover link. This finding is similar in form to the one I observed analyzing threshold effects when school tenure was non-linearly related to attitude thresholds.

Commitment item #4 (“I feel loyal to this school”) also has a lower ability to predict turnover among teachers in tested grades ($\delta = .13$, $p < .05$). It is not affected by teacher ability ($\delta_{medium} = -.08$, n.s.; $\delta_{high} = -.10$, n.s.), but it is affected by teaching certification ($\delta = .16$, $p < .05$). Changes in ratings provided by teachers holding regular certification are less informative about their subsequent turnover behavior compared to teachers with provisional certification. The job satisfaction rating is similarly affected by response bias based on teaching certification ($\delta = .26$, $p < .01$). Finally, I found no response biases attributable to teacher characteristics for commitment item #3 (“I usually look forward to each working day at this school”).

School-level response biases in the relationship between attitudes and turnover

Response biases related to school characteristics are found in two out of the four commitment items, as well as in the job satisfaction rating. Ratings are affected more by response biases based on special education enrollment: $\zeta_{medium} = -.18$ ($p < .05$) for commitment item #3 ("I usually look forward to each working day at this school") and for commitment item #4 ("I feel loyal to this school) $\zeta_{\text{medium}} = -.24$ ($p < .05$), $\zeta_{\text{high}} = -.19$ ($p < .05$). The difference across school categories in the strength of the attitude-turnover relationship is illustrated in Figure 2-5, Panel B. In schools with medium and high special education enrollment, responses to commitment item #4 ("I feel loyal to this school") correspond to turnover rates as theoretically predicted, i.e. the lowest turnover rates are observed when teachers report the highest level of commitment, while turnover rates increase as commitment ratings lower. In contrast, in schools with low special education enrollment, turnover rates are almost identical for the commitment rating of "2" to "5". In such schools commitment ratings fail to provide any diagnostic information about turnover probabilities almost along the entire commitment scale. In addition, the job satisfaction rating provided by teachers from schools having student bodies with low SES rather than high SES are less diagnostic of subsequent turnover behavior ($\zeta_{\text{high}} = -.21$, $p < .01$).

2.4.4 Are Response Biases Eliminated by Constructing a Composite Index of Commitment?

According to psychometric theory, a multi-item scale measuring an abstract construct is preferable to a single-item rating (Nunnaly & Bernstein, 1994). A composite index (e.g. a mean) constructed from a multi-item scale has higher reliability, i.e. reduces the effect of measurement error. However, as seen in my analysis, a composite index of the commitment items is not effective in eliminating response biases. A measure of commitment based on averaging the four items exhibits response bias in three out of fourteen examined teacher categories, compared to two categories for commitment item #2 ("I would recommend this school to parents seeking a place for their child") and commitment item #4 ("I feel loyal to this school"). The best item regarding response bias is commitment item #3 ("I usually look forward to each working day at this school") where there were no significant differences across teacher categories. Similarly, among schools having medium levels of special education enrollment, the averaged measure of commitment shows a high degree of response bias ($\zeta_{\text{medium}} = -.24$, $p < .05$). In contrast, two of the commitment statements demonstrated no response bias in school-related categories. These analyses imply that in this particular sample and for this particular scale, the composite measure of organizational commitment does not demonstrate fewer response biases comparing to individual items.

2.5 DISCUSSION

The theoretical importance of job attitudes—commitment and satisfaction—as antecedents of turnover is undeniable, although the strength of the empirical evidence examining this relationship is quite variable. As discussed earlier, the relationship of job satisfaction and organizational commitment with turnover ranges from moderate (Blau & Boal, 1989; Mitchell et al., 2001), to low (Lee et al., 2004), to statistically non-significant (Cohen, 2000; Taylor et al., 1996). In this paper I argue that one reason for attenuation may be systematic variability in attitude thresholds and response bias. I develop a formal model to account for these issues. An empirical application of the model shows the widespread persistence of both attitude thresholds and response bias. More importantly, several insights for better understanding the attitude-turnover relationship can be gleaned from my analysis.

First, it is clear that the ability of job attitudes to predict actual turnover differs systematically for different types of employees and across organizations. The meta analyses mentioned in the beginning of the paper find some such differences, but heretofore a systematic model for controlling these employee-level and organization-level sources of bias has not been formalized. In this essay I develop such a model. In estimating my model, I found that, depending on the individual and school characteristics, respondents systematically differed in how their job attitude ratings translated into turnover. For instance, employee characteristics like gender, school tenure, certification, and ability, along with organizational characteristics like size, region, and student population, all were systematically related to attitude thresholds and/or response bias. In an empirical study, this means that treating employee populations or participating organizations as homogeneous can mask significant systematic differences in their attitude-turnover links. More notably, by simply including these individual or organizational characteristics as covariates—a common practice—one may partially account for attitude thresholds, but not for systematic response bias. The latter can only be statistically accounted for by including the two-way interaction of the individual characteristic with the attitude in question. This insight is an important one, which, if implemented in future empirical studies, should provide a more nuanced and richer understanding of the relationship between work attitudes and employee turnover.

The importance of job attitudes as antecedents of turnover is a theoretically well-developed and widely accepted tenet in modeling employee turnover. In light of my results, one productive avenue for future empirical research is to focus on refining measures of job attitudes and ways to statistically translate those measures into observed behavior, in addition to articulating more elaborate turnover models. As Saari and Judge (2004, p. 403) have suggested, problems with attitude assessment may also hinder the ability of researchers to affect practice: "The need to measure, understand, and improve employee attitudes is essential for organizations today. Yet, without the numeric comfort needed to fully understand and discuss employee attitude measurement, what they mean, and how they relate to other business measures, HR cannot be at the table to assist with achieving this goal." For instance, future research can improve the insights available from my sample by including a richer set of employee and organizational characteristics that may systematically enhance or attenuate the attitude-behavior link. In doing so, an empirical base of observations can be developed, and insights from this may help develop theories about the nature and magnitude of the bias. For example, in my research I found that males and females have different attitude thresholds such that for a given attitude score, males are more likely to leave their jobs. Why? Several explanations ranging from work-family issues (Pitt-Catsouphes, Kossek, & Sweet, 2006) to differential human and social capital (Leana & Pil, 2006) may be driving this observed result.

The attitude threshold effects based on mandatory testing and certification are equally robust. I can speculate as to why this is the case – e.g., mandatory student testing results in higher job stress for teachers which may translate into higher turnover – but more research is needed to fully understand the underlying causes of these systematic differences. Once these causes have been understood, specific strategies for addressing the underlying predictors of turnover can be developed. Equally important, different retention strategies may be targeted toward employees having different characteristics. For instance, given the persistent difference among male and female teachers, or teachers with or without full certification, school districts would do well to develop a customized strategy for each target group rather than using a single "shotgun" approach to reducing turnover. One contribution of my paper is that it offers practical guidelines to how an organization can ascertain the different characteristics that should be used to develop target groups among employees.

The model developed in this essay links true and measured work attitudes, turnover, and observable employee characteristics. In its current formulation the model incorporates two levels of analysis, i.e. individual and organizational, implying that actual turnover behavior differs systematically across employee groups and across organizations with similar characteristics. At the same time work groups are important elements in many organizations. Moreland and Levine (2000) argue that many organizational phenomena (e.g. socialization, commitment) are more pronounced at the group rather than organizational level. For example, work group commitment was found to be stronger than organizational commitment in several empirical studies (e.g. Barker & Tompkins, 1994; Becker, 1992; Zaccaro & Dobbins, 1989). Therefore, it is highly recommended to account for systematic turnover differences across groups in the settings in which work is organized around groups. In my sample, however, the amount of variance in teacher turnover accounted for grade variation was not statistically significant while the amount of variance in teacher turnover accounted for school variation was significant at $p < .0001$. Consequently, the focus at only individual and organizational systematic differences is justified in my study. At the same time, the proposed model can be easily extended to incorporate more levels of analysis, if necessary.

As Figure 2-5 illustrates, systematic response biases seriously undermined the ability of job attitude ratings to predict turnover for subgroups of teachers and schools. If these sub-group differences are ignored, conclusions based on an "overall" analysis (i.e., aggregate data) can be grossly misleading. What is even more striking is that the nature of response bias is different for each of the four items used in the commitment scale. Moreover, the commonly used practice of averaging the scale items to produce a composite index did *not* help to eliminate response biases in my data. Clearly, my goal here is not to find fault with the Bryk and Schneider (2002) commitment scale – (or any other specific measure for that matter) – but to examine the potential response biases that intervene in relating attitudes to actual behavior. I would advise researchers to examine each item separately and compare its performance to the composite index. Only then should a choice between using specific items be made. Visual inspection of the data, as I did in this paper, might be a useful starting point for this purpose, and may also provide the basis of ascertaining employee characteristics that should be included in the empirical analysis.

My study is situated in public schools and among teachers. Thus, I used an organizational commitment scale that was developed specifically for a school context. The cost of this situational specificity is that the generalizability of my findings to other work settings may be limited. In other words, I do not expect that the same nature and magnitude of attitude thresholds and/or response biases will operate in different work contexts. Clearly, different organization and employee samples will exhibit different patterns. Therefore, additional research in different settings and with different employees is needed to refine and expand the findings reported here. This could be complemented with an examination of more generalized scales of organizational commitment (e.g. Porter, Steers, Mowday & Boulin's *Organizational Commitment Questionnaire*, 1974) or with more refined measures of job satisfaction (e.g., multi-item job satisfaction scales that rate work facets such as pay, promotion, coworkers, supervisors, and the work itself). Replicating and extending these results with different samples and scales will be important for strengthening the attitude-turnover research stream in the future. I hope that my research provides a useful step in this direction.

Table 2-1. Sample Characteristics

	%	Turnover rate	Mean commitment ratings: Item #1: "I wouldn't want to work in any other school than the one I do now"	Item #2: "I would recommend this school to parents seeking a place for their child"	Item #3: "I usually look forward to each working day at this school"	Item #4: "I feel loyal to this school"	Commitment as a mean	Mean satisfaction ratings
Teacher characteristics								
Age:								
Under 25	8.7	30.19	2.99	3.28	3.43	3.57	3.32	3.71
25-34 years	47.24	30.22	3.13	3.42	3.42	3.71	3.42	3.65
35-44 years	22.75	28.92	3.25	3.53	3.51	3.79	3.52	3.67
45-54 years	21.30	28.42	3.39	3.71	3.65	3.94	3.67	3.69
Gender:								
Female	93.17	28.88	3.22	3.51	3.50	3.77	3.50	3.68
Male	6.83	38.55	3.02	3.29	3.35	3.67	3.33	3.60
Race:								
Non-white	32.37	31.30	3.10	3.41	3.43	3.69	3.41	3.65
White	67.63	28.70	3.25	3.53	3.52	3.80	3.53	3.68
Education:								
Bachelor's degree	25.66	28.27	3.06	3.32	3.41	3.65	3.36	3.66
Master's degree	48.74	28.90	3.17	3.49	3.47	3.75	3.47	3.64
Beyond master's degree	25.63	32.03	3.40	3.69	3.61	3.90	3.65	3.73
School tenure:								
1 year or less	10.94	33.68	3.04	3.36	3.48	3.60	3.37	3.71
2-4 years	51.45	27.91	3.16	3.46	3.50	3.72	3.46	3.69
5-10 years	24.29	29.93	3.21	3.51	3.43	3.83	3.49	3.61
11 years or more	13.32	32.03	3.49	3.72	3.57	3.95	3.68	3.70
Mandatory testing:								
Untested	49.08	27.71	3.22	3.52	3.50	3.75	3.50	3.67
Tested	50.92	31.30	3.19	3.47	3.47	3.78	3.48	3.67
Teaching certification:								
Provisional	27.88	29.14	3.03	3.31	3.39	3.61	3.34	3.64
Regular	72.12	29.69	3.27	3.57	3.53	3.82	3.55	3.68
Ability:								
Low (under 30 % of correct answers)	33.24	26.72	3.17	3.47	3.44	3.71	3.45	3.64
Medium (30% - 49 % of correct answers)	33.73	29.01	3.24	3.52	3.52	3.79	3.52	3.68
High (50% and more of correct answers)	33.03	32.92	3.20	3.49	3.51	3.78	3.50	3.69

Note. N = 6,080

Table 2-2. Sample Characteristics (cont.)

	%	Turnover rate	Mean commitment ratings					Mean satisfaction ratings
			Item #1: "I wouldn't want to work in any other school than the one I do now"	Item #2: "I would recommend this school to parents seeking a place for their child"	Item #3: "I usually look forward to each working day at this school"	Item #4: "I feel loyal to this school"	Commitment as a mean	
School characteristics								
School size:								
Small (up to 600 students)	32.51	31.60	3.19	3.44	3.46	3.77	3.46	3.65
Medium (600-850 students)	33.50	31.30	3.27	3.54	3.51	3.80	3.53	3.69
Large (more than 850 students)	33.99	25.94	3.23	3.57	3.53	3.78	3.53	3.70
School SES (student enrollment below poverty line):								
Low (under 69.6%)	32.51	25.09	3.68	4.01	3.77	4.00	3.87	3.81
Medium (69.6% - 83.4%)	33.00	28.29	3.25	3.59	3.54	3.82	3.55	3.72
High (more than 83.4%)	34.48	35.03	2.78	2.97	3.21	3.54	3.13	3.51
School special education enrollment:								
Low (under 2.4%)	32.02	25.67	3.42	3.70	3.61	3.88	3.65	3.72
Medium (2.4% - 6.15%)	34.48	29.09	3.28	3.60	3.53	3.80	3.55	3.69
High (more than 6.15%)	33.50	33.81	3.00	3.25	3.37	3.67	3.32	3.63
School location:								
Region A	14.78	37.99	2.85	3.13	3.27	3.55	3.20	3.58
Region B	25.62	30.19	3.22	3.53	3.52	3.76	3.51	3.66
Region C	24.14	33.31	2.92	3.21	3.28	3.62	3.26	3.58
Region D	35.47	23.08	3.61	3.87	3.73	4.01	3.81	3.80

Note. $N = 204$

Table 2-3. Descriptive Statistics: Attitude Measures

		Mean	s.d.	1	2	3	4	5	6
	Commitment ratings								
1.	Item #1: "I wouldn't want to work in any other school than the one I do now"	3.20	1.23	1.00					
2.	Item #2: "I would recommend this school to parents seeking a place for their child"	3.49	1.14	.71	1.00				
3.	Item #3: "I usually look forward to each working day at this school"	3.49	1.08	.67	.67	1.00			
4.	Item #4: "I feel loyal to this school"	3.76	0.99	.67	.65	.71	1.00		
5.	Commitment as a mean	3.49	0.97	.88	.87	.87	.86	1.00	
6.	Satisfaction rating	3.67	0.89	.46	.45	.61	.50	.58	1.00

Note. $N = 6{,}080$

Table 2-4. Analysis of Variance for Commitment and Satisfaction Ratings

	Commitment ratings											
	Item #1: "I wouldn't want to work in any other school than the one I do now"		Item #2: "I would recommend this school to parents seeking a place for their child"		Item #3: "I usually look forward to each working day at this school"		Item #4: "I feel loyal to this school"		Commitment as a mean		Satisfaction rating	
	Mean Squared Error	p-value	Mean Squared Error	p-value	Mean Squared Error	p-value	Mean Squared Error	p-value	Mean Squared Error	p-value	Mean Squared Error	p-value
Teacher characteristics												
Age	28.00	<.01	34.63	<.01	16.65	<.01	22.74	<.01	24.44	<.01	.63	n.s.
Gender	14.24	<.01	18.02	<.01	8.63	<.01	4.09	<.05	10.53	<.01	2.00	n.s.
Race	35.55	<.01	24.99	<.01	14.06	<.01	21.52	<.01	23.40	<.01	.84	n.s.
Education	20.47	<.01	20.49	<.01	6.53	<.01	7.02	<.01	12.49	<.01	3.04	<.05
School tenure	6.56	<.01	1.54	n.s.	7.47	<.01	3.33	<.05	1.51	n.s.	5.09	<.01
Mandatory testing	.11	n.s.	1.85	n.s.	.56	n.s.	3.04	n.s.	.03	n.s.	.00	n.s.
Teaching certification	9.81	<.05	12.83	<.01	9.02	<.01	9.01	<.01	10.11	<.01	3.46	<.05
Ability	2.77	n.s.	2.30	n.s.	4.00	<.05	3.47	<.05	2.83	<.05	1.41	n.s.
Model $F_{(14,6065)}$ significance	10.12	<.01	11.88	<.01	7.81	<.01	10.09	<.01	11.87	<.01	2.62	<.01
R-squared	2.28%		2.67%		1.77%		2.28%		2.67%		.60%	

Note. N = 6,080

Table 2-5. Analysis of Variance for Commitment and Satisfaction Ratings (cont.)

