The Education Policy Center
AT **MICHIGAN STATE** UNIVERSITY

Fitting In: Person-organization, Person-job, and Person-group Fit as Drivers of Teacher Mobility

Erin Grogan, Michigan State University
Peter Youngs, Michigan State University

September 6, 2011

Fitting In: Person-organization, Person-job and Person-group Fit as Drivers of Teacher Mobility

Abstract

For years, researchers studying organizations and management have been interested in how well individuals "fit" with their work environment (Kristof-Brown, Zimmerman, & Johnson, 2005), finding strong relationships between increased fit and positive employment outcomes, including increased performance and retention (Kristof-Brown et al., 2005; Lauver & Kristof-Brown, 2001). Using two different datasets (Schools and Staffing Survey/Teacher Follow-up Survey and the Michigan-Indiana Early Career Teacher Study), we explore how teachers' perceptions of "fitting in" with organizational goals and values, job requirements, and close professional colleagues impact teacher mobility. We create a series of multinomial logistic regression models to explore how increased fit is related to teacher mobility. In doing so, we find evidence that the more teachers believe they fit in at their school, the less likely they are to move to a new school for the next academic year or exit teaching entirely. We also find that the more teachers believe they are a good fit for the requirements of teaching, the less likely they are to leave teaching. Finally, we find that, for early career teachers, fitting in with a group of close colleagues predicts lower rates of teacher turnover.

**Fitting in: Person-organization, person-job, and person-group
fit as drivers of teacher mobility**

Eric Grogan, Michigan State University
Peter Youngs, Michigan State University

Introduction and purpose

An organization's ability to recruit and retain a sufficient number of high-quality employees is a major source of competitive advantage (Rynes & Barber, 1990) and the skills these employees bring to the organization -- that is, their human capital -- are key organizational assets (Becker, 1964; Wellman & Frank, 2001). As Pil and Leana (2009) assert, "public schools are organizations in which both intellectual and informational processes are important drivers of performance" (p. 1101). Emerging evidence on teacher "value-added" suggests that teachers are the most important in-school factor in student achievement gains (Hanushek et al., 2005; Kane & Staiger, 2008; Nye, Konstantopoulos, & Hedges, 2004; Rowan, Correnti, & Miller, 2002; Wright, Horn, & Sanders, 1997). Consequently, efforts to improve public education must necessarily address the human capital teachers bring to their classrooms (Pil & Leana, 2009), in addition to any types of changes that alter the organizational or informational processes of schools. One way to do so is to ensure that strong teachers are retained in the classroom.

When studying teacher recruitment and retention, educational researchers have typically emphasized economic perspectives such as labor market effects or supply and demand (for extensive reviews of these perspectives, see Borman & Dowling, 2008; Guarino, Santibanez, & Daley, 2006), and, to a lesser extent, relied on explanations based on school organizational or social structures (Baker-Doyle, 2010; George et al., 1995; Ingersoll, 2001; Johnson et al., 2004; Singh & Billingsly 1996; Smith & Ingersoll, 2004). Perhaps surprisingly, framing such as

person-environment fit theory, which grows out of industrial organizational psychology, is less commonly used in contemporary explorations of teacher turnover.

Theories of "fit" have arisen from a long-established line of research in industrial organizational psychology that has explored how people interact with their environments in an attempt to understand what factors influence desirable employment outcomes such as retention (Chatman, 1989; Kristof-Brown et al., 2005). While there are numerous conceptualizations of fit at work, the purpose of the present study is to focus on three types of teacher fit as they relate to teacher retention using two different datasets (Schools and Staffing Survey/Teacher Follow-up Survey and the Michigan-Indiana Early Career Teacher Study). Specifically, we focus on (1) fit with the demands of the job (person-job fit); (2) fit with colleagues (person-group fit); and (3) fit with the prevailing goals and values of the employing organization (person-organization fit). All three types of fit have been found to be significant predictors of employee satisfaction and retention (Kristof-Brown et al., 2002).

Theoretical framework: Person-environment fit

Person-Job Fit. Person-job (P-J) fit may be conceptualized as either the correspondence between employee needs and job 'supplies,' or alternatively as a match between needs and job 'demands' (Edwards, 1991). When individuals have the abilities required to complete the tasks of a given job, P-J fit is said to be high (Edwards, 1991; Kristof-Brown, et al., 2002). It should also be noted that the tasks of the job are distinct from the organization in which the job tasks are performed (Kristof, 1996), and will be treated as distinct in this analysis. In fact, Lauver and Kristof-Brown (2001) demonstrate that job fit and organizational fit are distinct concepts to employees, and are often uncorrelated when assessed simultaneously.

Existing research suggests that P-J fit is positively related to individual performance and adjustment at work and significantly predicts attitudes toward the organization (Caldwell & O'Reilly, 1990). Some older studies of P-J fit found no significant relationships with organizational commitment, including studies with teachers as participants (e.g., Alutto & Belasco, 1972). However, more recent research has uncovered relationships such that high levels of P-J fit have been found to be positively associated with organizational commitment and job-focused satisfaction, and negatively associated with intent to quit, which is particularly relevant for studies with retention as the primary outcome (Kristof-Brown et al., 2005; Lauver & Kristof-Brown, 2001). It is unclear if any existing studies have explored not only the intent to remain in the current job, but also, more generally, intent to remain in the profession.

Person-Organization Fit. Various researchers have hypothesized that the degree of similarity between profiles of individuals and employing organizations could have important implications for employee selection, job satisfaction, job performance, and retention. Chatman (1989), widely cited with developing the seminal theory of P-O fit (Kristof-Brown et al., 2005), conceptualized fit as congruence between the values of a person and an organization. This conceptualization grew out of an interactionist tradition, incorporating ideas about both the individual (i.e., the "person side") and the environment (i.e., the "organization side") in an effort to explain why particular behavioral outcomes were observed. Pursuing questions about behavior from an interactionist perspective is important because, as Chatman (1989) noted, individuals influence, and are influenced by, their situations. She explained, "[T]he tendencies exist for people both to choose situations and to perform best in situations that are most compatible to themselves" (p. 337). While for Chatman (1989), fit measures primarily focused on value congruence, subsequent studies of P-O fit operationalized three additional manifestations of P-O

3

fit: shared goals, common preferences for systems and structures, and similar preferences for work climate (Kristof, 1996).

Studies of P-O fit have focused on its role in attracting employees, motivating them to perform, increasing their satisfaction, and encouraging them to stay on the job. A recent meta-analysis by Kristof-Brown et al. (2005), which included 110 studies with P-O fit measures, provided evidence that high levels of P-O fit had a positive relationship with a candidate's attraction to the organization, the organization's desire to make a job offer, the organization's intent to hire, and the candidate's acceptance of the job. Further, measurements of P-O fit were also highly correlated with employees' organizational satisfaction. Finally, while P-O fit was only weakly correlated with actual job performance, high P-O fit was found to reduce turnover (Kristof-Brown et al., 2005). We use both datasets to create measures of P-O fit.

Person-Group Fit. At the most basic level, P-G fit is defined as compatibility between coworkers (Adkins, Ravlin, & Meglino, 1996). To date, P-G fit research has been limited, and has tended to focus on the psychological or attitudinal compatibility of team members in work groups (Ferris, Youngblood, & Yates, 1985; Kristof-Brown et al., 2005). An early experimental study found that perceived group attractiveness and cohesiveness were higher when group members had high degrees of attitude similarity (Good & Nelson, 1971). There is evidence that P-G fit has a moderate, positive correlation with job satisfaction and organizational commitment, while it is negatively correlated with intent to quit. Furthermore, prior research on P-G fit suggests that the degree of similarity between individuals and work team members may be especially important in assimilation and retention for new organization members (Ferris et al., 1985).

Measurement of Fit. In recent years, three general approaches to measuring fit have been outlined in the literature: subjective fit, perceived fit[1], and objective fit (Hoffman & Woehr, 2006; Kristof-Brown et al., 2005). Studies of subjective fit attempt to assess directly the compatibility of individuals and their environments. When using this approach, the degree of fit is measured simply by asking individuals whether or not they believe that they fit well with the environment (Cable & Judge, 1995; Kristof, 1996; Piasentin & Chapman, 2006). For example, Cable and Judge (1996) asked new hires, "To what degree do your skills and abilities 'match' those required by the job?"

Distinct from subjective and perceived fit, objective fit measurements incorporate information from multiple individuals within the same organization. While this approach relies on the collection of self-reported data regarding personal characteristics from the primary respondent, it also utilizes a calculation of the congruence between respondent data and information collected from other organizational members. By comparing aggregate organizational climate measures with individuals' ratings of their own characteristics, fit is operationalized as the congruence between the two independent descriptions (Hoffman & Woehr, 2006; Piasentin & Chapman, 2006; McCulloch & Turban, 2007). While this method benefits from collecting information about environmental characteristics from multiple members of the organization, it is still limited by the extent to which organizational members agree on the overall climate (Hoffman & Woehr, 2006; Kristof, 1996).

Literature review: Teacher retention

---

[1] Perceived fit will not be addressed in this study.

This study seeks to understand how fit is related to teachers leaving the teaching profession or switching schools, building on existing research regarding teacher mobility.[2] Features of the teaching position appear related to teacher retention. Multiple studies document teachers' preferences for teaching positions in schools that are physically close to their hometowns, or at least similar to the types of schools they attended as children (Boyd et al., 2005; Cannata, 2010). Another factor commonly cited in teacher retention studies is the demographic composition of the student body. As teachers acquire additional experience, they are frequently observed to move away from urban schools serving high percentages of low-income or minority students to suburban schools serving predominantly white students (Boyd et al., 2010a; Johnson & Birkeland, 2003; Guarino et al., 2006; Hanushek, Kain, & Rivkin, 2002; Smith & Ingersoll, 2004). Further, teachers are observed moving away from low-performing schools, and are more likely to stay at high performing schools (Feng, Figlio, & Sass, 2010). Higher salaries positively influence retention (Guarino, et al., 2006; Imazeki, 2005), particularly when teaching salaries are higher than non-teaching alternatives in the same geographic vicinity (Ondrich, Pas, & Yinger, 2008). There is some evidence that targeted financial bonuses can help keep teachers, particularly those with more experience, at low-income, low-performing schools, reversing the trend of teachers moving away from challenging environments (Clotfelter, Glennie, Ladd, & Vigdor, 2008).

Teachers' personal characteristics are also frequently associated with turnover (Borman & Dowling, 2008; Guarino et al., 2006). The age of the teacher is frequently found to be related to turnover, such that both younger and older teachers are more likely than others to leave,

[2] There have been two recent, in-depth reviews of the literature on teacher retention. Guarino, Santibanez, and Daley (2006) conducted a very thorough literature review of close to 50 empirical studies, and Borman and Dowling (2008) conducted a meta-analysis incorporating results from more than 30 studies. As such, we provide a broad summary of findings here, but refer readers to these two comprehensive reviews for additional details.

producing a "U-shaped" curve (Guarino et al., 2006). Additionally, women are more likely to leave teaching than men, as are White teachers when compared to minority teachers, and married teachers when compared to non-married teachers (Borman & Dowling, 2008; Guarino et al., 2006). Teachers with stronger credentials, such as prior test scores or attendance at more selective colleges, were also observed to leave teaching at higher rates (Guarino et al., 2006). Further, high school teachers are assumed to have more non-teaching alternative job prospects than elementary school teachers, and thus likely to be at higher risk for attrition (Theobald, 1990).

