

The Role of School-Based Colleagues in Shaping the Commitment of Novice Special and General Education Teachers

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ABSTRACT: *We compare beginning special education and general education teachers' access to school-based colleagues. Our findings demonstrate that colleague relationships are critical for the experiences of beginning teachers, as are the school organizational norms that these beginning teachers experience. For special education teachers in particular, perception of colleague support was a strong predictor of retention plans. Similar results were seen with respect to their perception of the level of collective responsibility among the faculty. Taken together, these results suggest that schools and districts should make efforts to facilitate productive relationships between general and special education faculty, as well as to differentiate induction support for beginning special educators.*

The scarcity of special education teachers is well documented, with 98% of U.S. school districts facing chronic shortages (Boe, Cook, Bobbitt, & Terhanian, 1998; Carlson, Chen, Schroll, & Klein, 2002; ERIC, 2001; McLeskey, Tyler, & Flippin, 2004). In many cases, positions remain vacant each year because suitable candidates cannot be found. The special education shortage has not only been a matter of inadequate supply. Further increasing demand for special education teachers is their disproportionately high rate of attrition. Recent data suggest that close to 22% of special educators

(compared to 16% of all other teachers) either leave teaching or move to new positions each year, with attrition rates much higher in some districts and states (Aud et al., 2011). The disparity in attrition rates is even higher among beginning teachers. Smith and Ingersoll (2004) found that first-year special education teachers were 2.5 times as likely to leave the profession as teachers in general education, a finding corroborated by others (Boe, 2006; McClesky et al., 2004).

One important predictor of teachers' career decisions is their commitment to their schools and to the teaching profession. Committed teachers are more likely to exert effort in their jobs,

work toward school goals, and stay in their schools (Ebmeier, 2003; Ingersoll, 2001; Somech & Bogler, 2002; Weisberg & Sagie, 1999; Weiss, 1999). Beginning teachers' commitment to teaching is frequently "tentative," and their decisions to remain in teaching long-term are largely affected by their experiences in their schools (Johnson, Kardos, Kauffman, Liu, & Donaldson, 2004; Peske, Liu, Johnson, Kauffman, & Kardos, 2001), including the quality of their relationships with teacher colleagues (Bryk & Schneider, 2002; Desimone, Porter, Garet, Suk Yoon, & Birman, 2002; Ebmeier, 2003). Teacher commitment has also been found to be associated with principal leadership, school climate, and working conditions (Chan, Lau, Nie, Lim, & Hogan, 2008; Horng, 2009; Ladd, 2011; Loeb, Darling-Hammond, & Luczak, 2005; Riehl & Sipple, 1996; Rosenholtz, 1985; Rosenholtz & Simpson, 1990; Weiss, 1999).

Less clear, based on existing research, is whether the organizational characteristics of schools have a stronger impact on beginning special education teachers' *planned* (i.e., *commitment*) and *actual career decisions* as compared to those of general education teachers. It is likely that when becoming socialized into their schools, novice special education teachers face a *double jeopardy* for attrition. Both because of their novice status and because of the organizational separation between general education and special education (Kilgore, Griffin, Otis-Wilborn, & Winn, 2003), these teachers are often poorly positioned to access support from colleagues. This, in turn, is likely to undermine their commitment to their schools and to teaching more generally. However, research on beginning teacher commitment and attrition has rarely focused on directly comparing the experiences of general education and special education teachers, making it difficult to isolate findings related specifically to teaching special education. In response, the current study simultaneously considers how beginning special education and general education teachers perceive the support available to them, as well as the consequences of this support for their retention plans.

CONTRASTING SPECIAL EDUCATION AND GENERAL EDUCATION TEACHERS' SOCIALIZATION INTO SCHOOLS

For both beginning general education teachers and beginning special education teachers, their success depends on their ability to achieve multiple goals: they must acquire instructional and classroom management skills, become familiar with district curricula, and adapt to the professional norms and procedures of their individual schools. Lortie (1975) explains that teacher preparation programs struggle to equip teachers with strategies for dealing with realities of classroom life, and beginning teachers—faced with an abrupt transition into their profession—are likely to learn by a process of trial and error.

Districts can facilitate the process by which teachers learn to manage these tasks. For general education teachers, districts often take a proactive role in defining curricular expectations, providing professional development, and using policies related to student assessment and teacher evaluation to provide clear messages about how the instructional practices of novice general education teachers should look (Achinstein, Ogawa, & Speigman, 2004; Grossman & Thompson, 2004; Stein & D'Amico, 2002). In contrast, for special educators, the messages about their instructional practices are often more ambiguous (Billingsley & Tomchin, 1992; Carter & Scruggs, 2001; Conderman & Stephens, 2000; Mastropieri, 2001; Youngs, Jones, & Low, 2011). This role ambiguity becomes apparent in curriculum, an area frequently cited by early career special educators as a problem of practice (Kilgore et al., 2003). Many special education teachers design curriculum for multiple subjects across multiple grade levels, yet do so without adequate resources for determining how this instruction should appear. And, the resources they receive—for example, textbooks, pacing guides, and state teaching standards—are often identical to those given to general education teachers but are provided without direction for adapting these materials to meet their students' needs.

Further, special education teachers frequently receive little guidance as to how they should manage routines and tasks that are specific to teaching

special education. These include managing relationships with their students' other classroom teachers, managing Individualized Education Plans (IEPs), employing assistive technology, and complying with federal special education laws (Billingsley, 2004; Boyer & Gillespie, 2000; Gersten, Keating, Yovanoff, & Harniss, 2001). Even though a special education teacher comes into the classroom with training in these areas, the challenge is in learning to balance the time spent on these tasks, relative to other responsibilities. It is estimated that the routine duties of completing administrative paperwork and forms (such as IEPs, initial and reevaluations, and functional behavior assessments) take up on average 5 hours per week (Carlson et al., 2002). More recent estimates suggest that special education teachers spend as much as 12% of their time at school on paperwork (Vannest & Hagan-Burke, 2010), and these tasks have been cited in several studies as a major reason for why special educators leave the classroom (Billingsley, 2004).

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In order to successfully navigate their teaching positions, beginning special education teachers are therefore likely to exert considerable effort addressing ambiguous messages related to how they should carry out and balance these responsibilities. What should be their priorities? What is their niche? When unable to answer these questions, it may intensify teachers' feelings of role ambiguity, while undermining the degree to which they feel that they can do their work successfully. This, in turn, can affect the degree to which they feel committed to their instructional assignments and to their schools (Youngs et al., 2011; Billingsley & Tomchin, 1992; Crane & Iwanicki, 1986; Mastropieri, 2001; Zabel & Zabel, 2001).

THE ROLE OF COLLEAGUES IN MAKING SENSE OF INSTRUCTIONAL RESPONSIBILITIES

To explain how special educators resolve these uncertainties, we draw on sensemaking theory (Coburn; 2001; Weick, 1995). According to this theory, individuals' actions are based on how they construct meaning from the multiple sources of information embedded in their environment, as well as how they interpret their context relative to their existing set of beliefs and practices. Through a series of interactions with others in the organization, individuals develop identities based on their perceived organizational roles (Weick, 1995). In the case of teachers, messages about their curricular, instructional, and role expectations are not always clear. To interpret these expectations, they are likely to draw on their own personal experiences (such as those in a teacher preparation program), while at the same time balancing these beliefs with cues from their social environment (Coburn, 2001; Spillane, 2000; Wilson, 1990).