	Commitment ratings											
	Item #1: "I wouldn't want to work in any other school than the one I do now"		Item #2: "I would recommend this school to parents seeking a place for their child"		Item # 3: "I usually look forward to each working day at this school"		Item #4: "I feel loyal to this school"		Commitment as a mean		Satisfaction ratings	
	Mean Squared Error	p-value	Mean Squared Error	p-value	Mean Square d Error	p-value	Mean Squared Error	p-value	Mean Squared Error	p-value	Mean Squared Error	p-value
School characteristics												
School size	.24	n.s.	.28	n.s.	.10	n.s.	.02	n.s.	.10	n.s.	.03	n.s.
School SES	27.30	<.01	18.43	<.01	5.30	<.01	3.58	<.01	9.27	<.01	1.63	<.01
School special education enrollment	2.18	<.05	.88	n.s.	.23	n.s.	.24	n.s.	.54	n.s.	.02	n.s.
School location	4.87	<.01	1.02	<.05	.80	<.05	.79	<.01	1.02	<.01	.19	n.s.
Model $F_{(9,193)}$ significance	13.26	<.01	13.91	<.01	7.10	<.01	6.33	<.01	11.22	<.01	4.72	<.01
R-squared	38.20%		39.35%		24.88%		22.78%		34.35%		18.04%	

Note. N = 204

Table 2-6. Hierarchical Linear Modeling Results for Turnover

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	"…wouldn't want to work in any other school…" [a]	"…would recommend this school…"	"…look forward to each working day…"	"…feel loyal…"	Commitment as a mean	Job satisfaction
Intercept	.66 *** (.09)	.66 *** (.09)	.66 *** (.09)	.67 *** (.09)	.65 *** (.09)	.66 *** (.09)
Level 1						
t	-2.07 *** (.10)	-2.05 *** (.10)	-2.06 *** (.10)	-2.07 *** (.10)	-2.06 *** (.10)	-2.07 *** (.10)
Attitude $_j$ [b]	-.22 *** (.03)	-.17 *** (.03)	-.24 *** (.03)	-.22 *** (.03)	-.29 *** (.04)	-.24 *** (.04)
Age (25-34 years) [c]	.02 (.13)	.00 (.12)	-.07 (.12)	-.01 (.12)	-.00 (.13)	-.08 (.12)
Age (35-44 years)	-.12 (.15)	-.14 (.14)	-.20 (.14)	-.15 (.14)	-.14 (.14)	-.23 (.14)
Age (45-54 years)	-.09 (.16)	-.09 (.15)	-.16 (.15)	-.10 (.15)	-.08 (.15)	-.23 (.15)
Gender	.31 * (.14)	.31 * (.14)	.33 * (.13)	.33 * (.14)	.31 * (.14)	.33 * (.13)
Race	-.06 (.08)	-.07 (.08)	-.05 (.08)	-.02 (.08)	-.07 (.08)	-.04 (.08)
Education (Masters)	.14 (.09)	.14 (.09)	.15 (.09)	.14 (.09)	.14 (.09)	.13 (.09)
Education (Beyond Masters)	.12 (.11)	.11 (.11)	.14 (.11)	.12 (.11)	.12 (.11)	.11 (.11)
School tenure (2-4 years)	-.32 ** (.11)	-.32 ** (.10)	-.33 ** (.11)	-.30 ** (.11)	-.32 ** (.11)	-.32 ** (.10)
School tenure (5-10 years)	-.25 * (.12)	-.25 * (.12)	-.29 * (.12)	-.24 (.12)	-.25 * (.12)	-.27 * (.11)
School tenure (11 + years)	.04 (.14)	.00 (.13)	-.04 (.14)	.03 (.14)	.00 (.14)	.01 (.13)
Mandatory testing	.16 ** (.06)	.16 * (.06)	.14 * (.06)	.17 ** (.06)	.16 ** (.06)	.15 * (.06)
Certification	.18 * (.08)	.16 * (.08)	.18 * (.08)	.19 * (.08)	.19 * (.08)	.19 * (.07)
Ability (medium)	.13 (.08)	.14 (.08)	.15 (.08)	.15 (.08)	.14 (.08)	15 (.08)
Ability (high)	.08 (.08)	.09 (.08)	.10 (.08)	.09 (.08)	.08 (.08)	.10 (.08)
Attitude $_j$ × Age (25-34 years)	.19 (.10)	.14 (.09)	-.00 (.11)	.12 (.12)	.14 (.12)	-.05 (.13)
Attitude $_j$ × Age (35-44 years)	.11 (.11)	.05 (.11)	.01 (.12)	.02 (.14)	.06 (.14)	-.03 (.15)
Attitude $_j$ × Age (45-54 years)	.05 (.12)	-.09 (.12)	-.22 (.13)	-.19 (.15)	-.16 (.14)	-.14 (.15)
Attitude $_j$ × Gender	-.04 (.10)	-.12 (.09)	.07 (.11)	.00 (.12)	-.05 (.13)	-.24 (.15)
Attitude $_j$ × Race	-.04 (.06)	-.05 (.07)	-.06 (.07)	-.05 (.08)	-.07 (.08)	-.03 (.08)
Attitude $_j$ × Education (Masters)	.01 (.07)	.02 (.08)	.07 (.08)	.03 (.09)	.04 (.09)	-.04 (.10)
Attitude $_j$ × Education (Beyond Masters)	.01 (.09)	.06 (.10)	.13 (.10)	-.00 (.12)	.07 (.12)	-.01 (.13)
Attitude $_j$ × School tenure (2-4 years)	-.00 (.08)	-.00 (.08)	.06 (.09)	.03 (.09)	.02 (.10)	.11 (.11)
Attitude $_j$ × School tenure (5-10 years)	.03 (.10)	.05 (.09)	.11 (.11)	.17 (.11)	.10 (.12)	.19 (.13)
Attitude $_j$ × School tenure (11 + years)	.02 (.11)	.14 (.11)	.16 (.13)	.17 (.13)	.14 (.13)	-.02 (.15)
Attitude $_j$ × Mandatory testing	.13 (.05)	.17 ** (.05)	.02 (.06)	.13 * (.06)	.14 * (.06)	.08 (.07)
Attitude $_j$ × Certification	.12 * (.07)	.04 (.07)	.09 (.08)	.16 * (.08)	.13 (.09)	.26 ** (.10)
Attitude $_j$ × Ability (medium)	-.19 ** (.06)	-.16 ** (.06)	-.10 (.07)	-.08 (.08)	-.19 * (.08)	-.05 (.09)
Attitude $_j$ × Ability (high)	-.14 * (.06)	-.12 (.06)	-.08 (.07)	-.10 (.07)	-.15 * (.08)	-.00 (.08)

Table 2-7. Hierarchical Linear Modeling Results for Turnover (cont.)

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	"…wouldn't want to work in any other school…"		"…would recommend this school…"		"…look forward to each working day…"		"…feel loyal…"		Commitment as a mean		Job satisfaction	
Level 2												
School size (medium)	-.12	(.11)	-.12	(.11)	-.12	(.11)	-.13	(.11)	-.12	(.11)	-.12	(.11)
School size (large)	-.35 **	(.11)	-.34 **	(.11)	-.36 **	(.11)	-.36 **	(.11)	-.35 **	(.11)	-0.36 **	(.11)
School SES (medium)	-.10	(.10)	-.10	(.10)	-.07	(.10)	-.06	(.09)	-.11	(.10)	-.03	(.09)
School SES (high)	-.04	(.11)	-.08	(.11)	.01	(.11)	.05	(.11)	-.07	(.11)	.05	(.11)
Special education enrollment (medium)	.01	(.10)	.03	(.10)	.02	(.10)	.03	(.10)	.02	(.10)	.01	(.10)
Special education enrollment (high)	-.01	(.10)	.03	(.10)	.01	(.10)	.03	(.10)	.01	(.10)	.02	(.10)
Region B	.02	(.12)	.02	(.12)	-.00	(.12)	-.02	(.12)	.03	(.12)	-.05	(.12)
Region C	-.08	(.15)	-.06	(.14)	-.12	(.15)	-.09	(.15)	-.08	(.15)	-.14	(.15)
Region D	-.32 **	(.12)	-.35 **	(.12)	-.37 **	(.12)	-.39 **	(.12)	-.31 **	(.12)	-.44 **	(.12)
Level 1 × level 2 interactions												
Attitude $_j$ × School size (medium)	-.01	(.07)	-.04	(.07)	-.02	(.07)	.07	(.08)	-.05	(.08)	-.04	(.09)
Attitude $_j$ × School size (large)	.05	(.07)	-.01	(.08)	.05	(.08)	-.02	(.09)	-.01	(.09)	-.08	(.09)
Attitude $_j$ × School SES (medium)	.03	(.07)	.08	(.10)	-.02	(.09)	-.02	(.09)	.02	(.10)	.01	(.10)
Attitude $_j$ × School SES (high)	.03	(.08)	-.02	(.10)	-.03	(.09)	.03	(.09)	-.01	(.11)	-.21 *	.10)
Attitude $_j$ × Special education enrollment (medium)	-.14	(.07)	-.14	(.08)	-.18 *	(.08)	-.24 *	(.09)	-.24 *	(.09)	-.06	(.08)
Attitude $_j$ × Special education enrollment (high)	-.11	(.07)	-.08	(.08)	-.15	(.08)	-.19 *	(.09)	-.18	(.10)	-.13	(.09)
Attitude $_j$ × Region B	.08	(.10)	.01	(.08)	.03	(.09)	-.06	(.10)	.03	(.10)	-.13	(.10)
Attitude $_j$ × Region C	.06	(.09)	.09	(.08)	-.00	(.09)	.00	(.11)	.06	(.11)	-.17	(.10)
Attitude $_j$ × Region D	.11	(.10)	.08	(.09)	.01	(.10)	.06	(.11)	.11	(.11)	-.13	(.11)

Note. N (level 1) = 6,080; *N (level 2)* = 204. Entries corresponding to model parameters are estimations of the fixed effects, with robust standard errors. Standard errors are given in parentheses.

[a] Complete item description:
"…wouldn't want to work in any other school…" = "I wouldn't want to work in any other school than the one I do now"
"…would recommend this school…" = "I would recommend this school to parents seeking a place for their child"
"…look forward to each working day…" = "I usually look forward to each working day at this school"
"…feel loyal…" = "I feel loyal to this school"

[b] The attitude used in the model, denoted by subscript $_j$ is shown in the column heading.

[c] Dummy variables coding:
Age: base category is "under 25 years"; Gender: 0 = female, 1 = male;
Race: 0 = non-white, 1 = white; Education: base category is "bachelor";
School tenure: base category is "1 year or less"; Mandatory testing: 0 = untested grade, 1 = tested grade;
Certification: 0 = provisional, 1 = regular certification; School location: base category is Region A;
Ability, school size, school SES, special education enrollment: base category is "low"

* $p < .05$. ** $p < .01$. *** $p < .001$

Figure 2-1. Effect of differences in attitude thresholds on attitude-turnover relationship

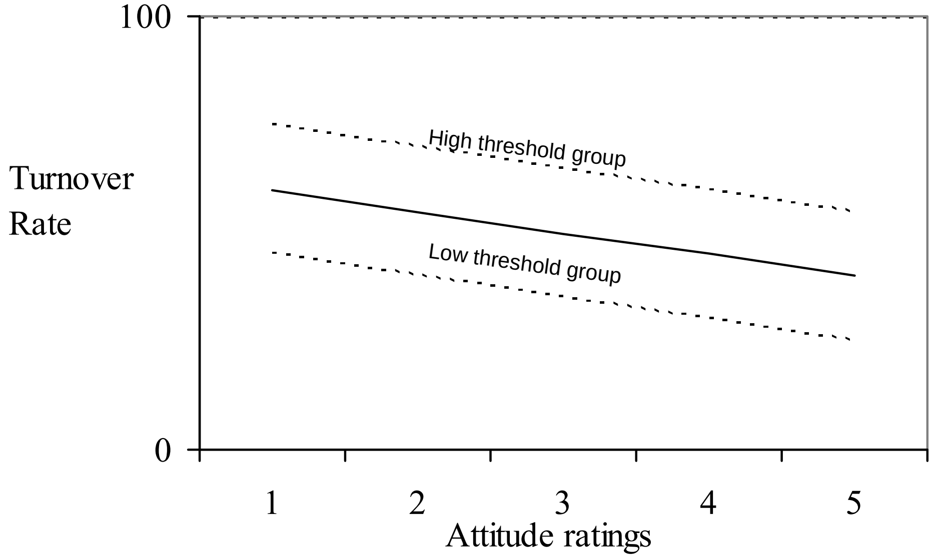


Figure 2-2. Effect of response biases on true attitude – attitude rating relationship