Some existing research has looked not at demographic characteristics of the school or the salary and benefits associated with the teaching position, but at organizational factors and working conditions related to retention. Ingersoll (2001), using data from the 1990-1991 Schools and Staffing Survey, found that teachers working in organizations where involvement in decision making was high were less likely to leave their schools. Boyd et al. (2010a) found similar patterns when studying New York City teachers. There is also evidence that administrative support is critical in teacher retention (Borman & Dowling, 2008; Boyd et al., 2010a; Ingersoll, 2001; Pogodzinski, *under review*); further, teachers appear less likely to leave schools with principals who have been judged to be highly effective (Grissom, 2011). These findings suggest that strong administrators who are able to involve teachers in collectively shaping the work environment can play a role in increasing retention.

The unique position of early career teachers in new organizations. Early career teachers are not only new to their schools, they are new to the teaching profession as a whole. As such, school leaders and district officials hope that expensive hiring efforts translate into a long-term relationship between teacher and school, despite evidence that early career teachers are

particularly likely to leave the profession (Ingersoll, 2001; Smith & Ingersoll, 2004). This difficult new teacher entry period has been characterized as "a 'sink-or-swim,' 'trial-by-fire,' or 'boot camp' experience" (Smith & Ingersoll, 2004, p. 682). Indeed, research across a variety of professions has indicated that "the period of early entry is one of the most critical phases of organizational life," when new employees form quick impressions that have a lasting impact on their attitudes and behaviors (Kammeyer-Mueller & Wanberg, 2003, p. 779).

One way that educational policy has attempted to ease organizational entry for new teachers is through the implementation of extensive mentoring and induction programs. However, evidence regarding the role of mentoring and induction in teacher retention is mixed. Smith and Ingersoll (2004), using data from the Schools and Staffing Survey (SASS), found that one aspect of socialization -- forming a relationship with a helpful mentor -- can reduce the likelihood of new teacher turnover. However, Kardos and Johnson (2010) found that the match between mentors and mentees is frequently poor. This finding is similar to that of Youngs (2007), who demonstrated that mentor selection and assignment (i.e., matching mentors and mentees based on common grade level assignments and familiarity with the curriculum) strongly influenced the induction experience of beginning teachers in urban Connecticut districts by directly affecting the focus of the mentor-mentee relationship, and that district policy played a role in the quality of the mentoring relationship experienced by new teachers. Grossman and Thompson (2004) further emphasized the important role of the district in shaping beginning teachers' experiences, demonstrating that policies "help beginning teachers learn what to worry about and how to get help" (p. 281). A recent longitudinal, randomized comparison of "high quality" and more typical induction programs demonstrated that teachers in the high quality induction programs met more frequently with their mentors than teachers in more typical

programs, and more frequently received assistance in terms of developing instructional goals and strategies, as well as assessing students (Glazerman et al., 2008). However, somewhat surprisingly, this study did not find any statistically significant differences between the teachers in the different types of induction programs in terms of classroom practices or teacher retention (Glazerman et al., 2008; Glazerman et al., 2010).

While many studies of early career teachers to date have focused on the role of the formal mentor and induction, the present study took a slightly different approach by considering the degree to which early career teachers fit in with their self-identified group of close colleagues. These types of social networks have a powerful influence on information sharing, gathering resources, setting norms and expectations, and enacting sanctions for unacceptable behavior (Frank & Zhao, 2005).

Analysis 1: Nationally Representative Sample

This analysis tested how P-O and P-J fit measures impacted teacher mobility, focusing on two research questions:

Research Question 1. How is fit with <u>teaching</u> related to the likelihood of switching schools or leaving the profession?

Research Question 2. How is fit with <u>the school</u> related to the likelihood of switching schools or leaving the profession?

Data and Sample

For our first analysis, data came from the restricted use 2003-2004 Schools and Staffing Survey (SASS) Teacher Questionnaire and 2004-2005 Teacher Follow-up Survey (TFS).[3] The

---

[3] While there is a more recent version of the SASS -- that fielded from 2007-2008 through the 2008-2009 academic year -- it was not yet available to researchers at the time of this analysis. As data become available, future research efforts could certainly attempt to replicate the methods described here with more current data.

SASS is the most comprehensive data source available for researching issues of staffing and organization in elementary and secondary schools (Ingersoll, 2001). The SASS consists of a series of linked surveys administered to school district personnel, school principals, and teachers. In this study, only data from the *public school* District, School, Principal, and Teacher Questionnaires were used; all results obtained from questionnaires administered to private schools are omitted.

Data were collected for the National Center for Education Statistics by the US Census Bureau using a stratified probability sample design, with the 2001-2002 Common Core of Data (CCD) as the sampling frame. Schools were sampled first, followed by districts. Schools were selected with a probability proportionate to the square root of the number of teachers (National Center for Education Statistics, n.d.). The schools were selected to be representative at the national and state level. The weighted school response rate was 80.8% (National Center for Education Statistics, 2007a, p. 90).

To obtain the teacher sample, school principals were contacted and asked to submit a list of all teachers currently working in their building, with a weighted response rate of 89.2% (National Center for Education Statistics, 2007a, p. 90). From the school-provided lists, teachers were assigned to strata based on race, assignment in a classroom where students had Limited English Proficiency, and "beginning teacher" status (i.e., the teacher had been teaching for 3 years or less). At least one but no more than 20 teachers from the same school were sampled (National Center for Education Statistics, n.d.). The weighted teacher response rate was 84.8% (National Center for Education Statistics, 2007a, p. 90).

The SASS also included a Teacher Follow-up Survey (TFS), administered 12 months after the 2003-2004 Teacher Questionnaire, which was sent to a sample of teachers who

completed the year 1 Teacher Questionnaire; the weighted response rate was 91.9% (National

Center for Education Statistics, 2007b, p. 40). The TFS was designed to support comparative

analysis of teachers who continued teaching in their original schools ("stayers"), who remained

in teaching but switch schools ("movers"), and who left the teaching profession ("leavers"). The

TFS was stratified by sector (private vs. public), grade level (elementary vs. secondary), and

years in teaching (beginning teacher vs. experienced). Again, only data from public school TFS

respondents were used in this analysis.

To create the final sample of teachers used in this analysis, data from the TFS were

merged with data from the SASS Public School Teacher Questionnaire. This linked the teacher's

responses to the Teacher Questionnaire to the data from the TFS, which was used to determine

the teacher's employment status in 2005. Consequently, the final dataset was limited to only

teachers whose 2005 employment status was known. Additionally, the dataset was restricted to

include only full-time teachers in a regular public school setting. This dataset was merged with

information from the District, School, and Principal surveys; teachers in the same school shared

information from these additional surveys.

Measures

Key measures used in the analysis are described in more detail below.

Mobility Measure. From the perspective of an individual school, whether a teacher

leaves the profession entirely or switches schools does not particularly matter; for the school, the

loss of that teacher still represents a position that needs to be filled (Ingersoll, 2001). However,

from the perspective of a school district, complete attrition from the profession may be more

problematic than teachers moving laterally across schools within the district. As such, the present

analysis distinguishes between complete attrition from teaching and switching schools. The

dependent variable in this analysis is a three-category variable representing the teacher's observed employment status at the time of the TFS: switching schools ("movers"), leaving teaching ("leavers") or remaining in the same school ("stayers"). This conceptualization of the dependent variable is fairly common in studies of teacher retention (see, e.g., Ingersoll, 2001; Boyd et al., 2010a).

Fit measures. Following the recommendations of Costello and Osborne (2005) and Fabrigar et al. (1999), the creation of this measure relied on exploratory factor analysis with maximum likelihood (ML) extraction methods and oblique (promax) rotation. Promax rotation was chosen over other orthogonal rotation methods because of the likelihood that there is correlation between underlying factors. Decisions about the number of factors to retain were made by identifying factors with appropriate number of items loading at 0.30 or greater (with minimal cross-loading), studying scree plots over multiple test runs, considering eigenvalues,[4] and drawing on previous research regarding items thought to comprise different types of fit.

The emergent P-O fit factor included 7 of the 14 survey items, which loaded at 0.40 or higher, accounting for about 74% of the variance in the underlying correlations, with an eigenvalue of 4.52. In addition to the P-O fit factor, a P-J fit Factor was identified, in which 5 of 14 items loaded at about 0.40 or higher (explaining about 17% of the variance), with an eigenvalue of 1.01.

After identifying the P-O and P-J fit factors,[5] factor scores were predicted using a least squares regression approach, which should lead to maximal validity (DiStefano, Zhu, &

---

[4] While a common approach is to simply retain factors with eigenvalues >1, some researchers find this approach to be arbitrary and inaccurate (see, e.g., Costello & Obsborne, 2005). Consequently, the decision about the number of factors to retain was made using multiple criteria.

[5] A third distinct factor representing "student disruptions" emerged, although only 2 of 14 items loaded at 0.60 or higher (about 9% of the variance), with an eigenvalue of 0.55. These two

Mindrila, 2009). This resulted in a P-O fit factor score with a weighted mean of 0.025 (SE=0.013) and a range of -3.461 to 1.521, and a P-J fit factor score with a weighted mean of -- 0.051 (SE=0.011) and a range of -1.405 to 3.347. These two factor scores were used as the primary predictor variables in the analysis that follows.

Other control variables. The teacher characteristics included were as follows: dummy variables representing beginning teacher status, gender, race, marital status, union membership, age, possession of master's degree, holding regular certification, and being the same race as the majority of students, colleagues, and the principal, respectively; measures of teacher perceptions of influence over decision making; total earnings; number of students taught; percent of students with limited English proficiency; percent of students receiving free/reduced lunch; grade level and subject area.

The principal and school characteristics included here were as follows: dummy variables for principal race and gender; years of principal experience; a measure of principal educational orientation; principal perceptions of the percentage of teachers in the school teaching to high standards; total enrollment; urbanicity; percent of minority teachers; percent of minority students; and the number of teaching vacancies. Finally, district characteristics included here were district enrollment and measures of the recruitment incentives offered to attract teachers.

Analysis

We used a design-based, single-level model, relying on adjustments based on the complex sampling design to account for the fact that, in this dataset, we could not make the assumption that data are "independent and identically distributed" (West, 2008; p.440). This approach took advantage of the *svy* set of commands in Stata, one commonly recommended

survey items had originally been hypothesized to be elements of P-J fit. This factor was not used in the present analysis.

approach for working with complex sample survey data (West, 2008; West, 2009), while using

the multinomial logistic regression model presented by Menard (2002) to consider the odds of

switching schools or leaving the profession, as compared to remaining in the first observed

teaching assignment:

$$g_h = (X_1, X_2, \dots, X_k) = e^{(a_h + b_{h1}X_1 + b_{h2}X_2 + b_{h3}T_3 + b_{h3}S_3 + b_{h4}D_4)} \tag{1.1}$$

$$h = 1,2$$

where the reference category was $h_0=0$ (remains in teaching), X_1 was a term representing

teacher P-O fit, X_2 was a term representing teacher P-J fit,[6] T was vector of other teacher

characteristics, S was a vector of school characteristics and D was a vector of district-related

variables.