From this perspective, school personnel—such as colleagues, administrators, and support staff—play a critical part in how beginning teachers make sense of the expectations placed on them. Special educators are likely to lean heavily on their colleagues for instructional support, and there is some evidence that informal support from mentors and colleagues is associated with increased commitment among novice special educators (Billingsley, Carlson, & Klein, 2004; Whitaker, 2000). Whitaker (2000) found that when relationships with mentors are informal and more personal, novice special education teachers are more likely to intend to stay in teaching. Billingsley and colleagues (2004) examined the induction experiences of a nationally representative sample of beginning special educators and found that informal channels of support are valued most highly by novices. Poor relationships with colleagues have been cited as a source of burnout for beginning special educators, and they have a negative influence on retention decisions (Billingsley et al., 2004; Billingsley & Tomchin, 1992; Mastropieri, 2001; Miller, Brownell, & Smith, 1999).

Colleagues appear equally important for general education teachers. Their access to formal and informal channels of support—such as formal mentoring programs, common planning periods with colleagues, and opportunities to collaborate with colleagues on instruction—can play an important role in retention decisions (Ingersoll, 2001; Johnson & Birkeland, 2003; Johnson et al., 2004). Regarding mentors, for example, Youngs (2007a) found that both the background of the mentor and the quality of the mentoring relationship seemed to influence novice teachers' induction experiences and retention plans. Meanwhile, Smith and Ingersoll (2004) found that having a common planning period with other colleagues or collaborating with other teachers on instruction increased the rate of retention of beginning teachers by more than 43%.

Paradoxically, beginning teachers (specifically those teaching special education) have the most to gain from their school-based colleagues, yet because of their novice status, they have few existing relationships on which to draw. They must therefore exert considerable effort to build relationships with colleagues, and their success at doing so depends largely on their location within the school. This is particularly true for beginning special educators. Whereas a math teacher may naturally identify with other math teachers in the school, a beginning special education teacher likely has a more dispersed set of colleagues on which to draw. For one, they are likely to have few school-based special education colleagues; and, the special education colleagues they have may teach students with disabilities that differ from those to which the novice is assigned. Thus, these colleagues may not be familiar with the novice's curriculum or caseload. Special educators' access to general education colleagues may be limited to those with whom they share common students, which can have a significant effect on their ability to access valuable resources. If these relationships are absent or limited, it could lead to high levels of stress and anxiety, and ultimately, to decreased levels of commitment (Billingsley et al., 2004; Mastropieri, 2001; Miller et al., 1999).

An additional source of support for beginning teachers as they make sense of and carry out their roles are their schools' existing organiza-

tional routines or norms. Consequently, we consider two organizational norms that are likely to shape beginning teachers' ability to make sense of instructional responsibilities: (a) the degree to which they feel they *fit* into the organizational school community, and (b) the degree to which they perceive a high level of school *collective responsibility*. Each of these norms is defined in the following.

Teachers' perceptions of "fit" can be conceptualized as whether they perceive that their beliefs and practices are aligned with their colleagues (Kardos, Johnson, Peske, Kauffman, & Liu, 2001; Kristof, 1996). When teachers report high levels of fit, it likely indicates that they have adopted an identity relative to others in their social environment, while also suggesting that they have access to the school-based resources available to them. Kardos and her colleagues (2001) explain how the school culture—and whether or not it is supportive of novice teachers—can potentially influence novices' retention decisions. Outlining three different forms of professional cultures (veteran-oriented, novice-oriented, and integrated professional cultures), they found that in integrated cultures—where beginning teachers received frequent support and interacted with colleagues across experience levels—novice teachers were best served (Kardos et al., 2001). The degree of fit between a person and his or her organization, across several occupations, has been linked to job satisfaction and retention plans (e.g., Cable & Judge, 1996; Kristof, 1996).

A second way to measure beginning teachers' perceptions of school norms is the degree to which they believe their colleagues promote collective responsibility, that is, common goals and responsibility for improving student learning (Newmann & Associates, 1996). It is likely that the presence of collective responsibility influences the degree to which more experienced colleagues reach out to beginning teachers. And, although the benefits of collective responsibility have typically been framed as being schoolwide (e.g., it has been shown to have a positive impact on student achievement; Lee & Loeb, 2000; Lee & Smith, 1996), there are likely to be individual returns to collective responsibility as well. This is particularly true for special education teachers who share responsibility for students with general education

teachers; when general education teachers are invested in the success of students with disabilities, they are more likely to provide the novice special education teacher with instructional resources.

In sum, from the perspective of sensemaking, we would expect that teachers' success at interpreting their roles would depend, in part, on their ability to draw on their colleagues for instructional and curricular support. Teachers are likely to draw on both direct sources of support (through their relationships with colleagues) and indirect sources of support (through broader schoolwide norms such as fit and collective responsibility). Because special education teachers are often poorly positioned to receive such support, we expect that they are more likely to struggle to make sense of their instructional responsibilities, and this will be manifested in lower levels of commitment to schools and to teaching.

Therefore, we analyze the degree to which novice teachers' perceptions of (a) colleague support, (b) fit with the school organization, and (c) the teaching faculty's collective responsibility predict their stated career plans (expressed as their commitment to their school and instructional assignment), once controlling for prior levels of commitment. We improve on previous studies by using a sample that includes both special education and general education teachers. In addition, we test between-group differences by including interaction terms for teaching special education and each of the theoretical variables of interest to determine, for example, whether higher levels of collective responsibility have a differential effect for special education teachers (as compared to general education teachers). The study findings provide important evidence regarding differences in the induction experiences of beginning special education and general education teachers. The results provide direction to schools and districts as to how to better support both groups of teachers in their first years of teaching. Formally, we test the following research questions:

- For beginning teachers, to what degree is instructional support from colleagues associated with higher levels of commitment? Is this association stronger for special education teachers?
- To what degree is perceived fit with the school faculty associated with higher levels of commitment? Is this association stronger for special education teachers?
- To what degree are perceptions of school collective responsibility associated with higher levels of commitment? Is this association stronger for special education teachers?

METHOD

SAMPLE

We draw on a sample of first-, second-, and third-year K–8 teachers from eight school districts in Michigan and Indiana. (Our sample was drawn from the Michigan Indiana Early Career Teacher Study, which is funded by the Carnegie Corporation of New York and examines how mentoring, social networks, and district policies are associated with beginning teachers' commitment, retention, and instructional practices, as well as student learning gains. This study began in 2006–2007 and continued through the 2008–2009 school year.) The districts in the current analysis were recruited because they were all medium to large in size and were hiring large numbers of beginning teachers. Our intention was to recruit the kinds of districts for whom teacher supply and teacher turnover would be challenges. Given the tight fiscal climate in both states, however, we were limited in the pool of districts that were hiring beginning teachers; thus, the districts differ somewhat in size and student composition, as shown in Table 1. Also worth noting with regard to state context is that both states required districts to provide novice teachers with formal mentors. In Michigan, all new teachers are to be assigned a master mentor teacher for their first 3 years in the profession; in Indiana, the law requires that all new teachers be assigned a mentor for their first year of teaching, with a recommendation that they also receive mentoring during their second year of teaching.

TEACHER SAMPLE

This study was restricted to beginning teachers who provide core academic instruction in Grades 1–8. We define “beginning teacher” as those

TABLE 1*Demographic Characteristics of Districts in the Sample*

<i>District</i>	<i># of Schools in District</i>	<i>Total K–12 Student Population</i>	<i>% Minority</i>	<i>% Free or Reduced Lunch</i>
Daus (MI)	36	18,386	12%	51%
Greenberg (MI)	80	21,448	80%	65%
Kaline (MI)	18	9,139	50%	42%
Wagner (MI)	12	7,994	46%	36%
Engram (IN)	20	13,666	48%	62%
Luckman (IN)	18	16,138	57%	44%
Payton (IN)	13	10,662	84%	50%
Wilson (IN)	19	12,483	59%	58%

within the first 3 years of the profession, a definition that corresponds to the one offered by the Center on Personnel Studies in Special Education (e.g., Brownell et al., 2009). It also aligns with Michigan's induction program, which extends through teachers' third year of teaching. In selecting special education teachers to participate in the study, we required that teachers provide academic instruction in Grades 1–8 (i.e., we excluded individuals who did not provide instruction, such as school psychologists), and we also required that they had standard teaching certificates and had completed university-based teacher preparation. General education teachers were only included if they taught in a core content area (math, science, social studies, English/language arts, and elementary general education) in Grades 1–8. In total, the sample for this study included 185 teachers of which 47 were special education teachers and 135 were general education teachers. The characteristics of the beginning teacher sample are provided in Table 2.