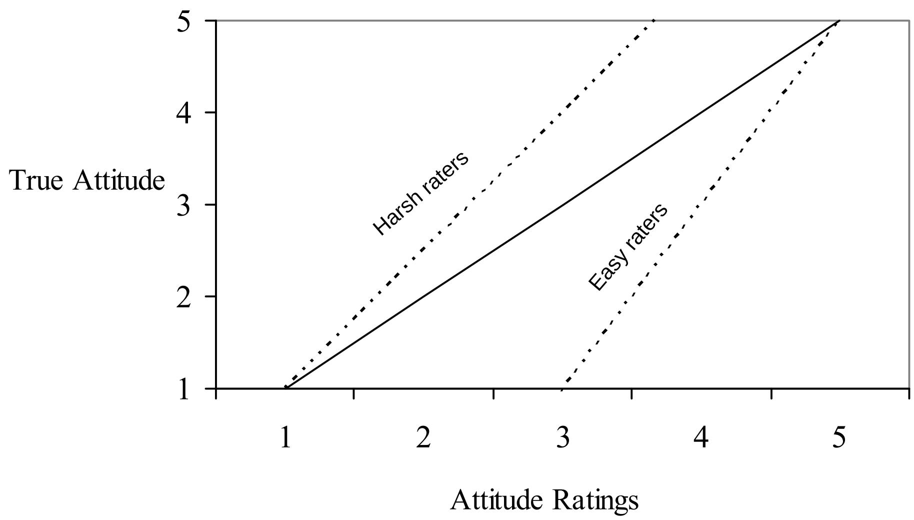


Figure 2-3. Effect of response biases on attitude-turnover relationship

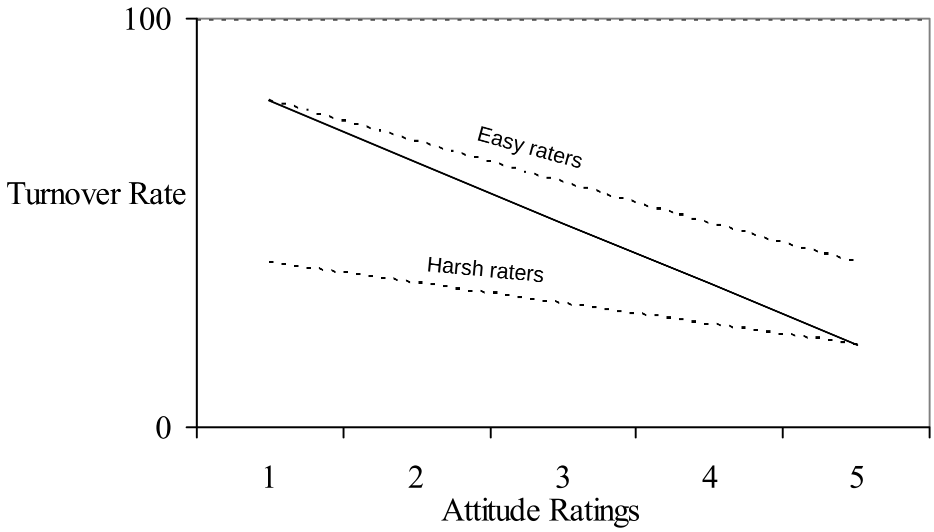
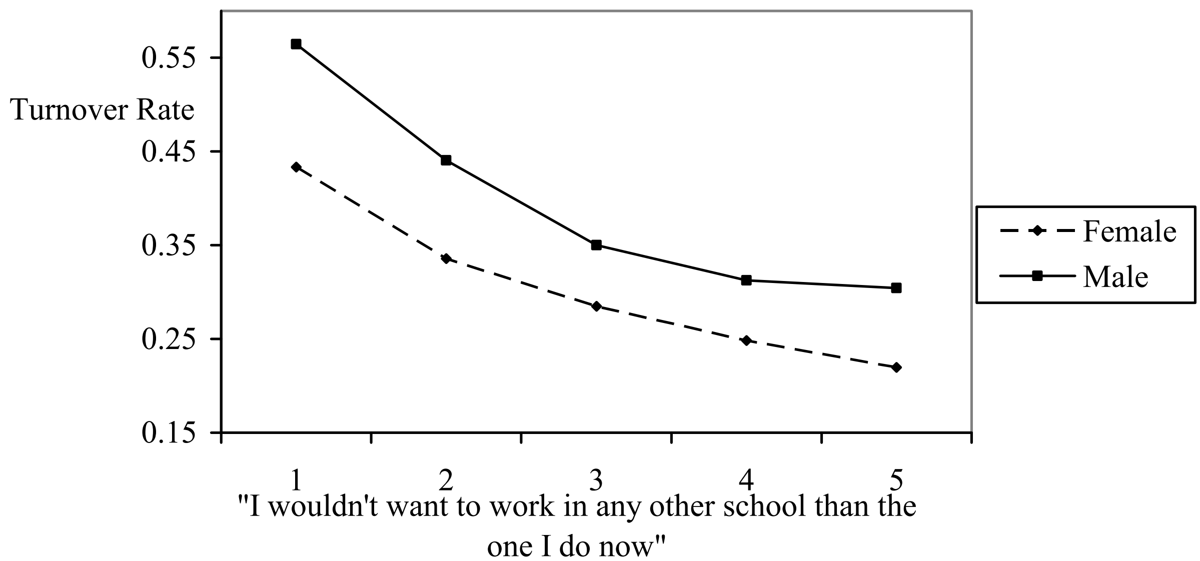


Figure 2-4. Threshold effect in attitude-turnover relationship

(a) Turnover, commitment, and gender



(b) Turnover, commitment, and school location

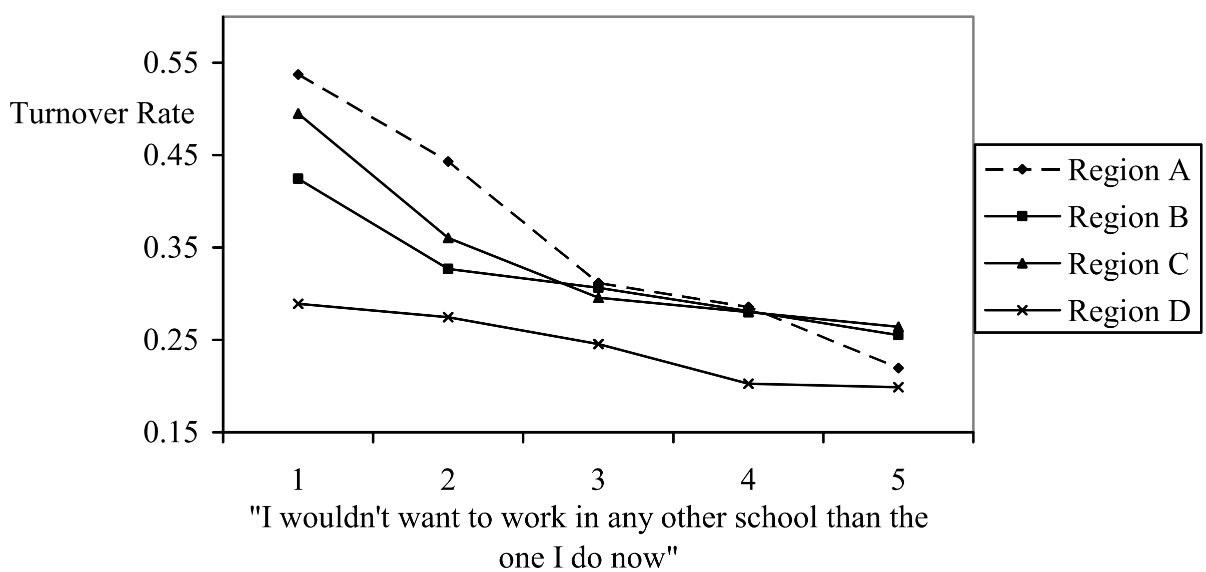
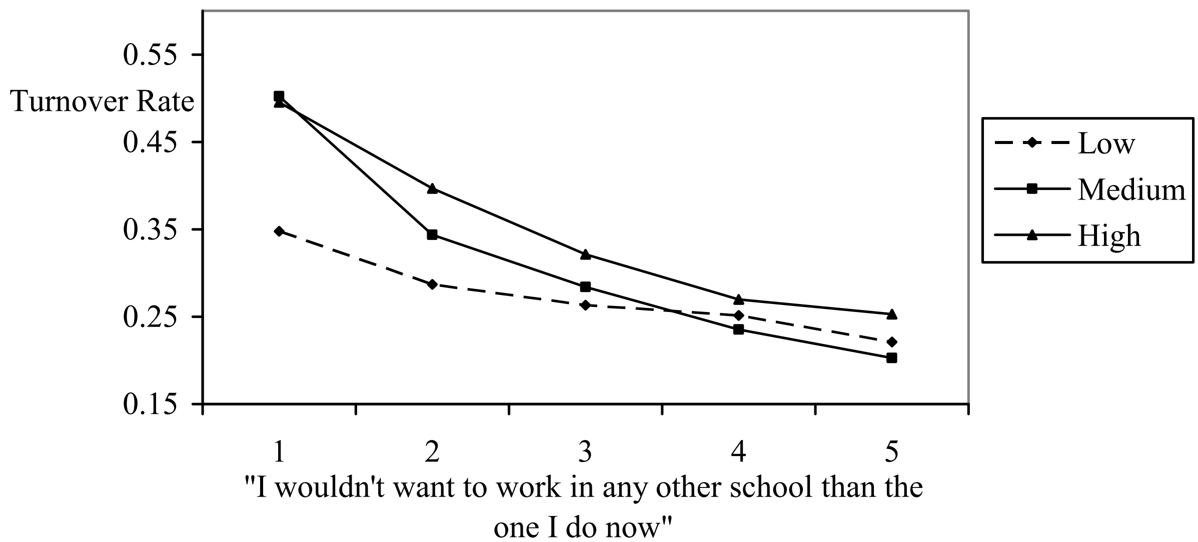
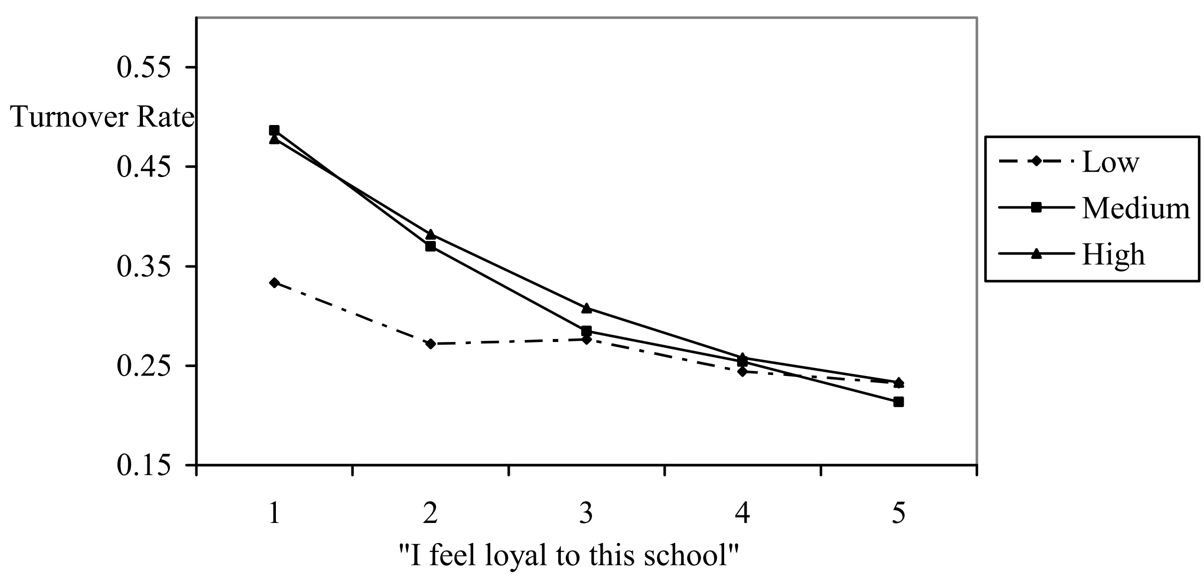


Figure 2-5. Response bias in attitude-turnover relationship

(a) Turnover, commitment, and ability



(b) Turnover, commitment, and school special education enrollment



3.0 ESSAY 2: EMPLOYEE RETENTION AND ORGANIZATIONAL PERFORMANCE: THE MEDIATING ROLE OF ORGANIZATION- AND TASK-SPECIFIC FORMS OF HUMAN AND SOCIAL CAPITAL

Employee retention has been an issue of considerable interest to researchers and practitioners alike. In a recent survey, more than two-thirds of HR practitioners indicated that retaining and recruiting workers was the highest priority for enhancing their firm's profitability, with nearly half citing employee retention as their top concern (Express Personnel Services, 2006). Research studies conducted over the past fifty years across a wide range of industries and occupations have shown that employee turnover is negatively associated with several indicators of organizational performance, including productivity (Guthrie, 2001), efficiency (Alexander, Bloom & Nuchols, 1994; Arthur, 1994), safety (Shaw, Gupta & Delery, 2005), and sales growth (Batt, 2002; Shaw, Duffy, Johnson,& Lockhart, 2005). However, such evidence is not incontrovertible. Koys (2001), for example, found no significant relationship between turnover and either profits or customer satisfaction. More recently, Glebbeek and Bax (2004) and Harris, Tang and Tseng (2006) found that moderate levels of turnover were, in fact, beneficial to organizational performance.

Such diverse findings reinforce Staw's (1980) earlier conclusion that employee turnover has multiple and conflicting outcomes, which provide multiple pathways for turnover to influence organizational performance. Illustrative of Staw's argument are recent papers examining mediators of the link between turnover rates and organizational performance. For example, Kacmar, Andrews, Van Rooy, Steilberg and Cerrone (2006) found that employee turnover adversely affected financial performance in fast-food restaurants because it reduced crew efficiency. Shaw et al. (2005) reported that the negative impact of turnover on productivity in trucking firms was the result of decreased workforce performance due to the loss of employees.

Building on these recent papers, I investigate human and social capital as mechanisms that may determine whether and why employee retention is associated with organizational performance. Specifically, I examine the mediating role of losses in employee human capital and social capital as explanations for the negative effect of turnover on performance. Critical to my theory and empirical analysis is a distinction between general forms of capital and specific forms of capital. In particular, I argue that task-specific capital losses – both human and social – are more deleterious to the organization than are losses in general forms of human and social capital.

The undesirable effects of turnover on both stocks of human capital and on social relations within the organization have been noted by theorists for some time. With regard to human capital, loss of employee knowledge and skills has been the underlying—albeit sometimes implicit – rationale explaining the negative relationship between employee turnover and organizational performance (Arthur, 1994; Batt, 2002; Guthrie, 2001; Shaw et al., 2005). Price (1977) and Mobley (1982) discussed the negative effect of turnover on group cohesion, integration, and social relationships among employees. More recently, Dess and Shaw (2001) and Shaw et al. (2005) concluded that organizations suffer when they lose employees who are well-connected and bridge structural holes within the firm.

Building on these studies, I examine the role played by multidimensional forms of human and social capital in explaining the relationship between employee retention and organizational performance. In doing so, I make several contributions to theory and practice. First, I examine not just the additive contributions of human and social capital, but also their relative and interactive effects on performance. Although researchers have discussed complementarities between human capital and social capital (e.g., Adler & Kwon, 2002; Coleman, 1988; Lin, 1999), empirical examination of these complementarities in the context of employee turnover is missing, leaving important questions unanswered. For example, can large stocks of human capital make up for losses in social capital incurred through turnover? Similarly, can strong social capital mitigate losses to human capital? I address such questions in this essay.

Second, I examine different forms of human and social capital, arguing that the more closely the form of capital resembles the performance outcome of interest, the greater is its ability to explain the effects of turnover on performance. Similar arguments have been made in studies examining the effect of turnover on different performance metrics—e.g., financial and non-financial metrics of performance (e.g., Kacmar et al., 2006). In a parallel vein, examining the relative specificity of human and social capital to explain the turnover-performance link would provide a nuanced understanding of the consequences of turnover.

Third, empirical studies of the relationship between turnover and performance have focused on structural dimensions of social capital, demonstrating the costs of turnover in terms of disruptions to communication networks (Shaw et al., 2005). The value of social capital, however, resides in the character and content of relationships among actors, in addition to the structure of those connections (Adler & Kwon, 2002; Leana & Van Buren, 1999; Nahapiet & Ghoshal, 1998). Thus, for example, declines in performance associated with turnover may be attributable at least as much to losses in the relational aspect of social capital (e.g., emotional closeness) as to structural losses (e.g., communication frequency). At the same time, aspects of social capital such as closeness need time to develop (Coleman, 1988) and thus may be particularly likely to be disrupted by turnover. In this research I examine several different dimensions of social capital, augmenting previous research that has focused primarily on the structure of relationships among employees.

Finally, much of the previous research examining turnover and organizational performance has been conducted in industries where performance does not extensively depend on relative stocks of knowledge and knowledge sharing, nor are the samples comprised of knowledge workers (see, for example, Kacmar et al., 2006 who examined fast-food restaurants; Shaw et al., 2005 who examined truck drivers). This particular research further contributes to the literature by offering a test of the effects of human and social capital in a setting where knowledge is likely to be a critical component of organizational performance.

In summary, my research contributes to the existing literature on turnover and performance by clarifying the underlying processes regarding changes in human and social capital as a consequence of turnover. Concurrently, I examine the effects of such changes on organizational performance within a setting in which human and social capital are clearly important. Finally, I examine the relative strength of the effects of general and specific capital losses on organizational performance. In addressing these questions, this research provides conceptual clarity about when and why human and social capital can, or cannot, be consequential in explaining the retention-performance link.