The probability that teachers switched schools or left the profession (i.e., Y was equal to

any value other than 0) was

$$(Y = h | X_1, X_2) \tag{1.2}$$

$$= \frac{e^{(a_h + b_{h1}X_1 + b_{h2}X_2 + b_{h3}T_3 + b_{h3}S_3 + b_{h4}D_4)}}{1 + \sum_{h=1}^{M-1} e^{(a_h + b_{h1}X_1 + b_{h2}X_2 + b_{h3}T_3 + b_{h3}S_3 + b_{h4}D_4)}}$$

for $h=1,2$

and for the excluded category, $h_0=0$ (teachers remained in first teaching assignment)

$$P(Y = h | X_1, X_2) \tag{1.3}$$

$$= \frac{1}{1 + \sum_{h=1}^{M-1} e^{(a_h + b_{h1}X_1 + b_{h2}X_2 + b_{h3}T_3 + b_{h3}S_3 + b_{h4}D_4)}}$$

---

[6] Note that we separately modeled the effects of P-O and P-J fit, and then created this model
which simultaneously includes both fit measures. While the magnitude of the results is slightly
smaller in the latter approach, the directionality is consistent. However, Tak (2011) points out
that employees experience these multiple types of fit simultaneously in the course of their work
experience, so it makes sense to look at the effect of one type of fit controlling for the other when
possible. Similarly, Kristof-Brown et al. (2002) empirically demonstrate that employees
experience significant and independent effects of P-O, P-J, and P-G fit simultaneously.

for h=0

Results-Analysis 1

Descriptives[7]

We began by looking at the composition of the full sample of 32,837 survey respondents.[8] We found that the sample of teachers was primarily composed of white females in full-time positions, with an average of about 14 years of teaching experience and a mean salary of about $47,000; 15.8% of teachers in the sample were beginning teachers.[9] The majority of teachers were union members, and more than half of the teachers (57.3%) taught at the secondary level.

Teachers held a variety of leadership roles at their schools; most common was serving on a school or district committee, followed closely by serving as a mentor to other teachers. The majority of teachers were also observed by their colleagues while teaching. While about one-third of teachers advised a student club, only between 10 and 20% of teachers were involved in coaching an athletic team or serving as a department chair or curriculum specialist. Finally, about 15% of teachers in the sample had obtained National Board Certification.

These teachers taught at 7,736 unique schools. Almost half of these schools were located in suburban areas, with a mean of 36 teachers per school, and a student-teacher ratio of 15:1. The schools overwhelmingly served white students; 42.7% of students received free or reduced-price lunch. Like the teachers in the sample, the principals were primarily white, though the majority

---

[7] Descriptives were obtaining using appropriate weights via Stata's *svy* commands, and group differences are explored using the *subpop* command within Stata's *svy* commands.
[8] These descriptive statistics are obtained from the 2003-2004 Schools and Staffing Survey, and include all teachers, not just those who became the subsample of the 2004-2005 Teacher Follow-up Survey.
[9] "Beginning teachers" are defined as those with three or fewer years of experience.

of principals were males (52.2%). These principals had a mean age of 49.3, and on average had taught for 13.5 years before becoming administrators.

The schools were located in 3,827 districts, most of which served primarily white student populations. The districts had, on average, about eight schools, and differed widely in the types of incentives and bonuses they offered to recruit new teachers. Virtually all districts provided traditional benefits (such as medical insurance and retirement account) to their teachers. Other "innovative" incentives (Balter & Duncombe, 2008) were far less common; about 13% of districts offered cash incentives for teaching in shortage fields, and about 5% of districts offered one-time signing bonuses or incentives for teaching in less desirable schools. Much less common were subsidies for housing, transportation, or meals.

Turning to teacher mobility, of the 7,429 teachers included in the sample for the Teacher Follow-Up survey, 38.6% remained in the same school, 25.7% switched to another school, and 35.7% left teaching altogether.

Regression Results

We began by looking at the impact of P-J and P-O fit separately, with a variety of teacher, school, and district covariates.

How is fit with <u>teaching</u> related to the likelihood of switching schools or leaving the profession?

Person-job fit was a strong predictor of teacher retention. For every one-unit increase in the measure of P-J fit, teachers were 22.2% less likely to switch schools rather than remain in their 2003-2004 academic year placement (*RRR*=0.778, $p<0.01$), and were 31.7% less likely to leave teaching all together (*RRR*=0.683, $p<0.01$).

16

How is fit with the <u>current school</u> related to the likelihood of switching schools or leaving the profession?

As hypothesized, the higher the P-O fit, the lower the odds of switching schools or leaving teaching. The results suggested that for every one-unit increase in the P-O fit measure, the odds of switching schools was 27.0% lower than the odds of remaining in the same school (*RRR*=0.730, p<0.01), while the odds of leaving teaching were 31.8% lower than the odds of remaining in the same school (*RRR*=0.682, p<0.01).

After considering separate models of P-J fit and P-O fit, we also created a combined model, in an attempt to see if P-O fit was still a valuable predictor of retention status while controlling for P-J fit and other teacher, school and district characteristics, and vice versa. The results of this model, reported in Table 1, were relatively consistent with the results from models looking at each type of fit singly.

Table 1

Results of multinomial logistic regression considering the impact of P-O and P-J fit on teacher retention decisions

	Switch Schools		Leave Teaching	
	RRR (t-statistic)		RRR (t-statistic)	
Teacher-level				
Teacher fit				
Person-organization fit	0.783	*	0.799	*
	(0.078)		(0.081)	
Person-job fit	0.886		0.760	**
	(0.086)		(0.079)	
Teacher background characteristics				
Beginning teacher flag	0.882		0.641	*
	(0.186)		(0.136)	
Female	0.720	ǂ	0.848	
	(0.139)		(0.170)	
Racial minority	1.361		1.456	
	(0.342)		(0.513)	
Married	1.158		1.391	ǂ
	(0.204)		(0.241)	
Union member	0.742		0.825	
	(0.140)		(0.170)	
Age 50 or greater	0.674	ǂ	3.564	***
	(0.141)		(0.648)	
Master's degree	1.255		1.010	
	(0.225)		(0.175)	
Regular certification	0.778		0.606	*
	(0.177)		(0.150)	

18

Same race as other teachers	1.098		0.812
	(0.377)		(0.387)
Same race as students	1.372		1.149
	(0.470)		(0.575)
Same race as principal	1.114		1.400
	(0.277)		(0.392)
Teacher perceptions of influence			
Teacher perception of influence over school management	1.627	*	1.092
	(0.349)		(0.233)
Teacher perception of influence over instructional decisions	0.636	*	0.970
	(0.112)		(0.197)
Teacher perception of influence over evaluating colleagues	1.154		1.083
	(0.146)		(0.142)
Congruence of teacher and principal perceptions of influence over school management	1.119		1.038
	(0.096)		(0.104)
Congruence of teacher and principal perceptions of influence over curriculum	1.105		0.994
	(0.094)		(0.088)
Congruence of teacher and principal perceptions of influence over professional development	0.895		1.079
	(0.071)		(0.101)
Congruence of teacher and principal perceptions of influence over evaluating colleagues	0.957		0.864 ǂ
	(0.077)		(0.073)
Congruence of teacher and principal perceptions of influence over hiring colleagues	0.947		1.272 **
	(0.074)		(0.108)
Congruence of teacher and principal perceptions of influence over student discipline	0.873		0.950
	(0.075)		(0.082)
Congruence of teacher and principal perceptions of influence over school budget	0.985		0.861 ǂ
	(0.082)		(0.076)

Teaching position

Teaches in charter school	0.410	‡	0.287	*
	(0.217)		(0.146)	
Total earnings (log)	0.296	**	0.862	
	(0.114)		(0.283)	
Number of students	1.020	*	1.005	
	(0.009)		(0.010)	
Percent LEP students	1.001		0.993	
	(0.004)		(0.005)	
Percent IEP students	0.997		0.996	
	(0.005)		(0.005)	
Teaches middle school	0.951		0.882	
	(0.207)		(0.215)	
Teaches high school	0.948		2.339	***
	(0.231)		(0.595)	
Teaches special education	3.269	*	1.142	
	(1.528)		(0.568)	
Teaches math	1.185		1.244	
	(0.360)		(0.349)	
Teaches science	0.491	*	0.740	
	(0.138)		(0.175)	

School-level

Principal background characteristics

Years as principal in current school	0.980		0.978	
	(0.016)		(0.016)	
Female	1.165		0.950	
	(0.186)		(0.154)	
Minority	1.878	*	1.242	
	(0.517)		(0.375)	

Principal educational orientation

Educational orientation: Academic	0.859	*	0.940	
	(0.067)		(0.080)	
Educational orientation: Work habits	1.037		0.985	
	(0.088)		(0.089)	
Educational orientation: Personal growth/social growth	0.931		1.047	
	(0.080)		(0.072)	
Educational orientation: Moral values	1.122	‡	1.103	
	(0.068)		(0.082)	
Principal perceptions about the percent of teachers teaching to high standards	0.981	***	0.989	*
	(0.004)		(0.005)	

School characteristics

Total enrollment (scaled by 100)	1.022		0.992	
	(0.016)		(0.016)	
Urban	1.261		1.033	
	(0.239)		(0.227)	
Rural	1.519	‡	1.126	
	(0.324)		(0.230)	
Percent of minority teachers	0.988	*	0.992	
	(0.006)		(0.006)	
Percent of minority students	1.004		1.003	
	(0.004)		(0.004)	
Number of vacancies	0.930		1.177	
	(0.191)		(0.254)	

District-level

Teacher recruitment strategies: Targeted bonuses	0.728	***	0.853	‡
	(0.065)		(0.082)	
Teacher recruitment strategies: Traditional benefits	1.238	‡	0.895	
	(0.157)		(0.071)	

Teacher recruitment strategies: Unique benefits	0.969		1.044
	(0.102)		(0.111)
Total enrollment (scaled by 100)	1.000		1.000
	0.000		0.000
Constant	2308748.033	***	44.332
	(9781635.732)		(166.060)
Observations	2936		2936

Source: Schools and Staffing Survey 2003-2004 Public School Teacher Survey and 2004-2005 Teacher Follow-up Survey

ⵜ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Specifically, we found that P-O fit played a role in both switching schools and leaving teaching altogether, while P-J fit was now only associated with the odds of leaving teaching. Controlling for job fit plus other teacher, school, and district characteristics, every one-unit increase in the P-O fit factor was associated with a 21.7% decrease in the odds that a teacher would switch schools versus remain in the 2003-2004 placement (*RRR*=0.783, p<0.05), and a 20.1% decrease in the likelihood that the teacher left the profession (*RRR*=0.799, p<0.05).