Elementary school teachers made up 70% of the sample ($n = 129$), with the remaining 30% teaching middle school. The teachers were also distributed fairly evenly with regard to experience (61 first-year teachers, 80 second-year teachers, 43 third-year teachers). In addition, the vast majority of the teachers were White (90%) and female (83%). Among the special education teachers, there were differences with respect to their assignments—15 taught in resource classes, 11 taught in co-teaching arrangements, 13 taught in self-contained classrooms, and 6 divided their time across settings. The majority ($n = 24$) of spe-

cial education teachers in our sample worked primarily with students from a single disability category— 6 worked primarily with students with autism, 7 worked with students with learning disabilities, 4 worked with students with emotional impairments, and the remaining 7 designated they worked with “other” disability categories. The remaining teachers ($n = 23$) worked with students from multiple disability categories. Their average caseload size was approximately 13 students ($SD = 6.2$),

DATA AND MEASURES

This study used survey data collected at two time points (in fall 2007 and spring 2008), and survey data were collected only after obtaining Institutional Review Board approval. The questions in our surveys were developed based on measures that have been validated in previous studies (e.g., Bryk & Schneider, 2002; Glazerman et al., 2008; Isenberg et al., 2009). All questions were asked on both the fall and spring surveys, allowing us to track change across the school year (see Table 3 for a description of the individual items collected on the surveys). The surveys were implemented only after extensive piloting in the 2006–2007 school year, with each pilot administration being followed by cognitive interviews with pilot participants. To ensure high response rates, we employed Dillman's (2007) five-contact approach; and the surveys were administered in both electronic and paper formats. The response rates for completing the fall survey were 68% for general education teachers and 67% for special education

TABLE 2*Demographic Characteristics of Teachers in the Sample*

<i>Characteristic</i>	<i>Number of Teachers (n=185)</i>	<i>%</i>
Special Ed. Status		
General Education	138	75%
Special Education	47	25%
Grade Level		
Elementary School	129	70%
Middle School	56	30%
Year of Teaching		
First	61	34%
Second	80	43%
Third	43	23%
Race/Ethnicity		
White	167	90%
African American	13	7%
Other	5	3%
Gender		
Male	31	17%
Female	154	83%

teachers; we also had a spring retention rate of about 75%.

Commitment. We considered two definitions of commitment—to school and to teaching assignment. We expect that the former reflects teachers' perceptions of their current teaching situation, namely, their investment in their relationships with colleagues and the school organization; whereas the latter provides a sense of teachers' commitments to their grade or subject area, irrespective of their current school. This distinction is important because although support could help teachers overcome isolation and refine their teaching skills (thereby increasing their commitment to assignment), there may be other issues that undermine their commitment to their schools. Our commitment measures were adapted from a multiyear study of new teacher induction conducted by Mathematica and funded by the U.S. Institute for Education Sciences (Glazerman et al., 2008; Isenberg et al., 2009). For each category of commitment, participants were asked to indicate their level of agreement with the following statements: (a) I would prefer to continue teaching in this

school/assignment next year; and (b) I could see myself teaching in this school/assignment in 5 years, with responses ranging from 0 = "strongly disagree" to 4 = "strongly agree." Because of the high correlation between the responses, we used the mean of the two items rather than treating each separately; the commitment to school items were correlated at .76, whereas the commitment to assignment items were correlated at .79. In our models, we used the spring commitment variables as the outcome, while controlling for previous (fall) commitment.

Key Predictors. Our measure of direct colleague support was constructed based on how much the novice teachers valued the support they received from colleagues; a dichotomous variable was created based on the spring survey data, where 0 = support is "not important at all" or "somewhat important," and 1 = "very important" or "extremely important." Important to note is that this measure only captured beginning teachers' perception of *informal* support from colleagues. In our models, we had initially included a separate measure indicating a teacher's perceived support from their formal mentor, yet this variable was not associated with commitment for special education or for general education teachers.

To represent the theoretical constructs of perception of fit and collective responsibility—each of which was considered to be an important source of support for novices—composite measures were created using the mean of single scale items from our spring survey. The *perception of fit* item was adapted from Bryk and Schneider's (2002) study of social relationships among teachers, administrators, parents, and students. It consisted of six items from our survey, including questions such as "my approach to teaching fits in throughout this school" and "I identify with other teachers throughout this school." Responses on the individual items ranged from 1 = strongly disagree to 4 = strongly agree; the composite measure ($\alpha = .89$) had a mean of 3.34 for general educators and 3.26 for special education teachers. Our measure of *collective responsibility* is adapted from work by Penuel (Penuel, Riel, Krause, & Frank, 2009; Penuel et al., 2010). The items making up collective responsibility asked teachers about the proportion of colleagues who took responsibility for such things as student discipline and student

TABLE 3*Description of Variables*

<i>Variables</i>	<i>Description</i>		<i>General</i>	<i>Special</i>
			<i>Education</i>	<i>Education</i>
			<i>Mean</i>	<i>Mean</i>
			<i>(SD)</i>	<i>(SD)</i>
<i>Dependent Variables</i>				
Commitment to Assignment	Composite measure taken from the survey, consisting of two questions: I would prefer to continue teaching in this assignment next year, I could see myself teaching in this assignment in 5 years. Responses on individual measures ranged from 1 = strongly disagree to 4=strongly agree. ($r = .79$)	F07	3.60	3.53
			(.70)	(.68)
Commitment to School	Composite measure taken from the survey, consisting of two questions: I would prefer to continue teaching in this school next year, I could see myself teaching in this school in 5 years. Responses ranged from 1 = strongly disagree to 4 = strongly agree. ($r = .76$)	S08	3.43	3.15
			(.76)	(.74)
Commitment to School	Composite measure taken from the survey, consisting of two questions: I would prefer to continue teaching in this school next year, I could see myself teaching in this school in 5 years. Responses ranged from 1 = strongly disagree to 4 = strongly agree. ($r = .76$)	F07	3.34	3.38
			(.85)	(.85)
Commitment to School	Composite measure taken from the survey, consisting of two questions: I would prefer to continue teaching in this school next year, I could see myself teaching in this school in 5 years. Responses ranged from 1 = strongly disagree to 4 = strongly agree. ($r = .76$)	S08	3.31	3.05
			(.84)	(.93)
<i>Independent Variables</i>				
Importance of Colleague Support	Dummy variable created from the ECT survey, where 0 = colleague support is "not important at all" or "somewhat important" and 1 = "very important" or "extremely important."		.90	.96
			(.30)	(.20)
Perception of School-Level Collective Responsibility	Composite measure taken from the survey; participants are asked the proportion of teachers in their school who: Help maintain discipline in the entire school, not just their classrooms; Take responsibility for helping one another do well; Take responsibility for improving the overall quality of teaching in the school; Feel responsible for helping students develop self-control; Set high expectations for academic work; Feel responsible for ensuring that all students learn. Responses ranged from 1 = none to 5 = all. ($\alpha = .90$)		3.61	3.58
			(.74)	(.69)
Perception of Fit in School	Composite measure taken from the survey, consisting of 6 questions: My approach to teaching fits in throughout this school; My professional interests are the same as those of other teachers throughout this school; I identify with other teachers throughout this school; My professional goals are the same as those of other teachers throughout this school; I matter to other teachers throughout this school; Other teachers throughout this school matter to me. Responses ranged from 1=strongly disagree to 4 = strongly agree. ($\alpha = .89$)		3.34	3.26
			(.48)	(.40)

learning, with responses ranging from 1 = none to 5 = all. (Note that the two variables representing school-level sources of support use different scales: perception of fit is on a 1–4 scale whereas perception of collective responsibility is on a 1–5 scale, making direct comparison of the two variables' regression coefficients difficult.) The collective responsibility composite measure had a mean of 3.61 for general education early career teachers (ECTs) and 3.58 for special education ECTs ($\alpha = .90$).