3.1 THEORY AND HYPOTHESES

As noted earlier, much of the existing empirical work has reported a negative relationship between employee turnover and various aspects of organizational performance (Alexander et al., 1994; Arthur, 1994; Batt, 2002; Guthrie, 2001; Shaw et al., 2005; Shaw et al., 2005). The dominant theoretical explanations for this can be classified into three perspectives: (1) replacement costs; (2) human capital losses; and, most recently, (3) social capital disruptions (Dess & Shaw, 2001). Although these perspectives can be complementary and yield similar predictions, as Dess and Shaw (2001) have argued, the performance outcomes of turnover may be different depending upon the theoretical perspective applied. In particular, cost perspectives should be more applicable to the financial metrics of organizational performance since they emphasize such consequences of employee turnover as increased recruitment, training, and development costs (Staw, 1980).

When the focus turns to non-financial measures of organizational performance (such as the organization's ability to successfully meet its core goals), the human capital and social capital models may be more applicable. The reasons for this are threefold. First, not only are financial measures of performance more remote from actual production/service processes (Kacmar et al., 2006), but financial indicators are also influenced by a host of factors beyond employee performance (e.g., financial and marketing decisions). Second, in many settings, non-financial metrics of performance may be more critical and consequential to the firm's mission and longer-term competitive advantage than financial metrics (Argote, 1999). Many theorists (e.g., Barney, 1991; Nahapiet & Ghoshal, 1998) argue that in knowledge-intensive industries, competitive advantage resides in the skills and information held by individual employees, and how these may be integrated and transformed to produce inimitable advantages. Third, and finally, financial measures may not be as applicable in determining the performance of organizations in the public and non-profit sectors such as public schools, the focus of this research. For these reasons I argue that human and social capital explanations of the relationship between retention and performance are more plausible candidates for explicating ways in which turnover affects performance in knowledge-intensive work.

3.1.1 Retention and Organizational Performance: The Human Capital Perspective

Human capital manifests itself in several forms. A common distinction in the economics literature is between general knowledge, skills and abilities (KSAs) that can be applied across many different contexts ("general human capital"), and specific KSAs that are valuable only in particular situations or settings ("firm-specific human capital") (Becker, 1964). Both forms of human capital can positively affect organizational productivity and performance (Osterman, 1987). However, firm-specific human capital comprises an idiosyncratic set of capabilities that, because of their uniqueness, can yield superior financial returns through sustained competitive advantage (Barney, 1991).

Human capital in organizations, however, is neither static nor discrete. Accumulation of specific human capital requires sustained investment by both the employee and the employer. A newcomer who has not absorbed the organization's routines and processes is unlikely to perform at the same level as a long-standing employee. Over time, through training and observation, the new employee can attain a higher level of human capital specific to the job setting and related set of tasks. The costs of such situated learning are borne not just by the new employee and her employer, but also by more established co-workers. A veteran teacher succinctly summarized these costs: "I am willing to give my time to new teachers because it needs to be done. If their classroom is running smoothly then I don't have to spend that much time with them. If they know the routines of my school, then I am not spending time dealing with their kids. But it can take a lot of energy, especially the first couple of months of school" (Guin, 2004: 10-11).

With every employee who leaves his job, the organization loses a part of its firm-specific human capital. Replacing such capital losses can not only be expensive in terms of replacement and retraining (cost model), but perhaps more importantly, in terms of the unique set of capabilities embodied in the workforce (human capital). Thus, high rates of organizational turnover should be associated with a decline in its stocks of organization-specific human capital. This decline in turn should have a deleterious effect on organizational performance (Dess & Shaw, 2001; Osterman, 1987).

3.1.2 Retention and Organizational Performance: Social Capital Perspective

A high retention rate—the proportion of employees who stay with an organization during a specified period of time—preserves not only the knowledge, skills and abilities available through those members (human capital), but also the existing structure of the relationships among them (social capital). Social capital theorists maintain that ties among individuals within an organization can serve as a repository of actual and potential resources *for* the organization (Adler & Kwon, 2002; Coleman, 1990; Leana & Van Buren, 1999; Nahapiet & Ghoshal, 1998). These resources, however, become less accessible once the relationships are dissolved. Indeed, stability of the social structure is a key factor affecting the creation and maintenance of organizational social capital (Coleman, 1990; Leana and Van Buren, 1999). As Coleman (1990: 320) notes, "disruptions of social organization or of social relations can be highly destructive to social capital." By bringing stability to the fabric of social relations within the organization, employee retention thus facilitates the creation and maintenance of organizational social capital.

Social capital is credited with facilitating the combination and exchange of valuable resources within an organization (Nahapiet & Ghoshal, 1998) that lead to sustained value creation (Tsai & Ghoshal, 1998). According to Nahapiet and Ghoshal (1998), these gains can be realized through three facets of social capital: structural, relational, and cognitive. The number and frequency of connections among organizational members (structural facet of social capital) influence the amount and direction of information flows within the organization (Zander & Kogut, 1995). When such connections are characterized by high levels of trust (relational facet), employees are more likely to share sensitive and valuable information (Edmondson, 1999; Krackhardt & Hanson, 1993). Trust also fosters cooperation among individuals and reduces the need for more formal control mechanisms (Coleman, 1990) while enhancing the prevalence of organizational citizenship behavior and beneficial extra-role behavior (Adler & Kwon, 2002; Shaw et al., 2005). When employees share the same narratives and goals regarding their work (cognitive facet), they can more easily develop routines and work practices that are not formally specified but nonetheless result in enhanced knowledge creation, productivity, and performance (Brown & Duguid, 1991; Orr, 1996). As Leana and Pil (2006) empirically demonstrated, differences in the endowment of all three facets of social capital explained significant variation in organizational performance. To the extent that turnover reduces stocks of social capital, then, organizational performance is likely to suffer.

My predictions based on the discussion so far are summarized in the hypotheses below:

Hypothesis 1: Employee retention rates are positively associated with organizational performance.

Hypothesis 2: Organization-specific human capital mediates the relationship between employee retention rates and organizational performance.

Hypothesis 3: Organizational social capital mediates the relationship between employee retention rates and organizational performance.

3.1.3 Interacting Effect of Human and Social Capital

Although conceptually distinct, social capital and human capital are related in affecting organizational outcomes. Coleman (1988) and Nahapiet and Ghoshal (1998) argue that social capital is an important and perhaps necessary vehicle for enhancing human capital development because social capital provides access to new sources of information and knowledge. Burt (1997) argues that while human capital is necessary for success, it in and of itself is useless without social capital because the latter provides the necessary context that allows human capital to realize its potential. In other words, a person's returns to her education, experience, and intelligence depend, to a certain extent, on her position in the social structure. At the same time, Adler and Kwon (2002) and Linn (1999) argue that some level of human capital is necessary for social capital to create organizational value. Thus, both forms of capital can act as catalysts for one another to enhance organizational performance (Linn 1999).

To be sure, theorists have also debated the relative importance of both social and human capital in enhancing performance. At the individual level, some studies demonstrate the relatively higher importance of human capital over social capital in fulfilling individual status objectives (e.g., DeGraaf & Flap, 1988), while others have drawn the opposite conclusion (e.g., Marsden & Hurlbert, 1988). At the organizational level, Pennings, Lee and Witteloostuijn (1998) found both human and social capital to be significant predictors of the survival of Dutch accounting firms. Dess and Shaw (2001) argue that losses in either human or social capital due to turnover can be detrimental to organizational performance.

In addition to their relative effects, human and social capital may have synergistic effects, particularly in a knowledge-intensive environment. The knowledge-based view of the firm identifies knowledge as the most strategically important resource for an organization because it is the primary source of organizational value (Grant, 1996). Since "knowledge is created and expanded through social interactions between explicit and tacit knowledge" (Nonaka & Takeuchi, 1995: 61) one can argue that social and human capital will jointly influence organizational performance. Knowledge is created by individuals but the organization provides the social fabric in which individuals can learn and expand their knowledge (Nonaka, 1994). Social interactions are, in other words, a conduit to sharing, expanding and transforming individual knowledge.

Logic suggests that organizations possessing higher individual endowments of knowledge in the form of employee human capital are more likely to create organizational knowledge of higher quality than those that have lower stocks of human capital. Two organizations that have similar levels of social capital have the capacity to pass similar amounts of information through their social networks. However, organizations benefit not from mere information flow, but from the knowledge that is created as a result of such exchanges. Thus, an organization that can facilitate the flow of higher quality knowledge – through the structural, relational, and cognitive facets of social capital previously described – should benefit more from such exchange than an organization with lower quality knowledge and flow. Organizations possessing higher endowments of knowledge in the form of employee human capital are likely to out-perform those that have lower stocks of human capital. Similarly, organizations possessing higher endowments of social capital have a stronger capacity to transmit information through their social networks (Nahapiet & Ghoshal, 1998) and thereby create conditions for knowledge creation and expansion (Nonaka, 1994).

At the same time, employees differ in their individual endowments of both forms of capital and, consequently, are not equally valuable in terms of their effects on overall organizational performance. The loss through turnover of employees with high levels of human capital leaves the organization with diminished stocks of knowledge (human capital losses), while the loss of employees with frequent and close contact with colleagues or those who are more central in their social networks (social capital losses) leaves the organization with a diminished capacity for knowledge transmission. Diminished stocks of knowledge due to high human capital losses themselves threaten organizational performance, but their negative effect will be amplified if they are accompanied by high social capital losses.

Hypothesis 4: Human and social capital losses due to employee turnover interact in their negative effect on organizational performance. The detrimental effect of human capital losses on organizational performance will be greater when social capital losses are also high.

3.1.4 Capital Specificity

Knowledge can differ in its applicability and can be very specific regarding its effective application in attaining the organization's goals. Indeed, in his study of technicians at work, Barley (1996) describes what he calls "particular knowledge" that is only relevant when it is put into practice in particular contexts and for particular types of problems. Similarly, Leventhal and Fichman (1988) and Broschak (2004) found that within consulting firms, individual knowledge of specific client needs – rather than generalized knowledge of the industry – was predictive of client retention. In the same way, different forms of human and social capital can be distinguished based on the degree to which the relevant knowledge (human capital) and knowledge flow (social capital) are specific to a particular task.

Regarding human capital, Gibbons and Waldman (2004) define task-specific human capital as knowledge gained through "learning by doing" a particular set of tasks. As they note, "some of the human capital an individual acquires on the job is specific to the tasks being performed, as opposed to being specific to the firm" (p. 203). Thus, task-specific human capital consists of the KSAs that are applicable to the work being done rather than to a particular organizational context. Gibbons and Waldman (2004) argue that task-specific human capital creates value for the organization to the extent that organizational performance is dependent on how well individuals perform particular tasks that make up their jobs. If organizational performance is highly dependent on individual job performance, task-specific human capital should affect important organizational outcomes.

Regarding social capital, the distinction between general and task-specific forms of capital might be not as clear as in the case of human capital. At the same time, social capital often develops to target a specific need or domain, such as social needs or informational needs, and thus different ties can be classified according to the purpose they serve (Podolny & Baron, 1997; Wellman and Frank, 2001). To illustrate task-specific nature of social ties, consider Podolny and Baron's (1997) example of a faculty member who becomes a dean. The task-related ties with other faculty members that were valuable sources of advice regarding research and teaching are not likely to contribute much to new administrative responsibilities, i.e. are not task-specific anymore. When the outcome of interest is operational performance, then task-specific –

or instrumental – ties are arguably the ones that are most likely to affect job performance. Not surprisingly, they have been commonly used to represent social capital in previous research (e.g., Reagans & Zuckerman, 2001; Sparrowe, Liden, Wayen, & Kraimer, 2001). Following this stream of research, I also argue that task-specific social capital will exert a stronger influence on performance than will more general forms of social capital. Thus, for both forms of capital, the closer the link between the resource – human and social capital – and the task, the greater will be its effect on organizational performance. Consequently, the greatest declines to performance occur when more specific, rather than more general resources are lost because of turnover.

Hypothesis 5: Losses in task-specific forms of human and social capital due to turnover will have a stronger negative effect on organizational performance than will losses of more general forms of human and social capital.

Implicit in Hypotheses 4 and 5 is the idea that performance is adversely affected by not just the overall rates of employee turnover within an organization, but also by the specific characteristics of the individuals who stay versus those who leave. When an individual leaves the organization, he takes his human capital with him. In addition, every quit induces some changes into the organization's social capital network. However, based on their endowments of intangible assets, employees are not equally valuable in terms of the content of their human and social capital and, consequently, in terms of their effect on the relationship between turnover and performance. Consequently, if employees who leave the organization carry with them, on average, human and social capital of better quality than those who remain, the potential negative effect of their departure on organizational performance will be heightened. The departure of such employees should be particularly threatening to organizational performance.

3.2 OVERVIEW OF THE RESEARCH

I tested my hypotheses in public elementary schools in the United States. Schools are particularly appropriate settings for my research for several reasons. First, the quality of education available in public schools is a key ingredient in gaining and maintaining global competitiveness for the U.S. workforce (Blinder, 2006; Committee for Economic Development, 2005; National Science Board, 1998). As such, schools have received heightened scrutiny from a myriad of constituents, including parents, business firms, and public policy makers at the local, state, and federal levels. Second, much of the previously-discussed theory regarding the mediating role of capital in the relationship between turnover and performance is predicated on the assumption that knowledge and its transmission are important influences on organizational performance. Schools are indisputably “knowledge-intensive organizations” and teachers are surely “knowledge workers.” Third, the teaching occupation has noticeable turnover rates: in 1998-2001 annual teacher turnover in the U.S. was reported to be 15.7% (Hunt & Carroll, 2003). Moreover, teacher turnover is disproportionately higher in schools serving students from disadvantaged backgrounds. This means that a good deal of the disruption associated with high turnover is borne by a narrow range of especially needy children and their families.

Finally, from a theory-testing perspective, the teaching profession is especially well suited for studying linkages between human and social capital (Leana & Pil, 2006). Recent federal legislation requiring more accountability for student achievement has called attention both to teacher capacity and to the collective responsibility of all teachers for school performance. Schools, rather than individual teachers, are held accountable for student achievement. Related to these changes (and perhaps because of them) has been a movement among educators to distance themselves from traditional instructional model where each teacher is responsible only for the children in her classroom, in favor of more collaborative models which emphasize information exchange among teachers and teacher communities of practice within schools (Bryk & Schneider, 2002; McLaughlin & Talbert, 2001). In such settings employee retention is especially desirable because of its positive association with social capital (Leana & Pil, 2006; Leana & Van Buren, 1999).

I tested my hypotheses in three separate but highly related studies. In the first study I used publicly-available archival data on teacher retention and school performance in 593 public elementary schools to test Hypothesis 1. The goal of this study is to establish the overall effect of employee retention rates on organizational performance using an entire population of schools within a given geographic area, enabling a high level of external validity. In Study 2 I utilized a sub-sample of 194 schools in the same district. For these schools, I was able to augment archival data with social and human capital measures collected via teacher surveys. These data allowed me to test the potential effect of social and human capital in mediating the relationship between retention and performance (Hypotheses 2 and 3). Finally, in Study 3, I augmented the data used in Study 2 with two years of data that tracked individual teachers, i.e., whether an individual teacher left the school at the end of the year or returned the following school year. For each individual teacher, I matched turnover data to her organization- and task-specific human and social capital. Study 3 is comprised of 182 observations as I lost twelve observations due to missing data. Study 3 allowed me to test the potential interactive effects of human and social capital losses on performance (Hypothesis 4) and to test my prediction regarding the specificity of capital losses due to turnover and its relationship to performance (Hypothesis 5).

3.3 STUDY 1: METHODS

3.3.1 Sample

Study 1 examined the relationship between employee retention and organizational performance using archival data from elementary schools in a large urban district in the United States. I limited my sample to elementary schools from one district to control for differences in local labor markets, general school system administration, and student body (e.g. students in elementary schools are likely to differ significantly from students in secondary schools) that could potentially offer competing explanations for my results (see Gleebeek & Bax, 2004; and Shaw et al., 2005, for a similar approach). Every year the district constructs an Annual Report Card for each school to assist parents in evaluating options for their children. These report cards contain summary statistics about teachers, students, and resources allocated to the school, along with student performance data on mandated state and city achievement tests. Information in annual report cards is based on the data submitted by local school district officials. School superintendents were also provided with an opportunity to review and correct summary reports based upon submitted data.