As hypothesized, P-J fit was significantly related to the odds of remaining in the profession, but after controlling for organizational fit, it was not a significant predictor of switching schools. In the combined model, for every one-unit increase in P-J fit, the odds that the teacher left the profession instead of remaining at the 2003-2004 placement school decreased 24.0% (*RRR*=0.760, p<0.01).

After controlling for teachers' fit with their school and their job, several other teacher, school, and district characteristics emerged as significant predictors of retention. These findings are presented in Table 1.

Teacher age and experience were associated with the likelihood of leaving teaching. However, after controlling for fit, this analysis produced the somewhat unexpected finding that beginning teachers had *lower* odds of leaving the profession than those with more than three years of experience. More consistent with previous research, teachers over 50 years old were more likely to leave than younger teachers.

Teacher perceptions of influence over various school-level decisions and policies were also related to teacher mobility after controlling for fit. The more influence teachers felt they had

over school management, the higher their odds of switching schools, but the more influence they had over instructional decisions, the lower their odds of switching schools. Further, the higher the congruence between teacher and principal perceptions of teacher influence over hiring, the higher the odds that teachers left the profession.

Some characteristics of the teaching position were related to the odds of moving or leaving. After controlling for fit, contrary to previous research, charter school teachers actually appeared somewhat *less* likely to switch schools or leave teaching. Higher earnings were associated with lower odds of switching schools, but were not significantly related to leaving teaching. High school teachers were about twice as likely as elementary teachers to leave teaching completely, which was not unexpected given the likelihood that they had more job alternatives than elementary teachers. Special education teachers were more than three times as likely as others to switch schools, but science teachers were actually significantly less likely than other types of teachers to move to a new school.

We also found some evidence that, after controlling for fit, the school leader played a role in teacher retention decisions. For every one percent increase in the percentage of teachers that principals perceived as "teaching to high standards," teachers were about two percent less likely to switch schools and about one percent less likely to leave teaching altogether. Teachers who worked for principals with an "academic orientation" to education were significantly less likely to switch schools than teachers whose principals had a different primary goal for education. Further, teachers working for principals with an emphasis on "moral values," were marginally more likely to switch schools than teachers working for principals with a different orientation. Finally, teachers were about 80% more likely to switch schools if they worked for a racial minority principal than if they worked for a white principal.

There was also some evidence that district recruitment practices impacted teacher retention decisions even after controlling for fit. In districts that primarily offered "traditional" benefits (i.e., medical insurance and retirement), teachers were somewhat more likely to switch schools. However, in districts with special bonuses designed to retain teachers (i.e., signing bonuses or incentives for hard-to-staff schools or subjects), teachers did appear less likely to switch schools or leave the profession.

Analysis 2- Early Career Teacher (ECT) Sample

This analysis tested how P-O and P-G fit measures impacted the mobility of early career teachers:

Research Question 1. How is fit with the school related to the likelihood of switching schools or leaving the profession?

Research Question 2. How is fit with the group of close colleagues identified by the ECT related to the likelihood of switching schools or leaving the profession?

Data and Sample

The Michigan Indiana Early Career Teacher Study was a multi-year study of early career teachers' professional relationships and induction experiences. This study included five Michigan districts and five Indiana districts in 2008-2009. A sample of early career teachers was surveyed during the 2008-2009 academic year, with a mobility survey following in spring of 2010. Additionally, the mentors and close colleagues of the early career teachers in the study were also surveyed in 2008-2009.

Early career teacher sample. Teachers who taught the core-content areas (math, science, social studies, English/language arts, and general elementary) in grades 1-8 and were in their first three years of the teaching profession were invited to participate in the study in 2008-2009.

Participation included the completion of a fall and spring survey. The surveys were administered in both electronic and paper form. The current analysis used data from the spring survey only.

The surveys asked teachers about their instructional practices; the frequency and substance of their interactions with their mentors and colleagues; their perceptions of relations within their schools; their work conditions; and their future career plans. The spring surveys also included items regarding teacher background, such as degrees, certification, and college attended.

Follow-up mobility survey. Early career teachers who completed the fall and/or spring surveys were also asked to complete a follow-up mobility survey in April 2010. Based on district personnel rosters, we determined if our early career teachers were stayers, movers, or leavers. Stayers were sent one version of the mobility survey, while movers/leavers received a version that included all the questions asked of stayers, as well as specific questions about the reason for leaving the 2008-2009 placement school. This follow-up mobility survey provided the data used in the calculation of the P-O fit measure, and contributed two individual survey items that make up one of the P-G fit measures. Teachers answered these questions retrospectively, providing information in Spring 2010 about fit with the position they held the 2008-2009 academic year. They also rated specific features of their 2008-2009 school placement, as well as the same features relative to whatever job they had in the 2009-2010 academic year (whether they worked as a K-12 teacher, worked in another position in education, or worked outside of the field of education).

Colleague sample. Early career teachers "nominated" up to eight close colleagues on their fall survey, and those close colleagues were also asked to complete a survey in the spring.

The content of the colleague survey was very similar, asking teachers questions regarding instructional practices, relationships within the school, and working conditions.

School characteristics. Characteristics of the schools in which early career teachers were placed were obtained from the National Center for Education Statistics' Common Core of Data (CCD). Data on the demographic makeup of the student body (percent eligible for free or reduced price lunch; percent of minority students), urbanicity, number of full-time equivalent staff, and student-teacher ratio were obtained for the 2008-2009 school year, and merged with the early career teacher data file.

Measures

Below, we summarize the key measures that are used as predictors of teacher retention.

Mobility Measure. Much like in Analysis 1, the dependent variable in this analysis was a three-category variable representing the observed employment status at the time of the follow-up survey: switching schools ("movers"), leaving teaching ("leavers") or remaining in the same school ("stayers").

Fit measures

Objective fit. Early career teachers and their group of close colleagues completed a series of survey items regarding the type of instructional strategies they used in teaching English/ Language Arts, which provided the opportunity to create an objective fit measure by assessing the congruence of the responses of these multiple survey respondents. The set of items, derived from Bidwell, Frank, and Quinoz (1997), provided the basis for categorizing teachers into three broad instructional orientations for English/Language Arts: "basic skills," "lower order comprehension skills," or "higher order comprehension skills." These survey items asked about

the frequency of use of a variety of specific instructional practices, using a 6-point scale

(0="Never;" 1= "Less than once a month;" 2= "1-3 times a month;" 3= "1-2 times per week;" 4=

"3-4 times per week;" 5= "Every day"). Following Pogodzinski (2009), we computed the

correlation alpha between the items in each category,[10] and then calculated composite variables

representing the mean value for each ECT and his or her colleagues across the three instructional

orientations. For each teacher (both ECTs and colleagues), we then determined which

instructional orientation was more prevalent than the others by designating the highest mean

value to represent that teacher's predominant instructional orientation. Every ECT was assigned

an instructional orientation in this way.

In addition, we looked across the instructional orientations of the group of close

colleagues, and similarly selected the highest mean value across all group members to represent

the predominant instructional orientation used by group members.[11] Finally, we created a simple

dummy variable coded "1" when the ECT's instructional orientation matched the predominant

orientation of the group of close colleagues, and "0" when it did not match; this variable

represents the objective P-G fit measure used in this analysis of teacher retention.

Subjective fit. Two subjective fit measures were created. Briefly, the first measure of

subjective fit incorporated items related to P-O fit from the Teacher Mobility Survey. We used

exploratory factor analysis with maximum likelihood (ML) extraction methods and oblique

(promax) rotation to create a P-O fit factor. Second, we used a similar approach to create a P-G

fit factor, using a series of items related to group fit from both the spring Teacher Survey and the

---

[10] While the survey items differed somewhat for Elementary and Middle School teachers, after creating the scales separately, the process for assigning teachers to one of the three instructional orientations was the same.

[11] In cases where the group means in multiple categories were identical, we randomly selected one instructional orientation to represent the group.

Teacher Mobility Survey.[12] To make it easier to interpret the results, we standardized these factors to have a mean of 0 and a standard deviation of 1.

Other control variables. The teacher characteristics included were as follows: dummy variables representing teacher gender, race, union membership, and possession of master's degree; number of students taught; number of years teaching at the current school; a measure of commitment to the current school; and grade level. Finally, the school characteristics included here were as follows: urbanicity; percent of minority students; percent of students eligible for free/reduced price lunch; number of full-time equivalent staff; and student-teacher ratio.

Analysis

We again used a multinomial logistic regression model to consider the odds of switching schools or leaving the profession, as compared to remaining in the first observed teaching assignment, and adjusted standard errors to account for the clustering of individual teachers within the same school. The primary predictors included in the model were the various subjective and objective fit measures described above.

Results- Analysis 2

Descriptives

A total of 269 early career teachers completed the spring MIECT survey, for a response rate of 95.1%. In addition, 203 early career teachers completed the Teacher Mobility Survey in spring of 2010, for a response rate of 74.5%.[13] The early career teachers nominated 721 mentors

---

[12] See Appendix A for the complete list of survey items used in creating the subjective fit measures.

[13] Recall that completers from both the fall and spring 2008-2009 survey cycles were sent the Teacher Mobility Survey, meaning that the response rate for the latter survey was based on a different number of potential respondents than the response rate for the spring 2009 teacher survey.

and close colleagues on the spring survey, of which 435 completed the mentor/colleague survey, for a response rate of 60.3%.[14]

Both the early career teachers and their close colleagues were predominantly white (91% and 92%, respectively), female (78% and 84%, respectively), and union members (82% and 87%, respectively). The majority of close colleagues had a master's degree (69%), and had been teaching in their 2008-2009 school for just over 10 years. The early career teachers had obviously spent less time in their current schools (on average, just over 2 years), and only about 16% had a masters degree.

The majority of early career teachers in this study taught in urban schools (64%). On average, just less than half of the students in these schools were minorities (47%), and about 60 percent qualified for free or reduced priced lunch. On average, each school in the study employed about 37 teachers, and had a student teacher ratio of about 17 to 1.

In terms of English/Language Arts instructional orientation, which was used to calculate the objective P-G fit measure, early career teachers differed significantly from their group of close colleagues (X^2(4, n=92)=15.27, p<0.01). The majority of early career teachers (about 53%) reported a primarily "lower order comprehension" approach, with about 30% using a "basic skills" approach and about 18% using a "higher order comprehension" approach. The close colleagues were about evenly split between a "lower order comprehension" approach (about 48%) and a "basic skills" approach (46%); only five percent reported using a "higher order comprehension" approach. Misalignment between early career teachers and their close colleagues was most evident for those who did not use the "basic skills" approach. While 72% of ECTs with a "basic skills" orientation worked with a group of close colleagues sharing this

---

[14] While these calculations are based on the number of mentors and close colleagues responding to the survey, note that only responses from 389 close colleagues are included in this analysis.

approach, more than 80% of the small group of ECTs with a "higher order comprehension" orientation experienced misfit with their group of close colleagues.

Most of the teachers in our early career sample remained in their school between the 2008-2009 and 2009-2010 academic years. Almost 78% of the early career teachers were classified as "stayers," with about 11.5% designated "movers," and about 10.7% "leavers."[15]

Regression Results

We began by looking at the impact of each fit measure separately, with a variety of teacher and school covariates.