Person and School Demographic Characteristics. In addition to special education status, the models included other teacher demographic variables, including whether they taught in middle school or in elementary school and whether they were in their first, second, or third year of teaching. Teaching experience was classified as a binary variable, with second- and third-year teachers being collapsed into one category and first-year teachers representing the other; this step accounted for the unique factors facing first-year teachers, like negotiating new relationships with colleagues and learning a new curriculum. Race and gender were included in all models.

We recognize that there are also likely important differences among special educators (e.g., student disability category, service delivery model, or caseload size). Teacher caseload size, for example, has been shown to be associated with planned and actual attrition (Billingsley, 2004; Russ, Chiang, Rylance, & Bongers, 2001). We did not include these differences in our model for several reasons. For one, we wanted to ensure that the general education and special education models were identical comparisons (we did not, for example, control for general education teachers' subject areas or grade levels). Also, initial analyses with the special education sample suggested that these differences were rarely predictive of retention plans. Caseload size did not predict commitment, nor did spending the majority of one's time in a general education or special education setting; these associations were even weaker when including the colleague support variables in our models. Last, with so many disability categories represented in our sample (e.g., only four teachers worked with students with emotional impairments), we could not produce stable estimates of

the association between disability category and commitment.

ANALYTIC APPROACH

Prior research has indicated the importance of accounting for dependencies associated with the nesting of teachers within schools (e.g., Barr & Dreeben, 1983; Raudenbush & Bryk, 2002). As members of a school interact and influence one another, they develop shared understandings, beliefs, and educational practices (Bidwell, Frank, & Quiroz, 1997; Lightfoot, 1983; Little, 1982; Rosenholtz, 1989; Rowan, 1990). It is likely that teachers within a school share common experiences. When predicting teachers' levels of commitment, individual differences such as years of experience, instructional assignment, and special education status will likely dictate how teachers experience this shared social context; therefore, the use of multilevel models is warranted.

We used hierarchical linear modeling (HLM), treating beginning teacher commitment as a function of perception of (a) colleague support, (b) fit with colleagues, and (c) collective responsibility. We also explored the use of three-level models (i.e., teachers nested within schools nested within districts), yet initial analyses suggested that little of the observed variation in the outcome measures was attributable to district-level differences. However, the between-school variance was sizeable (the intraclass correlation when predicting commitment to school was .13 and .25 when predicting commitment to teaching assignment); thus, we decided to use two-level models with teachers nested within schools.

All models were run separately for general education and special education teachers, allowing us to directly compare the degree to which predicted relationships varied across groups. We also tested for differences in regression coefficients by running a model on the full sample, with interaction terms by special education status. The final model is as follows:

$$\text{CMT}_{ij} = \gamma_{00} + \gamma_{10} (\text{CMT}_{t-1}) + \gamma_{20} (\text{SUPPORT}) + \gamma_{30} (\text{FIT}) + \gamma_{40} (\text{COLLRES}) + \gamma_{50} (\text{ELEM}) + \gamma_{60} (\text{GENDER}) + \gamma_{70} (\text{RACE}) + \mu_{0j} + r_{ij}$$

CMT_{ij} represents the outcome variable—commitment in spring 2008—for individual teacher i , in

school j . At the teacher level, we also controlled for a novice's prior level of commitment (fall 2007) as well as measures for the key theoretical variables of interest: support from colleagues, perception of fit, and collective responsibility. (As described by Allison [1990], an alternative approach for controlling for the dependent variable at a prior time point is a change model where the dependent variable is represented as $Y_2 - Y_1$. However, coefficients on key variables did not differ significantly when using change scores [instead of controlling for the prior].) We also controlled for a teacher's instructional level, gender, and race. Error terms were as follows: $r_{ij} \sim N(0, \sigma^2)$, $\mu_{0j} \sim N(0, \tau_\pi)$.

QUANTIFYING THE ROBUSTNESS OF THE INFERENCE

To address concerns about the potential impact of an unmeasured variable, we attempted to quantify the robustness of our inferences using indices developed by Frank and colleagues (Frank, 2000; Pan & Frank, 2003); applications of this approach include Carbonaro & Covay (2010); Cheng, Werum, & Martin (2007); Crosnoe (2009); Crosnoe & Cooper (2010); and Frank, Zhao, Penuel, Ellefson, & Porter (2011). We then put the omitted variable concern into context by comparing the threat of an unmeasured confound to the impacts of measured covariates.

RESULTS

PREDICTING TEACHER COMMITMENT (BY SPECIAL EDUCATION STATUS)

Table 4 presents findings from a series of models run separately for special education and general education teachers. Commitment to instructional assignment and commitment to school were used as outcome variables, and we controlled for several teacher characteristics including gender, race, and year of teaching. Further, to test differences between special and general educators, we also ran models using the full sample and included interaction terms between special education and each of the independent variables of interest (i.e., colleague support, perception of fit, and collective responsibility), as well as the prior measures of

commitment. Significant differences between the two groups are highlighted in Table 4. For general education teachers, we included random effects to better account for similarities among teachers within schools. (Random effects models are reported because we do not have the degrees of freedom necessary to use fixed effects. We also ran the Table 4 models using fixed effects and the inferences for the predictors of interest did not change. Level-2 residuals in the random effects models in Table 4 did not violate normality assumptions.) For special education teachers, given that approximately 55% were the only novice special education teacher in their schools, we used ordinary least squares (OLS) regression with the cluster option in STATA (which uses Huber/White standard errors). Across both samples of teachers, we calculated effect sizes using η^2 (η^2), which is equal to the proportion of the total variance that is attributed to an effect.

Important differences emerged in how the groups perceived the support they received from colleagues and the school organization. Among special education teachers, colleague support was highly predictive of commitment to assignment ($\eta^2=.67$), yet for general education teachers this association was small and nonsignificant ($\eta^2=.01$). The η^2 was less strong for special educators when using commitment to school as an outcome ($\eta^2=.01$) and also less reliable—the regression coefficient had a standard error of .28 versus .15 when using commitment to assignment. When predicting commitment to school, collective responsibility was also a significant predictor for special education teachers ($\eta^2=.05$) but not for general education teachers (.09). Finally, the association between the prior and spring measures of commitment to assignment for special educators ($\eta^2=.00$) was small and nonsignificant, suggesting that special educators who started the year with low levels of commitment were more susceptible to altering their plans to remain in their assignments by the spring.

For special education teachers and general education teachers, perception of fit was associated with both commitment to assignment and to school; and, the association was strongest for the commitment to assignment variable ($\eta^2=.23$ for special education and $\eta^2=.05$ for general education). When using commitment to school as an

TABLE 4

Models Predicting Teacher Commitment – Spring (by Special Education Status)

<i>Independent Variables</i>	<i>Special Education Commitment</i>				<i>General Education Commitment</i>			
	<i>Assignment</i>	η^2	<i>School</i>	η^2	<i>Assignment</i>	η^2	<i>School</i>	η^2
Prior Commitment	0.116 (0.174)	0.005 ^a	0.298* (0.178)	0.030	0.548** (0.083)	0.253	0.619** (0.062)	0.361
Colleague Support	1.116** (0.147)	0.665 ^a	0.318 (0.282)	0.014 ^a	0.195 (0.188)	0.007	0.023 (0.171)	0.001
Perception of Fit	0.749** (0.168)	0.229 ^a	0.350 [^] (0.204)	0.031 ^a	0.411** (0.134)	0.050	0.252* (0.110)	0.021
Collective Resp.	0.126 (0.178)	0.006	0.592* (0.267)	0.053 ^a	0.038 (0.094)	0.002	0.085 (0.079)	0.004
Middle School Teacher	-0.299 [^] (0.167)	0.037	-0.450* (0.213)	0.047	0.220 (0.137)	0.016	-0.184 (0.131)	0.010
Constant	-0.883 (0.749)		-0.898 (.955)		-0.363 (0.509)		0.118 (0.411)	
Observations	40		42		112		118	
Number of Schools	33		34		64		65	

Note. Standard errors in parentheses. η^2 (η^2) is a measure of effect size and is equal to the proportion of the total variance that is attributed to an effect.