I obtained data for the 2003-2004 school year when the population of elementary schools in the district totaled 630. Some schools had to be removed from the analysis for various reasons. Due to restructuring (e.g., combining an elementary school with a middle school), 23 schools had no data available and were dropped from the analysis. Another 13 schools were newly opened and had no meaningful teacher retention information. Finally, one school was deemed an outlier because its retention rate dropped drastically from the previous year: from

66.1% in 2002-03 to 35.1% 2003-04. Thus, the final sample was comprised of 593 usable observations.

3.3.2 Dependent Variable

The goal of the federal No Child Left Behind (NCLB) Act (Public Law 107-110), implemented in 2002, is to hold all public schools in the U.S. accountable for student achievement by documenting the percentage of students who meet or exceed established standards for math and literacy at their grade level, and mandating achievement gains in schools where students are performing below these standards (Linn, Baker, & Betebenner, 2002). At the elementary school level, state-mandated achievement tests are administered to all fourth grade students in May. Mandated city tests, which are scaled to correspond with the state achievement tests, are administered annually to all third and fifth grade students at the same time. I used both the city and state assessments of student achievement – the percentage of students meeting the grade level standards – as my measure of organizational performance for each school. Since math and literacy achievement were highly correlated ($r = .94$, $p < .01$) and in a factor analysis load on a common factor, I used a single measure of school performance. Thus, my measure of organizational performance was constructed as the factor-scores of student achievement levels in both math and literacy.

3.3.3 Independent Variable

Employee (i.e. teacher) retention was measured as the proportion of teachers who had been teaching at a given school for two years or more. Reasoning that teacher retention over a two-year period is a more stable measure of school-wide retention than a retention rate of one year or less, I adopted this measure as reported by the district in the Annual School Report Cards.

The goal of this analysis is to examine and explain the consequences – rather than the antecedents – of teacher retention. As such, identifying the reasons behind teacher retention (or, conversely, turnover) is not as important as it might be in a study examining the causes of turnover (Griffith, Hom & Gaertner, 2000) or the processes individuals use in making turnover decisions (Lee & Mitchell, 1994; Mobley, 1977). I was unable to disentangle voluntary from involuntary turnover in my data. However, for several reasons, teacher retention appears to be an overwhelmingly voluntary action in this district. First, the teachers are represented by a union whose contract essentially restricts a principal's ability to select individual teachers in or out of the school, and specifies a complex and protracted procedure for termination for cause. Second, the performance of a given teacher is difficult to measure with any precision and thus there are almost no performance-related terminations except for the most extreme behavior. Third, and finally, teachers can bid into different school assignments based on their seniority with little or no input from principals. These factors combine to keep involuntary turnover low, even while voluntary turnover can be quite high. Moreover, previous research has provided little empirical evidence to support the contention that involuntary turnover positively affects organizational performance (McElroy, Morrow & Rude, 2001), further calling into question the importance of disentangling voluntary turnover from involuntary turnover in the current analysis.

3.3.4 Control Variables

I controlled for two variables that previous education research suggests are related to student achievement (Hanushek, 1986; Levin, 1997; Rumberger & Palardy, 2005): characteristics of the student body and the school's structural characteristics.

School need group. I captured the characteristics of the student body using an index developed by the district participating in my study. This index is based on three variables: (a) students' socio-economic status (SES), measured as the percentage of students in the school eligible for government-subsidized lunch; (b) the percentage of special education students in the school; and (c) the percentage of students who are entitled to bilingual or English as a Second Language services. The district created an index from these measures using the following weights: .45 for SES, .45 for special education enrollment, and .10 for ESL enrollment. These weights reflect the district's calculations regarding the relative contribution of each characteristic in mitigating student achievement, and reflect the long-established negative relationship between the relative challenges represented in the student body and overall school performance. Elementary schools are ranked by the district into twelve groups based on these factors, with each school receiving a "need rank" ranging from 1 (low need group) to 12 (high need group). Schools with higher proportions of students eligible for free lunch, enrolled in special education programs, and entitled to ESL services are assigned to higher need groups, while schools with lower percentages of such students are assigned to lower need groups.

School size. In economic models of school performance, school size, type, and location have been important structural predictors of student achievement (Rumberger & Palardy, 2005). Since the schools in my study come from the same school type - i.e. public elementary schools - and from the same urban location, school size is the only structural characteristic controlled for in the analysis. The empirical evidence regarding school size is generally mixed (Rumberger & Palardy, 2005) although some evidence stresses the benefits of small schools, particularly for elementary-level students (Huang & Howley, 1993). I measured school size as the number of teachers who worked at a school during the target academic year (2003-2004). Since maximum class sizes are uniform across the district, the results do not change if I measure school size as the number of students enrolled in the school.

3.3.5 Analytic Approach

I used hierarchical regression analysis (Cohen, Cohen, West & Aiken, 2003) to examine the relationship between teacher retention and school performance. I entered the control variables (school need category and school size) in Step 1, teacher retention in Step 2, and, to test for a possible non-linear relationship, teacher retention squared in Step 3. Following convention (Cohen et al., 2003) I mean-centered teacher retention prior to computing the squared term.

3.4 STUDY 1: RESULTS

Table 3-1 displays the descriptive statistics, along with correlations among the variables used in Study 1. Table 3-2 reports the results of the regression analysis.

Hypothesis 1 states that retention rates are positively related to organizational performance. As expected, the control variables entered in Step 1 are significant and explain a large proportion of the variance in school performance scores. Teacher retention, added in Step

2, is a positive and statistically significant predictor (b = 1.48, p < .01), explaining additional variance in school performance (ΔR^2 = .02, p < .01). This result supports Hypothesis 1.

There is some debate in the organizational literature about the functional form of the retention – performance relationship. For example, Glebbeek and Bax (2004), as well as Harris et al. (2006), found an inverted U-shape relationship between turnover and organizational performance. They conclude that some level of employee turnover is desirable for the organization but as turnover reaches its critical level, further increases depress performance. In contrast, Shaw et. al. (2005) found turnover to be negatively related to organizational performance but its negative effect is most detrimental at low rates of turnover and weakens as turnover rates increase. Based on these findings, I tested for a curvilinear retention-performance relationship in my sample by adding the squared-term for the teacher retention variable in Step 3 of the regression. As seen in Table 3-2, the squared term is not statistically significant (b = -2.61, n.s.), suggesting that the retention-performance relationship is linear in my sample[2].

The above analyses allowed me to establish the direction and statistical significance of the relationship between employee retention and organizational performance. However, the dependent variable in its current form - i.e. factor scores of student achievements in math and literacy – precludes me from deriving quantitative inferences regarding the effect of employee retention with respect to organizational performance. To answer this question, I evaluated separate models for math and literacy performance (see Step 4 and Step 5 in Table 3-2). The obtained results imply that a one-percent increase in teacher retention is associated with 0.26 percent increase in math performance and 0.30 percent increase in literacy performance.

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[2] I also tested the cubed-term of teacher retention – it was not statistically significant.

3.4.1 Summary

In summary, the results of this study fully support Hypothesis 1. Using archival data I show that retention among knowledge workers – in this case teachers – does have a positive relationship with organizational performance as measured by student achievement scores administered by an independent third party. Moreover, contrary to some earlier studies conducted in industries where knowledge stocks and flows may not be so critical to success (e.g., Shaw et al., 2005), I do not find evidence for a non-linear functional form. Although interesting in this regard, as argued earlier, the results do not provide insights about the underlying process driving the observed relationship. Study 2 takes a step in that direction by augmenting the archival data with survey measures collected from teachers.

3.5 STUDY 2: METHODS

3.5.1 Sample and Procedure

Study 2 tests Hypotheses 2 and 3, which predict that human capital and social capital mediate the relationship between employee retention and organizational performance. To test these predictions, I augmented archival data used in Study 1 with data from teacher surveys conducted in a subset of the schools. The surveys were administered in March 2004 as part of a larger study aimed at examining teachers' experiences with a new mathematics curriculum. All K-5 classroom teachers were asked to complete the survey during paid after-school time. Teachers who completed the survey were given a $10 gift card for their participation. Out of

6,435 surveys administered to teachers in 202 participating schools, 5,963 were returned, yielding a response rate of 92.7% for teachers and 100% for schools.

Eight schools were dropped from the analysis, leaving 194 schools in the final sample. Seven of these schools were newly opened and therefore no meaningful retention data were available. As in Study 1, one school was an outlier because the retention rate dropped almost twice as much in the study year as it had in the previous year.

Although practical considerations did not allow me to randomly select schools from the Study 1 population for this analysis, the sample was selected to be representative of the district as a whole in terms of both geographic location and student characteristics. The sample of schools used in Study 2 closely matches the population of schools in Study 1 on the control variables (school need group and school size). T-tests revealed that the differences between Study 1 means and Study 2 means were not statistically significant (all p's >.10).

3.5.2 Measures

The measures of teacher retention, school performance, school need group and school size used in Study 2 are identical to those used in Study 1.

3.5.3 Mediating Variables

Organizational social capital. Leana and Van Buren (1999: 538) define organizational social capital as "a resource reflecting the character of social relations within the firm. . . which create value by facilitating successful collective action." I measured organizational social capital using a 12-item scale adapted from Leana and Pil's (2006) *School Social Capital Scale* (shown in Appendix B). The items capture the three facets of organizational social capital specified by Nahapiet and Ghoshal (1998): structural, relational, and cognitive. Respondents answered using a 5-point scale with anchors ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Consistent with Nahapiet and Ghoshal's (1998) social capital theory, and consistent with the findings of Leana and Pil (2006), all 12 items loaded well on one factor (the lowest factor loading was .61) and the Cronbach's alpha for the scale was .96. Following Leana and Pil (2006), individual assessments of social capital were mean-aggregated to the school level. Intra-class correlations (ICCs) were ICC(1) = .50, and ICC(2) = .83; $F(193,5704) = 6.00$, $p < .01$, supporting the assumption that my organizational social capital measure indeed resides at the school level.

Organization-specific human capital. To capture organization-specific human capital I constructed two alternative measures. The first measure of organization-specific human capital is based on teacher tenure within the school. Tenure in the job has been shown to be positively associated with the accumulation of firm-specific skills (Rice, 2003) and has been used as a proxy for firm-specific human capital in previous organizational research (e.g., Hitt, Bierman, Shimizu & Kochhar, 2001). However, school tenure itself may be only a rough indicator of school-specific skills since it might account for a reasonable portion of general human capital as well, i.e. the more experience a teacher has in the school, the more opportunities she has to improve her general teaching skills. As such, school tenure (number of years teaching in a current school) is likely to reflect two components: (a) the amount of general human capital gained from teaching experience; and (b) the amount of organization-specific human capital gained from teaching in that particular school. To distinguish these two forms of human capital, I regressed school tenure (i.e., number of years teaching in the current school) on total tenure in the profession (i.e., number of years teaching in the current school or any other). General human capital from teaching experience takes the predicted values from that regression, while organization-specific human capital is comprised of its residuals.

This approach is similar to Roberts and Dowling (2002) who created a measure of corporate reputation, and Kamakura and Russell (1993) who created a measure of brand value, using a residual-based approach. To obtain the value of organization-specific human capital at the school level, I averaged the residual scores for each school.

It has to be noted, however, that school tenure is likely to reflect not only general and school-specific human capital but also school-specific social capital: i.e. the longer an individual works for a particular school, the more opportunities she has to develop more and closer connections to others at the workplace. At the same time, as was described above, school-specific social capital is measured with a separate instrument in this research. The correlation between both measures is moderate and is equal to .33 ($p < .01$), see Table 3-3. I enter both variables, i.e. school-specific human and school-specific social capital, simultaneously into the regression.

The second measure operationalizes organization-specific human capital as teachers' average tenure within the school in teaching in the current grade. I measure grade tenure as opposed to simply measuring school tenure because task requirements differ across grades, and because the level of experience teaching children at a particular grade is more "firm-specific" than overall tenure in the school. Respondents were asked to select the category that describes their grade tenure out of eight possible choices: (1) less than 1 year; (2) 1 year; (3) 2 years; (4) 3 years; (5) 4 years; (6) 5 years; (7) 6-10 years; and (8) 11 or more years. Responses were then averaged to the school level.

The two measures of organization-specific human capital were highly correlated ($r = .76$, $p < .01$).

3.5.4 Analytic Approach

To test Hypotheses 2 and 3, which specify mediation, I used the procedures outlined by Baron and Kenny (1986). This approach specifies a series of tests that evaluate specified links in a causal chain. In particular, Baron and Kenny (p. 1176) defined three conditions for mediation: (a) a link from the independent variable to the mediator (Path a) - "Variations in levels of the independent variable significantly account for variations in the presumed mediator"; (b) a link from the mediator to the dependent variable (Path b) - "Variations in the mediator significantly account for variations in the dependent variable"; and (c) a link from the mediator to the dependent variable adjusted for the effect of the independent variable (Path c) - "When Paths a and b are controlled, a previously significant relation between independent and dependent variables is no longer significant, with the strongest demonstration of mediation occurring when Path c is zero". Baron and Kenny's (1986) approach to testing mediation is the most commonly used approach in the psychological literature and demonstrates low Type I error rates (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

3.6 STUDY 2: RESULTS

Table 3-3 reports descriptive statistics, and correlations among the variables used in Study 2. Tables 3-4 and 3-5 report the mediated regression results. In particular, Table 3-4 reports the regression results where organization-specific human capital is measured as the average residual scores obtained from regressing school tenure on tenure in the profession, while Table 3-5 reports the regression results where organization-specific human capital is measured as the average tenure in the current grade.

Hypotheses 2 and 3 predict that the effect of employee retention on organizational performance is mediated by organization-specific human and social capital. [3] As seen, two-year teacher retention rates are significantly and positively related to both measures of organization-specific human capital: for the average residual scores $b = 5.98$ ($p < .01$; see columns *A* and *B*, Table 3-4); and for the average grade tenure of teachers in the school $b = 4.24$, ($p < .01$; see columns *A* and *B,* Table 3-5). As seen in columns *E* and *F*, two-year teacher retention rates are also significantly and positively related to school performance ($b = 1.44$, $p < .01$). However, the effect of teacher retention on school performance reduces to non-significance once organization-specific human capital enters the model. This effect is true for both measures of organization-specific human capital (see column *G,* Table 3-4 and 3-5 correspondingly). A Sobel test (see Baron & Kenny, 1986) confirms the reduction in the direct effect of retention due to the mediating role of organization-specific human capital. For organization-specific human capital measured as the average residual scores Sobel test results in $F = 2.29$ ($p < .05$). For organization-specific human capital measured as the average grade tenure in the school Sobel test results in $F = 2.75$ ($p < .01$). This result supports Hypothesis 2.

Similarly, as shown in columns *C* and *D,* teacher retention rates are significantly and positively related to the level of organizational social capital within the school ($b = 1.48$, $p < .05$). Recall that by itself the direct effect of teacher retention on school performance is

[3] I also included an indicator of general human capital (i.e., educational attainment) in the model with no change in the results.

statistically significant (*b* = 1.44, p < .01, column *F*). However, as shown in column *H,* when organizational social capital enters the equation, the effect of teacher retention on school performance is significantly smaller (*b* = 1.13, *p* < .05). A Sobel test results in F = 1.88 (p < .10). Since the direct effect of teacher retention is reduced but is still statistically significant, organizational social capital partially mediates the relationship between teacher retention and school performance. Thus, Hypothesis 3 is partially supported.