How is fit with the school related to the likelihood of switching schools or leaving the profession?

Person-organization fit was not a significant predictor of teacher retention. While not significant, the relationship between P-O fit and retention was actually in the opposite direction of the hypothesized relationship; as P-O fit increased, it actually appeared that, after controlling for teacher and school characteristics, early career teachers were about 22% *more* likely to switch schools rather than remain in their 2008-2009 academic year placement (*RRR*=1.227, p>0.10), and were almost 80% *more* likely to leave teaching all together (*RRR*=1.796, p>0.10).

---

[15] Because of the small number of teachers in the "mover" and "leaver" categories, there is some concern that the regression results which follow would not be replicated if a larger sample with more variation was available. As an alternative to the multinomial logistic regression, where mobility is expressed as a three category outcome, we ran all models as logistic regressions, with a dichotomous outcome variable coded "1" if an early career teacher either switched schools *or* left the teaching profession. The results for the fit measures were generally similar, but the AIC values for these logistic regressions were larger than the Akaike Information Criteria (AIC) values for the multinomial logistic regressions, and the results reported below suggest that much of the relationship between fit and mobility in this sample was related to the teachers who left entirely versus those who switched schools. As such, we choose to retain the three-level dependent variable as opposed to this alternative dichotomous outcome, although concerns about replicability can only really be tested with a larger, future sample that provides more variation in terms of teacher mobility.

How is fit with the <u>group of close colleagues</u> related to the likelihood of switching schools or leaving the profession?

The subjective measure of person-group fit was a significant predictor of teacher retention, although only for the likelihood of leaving teaching entirely. For every one standard deviation increase in the P-G fit measure, early career teachers were 57% less likely to leave teaching all together (*RRR*=0.443, p<0.05).

The objective measure of person-group fit was also significantly related to retention. Early career teachers whose predominant instructional orientation matched with their group of close colleagues were 64% less likely to leave teaching than those whose instructional orientation was misaligned with the orientation of their close colleagues (*RRR*=0.339, p<0.05). There was a similar relationship with the likelihood of switching schools, although this result was not statistically significant (*RRR*=0.608, p>0.10).

After considering these separate models of P-O fit and P-G fit, we also created a combined model (model (1) in Table 2), in an attempt to see if P-O fit would be a more valuable predictor of retention status after controlling for P-G fit and other teacher and school and characteristics, and also how its inclusion impacted the predictive power of the P-G fit factors. Further, we wanted to see what would happen when both subjective and objective P-G fit measures were included in a model simultaneously (model (2) in Table 2).

Table 2

Results of Multinomial Logistic Regressions with Multiple Fit Measures

	(1) Subjective and Objective P-G fit plus P-O Fit		(2) Subjective and Objective P-G fit	
	Mover	Leaver	Mover	Leaver
Teacher fit				
Person-organization fit	1.281	1.772		
	(0.534)	(0.992)		
Subjective person-group fit	1.157	0.417**	1.220	0.425**
	(0.501)	(0.172)	(0.537)	(0.183)
Objective person-group fit	0.789	0.177**	0.795	0.172*
	(0.610)	(0.155)	(0.618)	(0.160)
Teacher characteristics				
Minority	1.742	0.000***	1.818	0.000***
	(2.708)	(0.000)	(2.731)	(0.000)
Female	2.418	1.407	2.471	1.292
	(2.142)	(1.872)	(2.072)	(1.510)
Union member	0.000***	0.692	0.000***	0.695
	(0.000)	(0.822)	(0.000)	(0.839)
Masters degree	2.820	1.472	2.846	1.442
	(2.082)	(1.591)	(2.102)	(1.482)
Commitment to school	0.271***	0.138***	0.292***	0.163***
	(0.125)	(0.0901)	(0.118)	(0.105)
Teaches elementary[a]	1.078	0.000***	1.091	0.000***
	(1.322)	(0.000)	(1.355)	(0.000)
Total number of students	0.997	0.949**	0.999	0.951**
	(0.011)	(0.023)	(0.001)	(0.023)
Number of years teaching at school	0.512***	0.501	0.500***	0.471
	(0.112)	(0.452)	(0.112)	(0.431)
School characteristics				
Urban[b]	0.429	0.0863	0.404	0.0700
	(0.326)	(0.144)	(0.289)	(0.131)
Rural[b]	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Percent minority students	0.198	21.580	0.185	19.290
	(0.345)	(79.280)	(0.321)	(71.230)
Percent students receiving FRL	4.199	0.0163	4.917	0.0249
	(12.78)	(0.0500)	(15.150)	(0.0768)

33

		1.032	1.171	1.025	1.167
Full-time equivalents		1.032	1.171	1.025	1.167
		(0.0338)	(0.143)	(0.039)	(0.142)
Student-teacher ratio		1.083	0.999	1.065	0.996
		(0.265)	(0.231)	(0.253)	(0.255)
Constant		0.000	0.000	0.000	0.000
		(0.000)	(0.000)	(0.000)	(0.000)
Observations		160		160	
	-2 log likelihood	-50.205		-50.748	
	AIC	168.410		165.497	

a. Middle school is the reference group

b. Suburban is the reference group

Notes. Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

After controlling for group fit and the other teacher and school characteristics, P-O fit continued to exhibit a non-significant relationship with mobility, and once again the directionally of the relative risk ratios suggested that teachers with above-average P-O fit were *more* likely to leave. However, after controlling for this measure of P-O fit, the relationship between P-G fit and leaving teaching was still significant, and in the expected direction. For every one standard deviation increase in subjective P-G fit, teachers were 58% less likely to leave teaching, and those teachers whose instructional approach matched their group of close colleagues were about 83% less likely to leave teaching than those whose approach did not.

These relationships looked very similar after taking P-O fit out of the combined model. As seen in model (2) in Table 2, including subjective and objective P-G fit measures while also controlling for teacher and school characteristics still suggested that the better the group fit, the less likely it was that early career teachers would exit the profession.

In addition to P-G fit, commitment to the school also notably contributed to a decline in the odds of either switching schools or leaving teaching, across a variety of model specifications. Further, the longer an early career teacher remained at his or her school, the less likely it was that he or she would switch to a new school. Finally, for each additional student taught, there was a slight decrease in the odds that the early career teacher left the profession.

Several models have been presented, and in looking across these various models it appeared that the measure of P-O fit created for this analysis did not contribute much useful information about the mobility of early career teachers in this sample. Model fit statistics suggested that the best model to explain teacher mobility was model (2) from Table 2, which offered the lowest Akaike Information Criteria value as well as the lowest -2 log likelihood

value, and thus emerged as the most desirable model (Akaike, 1987). This model also showed the strongest relationship between both objective and subjective P-G fit and teacher mobility.

Conclusion: Implications for Policy and Practice

While existing studies of teacher retention have primarily attempted to isolate economic and, to a lesser degree, organizational factors which predict teacher turnover, this analysis extended the teacher retention research base by employing a person-environment fit theoretical framework, frequently used in studies of turnover in other professions, but infrequently seen in studies focusing on teachers. Specifically, we explored how person-organization (P-O), person-job (P-J), and person-group (P-G) fit related to teacher retention. The analysis incorporated multiple measures of fit simultaneously, a strategy that has been recommended by some industrial organizational psychology researchers, but is not common in fit research (Kristof-Brown, Jansen, & Colbert, 2002; Tak, 2011).

Taking the findings of the current study in total, it was evident that fit matters in teacher retention and, in many ways, the relationship between teacher fit and retention was consistent with findings from prior research using data from other types of professionals. Previous research has demonstrated that person-organization, person-job, and person-group fit can have simultaneous, independent effects on desirable employment outcomes, and that these effects may differ based on the number of years of work experience (Kristof-Brown, et al., 2002). For teachers with a range of experience levels, P-O fit and P-J fit were consistent and strong predictors of retention. For those with more work experience, P-O fit appeared a stronger predictor than P-J fit (Kristof-Brown et al., 2002). For teachers early in their careers, the findings were mixed; while organizational fit was not a significant predictor of retention, group fit was.

The differential effects of organizational fit for early career teachers and those with more experience were consistent with previous research indicating that experience plays a role in the salience of P-O fit for employees (Kristof-Brown et al., 2002). Specific to early career teachers, this finding may be a result of the fact that these beginning teachers were in the "sink-or-swim" phase of their careers (Smith & Ingersoll, 2004), and thus more responsive to close personal relationships, rather than the broader organizational context, when making decisions about their careers. Further, early career teachers have likely had less exposure to multiple organizations, and thus may not be as sensitive as more experienced workers to how well different types of organizational environments match up with their personal goals and expectations (Kristof-Brown et al., 2002).

Perceptions of fit aside, there may be policy-relevant reasons that these early career teachers were more at risk for turnover than those with more experience; early career teacher retention may simply be indirectly influenced by broader labor market contexts, including the specific teacher contracts that exist in participating school districts. If districts have a "last in, first out" approach to teacher layoffs, then our early career teachers may have been disproportionately targeted for reduction in force efforts, making fit a less useful predictor of retention than it would be if the sample included teachers with a range of experience levels. Future research with these MIECT data should control for whether or not teacher labor market moves were voluntary versus involuntary.

What are the implications of these findings regarding the relationship between fit and retention? It is clear from previous research that high levels of turnover are detrimental to organizations, including schools, for a variety of reasons. High levels of turnover may be a signal that there are serious underlying problems with how the organization is run (Ingersoll & May,

2010; Keesler, 2010). For example, teachers frequently report dissatisfaction with their involvement in school decision making and lack of support from school leadership when offering reasons for leaving their school (Allensworth, Ponisciak, & Mazzeo, 2009; Boyd et al., 2010a; Grissom, 2011; Ingersoll, 2001; Ladd, 2009). Additionally, high organizational turnover may reduce teacher community (Bryk & Schneider, 2002; Guin, 2004), lead to a decline in instructional cohesion (National Commission on Teaching and America's Future, 2003) or result in low employee morale (Rainey, 2003), which in turn could decrease the performance of remaining employees (Iverson & Zatzick, 2011) and leave the school in a cycle of continually "churning" employees (Borman & Dowling, 2008). Further, high levels of teacher turnover also seem to be related to high levels of *student* mobility; this organizational instability is in turn associated with decreased school-level academic performance (Keesler, 2010).

To avoid these negative consequences, principals and other administrators might do more to manipulate the environment in which teachers work, by "pay[ing] attention to job as well as coworker assignments and to how organizational culture is conveyed to employees" (Kristof-Brown et al., 2002, p. 992). Being intentional regarding teacher selection, job assignments, grade level teams, and induction experiences may positively impact all three types of fit, thus increasing the likelihood of teacher retention.