^aThe difference in coefficients for the special education and general education teachers is significant, as tested with interaction terms by special education status in a model including both general education and special education teachers.

The General Education models include random effects to better account for similarities among teachers within schools. The Special Education models were run using OLS regression, given that approximately 55% were the only novice special educator in their schools. However, we still used the *cluster* option in Stata, which gives robust standard errors (i.e., Huber/White standard errors). All models control for race, gender, and first-year teacher status.

** $p < 0.01$, * $p < 0.05$, [^] $p < 0.10$

outcome, the η^2 for special education (.03) was again higher than that for general education (.02). However, because the standard error for the special education estimate was higher than it was for general education, the special education coefficient was only significant at $p \leq .10$. With regard to the control variables, it appeared that first-year special education teachers were less likely to be committed to their school than more experienced teachers, though the standard error for this association was high; a similar result was found with respect to nonminority special education teachers and commitment to school. Neither finding was observed in the general education sample.

In sum, our results suggest that the relationship between the colleague support variables and teacher commitment functions differently for the

two groups of teachers (the only significant predictor they shared was perception of fit). For special education teachers, colleague support was a strong predictor of commitment to assignment, and collective responsibility was a positive predictor of commitment to grade. Meanwhile, for general educators, the only colleague measure that was significant was perception of fit. The consequences of these differences, as well as a rationale for why they exist, are described in greater detail in the discussion.

ROBUSTNESS OF INFERENCE

Any policy or theoretical interpretations we make in our study will depend on the robustness of our inferences. Although we included controls for

prior levels of commitment as well as other key covariates, the observational nature of our data limits our ability to make causal claims regarding our findings. We recognize that no matter how many statistical controls we employ, there will be inevitable concerns about the validity of our inferences. Therefore, we quantify the concerns about the potential to invalidate our inferences. Our approach can be considered an extension of sensitivity analysis (Copas & Li, 1997; Diprete & Gangl, 2004; Holland, 1986; Rosenbaum & Rubin, 1983; Scharfstein & Irizarry, 2003). Classically, internal validity can be expressed in terms of confounding variables that are correlated with both the predictor of interest and the outcome (Shadish, Cook, & Campbell, 2002). For example, the effect of fit with colleagues could be confounded with a novice's motivation to reach out to colleagues because motivation to reach out to colleagues could be correlated both with perceived fit as well as subsequent plans to remain in teaching. This is also known as concern over selection bias (Heckman, 1978) or identification (Manski, 1995).

We quantified the robustness of our inferences with respect to concerns about omitted confounding variables using Frank's (2000) impact threshold for a confounding variable (ITCV). Frank (2000) defines the *impact* of a confounding variable on an estimated regression coefficient as $r_{yv} \times r_{mv}$, where r_{yv} is the correlation between a confounding variable, v , and the outcome y ; and r_{mv} is the correlation between v and m , a predictor of interest (for example, a novice's perception of fit). Critically, the product $r_{yv} \times r_{mv}$ is a function of the two key relationships necessary for confounding: a relationship between the confounder and the predictor of interest, r_{yv} and a relationship between the confounder and the outcome, r_{mv} . Frank then uses the definition: $\text{impact} = r_{yv} \times r_{mv}$ to quantify how large the impact must be to invalidate an inference.

We calculated Frank's (2000) impact threshold for several of our findings. For special educators, these included two predictors of commitment to assignment (colleague support and perception of fit) and one predictor of commitment to school (collective responsibility). For general educators, we calculated an impact threshold for the association between perception of fit

and commitment to assignment. Table 5 summarizes the impact thresholds for our correlations of interest.

Given these calculations, the association between special educators' access to colleague support and their commitment to their instructional assignments appears most robust to an omitted confound. The impact of a confounding variable would have to be greater than .56 to invalidate this inference; in terms of the component correlations, r_{yv} would need to be greater than .63 and r_{mv} must be greater than .90 to invalidate the inference (using Frank's multivariate correction). In addition, the association between perception of fit and commitment to assignment is robust for both special educators (ITCV = .27) and for the sample as a whole (ITCV = .15). The impact thresholds reveal that the inference for collective responsibility for the special education teachers (.03) and the inference for perception of fit for the general education teachers (.05) are less robust than the other inferences. Collectively, these results suggest that although an unmeasured confound could exist, it would have to be more strongly correlated with both the theoretical constructs of interest and the outcome to invalidate our statistical inferences.

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DISCUSSION

Evidence from both special education (e.g., Billingsley et al., 2004; Mastropieri, 2001) and general education (e.g., Johnson et al., 2004; Ingersoll, 2001) suggests that school-based colleagues can serve as important sources of support in navigating these various responsibilities. However, beginning teachers—particularly those teaching special education—are frequently poorly positioned to access these resources. We, therefore, hypothesized that teachers' retention plans

TABLE 5*Robustness Indices for Key Variables*

<i>Predictor</i>	<i>Outcome</i>	<i>Threshold of Significance ($r^\#$)^a</i>	<i>Impact Threshold for a Compounding Variable (ITCV)^b</i>
Perception of Fit (General Ed)	Commitment to Assignment	0.189	0.053
Perception of Fit (Special Ed)	Commitment to Assignment	0.327	0.296
Colleague Support (Special Ed)	Commitment to Assignment	0.327	0.587
Collective Responsibility (Special Ed)	Commitment to School	0.319	0.034

^a $r^\#$ is defined by a correlation that is just statistically significant at $p = .05$.

^b Given the definition of $r^\#$, Frank (2000) shows that the inference would be invalidated if $impact > (r_{xy} - r^\#) / (1 - |r^\#|)$

would be based, at least in part, on whether they were able to develop relationships with their colleagues.

Overall, our findings point to important differences in the quality of relationships novice special education and general education teachers have with their colleagues, and differences appear to be critical for their career plans. For both groups of teachers, perception of fit was a strong predictor of commitment to assignment and commitment to school; this finding was particularly robust with the special education teacher sample. Our results lend support to previous research suggesting that when novices feel they are a part of their school's professional community, they are more likely to access important resources among their colleagues (Desimone et al., 2002; Kardos et al., 2001). Similar results were seen with respect to special educators' perception of support from their colleagues, which was strongly predictive of their commitment to assignment and (to a lesser extent) to their schools. Last, there was a strong positive correlation between collective responsibility and commitment to school, a finding that did not hold for general education teachers.

To date, there has been little evidence of how collective responsibility might function differently for special education teachers. Yet researchers in special education have frequently suggested that the degree to which general education teachers take responsibility for students with disabilities has an influence on how successfully special edu-

cation teachers can fulfill their responsibilities (Billingsley et al., 2004; Gersten et al., 2001; Miller et al., 1999); this is in contrast to beginning general education teachers, who stand to benefit from support from colleagues but are ultimately responsible only for the students in their classroom. Therefore, the difference in the size of the collective responsibility coefficient between the two groups is likely attributable (at least in part) to how their responsibilities are defined.