Finally, in column *I* I include both organization-specific human capital and organizational social capital. As seen from the tables, both forms of organizational capital remain statistically significant when entered simultaneously, and teacher retention remains statistically non-significant. Again, both Hypotheses 2 and 3 receive support.

3.6.1 Summary

Building on the results of Study 1, this study shows that the effect of employee retention on organizational performance is fully mediated by organization-specific human capital and partially mediated by organizational social capital. This supports the classic human capital argument (Osterman, 1987), as well as more recent assertions by Dess and Shaw (2001) and their colleagues regarding social capital as an underlying process explaining the retention-performance relationship. This, to my knowledge, is the first empirical demonstration of how both forms of capital bridge the gap between retention and performance at the organizational level. In the next study I address the potential interactive effects of human and social capital as depicted in Figure 3-1, as well as potential differences in the effects of organizational and task-specific forms of human and social capital.

3.7 STUDY 3: METHODS

Study 3 prospectively examines the differences among teachers who leave their jobs, i.e., turn over, and how such differences affect organizational performance. Recall that H4 predicts that the negative effect of human capital losses on organizational performance is greater when social capital losses are also high. H5 predicts that the negative effect on performance will be greater when human and social capital losses are task-specific rather than organization-specific. Empirically testing H4 and H5 required me to ascertain not just the percentage of teachers who are retained in each school and the aggregate levels of human and social capital (as in Study 2), but to identify *which* teachers stay versus leave, and match that with their individual levels of human and social capital. Thus, to test H4 and H5 I needed to be able to track the movement of individual teachers, rather than just overall retention levels.

In addition, in the previous analysis I examined the effects of human and social capital using global organizational indicators (i.e., average experience in the school/grade and overall social capital among teachers in the school). However, as noted previously, social capital often develops to target a specific need or domain (e.g., social needs; informational needs) and thus different ties can affect different outcome measures (Podolny et al. 1997; Wellman & Frank, 2001). To test the specific predictions in H5, this study examines instrumental – or task-related – ties. Other researchers (e.g., Reagans & Zuckerman, 2001; Sparrowe et al., 2001) have used a similar approach, arguing that ties that are task specific should have more powerful and direct effects on performance than other types of ties. Recall also that Gibbons and Waldman (2004) argue for the importance of specifying human capital as it is applicable to particular tasks (task-specific human capital). Thus, testing H5 also required me to develop a measure of human capital that is specifically applicable to teachers' ability to teach mathematics.

3.7.1 Sample

In Study 3 I again used data gathered through teacher surveys and archival records. To evaluate the effect of losses in human and social capital on organizational performance, I collected turnover data that allowed me to identify departed teachers. Teachers who leave their jobs tend to do so between the end of one school year (June) and the beginning of the next (September). Thus, teacher retention data were obtained from personnel records six month after survey administration, i.e. in September 2004. Except for the minor changes summarized below, the school performance and control variables (i.e. school need group and school size) are the same as those previously described.

3.7.2 Dependent Variable

Recall that Hypothesis 5 argues that losses of task-specific forms of human and social capital would have stronger negative effect on performance than have losses of more general forms of capital. To test this hypothesis I need to focus on a specific task within teaching domain. Unlike teachers at higher grade levels, elementary school teachers, with few exceptions, are charged with teaching all primary subject areas, including math, reading, science, and social studies. Previous research, however, has demonstrated that teachers vary considerably in their individual abilities to teach across such a wide range of subject areas, so they have subject-specific networks of others from whom they seek advice (Burch & Spillane, 2003). Thus, I would expect both human capital and social capital to differ based on the task (i.e., subject matter taught) being performed by the teacher.

As I am focusing on task-specific measures of human and social capital, the measure of performance has to correspond to that particular task too. In this study I restricted my analysis to a specific task, i.e. teaching mathematics. Therefore, I measured school performance as the percentage of students who meet or exceed established standards on state and city achievement tests in mathematics. This is consistent with the task-specific focus of my measures of human and social capital as explained below. Also, because turnover data on individual teachers was not available until the beginning of the 2004-05 school year (September 2004), I used student achievement data from the 2004-05 school year (collected in May 2005). As in the previous studies, school records provided the aggregate achievement information for students in grades three, four, and five.

3.7.3 Independent Variable

Turnover rate. I measured turnover rate as the number of teachers who left a given school in September 2004 divided by the total number of teachers in the school. The average one-year turnover rate was 23%, with rates ranging from as low as zero to as high as 55% of turnover in a given year. In Studies 1 and 2, my independent variable was two-year retention rates for each school. Here, since I was using personnel records provided by the district rather than publicly-available data on the Annual Report Cards, and because student achievement data for 2005-2006 were not yet available, I used one-year rather than two-year retention/turnover rates. As with Studies 1 and 2, I was not able to ascertain whether any individual teachers who left did so involuntarily. Again, since my focus is on the outcomes rather than the antecedents of turnover, this distinction is not central to my research. Moreover, as stated previously, involuntary turnover represents a small fraction of total turnover.

Organizational social capital losses. In this analysis, I used the same organizational social capital scale described earlier in Study 2. However, in the current analysis I mean aggregated the social capital scores of teachers who left as well as mean aggregated scores for all teachers in the school. To standardize the measure for cross-school comparison, I divided the average social capital of leavers by the average social capital of all teachers in the school. This yielded a school-level score representing losses of organizational social capital (see Shaw et al., 2005, for a similar approach).

Social capital losses (task-specific). Recall that this analysis focuses on a specific task: teaching mathematics. To assess task-specific social capital, I asked teachers to report both the frequency of their communication about mathematics instruction with others within the school, and the degree of emotional closeness they felt with them. This measure of the *intensity of ties* follows the approach used in several previous studies of social capital effects (Hansen, 2002; Reagans & McEvily, 2003) and is particularly appropriate in this context. To derive the benefits of interacting with others at work, teachers must talk to one another with some frequency. Moreover, for such interactions to have a positive effect on student learning, they should be centered on task-specific topics, in this case information exchange about teaching mathematics. At the same time, teachers must have sufficiently trusting relations with others at work to be comfortable asking questions and, in doing so, potentially revealing weaknesses in their own preparation or ability to perform their jobs. Thus, the frequency of interaction and closeness with other teachers were both combined into my measure.

Several previous studies of social capital assessed the ties among individuals at work by using a roster method that lists all possible contacts in the respondent's network and then asks them to report on their connections to each one (Burt, 1992; Reagans & McEvily, 2003; Shaw et al., 2005). While there are several advantages to such an approach, these are largely realized when analysis is conducted at the level of the individual respondent. Further, the roster method imposes constraints in terms of respondents' willingness to report on individual relations, and the resources required to obtain sufficiently high response rates across large numbers of participants (Salant & Dillman, 1994). Recall that my research questions concern organization-level performance, and my measures are at the organizational level. Because of this, a roster method loses much of its appeal, i.e., providing rich information about individual networks. Thus, I concluded that a roster method would significantly reduce response rates without yielding a clearly superior assessment of social capital for my purposes.

I instead elected to follow the approach taken by Collins and Clark (2003) and others (Smith, Collins & Clark, 2005) whereby respondents report on the frequency and closeness of their connections with *categories* of others from whom they might seek advice. In this study I identified three distinct categories of contacts at work: (a) teachers in the school who teach at the same grade level as the respondent; (b) other teachers in the school not at the same grade level; and (c) administrators in the school (e.g., principal; vice principal). To assess frequency, each teacher was asked to report on the number of times in an average month they talked about math with others within each of the three categories. To assess closeness, teachers were asked to indicate on a five-point scale (1 = *not at all close*; 5 = *very close*) the degree of closeness they felt with others they talked to in each of the three categories. The intensity of the tie was computed as the product of frequency and closeness with respect to each category of others (Burt, 1992; Reagans & McEvily, 2003). For the first category, i.e. teachers in the school who teach at the same grade level as the respondent, the mean value of the intensity of the tie was 32.67, standard deviation was 32.42, while minimum and maximum values were 0 and 150 correspondingly. For the next category, i.e. other teachers in the school not at the same grade level as the respondent, the mean value of the intensity of the tie was 10.28, standard deviation was 17.83, while minimum and maximum values were 0 and 150 correspondingly. Finally, for the intensity of the tie with administrators in the school, the mean value was 6.35, standard deviation was 12.50, while minimum and maximum values were 0 and 150 respectively. The three intensity measures for each teacher were then added to comprise the measure of task-specific social capital (overall intensity of contacts within the school).

As with the measure of losses in organizational social capital, the task-specific social capital scores of lost teachers and the task-specific social capital scores of all teachers in the school were mean-aggregated to the school level. To standardize the measure for cross-school comparison, I again divided the average social capital of leavers by the average social capital of all teachers in the school to arrive at a school-level score representing task-specific social capital losses. Measures of losses in social capital, which take on values of less than one, imply that, on average, social capital of those who stayed is higher than social capital of those who left. On the contrary, losses in social capital, which take on values of more than one, imply that the average social capital of stayers is lower than the average social capital of leavers. In my sample, losses in organizational social capital ranged from as low as 0 (no losses since no turnover has occurred) to as high as 1.24 (with mean = .98 and standard deviation = .14). At the same time losses in task-specific social capital ranged from 0 to 2.7 (with mean = .86 and standard deviation =.43).

Organization-specific human capital losses. As in Study 2, I utilized two measures of organization-specific human capital: a. the residual scores of school tenure regressed on professional tenure, and b. the average grade tenure in the school. In the current analysis I used the same measures but computed separate mean aggregate scores for teachers who left versus all teachers in the school. I then divided the average human capital of leavers by the average human capital of all teachers in the school to create school-level measures of loss of organization-specific human capital. As with social capital, the values of human capital losses less than one indicate that the average human capital of stayers is higher than the average human capital of leavers; while the values higher than one indicate that the average human capital of stayers is lower than that of leavers. In this particular sample, losses in organization-specific human capital measured as the residual scores of school tenure regressed on professional tenure ranged from as low as 0 (no losses since no turnover has occurred) to as high as 1.36 (with mean = 1.01 and standard deviation = .18). Losses in organization-specific human capital measured as the average grade tenure in the school ranged from 0 to 2.02 (with mean = 1.01 and standard deviation =.29).

Task-specific human capital losses. To measure task-specific human capital I used an assessment of each teacher's ability to teach mathematics. As part of the larger study, the ability to teach math was measured using items developed by the *Learning Mathematics for Teaching Project* at the University of Michigan (Hill, Schilling, & Ball, 2004). A set of twelve questions was selected from the full battery of items that mapped onto the National Council for Teachers of Mathematics recommended subject matter for elementary school children. The measure was pre-tested with approximately 100 school specialists whose job was to assist classroom teachers in improving their teaching performance. Half of the sample consisted of math specialists and half were reading specialists. The math specialists scored on average nearly twice as high as the reading specialists on the assessment, providing some support for the validity of the scale. In addition, Ball and her colleagues have subjected this assessment to extensive analysis (see Hill et al., 2004 for details), providing evidence of the discriminate validity of the measure in assessing a teacher's ability to teach math rather than, for example, a teacher's beliefs or attitudes regarding math, or her knowledge of mathematic principles. The assessment uses different scenarios and asks teachers to interpret how students might think about math in a given situation (a sample release item is shown in Appendix A). The ability score in my study was constructed as the proportion of correct answers to the total number of questions.

As with the measures of social capital losses, I calculated losses of task-specific human capital as the average human capital scores for leavers divided by the average human capital scores for all teachers in the school. Losses in task-specific human capital ranged from 0 to 2.59 (with mean = 1.01 and standard deviation =.27).

3.7.4 Control Variables

To match the data collection period of the dependent variable (i.e. 2004-2005), I collected the control variables of school need group and school size for the 2004-2005 school year.

3.7.5 Analytic Approach

I used hierarchical regression analysis to test Hypotheses 4 and 5. In this analysis I have two goals. My first goal (H4) is to examine the joint impact of human and social capital losses on school performance irrespective of their specific form (organization-specific versus task-specific). To test this hypothesis, I created two interaction terms: (a) organizational social capital losses interacting with organization-specific human capital; and (b) task-specific social capital losses interacting with task-specific human capital losses. My second goal (H5) is to examine the relative impact of organization-specific versus task-specific losses of human and social capital. This is tested by comparing the strength of the main and interaction effects of organization-specific forms of capital with the strength of the main and interaction effects of task-specific forms of capital. In addition, I performed an F-test to evaluate the equivalence of corresponding parameter estimates (under the null hypothesis that parameter estimates for organization- and task-specific forms of capital are equal).

I entered the control variables in Step 1. In Step 2 I entered organizational and task-specific social capital losses and organization-specific and task-specific human capital losses. The interaction terms were entered in Step 3. To reduce nonessential colinearity, I followed recommended procedures (Cohen et al., 2003) and mean-centered all interacting variables (social and human capital) prior to creating the product terms.

3.8 STUDY 3: RESULTS

Table 3-6 reports the descriptive statistics, and correlations among the variables, in Study 3. Tables 3-7 and 3-8 reports the results of the regression analysis used to test Hypothesis 4 and 5.

Hypothesis 4 states that the detrimental effect of human capital losses on organizational performance will be greater when social capital losses are also high. I make this prediction irrespective of the nature of the capital (organization-specific versus task-specific). This hypothesis would be supported if the interaction between social and human capital losses is negative and statistically significant. The results of the hierarchical regression analysis to test the significance and sign of these interactions are reported in Table 3-7 (organization-specific human capital is measured as the average residual scores obtained from regressing school tenure on tenure in the profession) and Table 3-8 (organization-specific human capital is measured as the average grade tenure in the school). As seen in Steps 3 and 5, Tables 3-7 and 3-8, the interaction between organization-specific social and human capital losses is not statistically significant (b = - 12.98, *n.s.*, Step 3, Table 3-7; and b = - 16.78, *n.s.*, Step 3, Table 3-8). However, the interaction between task-specific social and human capital losses is statistically significant (b = - 17.50, $p < .01$, Step 4, Table 3-7; and b = - 18.27, $p < .01$, Step 4, Table 3-8). The 95% confidence intervals for these significant interactions are the following: $- 35.17 \leq \beta \leq - 0.23$ (Step 4, Table 3-7), and $- 36.55 \leq \beta \leq 0.10$ (Step 4, Table 3-8). Moreover, the interaction between task-specific social and human capital losses explains additional variance in school math performance ($\Delta R^2 = .02, p < .05$).

To examine the nature of this significant interaction, I plotted simple regression lines representing the relationship between school performance (student achievement in mathematics) and task-specific human capital losses at high (one standard deviation above the mean) and low (one standard deviation below the mean) levels of task-specific social capital losses (Aiken & West, 1991). Using the approach of Preacher, Curran, and Bauer (2006), I computed statistical significance of the simple slopes of these regression lines. In particular, for low losses of task-specific social capital the slope is equal to – 6.72 (n.s.), while for high losses of task-specific social capital the slope is equal to – 21.26 ($p < .05$). As seen from the plot (Figure 3-1, panel A), the lowest math performance is in schools that suffer from high losses of both task-specific human and social capital, while the highest is in schools with low losses of these two forms of capital. Moreover, for schools incurring low losses of task-specific social capital due to turnover, the slope going from low to high losses of human capital is virtually flat (recall that this slope is not statistically significant). For schools incurring high losses of task-specific social capital, the slope is negative and steeper when going from low to high human-capital losses. This suggests that social capital is a relatively safe buffer from the losses of human capital: once task-specific social capital is preserved, the losses of human capital are not that detrimental to school performance. However, when turnover produces high losses of task-specific social capital, the corresponding losses of task-specific human capital will exacerbate the negative effect on performance. Although Hypothesis 4 specifies task-specific social capital losses as a moderator, I also examined this interaction as if task-specific human capital losses are a moderator. Figure 3-1, panel B presents the interaction from this perspective. Particularly, I plotted simple regression lines representing the relationship between school performance and task-specific losses of social capital separately at high (one standard deviation above the mean) and low (one standard deviation below the mean) levels of task-specific losses of human capital. Examination of statistical significance of these slopes (Preacher, Curran, & Bauer, 2006) revealed that at low levels of human capital losses the slope is equal to – 11.75 ($p < .05$), while at high levels of human capital losses the slope is almost twice as much and is equal to – 20.88 ($p < .05$). In short, for schools incurring high losses of task-specific human capital, the slope going from low to high losses of social capital is negative and twice as steep as that for schools incurring low losses of task-specific human capital. Based on the presented evidence I conclude that Hypothesis 4 is supported but only in the case of task-specific human and social capital.