Schools and school districts also face significant financial and human capital costs associated with teacher turnover. Teacher turnover is costly to schools and districts (Barnes, Crowe, & Schaefer 2007; Ingersoll & Smith, 2003; Texas Center for Educational Research (TCER), 2000; Tziner & Birati, 1996; Watlington et al., 2010). Districts make significant investments in induction and mentoring for newly hired teachers; one study estimates that high quality induction programs cost approximately $6,000 per teacher (Barnes et al., 2007). When

teachers leave the district, this investment in the teacher is lost. However, turnover costs are not limited to the just the loss of the direct investment in induction, but also encompass the costs of the full selection process, which take school leaders away from other tasks related to teaching and learning (Allensworth et al., 2009). A frequently cited study estimates that teacher turnover costs for just one large state are in excess of $200 million each year, with half of those costs associated with the loss of early career teachers (TCER, 2000); other studies estimate a per-teacher cost ranging from $5,000 to $18,000 (Barnes et al., 2007). In a policy climate in which schools are facing huge budget shortfalls, unnecessary costs associated with high levels of teacher turnover are obviously problematic, and districts have strong incentives to avoid these costs.

Because of the high costs associated with turnover, another implication of the findings between fit and retention suggest that personnel managers, whether at the school or district level, might incorporate judgments regarding organizational, job, and group fit into the recruitment, selection, and induction process, rather than wait until the employee is on the job to attempt to influence fit (Kristof-Brown et al., 2002; McCulloch & Turban, 2007). One practical policy recommendation is to move away from hiring through forced placement, and place greater emphasis on hiring using "mutual consent" policies which take into account how well an applicant will fit with organizational goals, colleagues, and specific characteristics of the job. Mutual consent hiring requires the agreement of both teacher and principal before a teacher is placed in a school, heightening the likelihood of a strong fit. Evidence suggests teachers and administrators strongly favor the mutual consent approach to hiring (Daly et al., 2008; Rutledge et al., 2008) and that schools are able to successfully hire quality teachers under this type of selection system (Boyd et al., 2010b).

Jackson (2010) stresses the importance of "match quality" for hiring effective teachers, observing "[W]e have very little evidence that a teacher in a suburban school who is effective at increasing the test scores of affluent suburban (poor inner city) kids would be effective at improving the test scores of low-income inner-city (affluent suburban) students *at another school*" (p. 3). There are many mechanisms by which assessing fit prior to hiring teachers is related to desirable employment outcomes. A good fit of skills and knowledge can help teachers be more effective in their teaching assignment. Further, when positions match their expectations, teachers are likely to be more satisfied in the job (Liu & Johnson, 2006). In their summary of existing research on administrator preferences in teacher hiring, Rutledge et al. (2008) concluded that principals "seek both professional and personal characteristics that *match those of the teachers already present at the school*" (p. 238, emphasis added). They also found that principals of Title I schools in an urban district in Florida were not bothered by the fact that some prospective teachers attempted to circumvent district hiring policies designed to reduce staffing challenges in Title I schools; the principals did not believe that teachers who set out to thwart such policies would have been a good fit for their schools even if hired. These Title I principals "expressed disinterest in applicants not committed to working with the Title I population of students" (p. 250), showing that candidates' willingness and interest in the specific school environment was very important to the principals. Finally, while the evidence regarding the effectiveness of teacher induction programs in terms of reducing teacher turnover is mixed (Glazerman et al., 2008; Glazerman et al., 2010), there is compelling evidence that the relationship between fit and turnover is likely different for employees with work experience in multiple organizations as compared to employees early in their careers (Kristof-Brown et al.,

2002). This suggests that policy interventions to increase fit, and therefore retention, will likely look different depending how long a teacher has been in the classroom.

While there is clear evidence that high levels of turnover are related to negative organizational outcomes, it is worth noting that not all turnover is negative (Guarino, et al., 2006; Meier & Hicklin, 2008; Mosher & Kingsley, 1936). The consequences of turnover likely follow a U-shaped, rather than linear, curve (Hausknecht & Trevor, 2011; Meier & Hicklin, 2008; Mosher & Kingsley, 1936). For example, some existing research shows that school districts with extremely low levels of turnover actually had lower academic performance than those that had more typical levels of turnover (Meier & Hicklin, 2008). Research on fit intersects with these findings regarding "positive" turnover. While both the individual and the organization might benefit from some degree of P-O fit, "too much" may have negative implications (Chatman, 1989; Ryan & Kristof-Brown, 2003). Extremely high P-O fit can lead to conformity and homogeneity (Chatman, 1989). Fit that is "too good" can suppress creativity and, in times of crisis, limit the expression of diverse perspectives. High levels of P-O fit may impede decision making and innovative approaches to problem solving if multiple or conflicting viewpoints are not factored into the process (Ryan & Kristof-Brown, 2003). Additionally, while decreased turnover is generally mentioned as a positive outcome of high levels of P-O fit, if fit is so high that dissenting viewpoints are not tolerated, individuals with conflicting values may chose to leave the organization. Kristof-Brown et al. (2005) note that organizations often reinforce a set of values for their employees, which may cause individuals who do not share the same values to leave. They recommend that "special attention should be paid to maintaining a healthy level of diversity in order to avoid the drawbacks associated with excessive homogeneity" (p.326).

Based on findings illustrating the U-shaped effects of turnover, one concrete recommendation for schools and districts is to approach turnover as "a process that needs to be managed" (Meier & Hicklin, 2008; p. 585). Schools and districts could actively pursue a talent management strategy that focuses on the retention of high performers (Hausknecht, Rodda, & Howard, 2009). One way that schools and districts might do this is to pivot their efforts to focus not on teacher retention generally, but specifically on *differential* retention; that is, target efforts to retain their most effective teachers, with less emphasis on retaining lower performers. Attrition of the lowest performers may actually lead to positive outcomes for students and the teachers who remain in the school. Prior research suggests that attrition of low performers may have positive impacts on the organization by replacing low performers with higher performers, and "signaling" to remaining employees that low performance is not acceptable (Dalton & Todor, 1979; Dalton, Todor, & Krackhardt, 1982; McElroy, Morrow & Rude, 2001; Meier & Hicklin, 2008). As previously noted, healthy levels of turnover provide an opportunity to bring new, innovative ideas to the organization (Kellough & Osuna, 1995; McElroy, Morrow & Rude, 2001; Meier & Hicklin, 2008).

The present study offers evidence that higher levels of group fit were related to increased retention (in both the school and the profession) of early career teachers. This result may be particularly important in the retention of the most promising new teachers. Highly effective teachers are more likely to experience positive outcomes when their group of close colleagues is also high performing. Student achievement is positively affected by "spillover effects" of higher performing teachers; that is, when teachers have high performing colleagues, their own students are more likely to experience larger test score gains (Jackson & Bruegman, 2009). Emerging research suggests that the most effective teachers, as measured by value-added scores, are less

likely to switch schools or leave teaching than their lower-performing peers (Boyd et. al., 2008; Goldhaber, Gross, & Player, 2010; Hanushek et al., 2005; Krieg, 2006). For example, Ingle (2009) finds a negative relationship between reading value-added scores and teacher attrition. Similarly, one study demonstrated that the lowest value-added elementary math teachers were those who were most likely to switch schools, which the authors interpreted as evidence of the "dance of the lemons" (Goldhaber et al., 2010, p. 32). However, when effective teachers do leave their schools, they tend to move to schools in which the majority of their colleagues are in the top quartile of teacher quality (Feng & Sass, 2008). Further, teachers who encounter a large gap between their own effectiveness and those of their close colleagues are more likely to leave their schools (Feng & Sass, 2008).

Limitations

While these results offer useful evidence of the relationship between fit and retention, there are limitations that warrant discussion. First, it is worth noting that these data make it impossible to distinguish between permanent leavers and those who "stop out" to pursue other opportunities (i.e., graduate school, caring for a relative, having a baby) for a period of time before returning to the classroom. In this analysis, they can only be considered "leavers." Ingersoll and May (2010) note that temporary attrition leads to school-level staffing challenges that are similar to complete exit, but stop short of quantifying exactly what percentage of teachers who leave a school eventually re-enter the classroom. Recent estimates of the percent of teachers who "stop out" are scarce, but Provasnik and Dorfman (2005) estimated that about 4 percent of the teachers who entered a new school in the 1999-2000 academic year were returning to the classroom after taking time off, which was relatively consistent with estimates from the prior 10 years. Estimates using older data (from the 1980s) suggested that approximately 30

percent of teachers who left at some point did return to the teaching workforce (Murnane & Willett, 1988; Nataraj Kirby & Hudson, 1991). Given that "stopping out" is typically related to life circumstances such as child rearing, it is unlikely that this form of temporary attrition would be significantly related to the types of fit used in this analysis.

Another data challenge is that the MIECT study relies on district-level personnel records, rather than a state-level database, to determine retention. The "leavers" in that study could in fact still be teaching, albeit in a different district, but we could not observe inter-district mobility given our data. Consequently, future research could attempt to incorporate additional years of data, preferably from state-level data systems, to determine if these fit measures impact teacher retention differently when inter-district moves or "stopping out" are also modeled as mobility outcomes.

It is worth noting that we tested relationships between fit and retention using two decidedly different datasets. First we used a nationally representative datasetthat included teachers with a range of experience levels. Next, we analyzed a dataset covering two states and including only early career teachers. The contradictory findings related to P-O fit obtained from these two distinct datasets have already been discussed in light of the possible lack of salience of fit for inexperienced employees. Further, it is possible that the MIECT findings were out of step with SASS findings because of the difficult economic conditions in Michigan and Indiana. In a labor market that presents few job alternatives, retention decisions may not be as susceptible to teacher perceptions of fit as they might be were conditions more promising. Indeed, existing research indicates that turnover intentions are strongly influenced by perceived job alternatives (March & Simon, 1958; Wheeler et al., 2005; Wheeler et al., 2007); perhaps teachers in our MIECT study were willing to tolerate some degree of misalignment given limited job

alternatives, particularly for early career teachers. This possibility could result in an omitted variable problem for the analysis -- perceived alternatives were not measured with our surveys -- thus leading to a downward bias of estimates of the relationship between fit and turnover.

Another limitation of this study was that it did not include any measures of student achievement or teacher effectiveness. While improving, data system limitations to date have made it difficult to link student achievement to individual teachers (Schneider, Grogan, & Maier, *in press*), and only a handful of studies have been able to do so when exploring teacher retention (Boyd et. al., 2008; Goldhaber et al., 2010; Hanushek et al., 2005; Krieg, 2006). Unfortunately, the data used in the present study did not allow this. It seems likely that future teacher retention studies will focus on *differential* retention; that is, are teachers who are deemed to be "more effective" than their peers more likely to be retained, while those who are "least effective" more likely to leave? Given the fast pace at which states and districts are developing definitions of teacher effectiveness and linking these measures to other personnel datasets, it is highly likely that this question of differential retention will receive increased attention in the near future. It will be important to look at how fit interacts with teacher effectiveness; thus, the next step in this research is to integrate teacher effectiveness measures into analysis of fit and retention.