These findings are also in line with research on sensemaking (Coburn, 2001; Youngs et al., 2011). We have argued that, in comparison to general education teachers, beginning special educators exert tremendous effort in creating and modifying curriculum, addressing ambiguity in their assignments, and navigating interactions with general education. Special educators' ability to navigate these uncertainties depends on drawing on colleagues to help them (a) make sense of the expectations placed on them; (b) adjudicate among their own beliefs, the expectations they face, and professional norms; and (c) negotiate relationships with others and access resources from them. If beginning special educators perceive that they fit in with their colleagues and that there are high levels of collective responsibility in their schools (i.e., their colleagues are capable of producing high levels of student learning), this may alter the ways in which they access and make use of resources from colleagues. Similarly, when novice teachers feel that support is available to

them—and when they value this support—it is likely that they will feel more committed to their schools (Kardos et al., 2001).

We also recognize that special educators are not the only ones likely to experience role ambiguity. For all beginning teachers, a successful transition into their school depends on their ability to integrate their colleagues' knowledge and beliefs with their own expectations. Further, it is not uncommon—because of prevailing norms surrounding seniority—for novices to be forced to change courses, grades, or even schools in their first years in a district. Many of the uncertainties described here are not unique to special education teachers, which could help to explain why some of our findings hold across both groups of teachers. The difference, then, is that special educators face more uncertainty at the onset *and* their avenues for resolving these uncertainties are likely to be more dispersed.

Last, although this research has been framed largely in terms of the *individual* returns of support from colleagues (e.g., plans to stay in teaching), it is also likely that the colleagues of beginning special education teachers feel the effects of the novice's role ambiguity. Because much of the action in schools is coordinated, the role ambiguity of one teacher likely impacts the role ambiguity of other teachers. General education teachers share students with special education teachers, and they stand to benefit from the unique knowledge that special educators supply; when the special education teacher is clear about his or her responsibilities and committed to the school, it increases the likelihood that these resources are provided to general education colleagues. This is particularly the case in the context of No Child Left Behind, where schools are now held responsible for the performance of students in special education.

LIMITATIONS

Several limitations of this study are worth noting. There are likely sources of instructional support for which we have not adequately accounted. For example, research has suggested that principal support is a key component of a successful induction program (Kardos et al., 2001; Youngs, 2007b). Particularly for special educators, princi-

pals can foster collaboration with general education colleagues, provide curricular and instructional support directly aimed at special educators, and shape the overall school climate. Principals also often take an active role in assigning novice teachers to mentors, which can be critical to their induction experiences.

It could also be the case that novices' career plans are shaped by a number of other factors, such as their perceived self-efficacy or the degree to which they receive psychic rewards from teaching. We have included prior measure of commitment to account for many of the differences among teachers that were present when the prior measure was obtained (Allison, 1990), but we cannot be sure about the causal process linking support from colleagues, both direct and indirect, with plans to remain in teaching. We have, therefore, tried to further address alternative explanations by employing Frank's (2000) impact threshold, and we expect that our more robust findings (such as the relationship between colleague support and commitment to assignment for special education teachers) would likely hold if other covariates were included in our models.

Finally, an argument could be made that we have not adequately explored the variation within the special education teacher sample. For example, teachers of students with learning disabilities or mild cognitive impairment are more likely to spend their time interacting with general education teachers because they may share responsibility for students. On the other hand, this experience may contrast greatly from teachers of students with severe multiple impairments; there will likely be fewer opportunities for these teachers to collaborate on instruction with other teachers in their schools. To make claims about special education teachers as a group overlooks their varying needs, as well as potential differences in whether their needs are met.

IMPLICATIONS

This research brings together an analysis of two significant predictors of leaving teaching—being a novice teacher and teaching special education. By describing the ways in which schools as social organizations shape the commitment of novice special educators, this study provides researchers,

policymakers, and district administrators with ways to better support special educators and general education teachers in their early years of teaching. With districts facing impending recession-induced budget cutbacks (increasing the likelihood of involuntary layoffs), the stability of the teaching workforce is likely to be further weakened. On top of these losses, districts cannot afford to lose teachers in hard-to-staff assignments (such as special education teachers) to voluntary attrition. The current economic climate also strengthens our argument for the importance of attending to teacher commitment, as dissatisfied teachers who might otherwise leave may now remain in their positions but exert lower levels of effort.

Although not a focus of this study, decreased teacher commitment could impact the academic achievement of students. Prior research suggests that teachers exhibiting lower levels of commitment are also likely to exhibit lower levels of effort toward student achievement and toward broader school goals (Ebmeier, 2003; Somech & Bogler, 2002; Weisberg & Sagie, 1999; Weiss, 1999). Further, when teachers are not invested, schools' ability to implement broader school reform efforts (that would likely have an effect, in turn, on student achievement) are likely to be inhibited. In addition, teacher attrition itself appears to have consequences for student achievement (Achinstein, Ogawa, Sexton, & Freitas, 2010; Ingersoll & Perda, 2010; Ronfeldt, Loeb, & Wyckoff, 2012).

In sum, although researchers are increasingly mindful of the ways in which relationships in schools impact teachers' work lives and career decisions, few studies address patterns unique to special education. The findings of this study demonstrate that informal relationships are critical for beginning teachers, as are the broader school conditions in which they work. Strong relationships with colleagues and positive perceptions of the school environment are likely to increase levels of commitment for both special educators and general educators. As evidence from this study suggests, these channels of support are especially salient for beginning special educators: when faced with the multiple sources of ambiguity related to their job responsibilities, special educators rely heavily on their colleagues for

information and support. If they cannot adequately resolve these uncertainties, their commitment and retention will very likely be affected. Schools and districts can take steps to resolve the uncertainty that novice special education teachers face, including differentiating induction support for special educators and setting more explicit curricular expectations for them. Last, schools can facilitate productive relationships between general and special education faculty by providing common learning goals, fostering collaboration on instruction, and ensuring that responsibility for student learning is shared.

REFERENCES

- Achinstein, B., Ogawa, R. T., Sexton, D., & Freitas, C. (2010). Retaining teachers of color: A pressing problem and a potential strategy for "hard-to-staff" schools. *Review of Educational Research, 80*, 71–107. doi: 10.3102/0034654309355994
- Achinstein, B., Ogawa, R. T., & Speigman, A. (2004). Are we creating separate and unequal tracks of teachers? The impact of state policy, local conditions, and teacher characteristics on new teacher socialization. *American Educational Research Journal, 41*, 557–603. doi:10.3102/00028312041003557
- Allison, P. D. (1990). Change scores as dependent variables in regression analysis. *Sociological Methodology, 20*(1), 93–115. doi:10.2307/271083
- Aud, S., Hussar, W., Kena, G., Bianco, K., Frohlich, L., Kemp, J., & Tahan, K. (2011). *The Condition of Education 2011* (NCES 2011-033). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office. Retrieved from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011033>
- Barr, R., & Dreeben, R. (1983). *How schools work*. Chicago, IL: University of Chicago Press.
- Bidwell, C. E., Frank, K. A., & Quiroz, P. A. (1997). Teacher types, workplace controls, and the organization of schools. *Sociology of Education, 70*, 285–307. doi: 10.2307/2673268
- Billingsley, B. (2004). Special education teacher retention and attrition: A critical analysis of the research literature. *Journal of Special Education, 33*, 39–55. doi: 10.1177/00224669040380010401
- Billingsley, B., Carlson, E., & Klein, S. (2004). The working conditions and induction support of early ca-