Hypothesis 5 states that the lowest performance is expected in schools that, due to turnover, incur high losses of task-specific (vs. organization-level) human and social capital. To test this prediction I examined the relative significance of the two interactions terms I created. Hypothesis 5 would be supported if the coefficient for the task-specific interaction term is statistically significant and, at the same time, different and lower than the coefficient for the organization-specific interaction term. As described above, the interaction between task-specific human capital losses and task-specific social capital losses is negative and statistically significant (b = -17.50, $p < .05$). The corresponding interaction between organization-specific human and social capital losses is statistically non-significant (b = -12.98, n.s.). To further explore this issue I tested for the differences among organization-specific and task-specific interaction terms. This test compares sum of squares obtained from two separate regressions: (a) one that specifies a common coefficient for both interaction terms, and (b) another that allows different coefficients for the two terms (Pedhazur, 1997). Since such an approach is susceptible to Type II error, it is recommended to accept a relatively large α level (e.g., .10 or even .25) when testing differences among coefficients (Pedhazur, 1997). Recall that I use two separate organization-specific human capital measures. Therefore, I report tests for the differences among organization-specific and task-specific interaction terms for each measure separately. When organization-specific human capital is measured as the average residual scores obtained from regressing school tenure on tenure in the profession, then the test for the differences yields $F = 4.09$ ($p < .05$), rejecting the null hypothesis that both coefficients are equal. Similarly, when organization-specific human capital is measured as the average tenure in the current grade, then the test yields $F = 2.79$ ($p < .10$), rejecting the null hypothesis that both coefficients are equal. Based on this evidence I conclude that Hypothesis 5 receives support in my sample.

3.9 DISCUSSION

Employee retention is a topic of substantive interest for a variety of constituents: managers, academics, and employees themselves. While there is a relatively large body of knowledge about the antecedents of employee turnover, its consequences are not as well understood (Glebbeek & Bax, 2004). This may be due in part to the multiplicity of outcomes in such studies, and in part due to the fact that some outcomes are beneficial while others are deleterious for organizations (Staw, 1980). Importantly, there is a growing realization that the impact of turnover on performance metrics, instead of being direct, may be mediated by intervening factors.

Using large-scale, longitudinal databases assembled from multiple sources, I sought to examine these issues in the current set of studies. Specifically, after linking employee retention to organizational performance, I examined human and social capital as mechanisms that may mediate the impact of turnover on performance. I drew a distinction between general forms of capital and specific forms of capital, arguing that task-specific capital losses – both human and social – are more injurious to the organization than are losses in more general (i.e., organizational) forms of capital. These results show that turnover indeed impedes performance as measured by non-financial metrics, i.e., student achievement scores in schools (Study 1). Moreover, I found support for a linear relationship between retention and performance, but not the non-linear effects reported in other recent studies (e.g., Harris et al., 2006; Shaw et al., 2005). Study 2, augmented by survey data, shows that the impact of turnover on performance was mediated by the stocks of organization-level social and human capital. In the case of human capital, the retention-performance relationship was fully mediated, while social capital partially mediated the relationship.

Going further, Study 3 illuminated these findings by examining the human and social capital of specific employees who remain with the organization versus those who leave. In Study 3 I also examined losses in organization- and task-specific social and human capital, showing both the importance of task-specific capital and that the losses have an interactive, rather than an additive, effect on subsequent performance. As a result of turnover, organizational performance suffers most when the employees who leave have high levels of task-specific human and social capital.

My finding that human capital mediates the turnover-performance relationship is consistent with much prior theorizing about the value of human capital to organizations (Becker, 1964; Osterman, 1987). The mediating role of organizational social capital reinforces Dess and Shaw's (2001) argument for a broadened perspective in explaining the turnover-performance relationship. I believe that such a broadened perspective is particularly appropriate for knowledge-intensive organizations where knowledge creation and dissemination is at the core of value creation (Grant, 1996). In schools, the subject of my investigation, teachers are clearly "knowledge workers"—not only do they utilize knowledge in their daily work, but their performance and the organization's success is measured by the extent to which students absorb and retain knowledge. As such, social capital, because of its facilitative role in disseminating individual knowledge, becomes a core mechanism for linking retention to performance. Specifically, my findings suggest that knowledge organizations with high turnover rates are likely to under-perform because they are unable to develop and retain their task-specific social capital. In the absence of such social capital, high levels of task-specific human capital did not enhance organizational performance (Study 3). In other words, turnover's negative effect on performance here can be explained by the combined losses of human and social capital.

The interactive effects examined in this regard (Study 3) offer two provocative findings. First, the more specific the loss of human and social capital, the more deleterious is the impact of turnover on performance. Second, the effects of losses in human and social capital are not merely additive — both these forms of capital are mutually re-enforcing and one, in the absence of the other, may not benefit the organization to it fullest extent. Thus the answer to the questions posed in my introduction (e.g., can human and social capital substitute for one another?) is a clear no. Further, as shown in Figure 3-1, when an organization incurs high losses of task-specific social capital through turnover, human capital cannot compensate for the negative effects on performance.

Building on Shaw et al. (2005), I examined the role of social capital in the retention-performance relationship, but by taking a different tack. In particular, Shaw et al. (2005) focused on the structural dimension of social capital and demonstrated that turnover threatens organizational performance by disrupting communication networks. The structural dimension is indeed a core facet of social capital and has understandably received a good bit of attention in the literature. Social capital, however, is not limited to the structure of the relationships between actors but is also characterized by the nature and content of these relationships (Adler & Kwon, 2002; Leana & Van Buren, 1999; Nahapiet & Ghoshal, 1998). In my research I examined both structural (frequency of interaction) and relational (closeness) facets of social capital. In addition, in Study 3 I focused on the content of the knowledge being exchanged. In these ways, my research contributes to the literature on social capital as well as the turnover-performance literature.

The findings of this study, although provocative, must be examined in light of several limitations, many of which provide useful directions for future research. For instance, I focus here on social capital within organizations. Clearly, external relations can also be important in explaining the link between turnover and performance, and external social capital has been linked to organizational performance in previous research in public schools (Leana & Pil, 2006) and business settings (e.g., Collins & Clark, 2003). Obtaining measures of external and internal social capital would be particularly useful in service settings (e.g. lawyers, consultants, etc.), where external connections are crucial for the success of the organization. In such settings, turnover might, in fact, represent an opportunity rather than a threat to performance when a person with fewer external connections is replaced by one with an extensive network. Second, while largely consistent with previous research, I also find some different results, particularly the linear relationship between turnover and performance. One explanation to be explored is occupational differences among the samples used in the various studies (e.g., teachers vs. fast food workers vs. truck drivers). Future research may include diverse samples in the same study and more systematically address the effects of occupational differences.

Although I contend that losses in organizational stocks of human and social capital are plausible mechanisms through which employee turnover affects organizational performance, the strengths of these paths – especially of the links from both forms of capital to performance – may vary across the settings. In particular, Argote (1999) proposed that organizationally valuable knowledge resides in three components: (1) individuals (i.e. employees), (2) the organization's technology and tools, and (3) the organization's structure (including organizational routines). Consequently, the value creation comes either from organizational employees, or the organization's structure, or the organization's technology. For the firms that organize their value creation processes primarily around the knowledge embedded in individuals, I expect stronger manifestation of the theory discussed in this essay. On the other hand, the paths: (a) retention –

stocks of human and social capital – organizational performance, and (b) turnover losses in human and social capital – organizational performance are likely to be less pronounced in organizations whose competitive advantage derives primary from technology and/or structure.

The amount of variance explained by employee turnover and by human and social capital losses was modest (2%). Indeed, two percent of additional variance explained in school performance look pale comparing to fifty six percent of variance explained by school need group (i.e. student characteristics) and school size. At the same time, teacher retention is manageable comparing to student characteristics and is less costly and more attainable comparing to building more schools in order to reduce school size. Moreover, increasing teacher retention might comprise one of those "small wins" (Weick, 1984), i.e. concrete steps of moderate importance, that will accumulate positive outcomes to create a larger overall effect.

It has to be noted that the study was performed in a sample of elementary school teachers. This is a setting where involuntary turnover is not prevalent. Such a situation is different from for-profit organizations where refreshing employee pool is a common practice. As an illustration consider a remark made by a Goldman Sachs spokesman: "As we do every year, we are reviewing the performance of the bottom 5 percent of our people and some number of them will be leaving the firm…In most years we ask a significant percentage of that 5 percent to leave" (Cimilluca, 2008). Prior research, however, has provided little empirical evidence to support the contention that involuntary turnover positively affects organizational performance (McElroy, Morrow & Rude, 2001). Another important feature of my sample is the focus on non-financial results, i.e. educating students. The findings of this study, therefore, are generalizable to setting with similar focus on non-financial results, such as policemen, firemen, nurses, etc.

In Study 2 I used the Baron and Kenny (1986) approach to testing mediation effects of organization-specific human and social capital in explicating the relationship between employee retention and organizational performance. I also incorporated the Sobel test to test the significance of the intervening variable effect. According to MacKinnon et al. (2002) simulation study, the Baron and Kenny (1986) method has low Type I error rates, while the Sobel test has somewhat higher power. In my study, both hypothesized mediation effects received support pointing to no need to utilize other methods to test the significance of the intervening effect. However, if researchers wish to have the maximum power to detect the intervening variable effect and can tolerate some increase in Type I error, there are other methods available. In particular, MacKinnon et al. (2002) discussed and compared Type I errors and statistical power of 14 distinct methods to test the statistical significance of the intervening variable effect.

In summary, I believe that my work takes an important step by examining the underlying mechanisms by which employee retention rates can impact performance in knowledge-based organizations. The insights provided in my study, I hope, will stimulate future research in this area, particularly with respect to the multiple forms and levels of social and human capital, and their role in organizational success.

Table 3-1. Descriptive Statistics: Study 1

		Mean	s.d.	1	2	3	4	5	6
1.	School performance (measured as factor scores)	0.00	1.00	1.00					
2.	School need group	6.63	3.37	-.72	1.00				
3.	School size	0.48	0.18	-.25	.25	1.00			
4.	Teacher retention	68.31	10.20	.25	-.14	.05	1.00		
5.	Math performance	60.46	17.85	.99	-.69	-.24	.24	1.00	
6.	Literacy performance	53.45	19.97	.99	-.73	-.25	.25	.94	1.00

N = 593; Correlations higher than .10 are significant at p <. 01

Table 3-2. Hierarchical Regression Analysis: Test of Hypothesis 1, Study 1

	School Performance (measured as factor scores)						Math performance		Literacy performance	
	Step 1		**Step 2**		**Step 3**		**Step 4**		**Step 5**	
School need group	-0.21	**	-0.20	**	-0.20	**	-3.42	**	-4.10	**
School size	-0.49	**	-0.56	**	-0.60	**	-9.46	**	-10.02	**
Teacher retention			1.48	**	1.38	**	0.26	**	0.30	**
Teacher retention squared					-2.61		0.00		0.00	
ΔR^2	0.56	**	0.02	**	0.00					
R^2	0.56	**	0.58	**	0.58	**	0.51	**	0.57	**

N = 593 ; * $p < .05$; ** $p < .01$

Table 3-3. Descriptive Statistics: Study 2

		Mean	s.d.	1	2	3	4	5	6	7
1.	School performance	0.16	0.92	1.00						
2.	School need group	6.02	3.16	-.74	1.00					
3.	School size	0.53	0.19	-.16	.12	1.00				
4.	Teacher retention	0.70	0.09	.23	-.13	.00	1.00			
5.	Organizational social capital	3.51	0.33	.54	-.47	-.24	.19	1.00		
6.	Organization-specific human capital measured as the average tenure in the current grade	4.41	0.77	.49	-.41	-.11	.45	.33	1.00	
7.	Organization-specific human capital measured as the average residual scores obtained from regressing school tenure on tenure in the profession	5.34	0.59	.42	-.31	-.20	.56	.33	.76	1.00

N = 194

Correlation values > .19 are significant at $p < .01$; correlation values > .15 are significant at $p < .05$

Table 3-4. Results of Mediation Analyses: Testing Hypotheses 2-3, Study 2

	Organization-specific human capital [a]				Organization-specific social capital				School performance (2004)									
	Step 1		Step 2		Step 1		Step 2		Step 1		Step 2		Step 3		Step 4		Step 5	
	A		*B*		*C*		*D*		*E*		*F*		*G*		*H*		*I*	
School need group	-0.09	**	-0.07	**	-0.14	**	-0.14	**	-0.21	**	-0.21	**	-0.20	**	-0.18	**	-0.17	**
School size	-0.86	*	-0.89	**	-0.97	**	-0.98	**	-0.33		-0.34		-0.20		-0.14		-0.03	
Teacher retention			5.98	**							1.44	**	0.51		1.13	*	0.38	
Organization-specific human capital [a]													0.16	**			0.13	*
Organizational social capital															0.21	**	0.20	**
ΔR^2	*0.13*	**	*0.28*	**	*0.25*	**	*0.02*	*	*0.55*	**	*0.02*	**	*0.02*	**	*0.04*	**	*0.05*	**
R^2	*0.13*	**	*0.41*	**	*0.25*	**	*0.27*	**	*0.55*	**	*0.56*	**	*0.58*	**	*0.60*	**	*0.61*	**
N=194																		

N = 194 ; * $p < .05$; ** $p < .01$

[a] Organization-specific human capital is measured as average residual scores obtained from regressing school tenure on tenure in the profession

Table 3-5. Results of Mediation Analyses: Alternative Measure of Organization-Specific Human Capital

	Organization-specific human capital [a]		**Organization-specific social capital**		**School performance (2004)**				
	Step 1	**Step 2**	**Step 1**	**Step 2**	**Step 1**	**Step 2**	**Step 3**	**Step 4**	**Step 5**
	A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*
School need group	-0.13 **	-0.11 **	-0.14 **	-0.14 **	-0.21 **	-0.21 **	-0.19 **	-0.18 **	-0.16 **
School size	-0.29	-0.32	-0.97 **	-0.98 **	-0.33	-0.34	-0.29	-0.14	-0.10
Teacher retention		4.24 **				1.44 **	0.70	1.13 *	0.50
Organization-specific human capital [a]				1.48 *			0.18 **		0.15 **
Organizational social capital								0.21 **	0.20 **
ΔR^2	*0.18* **	*0.14* **	*0.25* **	*0.02* *	*0.55* **	*0.02* **	*0.02* **	*0.04* **	*0.06* **
R^2	*0.18* **	*0.32* **	*0.25* **	*0.27* **	*0.55* **	*0.56* **	*0.59* **	*0.60* **	*0.62* **
N=194									

N = 194 ; * $p < .05$; ** $p < .01$

[a] Organization-specific human capital is measured as average tenure in the current grade