Moving forward, fit and retention warrant continued attention in educational policy and research, particularly when one aim is to increase retention of *highly effective* teachers while minimizing costly efforts to retain lower performers who are unlikely to improve. Even the most talented teachers will be unable to reach their full potential if their teaching positions are not a good fit. Using recruitment and selection policies to match teachers with the environment in which they are most likely to be successful is a promising strategy for improving both retention

and student achievement. Matching early career teachers with a group of high performing colleagues may be a promising strategy for building an effective teaching force that will have long-term positive effects on student achievement. As policy continues to emphasize using teacher effectiveness as a component of teacher and school evaluation, fit with the job, school, and colleagues should also remain a focus of policymakers, practitioners, and researchers.

Appendix A

Table 3

Type of Fit Measured with Each Data Source

			Schools and Staffing Survey (SASS)
Type of fit	Measurement approach	Measure	Components
P-O	Subjective	Factor score	• Most of my colleagues share my beliefs and values about what the central mission of the school should be • I am generally satisfied with being a teacher at this school • The stress and disappointments involved in teaching at this school aren't really worth it (*reverse coded)* • The teachers at this school like being here; I would describe us as a satisfied group • I like the way things are run at this school • I think about transferring to another school (*reverse coded)* • The school administration's behavior toward the staff is supportive and encouraging • In this school, staff members are recognized for a job well done
P-J	Subjective	Factor score	• If I could get a higher paying job I'd leave teaching as soon as possible (*reverse coded)* • I don't seem to have as much enthusiasm as I did when I began teaching (*reverse coded)* • I sometimes feel it is a waste of time to try to do my best as a teacher (*reverse coded)* • The stress and disappointments involved in teaching at this school aren't really worth it (*reverse coded)* • Routine duties and paperwork interfere with my job of teaching (*reverse coded)*

			Michigan Indiana Early Career Teacher Survey (MIECT)

Type of fit	Measurement approach	Measure	Components
P-O	Subjective	Factor score	• My personal values match my organization's values and culture • When someone criticizes this organization, it feels like a personal insult • This organization's successes are my successes • I am a good match for this organization • I can reach my professional goals working for this organization • I like the responsibility and authority I have in this organization
P-G	Subjective	Factor score	• My approach to teaching fits in with that of my teaching colleagues • My professional interests are the same as those my teaching colleagues • I identify with my teaching colleagues • My professional goals are the same as those of my teaching colleagues • I matter to my teaching colleagues • My teaching colleagues matter to me • My coworkers are similar to me • I like the people I work with
	Objective	Congruence of ELA instructional orientation for ECT and colleagues (D-statistic)	English/Language Arts instructional orientation: Basic skills; Lower order comprehension; Higher order comprehension

References

Adkins, C., Ravlin, E., Meglino, B. (1996). Value congruence between co-workers and its relationship to work outcomes. *Group and Organization Management, 21*(4), 439-460.

Allensworth, E., Ponisciak, S., & Mazzeo, C. (2009). *The Schools Teachers Leave: Teacher Mobility in Chicago Public Schools.* Chicago: Consortium on Chicago School Research at the University of Chicago Urban Education Institute.

Alutto, J., & Belasco, J. (1972). A typology for participation in organizational decision-making. *Administrative Science Quarterly, 17*(1), 117-125.

Akaike, H. (1987). Factor analysis and AIC. *Psychometrika*, *52*(3), 317-332.

Baker-Doyle, K. (2010). Beyond the labor-market paradigm: A social network perspective on teacher recruitment and retention. *Education Policy Analysis Archives, 18*(26), 1-17.

Balter, D. & Duncombe, B. (2008). Recruiting highly qualified teachers: Do district recruitment practices matter? *Public Finance Review, 36*, 33-62.

Barnes, G., Crowe, E., & Schaefer, B. (2007). *The cost of teacher turnover in five school districts: A pilot study*. Washington, DC: National Commission on Teaching and America's Future. Retrieved February 21, 2011 from http://www.nctaf.org/resources/demonstration_projects/turnover/documents/CTTFullReportfinal.pdf

Becker, G. (1964). *Human capital.* New York: Columbia University Press.

Bidwell, C., Frank, K., & Quinoz, P. (1997). Teacher types, workplace controls, and the organization of schools. *Sociology of Education, 70*(4), 285-307.

Borman, G., & Dowling, N.M. (2008). Teacher attrition and retention: A meta-analytic and narrative review of the research. *Review of Educational Research, 78*(3), 367-409.

Boyd, D., Lankford, H., Loeb, S., & Wyckoff, J. (2005). The draw of home: How teachers' preferences for proximity disadvantage urban schools. *Journal of Policy Analysis and Management, 24*(1), 113-132.

Boyd, D., Grossman, P., Ing, M., Lankford, H., Loeb, S., & Wyckoff, J. (2010a). The influence of school administrators on teacher retention decisions. *American Education Research Journal, XX*(X), 1-31.

Boyd, D., Lankford, H., Loeb, S., Ronfeldt, M. & Wycoff, J. (2010b). The role of teacher quality in retention and hiring: Using applications-to-transfer to uncover preferences of teachers and schools. *NBER Working Paper #15966.* Cambridge, MA: National Bureau of Economic Research.

Bryk, A. & Schneider, B. (2002). *Trust in Schools: A Core Resource for Improvement.* New York: Russell Sage Foundation.

Cable, D., & Judge, T. (1996). Person-organization fit, job choice decisions, and organizational entry. *Organizational Behavior and Human Decision Processes, 67*(3), 294-311.

Caldwell, D. & O'Reilly, C. (1990). Measuring person-job fit with a profile-comparison process. *Journal of Applied Psychology, 75*(6), 648-657.

Cannata, M. (2010). Understanding the teacher job search process: Espoused preferences and preferences in use. *Teachers College Record, 112*(12), 2889-2934.

Chatman, J. (1989). Improving interactional organizational research: A model of person-organization fit. *Academy of Management Review, 14*(3), 333-349.

Clotfelter, C., Glennie, E., Ladd, H., & Vigdor, J. (2008). Would higher salaries keep teachers in high-poverty schools? Evidence from a policy intervention in North Carolina. *Journal of Public Economics, 92*(5-6), 1352-1370.

Costello, A. & Osborne, J. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your data. *Practical Assessment, Research, and Evaluation, 10*(7), 1-9.

Dalton, D., & Todor, W. (1979). Turnover turned over: An expanded and positive perspective. *Academy of Management Review, 4*, 225-235.

Dalton, D., & Todor, W., & Krackhardt, D. (1982). Turnover overstated: The functional taxonomy. *Academy of Management Review, 7*, 117-123.

Daly, T., Keeling, D., Grainger, R., & Grundies, A. (2008). *Mutual Benefits: New York City's Shift to Mutual Consent in Teacher Hiring*. New York: The New Teacher Project.

DiStefano, C., Zhu, M., & Mindrila, D. (2009). Understanding and using factor scores: Considerations for the applied researcher. *Practical Assessment, Research, and Evaluation, 14*(20), 1-11.

Edwards, J. (1991). Person-job fit: A conceptual integration, literature review, and methodological critique. In C.L. Cooper & I.T. Robertson (Eds.). *International Review of Industrial Organizational Psychology* (Volume 6, pp. 283-357). Chichester, England: Wiley.

Fabrigar, L., Wegener, D., MacCallum, R., Strahan, E. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*(3), 272-299.

Feng, L., Figlio, D., & Sass, T. (2010). School accountability and teacher mobility. *NBER*

Working Paper 16070. Washington, DC: National Bureau for Economic Research.

Feng, L. & Sass, T. (2008). *Teacher Quality and Teacher Mobility*. Unpublished manuscript. Tallahassee, FL: Florida State University. Retrieved February 27, 2011 from http://econ.as.nyu.edu/docs/IO/14691/Sass_1_20100419.pdf.

Ferris, G., Youngblood, S., & Yates, V. (1985). Personality, training performance, and withdrawal: A test of the person-group fit hypothesis for organizational newcomers. *Journal of Vocational Behavior, 27*, 377-388.

Frank, K., & Zhao, Y. (2005). Subgroups as a meso-level entity in the social organization of schools. In L.W. Hedges & B. Schneider (Eds.), *The Social Organization of Schooling* (pp.279-318). New York: Russell Sage Foundation.

George, N., George, M., Gersten, R., & Grosenick, J. (1995). To stay or leave? An exploratory study of teachers of students with emotional and behavioral disorders. *Remedial and Special Education. 16*(4), 227–236.

Glazerman, S., Dolfin, S., Bleeker, M., Johnson, A., Isenberg, E., Lugo-Gil, J., & Grider, M. (2008). *Impacts of Comprehensive Teacher Induction: Results from the First Year of a Randomized Controlled Study.* Washington, DC: Institute of Education Sciences.

Glazerman, S., Isenberg, E., Dolfin, S., Bleeker, M., Johnson, A., Grider, M., & Jacobus., M. (2010). *Impacts of Comprehensive Teacher Induction: Final Results from a Randomized Controlled Study*. Washington, DC: Institute of Education Sciences.

Good, L. & Nelson, D. (1971). Effects of person-group and intragroup attitude similarity on perceived group attractiveness and cohesiveness. *Psychonomic Science, 25*(4), 215-217.

Goldhaber, D., Gross, B., & Player, D. (2010). Teacher career paths, teacher quality, and persistence in the classroom: Are public schools keeping their best? *CEDR Working Paper # 2010-2*. Retrieved February 18, 2011 from http://www.cedr.us/papers/working/CEDR%20WP%202010-2_Teacher%20Career%20Paths%20%288-20-10%29.pdf.

Grissom, J. (2011). Can good principals keep teachers in disadvantaged schools? Linking principal effectiveness to teacher satisfaction and turnover in hard-to-staff environments. *Teachers College Record, 113*(11).

Grossman, P.L., & Thompson, C. (2004). District policy and beginning teachers: A lens on teacher learning. *Educational Evaluation and Policy Analysis, 26*(4), 281-301.

Guarino, C., Santibanez, L., Daley, G. (2006). Teacher recruitment and retention: A review of the recent empirical literature. *Review of Educational Research, 76*(2), 173-208.

Guin, K. (2004). Chronic teacher turnover in urban elementary schools. *Education Policy*

Analysis Archives, 12(42), 1-30.

Hanushek, E., Kain, J., & Rivkin, S. (2002). Why public schools lose teachers. *Journal of Human Resources, 39*(2), 326-354.

Hanushek, E., Kain, J., O'Brien, D. & Rivkin, S. (2005). The market for teacher quality. *NBER Working Paper #11154*. Cambridge, MA: National Bureau of Economic Research.

Hausknecht, J., Rodda, J., & Howard, M. (2009). Targeted employee retention: Performance-based and job-related reasons for staying. *Human Resources Management, 48*(2), 269-288.

Hausknecht, J. & Trevor, C. (2011). Collective turnover at the group, unit, and organizational levels: Evidence, issues, and implications. *Journal of Management, 37*(1), 352-388.

Hoffman, B. & Woehr, D. (2006). A quantitative review of the relationship between person-organization fit and behavioral outcomes. *Journal of Vocational Behavior, 68*(3), 389-399.

Imazeki, J. (2005). Teacher salaries and teacher attrition: How much is enough? *Economics of Education Review*, *24*, 431–449.

Ingersoll, R. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal, 38*(3), 499-534.

Ingersoll, R., & Smith, T. (2003). The wrong solution to the teacher shortage. *Educational Leadership, 60*(8), 30-33.