- reer special educators. *Exceptional Children*, 70, 333–347.
- Billingsley, B., & Tomchin, E. (1992). Four beginning LD teachers: What their experiences suggest for trainers and employers. *Learning Disabilities Research and Practice*, 7, 104–112.
- Boe, E. E. (2006). Long-term trends in the national demand, supply, and shortage of special education teachers. *Journal of Special Education*, 40, 138–150. doi:10.1177/00224669060400030201
- Boe, E. E., Cook, L. H., Bobbitt, S. A., & Terhanian, G. (1998). The shortage of fully certified teachers in special and general education. *Teacher Education and Special Education*, 21, 1–21. doi:10.1177/088840649802100103
- Boyer, L. & Gillespie, P. (2000). Keeping the committed. *TEACHING Exceptional Children*, 33(1), 10–15.
- Brownell, M. T., Bishop, A. G., Gersten, R., Klingner, J. K., Penfield, R. D., Dimino, J., Haager, D., Menon, S., & Sindelar, P. T. (2009). The role of domain expertise in beginning special education teacher quality. *Exceptional Children*, 75, 391–411.
- Bryk, A., & Schneider, B. (2002). *Trust in schools: A core resource for improvement*. New York, NY: Russell Sage Foundation.
- Cable, D. M., & Judge, T. A. (1996). Person-organization fit, job choice decisions, and organizational entry. *Organizational Behavior and Human Decision Processes*, 67, 294–311. doi:10.1006/obhd.1996.0081
- Carbonaro, W., & Covay, E. (2010). School sector and student achievement in the era of standards based reforms. *Sociology of Education*, 83, 160–182. doi:10.1177/0038040710367934
- Carlson, E., Chen, L., Schroll, K., & Klein, S. (2002). SPeNSE: Final Report of the Paperwork Substudy. Retrieved from <http://www.spense.org/Results.html>.
- Carter, K. B., & Scruggs, T. E. (2001). Thirty-one students: Reflections of a first-year teacher of students with mental retardation. *Journal of Special Education*, 35, 100–104. doi:10.1177/002246690103500205
- Chan, W.Y., Lau, S., Nie, Y., Lim, S., & Hogan, D. (2008). Organizational and personal predictors of teacher commitment: The mediating role of teacher efficacy and identification with school. *American Educational Research Journal*, 45, 597–630. doi:10.3102/0002831208318259
- Cheng, S., Martin, L., & Werum, R. E. (2007). Adult social capital and track placement of ethnic groups in Germany. *American Journal of Education*, 114, 41–74. doi:10.1086/520691
- Coburn, C. E. (2001). Collective sensemaking about reading: How teachers mediate reading policy in their professional communities. *Educational Evaluation and Policy Analysis*, 23, 145–170. doi:10.3102/01623737023002145
- Conderman, F., & Stephens, J. T. (2000). Voices from the field: Reflections from beginning special educators. *TEACHING Exceptional Children*, 33(1), 16–21.
- Copas, J. B., & Li, H. G. (1997). Inference for non-random samples. *Journal of the Royal Statistical Society, Series B (Methodological)*, 59, 55–95. doi:10.1111/1467-9868.00055
- Crane, S. J., & Iwanicki, E. F. (1986). Perceived role conflict, role ambiguity, and burnout among special education teachers. *Remedial and Special Education*, 7(2), 24–31. doi:10.1177/074193258600700206
- Crosnoe, R. (2009). Low-income students and the socioeconomic composition of public high schools. *American Sociological Review*, 74, 709–730. doi:10.1177/000312240907400502
- Crosnoe, R., & Cooper, C. E. (2010). Economically disadvantaged children's transitions into elementary school: Linking family processes, school contexts, and educational policy. *American Educational Research Journal*, 47, 258–291. doi:10.3102/0002831209351564
- Desimone, L., Porter, A. C., Garet, M., Suk Yoon, K., & Birman, B. (2002). Effects of professional development on teachers' instruction: Results from a three-year study. *Educational Evaluation and Policy Analysis*, 24, 81–112. doi:10.3102/01623737024002081
- Dillman, D. A. (2007). *Mail and internet surveys. The Tailored Design Method (2nd ed.)*. New York, NY: Wiley and Sons.
- Diprete, T., & Gangl, M. (2004). Assessing bias in the estimation of causal effects: Rosenbaum bounds on matching estimators and instrumental variables estimation with imperfect instruments. *Sociological Methodology*, 34(1), 271–310. doi:10.1111/j.0081-1750.2004.00154.x
- Ebmeier, H. (2003). How supervision influences teacher efficacy and commitment: An investigation of a path model. *Journal of Curriculum and Supervision*, 18, 110–141.
- ERIC Clearinghouse on Disabilities and Gifted Education. (2001, April). *Educating exceptional children: A statistical profile*. Arlington, VA: Council for Exceptional Children.
- Frank, K. A. (2000). Impact of a confounding variable on a regression coefficient. *Sociological Methods Research*, 29, 147–194. doi:10.1177/0049124100029002001

- Frank, K. A., Zhao, Y., & Borman, K. (2004). Social capital and the diffusion of innovations within organizations: The case of computer technology in schools. *Sociology of Education*, *77*, 148–171. doi:10.1177/003804070407700203
- Frank, K. A., Zhao, Y., Penuel, W., Ellefson, N., & Porter, S. (2011). Focus, fiddle, and friends: Experiences that transform knowledge for the implantation of innovations. *Sociology of Education*, *84*, 137–156. doi:10.1177/0038040711401812
- Gersten, R., Keating, T., Yovanoff, P., & Harniss, M. K. (2001). Working in special education: Factors that enhance special educators' intent to stay. *Exceptional Children*, *67*, 549–567.
- Glazerman, S., Dolfen, S., Bleeker, M., Johnson, A., Isenberg, E., Hugo-Gil, J., . . . Ali, M. (2008). Impacts of comprehensive teacher induction: Results from the first year of a randomized controlled study. Washington, DC: U.S. Department of Education, Institute of Education Sciences. Retrieved from <http://www.edpubs.gov/document/ed005058p.pdf?ck=7>
- Grossman, P. L., & Thompson, C. (2004). District policy and beginning teachers: A lens on teacher learning. *Educational Evaluation and Policy Analysis*, *26*, 281–301. doi:10.3102/01623737026004281
- Heckman, J. J. (1978). Dummy endogenous variables in a simultaneous equations system. *Econometrica*, *46*, 931–959.
- Holland, P. W. (1986). Statistics and causal inference. *Journal of the American Statistical Association*, *81*, 945–970. doi:10.2307/2289064
- @r:Horng, E. L. (2009). Teacher tradeoffs: Disentangling teachers' preferences for working conditions and student demographics. *American Educational Research Journal*, *46*, 690–717. doi:10.3102/0002831208329599
- Ingersoll, R. M. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal*, *38*, 499–534. doi:10.3102/00028312038003499
- Ingersoll, R. M., & Perda, D. (2010). Is the supply of mathematics and science teachers sufficient? *American Educational Research Journal*, *47*, 563–594. doi:10.3102/0002831210370711
- Isenberg, E., Glazerman, S., Bleeker, M., Johnson, A., Hugo-Gil, J., Grider, M., . . . Ali, M. (2009). Impacts of comprehensive teacher induction: Results from the second year of a randomized controlled study. Washington, DC: U.S. Department of Education, Institute of Education Sciences. Retrieved from <http://www.mathematica-mpr.com/publications/pdfs/education/teacherinduction.pdf>
- Johnson, S. M., & Birkeland, S. E. (2003). Pursuing a "sense of success": New teachers explain their career decisions. *American Educational Research Journal*, *40*, 581–617. doi:10.3102/00028312040003581
- Johnson, S. M., Kardos, S. M., Kauffman, D., Liu, E., & Donaldson, M. L. (2004). The support gap: New teachers' early experiences in high-income and low-income schools. *Education Policy Analysis Archives*, *12*(61). Retrieved from <http://epaa.asu.edu/epaa/v12n61>
- Kardos, S. M., Johnson, S. M., Peske, H. G., Kauffman, D., & Liu, E. (2001). Counting on colleagues: New teachers encounter the professional cultures of their schools. *Educational Administration Quarterly*, *37*, 250–290. doi:10.1177/00131610121969316
- Kilgore, K., Griffin, C., Otis-Wilborn, A., & Winn, J. (2003). The problems of beginning special education teachers: Exploring the contextual factors influencing their work. *Action in Teacher Education*, *25*(1), 38–47. doi:10.1080/01626620.2003.10463291
- Kristof, A. L. (1996). Person–organization fit: An integrative review of its conceptualizations, measurement and implications. *Personnel Psychology*, *49*, 1–49. doi:10.1111/j.1744-6570.1996.tb01790.x
- Ladd, H. (2011). Teachers' perceptions of their working conditions: How predictive of planned and actual teacher movement. *Educational Evaluation and Policy Analysis*, *33*, 235–251. doi:10.3102/0162373711398128
- Lee, V. E., & Loeb, S. (2000). School size in Chicago elementary schools: Effects on teachers' attitudes and students' achievement. *American Educational Research Journal*, *37*, 3–31. doi:10.3102/00028312037001003
- Lee, V. E., & Smith, J. B. (1996). Collective responsibility for learning and its effects on gains in achievement for early secondary school students. *American Journal of Education*, *104*, 103–147. doi:10.1086/1444122
- Lightfoot, S. (1983). *The good high school: Portraits of character and culture*. New York, NY: Basic Books.
- Little, J. W. (1982). Norms of collegiality and experimentation: Workplace conditions of school success. *American Educational Research Journal*, *19*, 325–340.
- Loeb, S., Darling-Hammond, L., & Luczak, J. (2005). How teaching conditions predict teacher turnover in California schools. *Peabody Journal of Education*, *80*(3), 44–70.
- Lortie, D. C. (1975). *Schoolteacher: A sociological study*. Chicago, IL: University of Chicago Press.
- Manski, C. (1995). *Identification problems in the social sciences*. Cambridge, MA: Harvard University Press.