Table 3-6. Descriptive Statistics: Study 3

		Mean	s.d.	1	2	3	4	5	6	7	8	9
1.	School performance (math)	73.80	14.73	1.00								
2.	School need group	5.90	3.05	-.66	1.00							
3.	School size	0.52	0.19	-.11	.16	1.00						
4.	Turnover rate	0.23	0.10	-.38	.26	-.02	1.00					
5.	Organization-specific social capital losses	0.98	0.14	-.02	.09	.10	.18	1.00				
6.	Task-specific social capital losses	0.86	0.43	.04	.01	.06	.04	.20	1.00			
7.	Organization-specific human capital losses measured as the average tenure in the current grade	1.01	0.29	.15	-.18	.04	-.04	.32	-.01	1.00		
8.	Organization-specific human capital measured as the average residual scores obtained from regressing school tenure on tenure in the profession	1.01	0.18	.13	-.12	.14	.09	.34	.07	.66	1.00	
9.	Task-specific human capital losses	1.01	0.27	.05	.00	-.03	.14	.26	.10	-.00	.20	1.00

[a] N = 189

Correlation values > .19 are significant at $p < .01$; correlation values > .15 are significant at $p < .05$

Table 3-7. Hierarchical Regression Analysis: Test of Hypotheses 4 and 5, Study 3

	School performance (2005)									
	Step 1		**Step 2**		**Step 3**		**Step 4**		**Step 5**	
School need group	-2.89	**	-2.83	**	-2.82	**	-2.86	**	-2.86	**
School size	-1.19		-2.39		-2.22		-2.88		-2.82	
Turnover rate	-0.32	**	-0.36	**	-0.37	**	-0.36	**	-0.36	**
Organization-specific social capital losses [a]			3.71		-1.10		-1.41		-2.38	
Task-specific social capital losses			1.38		1.16		0.80		0.77	
Organization-specific human capital losses [a]			5.02		2.70		2.06		1.61	
Task-specific human capital losses			3.09		2.33		0.66		0.56	
Interactions:										
Organization-specific social capital losses × organization-specific human capital losses [a]					-12.98				-3.08	
Task-specific social capital losses × task-specific human capital losses							-17.50	**	-16.91	*
ΔR^2	0.48	**	0.01		0.00		0.02	**	0.02	*
R^2	0.48	**	0.50	**	0.50	**	0.52	**	0.52	**

N = 189; * $p < .05$; ** $p < .01$

[a] Organization-specific human capital is measured as average residual scores obtained from regressing school tenure on tenure in the profession

Comment: Results of testing interaction terms for the difference: F = 4.09 ($p < .05$)

Table 3-8. Hierarchical Regression Analysis: Alternative Measure of Organization-Specific Human Capital

	School performance (2005)									
	Step 1		Step 2		Step 3		Step 4		Step 5	
School need group	-2.89	**	-2.87	**	-2.84	**	-2.86	**	-2.85	**
School size	-1.19		-1.76		-2.09		-2.73		-2.79	
Turnover rate	-0.32	**	-0.35	**	-0.38	**	-0.35	**	-0.36	**
Organization-specific social capital losses [a]			5.04		-2.72		-1.88		-4.26	
Task-specific social capital losses			1.39		1.17		0.83		0.78	
Organization-specific human capital losses [a]			0.87		0.19		1.28		1.01	
Task-specific human capital losses			3.56		2.35		0.82		0.55	
Interactions:										
Organization-specific social capital losses × organization-specific human capital losses [a]					-16.78				-6.15	
Task-specific social capital losses × task-specific human capital losses							-18.27	**	-17.06	*
ΔR^2	0.48	**	0.01		0.01		0.02	**	0.02	**
R^2	0.48	**	0.49	**	0.50	**	0.52	**	0.52	**

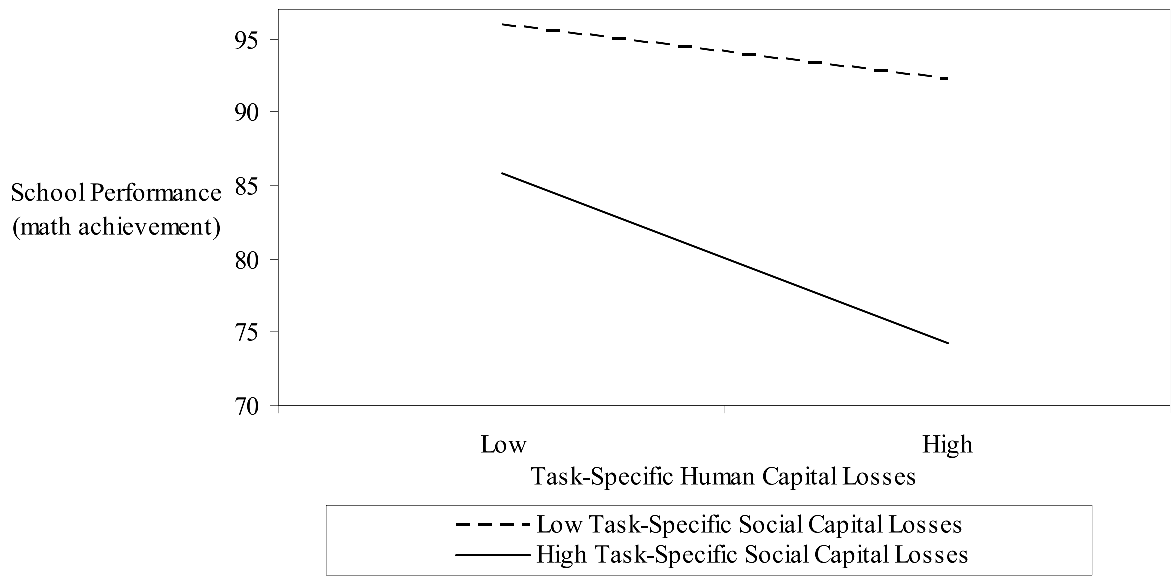
N = 189; * p < .05; ** p < .01

[a] Organization-specific human capital is measured as average tenure in the current grade

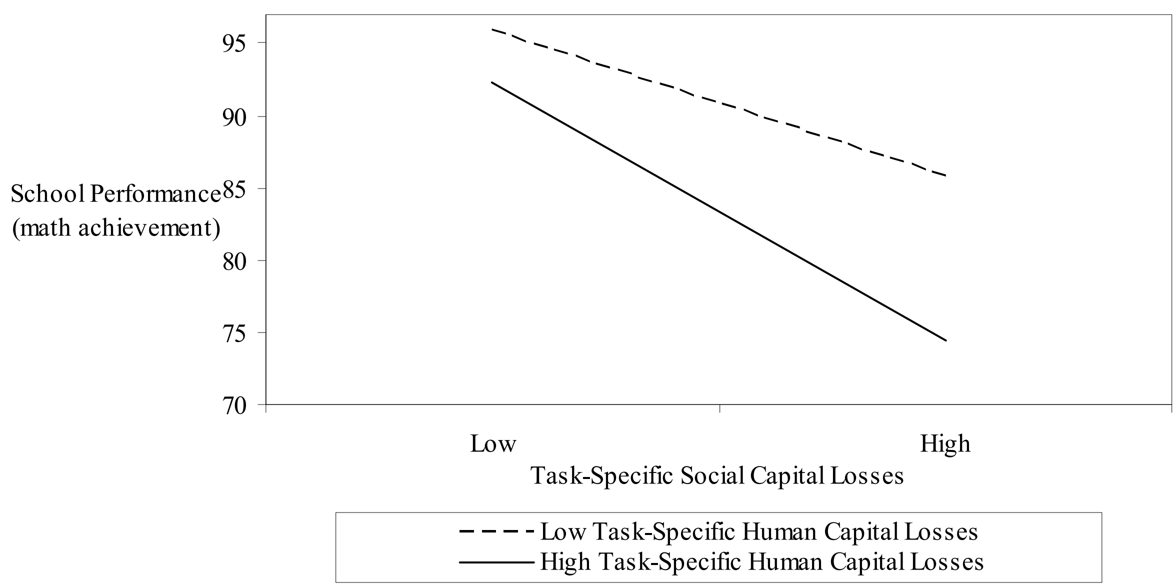
Comment: Results of testing interaction terms for the difference: F = 2.79 (p < .10)

Figure 3-1. Interaction between task-specific social capital and human capital losses predicting school performance

(a) Task-specific social capital losses plotted as a moderator



(b) Task-specific human capital losses plotted as a moderator



4.0 CONCLUSIONS

Both the popular press and academic literature stress the strategic importance of employees to the success of modern organizations. Managers affirm that employees are their most valuable asset (e.g. Bassi & McMurrer, 2007), and scholars similarly emphasize that human resources are “often hard to imitate due to scarcity, specialization, and tacit knowledge” (Coff, 1997: 374). The available empirical evidence consistently supports the assertion that employee retention is a positive factor in predicting organizational performance (e.g. Alexander, Bloom, & Nuchols, 1994; Arthur, 1994; Batt, 2002; Guthrie, 2001; Shaw et al., 2005). At the same time some level of personnel turnover is an inevitable part of organizational life. As turnover poses a threat to organizational performance by undermining its valuable intangible assets (Dess & Shaw, 2001; Moreland & Argote, 2003; Osterman, 1987), it requires an effective management strategy. The goal of my dissertation is to supplement the existing knowledge regarding the nature of employee turnover and to contribute additional insights to theory and practice regarding the creation of effective retention strategies. Specifically, I treat employee turnover as both a dependent and an independent variable. Such an approach does not only help to identify employee groups having the highest propensity to leave (i.e. employee turnover as a dependent variable) but also those producing the greatest impact on important organizational outcomes (i.e. employee turnover as an independent variable).

In particular, the first essay investigates the relationship between job attitudes and employee turnover behavior. This essay was motivated by questions relevant to both researchers and practitioners. In theory, job satisfaction and organizational commitment should be strongly related to employee turnover since job dissatisfaction signals unhappiness with the status quo and the desirability of movement (e.g. March & Simon, 1958), and organizational commitment is a binding force that links an individual to the organization (Meyer & Herscovitch, 2001). The empirical evidence, however, points to the moderate strength of the relationship between the above job attitudes and employee turnover. Griffeth, Hom and Gaertner (2000) report that the average correlation between overall job satisfaction and employee turnover is – 0.19, while the average correlation between organizational commitment and employee turnover is - .23. Such moderate strength of the relationship indicates the potential existence of contextual factors surrounding attitude-turnover relationship. In addition, from a practical standpoint moderate relationship between job attitudes and turnover prevents managers from making strong conclusions based on the available job satisfaction and organizational commitment surveys, at least with regard to employee turnover behavior.

In the first essay of my dissertation I offer a model that may assist in linking job-related attitudes and turnover among different employee profiles. My model is based on the premise that a. employee systematically differ in their propensity to tolerate job dissatisfaction and low organizational commitment, i.e. attitude thresholds, and b. employee systematically differ in their propensity to under- and over-report their true attitudes or, in other words, to be harsh or lenient raters, i.e. response biases. Consequently, this model offers a useful set of guidance regarding classifying employees into clusters of high/low tolerance to job dissatisfaction and organizational commitment and biased/unbiased clusters. These insights contribute to the development of more effective retention strategies because they provide a more nuanced approach for identifying prospective leavers.

My second essay, in turn, focuses on the link between employee turnover and organizational performance and on qualities of employees whose departure is particularly detrimental to the organization. Specifically, in line with prior literature (e.g. Alexander, Bloom, & Nucholds, 1994; Kacmar, Andrews, Van Rooy, Steilberg, & Cerrone, 2006; Shaw, Duffy, Johnson, & Lockhart, 2005; Shaw, Gupta, & Delery, 2005) I first establish that employee retention is positively associated with organizational performance. Next, I demonstrate that this positive association is reached through the accumulations of organization-specific human and social capital. In short, employee retention is beneficial to organizational performance because it provides the necessary conditions to accumulate valuable stocks of organization-specific intangible assets.

Despite the benefits derived from high employee retention, all organizations experience some level of employee turnover. However, since not all employees possess skills equally instrumental to organizational goal, turnover losses will depend on the specific human and social assets they entail. Thus one can talk not only about the quantity but also about the quality of turnover. In analyzing turnover losses of human and social capital I make a further distinction between organization- and task-specific forms of capital, arguing that losses of the capital that more closely resembles the outcome of interest should be more deleterious. The findings of my study demonstrate that turnover losses of task-specific human and social capital interact in their negative effect on organizational performance. While the interaction pattern points to some complementarities between both forms of capital, social capital is seen as a stronger buffer from the losses of task-specific human capital.

In line with prior research (Becker, 1964; Leana & Pil, 2006; Tsai & Ghoshal, 1998) this dissertation recognizes the importance of intangible forms of organizational capital such as human and social capital, to organizational performance. Since these forms of capital are embedded in individuals and the connections between them, employee turnover has a deleterious effect on performance by undermining the collective stocks of these important resources. I show that both overall rates of retention and the capital embedded in the individual employees being retained (versus lost to turnover) have significant effects on performance.

Another theoretical contribution lies in recognizing the existence of systematic work attitude thresholds. The importance of job attitudes – commitment and satisfaction – as antecedents of turnover is undeniable. The notion of attitude thresholds elaborated in this dissertation sheds some light on why satisfaction and commitment have variable power in predicting actual quit decisions among different classes of employees.

Collectively, the two studies illuminate the role of employee attitudes in shaping actual turnover behavior (Essay 1) and enrich current explanation for the effect of retention on performance (Essay 2).

Because employee retention has an impact on organizational performance, it is naturally of considerable interest to managers. Both essays agree that it is just as important to focus on whom to retain as it is to focus on how many to retain. Specifically, to assist in developing effective retention strategies, this dissertation identifies several groups of employees whose loss can be particularly costly to the organization: (a) employees possessing high quality relationships with their coworkers; and (b) employees having high competency in their specific tasks. Importantly, by showing how turnover affects performance, this research provides guidance for developing strategies to mitigate and ameliorate the negative effects of turnover. In addition, this dissertation develops a theory and provides methodology that identifies those employee groups whose "stay/leave" decisions are particularly susceptible to job-related attitudes. Such groups are the optimal targets for retention measures aimed at increasing job satisfaction and organizational commitment.

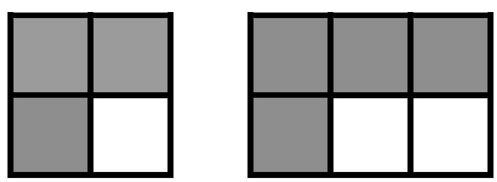
Finally, in this dissertation, all of the organizations were elementary schools and all of the employees were teachers. While similar samples, i.e. teachers in schools, were used in the prior organizational studies (e.g. Leana & Pil, 2006; Ostroff, 1992; Ostroff & Schmitt, 1993), future research is needed to determine if the relationships specified in this dissertation hold for other types of industries and occupations.

APPENDIX A

ASSESSMENT OF MATHEMATICS TEACHING ABILITY

Sample item

Takeem's teacher asks him to make a drawing to compare $\frac{3}{4}$ and $\frac{5}{6}$. He draws the following:



and claims that $\frac{3}{4}$ and $\frac{5}{6}$ are the same amount. What is the <u>most likely</u> explanation for Takeem's answer? (Mark ONE answer.)

a) Takeem is noticing that each figure leaves one square unshaded.

b) Takeem has not yet learned the procedure for finding common denominators.

c) Takeem is adding 2 to both the numerator and denominator of $\frac{3}{4}$, and he sees that that equals $\frac{5}{6}$.

d) All of the above are equally likely.

APPENDIX B

SCHOOL SOCIAL CAPITAL SCALE

1. Information sharing

Teachers engage in open and honest communication with one another.

Teachers at this school have no “hidden agendas” or issues.

Teachers discuss personal issues if they affect job performance.

Teachers at this school keep each other informed at all times.

2. Trust

Teachers in this school are usually considerate of one another’s feelings.

Teachers at this school have confidence in one another.

Teachers in this school show a grate deal of integrity.

Overall, teachers at this school are trustworthy.

3. Shared vision

Teachers share the same ambitions and visions for the school.

Teachers enthusiastically pursue collective goals and missions.

There is a commonality of purpose among teachers at this school.

Teachers at this school are committed to the goals of the school.

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