Ingersoll, R. & May, H. (2010). *The Magnitude, Destinations, and Determinants of Mathematics and Science Teacher Turnover. CPRE Research Report # RR-66.* Philadelphia: Consortium for Policy Research in Education, University of Pennsylvania. Retrieved February 22, 2011 from http://repository.upenn.edu/cgi/viewcontent.cgi?article=1222&context=gse_pubs.

Ingle, W.K. (2009). Teacher quality and attrition in a US school district. *Journal of Educational Administration, 47*(5), 557-585.

Iverson, R., & Zatzick, C. (2011). The effects of downsizing on labor productivity: The value of showing consideration for employees' morale and welfare in high-performance work systems. *Human Resource Management, 50*(1), 29-44.

Jackson, C.K. (2010). Match quality, worker productivity, and worker mobility: Direct evidence from teachers. *NBER Working Papers #15990*. Cambridge, MA: National Bureau of Economic Research.

Jackson, C.K. & Bruegman, E. (2009). Teaching students and teaching each other: The

importance of peer learning for teachers. *ILR Collection Working Papers.* Ithaca, NY: Cornell University. Retrieved October 2, 2009 from http://digitalcommons.ilr.cornell.edu/workingpapers/77.

Johnson, S.M. & Birkeland, S. (2003). Pursuing a "sense of success": New teachers explain their career decisions. *American Educational Research Journal, 40*(3), 581-617.

Johnson, S.M. & The Project on the Next Generation of Teachers. (2004). *Finders and Keepers: Helping New Teachers Survive and Thrive in our Schools*. San Francisco: John Wiley & Sons, Inc.

Kammeyer-Mueller, J.D., & Wanberg, C.R. (2003). Unwrapping the organizational entry process: Disentangling multiple antecedents and their pathways to adjustment. *Journal of Applied Psychology, 88*(5), 779-794.

Kane, T., & Staiger, D. (2008). Estimating teacher impacts on student achievement: An experimental evaluation. *NBER Working Paper #14607*. Cambridge, MA: National Bureau for Economic Research.

Kardos, S. & Johnson, S.M. (2010). New teachers' experiences of mentoring: The good, the bad, and the inequity. *Journal of Educational Change, 11*(1), 23-44.

Keesler, V. (2010). Teacher turnover and undersupply: A school organizational analysis. (Doctoral Dissertation). Retrieved from ProQuest Digital Dissertations database. (Publication No. 3435192).

Kellough, E., & Osuna, W. (1995). Cross-agency comparisons of quit rates in the federal service. *Review of Public Personnel Administration*, *15,* 58–68.

Krieg, J. (2006). Teacher quality and attrition. *Economics of Education Review, 25*(1), 13-27.

Kristof, A. (1996). Person-organization fit: An integrative review of its conceptualizations, measurement, and implications. *Personnel Psychology*, *49*(1), 1-49.

Kristof-Brown, A., Jansen, K., & Colbert, E. (2002). A policy-capturing study of the simultaneous effects of fit with jobs, groups, and organizations. *Journal of Applied Psychology, 87*(5), 985-993.

Kristof-Brown, A., Zimmerman, R., & Johnson, E. (2005). Consequences of individuals' fit at work: A meta-analysis of person-job, person-organization, person-group, and person-supervisor fit. *Personnel Psychology, 58*(2)*,* 281-342.

Ladd, H. (2009). Teachers' perceptions of their working conditions: How predictive of policy-relevant outcomes. *National Center for Analysis of Longitudinal Data in Education Research Working Paper 33.* Washington, DC: CALDER.

Lauver, K., & Kristof-Brown, A. (2001). Distinguishing between employees' perceptions of person-job and person-organization fit. *Journal of Vocational Behavior, 59*(3), 454-470.

Liu, E. & Johnson, S.M. (2006). New teachers' experiences of hiring: Late, rushed, and information-poor. *Educational Administration Quarterly, 42*(3), 324-360.

McCulloch, M., & Turban, D. (2007). Using person-organization fit to select employees for high-turnover jobs. *International Journal of Selection and Assessment, 15*(1), 63-71.

McElroy, J., Morrow, P. & Rude, S. (2001). Turnover and organizational performance: A comparative analysis of the effects of voluntary, involuntary, and reduction-in-force turnover. *Journal of Applied Psychology, 86*, 1294–1299.

March, J. & Simon, H. (1958). *Organizations*. New York: Wiley.

Meier, K., & Hicklin, A. (2008). Employee turnover and organizational performance: Testing a hypothesis from classical public administration. *Journal of Public Administration Research and Theory, 18*(4), 573-590.

Menard, S. (2002). *Applied Logistic Regression Analysis: Second Edition*. Thousand Oaks, CA: Sage Publications.

Mosher, W., & Kingsley, J.D. (1936). *Public personnel administration*. New York: Harper and Brothers.

Murnane, R., & Willet, J. (1988). The career paths of teachers: Implications for teacher supply and methodological lessons for research. *Educational Researcher, 17*(6), 22-30.

Nataraj Kirby, S. & Hudson, L. (1991). Sources of teacher supply: Some new evidence from Indiana. *Educational Evaluation and Policy Analysis, 13*(3), 256-268.

National Center for Education Statistics. (n.d.). *2003-2004 SASS Methods and Procedures.* Retrieved from http://nces.ed.gov/surveys/sass/methods0304.asp#frame on September 10, 2009.

National Center for Education Statistics. (2007a). *Documentation for the 2003-2004 Schools and Staffing Survey. NCES 2007-337.* Washington, DC: U.S. Department of Education.

National Center for Education Statistics. (2007b). *Documentation for the 2004-2005 Teacher Follow-up Survey. NCES 2007-349.* Washington, DC: U.S. Department of Education.

National Commission on Teaching and America's Future. (2003). *No dream denied: A pledge to America's children.* Retrieved February 27, 2010 from http://www.utofp.org/FormsandDocuments/NoDreamDenied.pdf

Nye, B., Konstantopoulos, S., & Hedges, L. (2004). How large are teacher effects? *Educational*

Evaluation and Policy Analysis, 26(3), 237-257.

Ondrich, J., Pas, E., & Yinger, J. (2008). The determinants of teacher attrition in upstate New York. *Public Finance Review, 36*(1), 112-144.

Piasentin, K., & Chapman, D. (2006). Subjective person-organization fit: Bridging the gap between conceptualization and measurement. *Journal of Vocational Behavior, 69*(2), 202-221.

Pil, F., & Leana, C. (2009). Applying organizational research to public school reform: The effects of teacher human and social capital on student performance. *Academy of Management Journal, 52*(6), 1101-1124.

Pogodzinski, B. (2009). Collective bargaining and human resource policies: Effects on mentoring and commitment levels of novice teachers. (Doctoral Dissertation). Retrieved from ProQuest Digital Dissertations database. (Publication No. 3381321).

Pogodzinski, B. (*under review*). Socialization of novice teachers. *Journal of School Leadership*.

Provasnik, S. & Dorfman, S. (2005). *Mobility in the Teacher Workforce: Findings from the Condition of Education 2005. NCES 2005-114.* Washington, DC: National Center for Education Statistics.

Rainey, H. (2003). *Understanding and managing public organizations*. San Francisco, CA: Jossey-Bass.

Rowan, B., Correnti, R., & Miller, R. (2002). What large-scale, survey research tells us about teacher effects on student achievement: Insights from the prospects study of elementary schools. *Teachers College Record, 104*(8)*,* 1525–1567.

Rutledge, S., Harris, D., Thompson, C., & Ingle, W.K. (2008). Certify, blink, hire: An examination of the process and tools of teacher screening and selection. *Leadership and Policy in Schools, 7*(3), 237-263.

Ryan, A.M. & Kristof-Brown, A. (2003). Focusing on personality in person-organization fit research: Unaddressed issues. Chapter 10 in Barrick, M. and Ryan, A. [Eds]. *Personality and work* (pp. 262-283). San Francisco: Jossey Bass.

Rynes, S., & Barber, A. (1990). Applicant attraction strategies: An organizational perspective. *Academy of Management Review, 15*(2), 286–310.

Schneider, B., Grogan, E., & Maier, A. (*in press*). Improving teacher quality: A sociological presage. In M. Hallinan (Ed.), *Frontiers in Sociology of Education.* New York: Springer.

Singh, K., & Billingsly, B. (1996). Intent to stay in teaching: Teachers of students with

emotional disorders versus other special educators. *Remedial and Special Education, 17*(1),37–47.

Smith, T., & Ingersoll, R. (2004). Reducing teacher turnover: What are the components of effective induction? *American Educational Research Journal, 41*(3), 681-714.

Tak, J. (2011). Relationships between various person-environment fit types and employee withdrawal behaviors: A longitudinal study. *Journal of Vocational Behavior, 78*(2), 315-320.

Texas Center for Educational Research. (2000). *The cost of teacher turnover*. Austin: Texas State Board for Educator Certification. Retrieved February 21, 2011 from: http://www.tcer.org/research/index.aspx.

Theobald, N. (1990). An examination of the influence of personal, professional, and school district characteristics on public school teacher retention. *Economics of Education Review, 9*(3), 241-250.

Tziner, A. & Birati, A. (1996). Assessing employee turnover costs: A revised approach. *Human Resource Management Review, 6*(2), 113-122.

Watlington, E., Shockley, R., Guglielmino, P., & Felsher, R. (2010). The high cost of leaving: An analysis of the cost of teacher turnover. *Journal of Education Finance, 36*(1), 22-37.

Wellman, B., & Frank, K. (2001). Network capital in a multi-level world: Getting support from personal communities. In R. Burt, N. Lin, & K. Cook (Eds.), *Social capital: Theory and research*: 1-33. Chicago: Aldine de Gruyter.

West, B. (2008). Statistical and methodological issues in the analysis of complex sample survey data: Practical guidance for trauma researchers. *Journal of Traumatic Stress, 21*(5), 440-447.

West, B. (2009). *Issues in the Analysis of Complex Sample Survey Data: A CSCAR Workshop.* Ann Arbor, MI: Center for Statistical Consultation and Research.

Wheeler, A., Buckley, M., Halbesleben, J., Brouer, R. & Ferris, G. (2005). 'The elusive criterion of fit' revisited: toward an integrative theory of multidimensional fit. In Martocchio, J. (Ed.), *Research in Personnel and Human Resource Management, Vol. 24:* 265-304. Greenwich, CT: Elsevier/JAI Press.

Wheeler, A., Coleman Gallagher, V., Brouer, R., & Sablynski, C. (2007). When person-organization (mis)fit and (dis)satisfaction lead to turnover: The moderating role of perceived job mobility. *Journal of Managerial Psychology, 22*(2), 203-219.

Wright, P., Horn, S., & Sanders, W. (1997). Teacher and classroom context effects on student

achievement: Implications for teacher evaluation. *Journal of Personnel Evaluation in Education, 11*(1)*,* 57–67.

Youngs, P. (2007). District induction policy and new teachers' experiences: An examination of local policy implementation in Connecticut. *Teachers College Record, 109*(4), 797-837.