- Mastropieri, M. A. (2001). Introduction to the special issue: Is the glass half full or half empty? Challenges encountered by first-year special education teachers. *Journal of Special Education, 35*, 66–74. doi:10.1177/002246690103500201
- McLeskey, J., Tyler, N. C., & Flippin, S. S. (2004). The supply and demand for special education teachers: A review of research regarding the chronic shortage of special education teachers. *The Journal of Special Education, 38*, 5–21. doi:10.1177/00224669040380010201
- Miller, M. D., Brownell, M. T., & Smith, S. W. (1999). Factors that predict teachers staying in, leaving, or transferring from the special education classroom. *Exceptional Children, 65*, 201–218.
- Newmann, F. M. & Associates (1996). *Authentic achievement: Restructuring schools for intellectual quality*. San Francisco, CA: Jossey-Bass.
- Pan, W., & Frank, K. A. (2003). A probability index of the robustness of a causal inference. *Journal of Educational and Behavioral Statistics, 28*, 315–337. doi:10.3102/10769986028004315
- Penuel, W. R., Riel, M., Krause, A. E., & Frank, K. (2009). Analyzing teachers' professional interactions in a school as social capital: A social network approach. *Teachers College Record, 111*, 124–163.
- Penuel, W. R., Riel, M., Joshi, A., Pearlman, L., Kim, C. M., & Frank, K. (2010). The alignment of the informal and formal organizational supports for reform: Implications for improving teaching in schools. *Educational Administration Quarterly, 46*, 57–95. doi:10.1177/1094670509353180
- Peske, H. G., Liu, E., Johnson, S. M., Kauffman, D., & Kardos, S. M. (2001). The next generation of teachers: Changing conceptions of a career in teaching. *Phi Delta Kappan, 83*, 304–311.
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd Ed.). Newbury Park, CA: Sage.
- @r:Riehl, C., & Sipple, J. W. (1996). Making the most of time and talent: Secondary school organizational climates, teaching task environments, and teacher commitment. *American Educational Research Journal, 33*, 873–901.
- Ronfeldt, M., Loeb, S., & Wyckoff, J. (2012). How teacher turnover harms student achievement. CALDER Working Paper 70. Retrieved from: <http://www.caldercenter.org/upload/Ronfeldt-et-al.pdf>
- Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika, 70*, 41–55. doi:10.1093/biomet/70.1.41
- Rosenholtz, S. J. (1985). Political myths about educational reform: Lessons from research on teaching. *Phi Delta Kappan, 66*, 349–355.
- Rosenholtz, S. J. (1989). *Teachers' workplace: The social organization of schools*. New York, NY: Longmans.
- Rosenholtz, S. J., & Simpson, C. (1990). Workplace conditions and the rise and fall of teachers' commitment. *Sociology of Education, 63*, 241–257. doi:10.2307/2112873
- Rowan, B. (1990). Applying conceptions of teaching to organizational reform. In R. Elmore (Ed.), *Restructuring schools: The next generation of educational reform* (pp. 31–58). San Francisco, CA: Jossey-Bass.
- Russ, S., Chiang, B., Rylance, B., & Bongers, J. (2001). Case load in special education: An integration of research findings. *Exceptional Children, 67*, 161–172.
- Scharfstein, D. A., & Irizarry, R. A. (2003). Generalized additive selection models for the analysis of studies with potentially non-ignorable missing data. *Biometrics, 59*: 601–613. doi:10.1111/1541-0420.00070
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston, MA: Houghton Mifflin.
- Smith, T. M., & Ingersoll, R. M. (2004). Reducing teacher turnover: What are the components of effective induction? *American Educational Research Journal, 41*, 681–714. doi:10.3102/00028312041003681
- Somech, A., & Bogler, R. 2002. Antecedents and consequences of teacher organizational and professional commitment. *Education Administration Quarterly, 38*, 555–577. doi:10.1177/001316102237672
- Spillane, J. P. (2000). A fifth-grade teacher's reconstruction of mathematics and literacy teaching: Exploring interactions among identity, learning, and subject matter. *The Elementary School Journal, 100*, 307–330. doi:10.1086/499644
- Stein, M. K., & D'Amico, L. (2002). Inquiry at the crossroads of policy and learning: A study of a district-wide literacy initiative. *Teachers College Record, 104*, 1313–1344. doi:10.1111/1467-9620.00205
- Vannest, K. J., & Hagan-Burke, S. (2010). Teacher time use in special education. *Remedial and Special Education, 31*, 126–142. doi:10.1177/0741932508327459
- Weick, K. E. (1995). *Sensemaking in organizations*. Thousand Oaks, CA: Sage.
- Weisberg, J., & Sagie, A. (1999). Teachers' physical, mental, and emotional burnout: Impact on intention

to quit. *Journal of Psychology*, 133, 333–339. doi:10.1080/00223989909599746

Weiss, E. M. (1999). Perceived workplace conditions and first-year teachers' morale, career choice commitment, and planned retention: A secondary analysis. *Teaching and Teacher Education*, 15, 861–879. doi:10.1016/S0742-051X(99)00040-2

Whitaker, S. D. (2000). Mentoring beginning special education teachers and the relationship to attrition. *Exceptional Children*, 66, 546–566.

Wilson, S. M. (1990). A conflict of interests: The case of Mark Black. *Educational Evaluation and Policy Analysis*, 12, 293–310.

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

Youngs, P. (2007b). How elementary principals' beliefs and actions influence new teachers' induction experiences. *Educational Administration Quarterly*, 44, 101–137. doi:10.1177/0013161X06293629

Youngs, P., Jones, N., & Low, M. (2011). How beginning special and general education elementary teachers negotiate role expectations and access professional resources. *Teachers College Record*, 113, 1506–1540.

Zabel, R. H., & Zabel, M. K. (2001). Revisiting burnout among special education teachers: Do age, experience, and preparation still matter? *Teacher Education and Special Education*, 24, 128–139. doi:10.1177/088840640102400207

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