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Is There Really a Teacher Shortage?

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Reprinted from *A Research Report Co-sponsored by The Consortium for Policy Research in Education and The Center for the Study of Teaching and Policy*, September 2003, 30 pages.

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Abstract
Contemporary educational thought holds that one of the pivotal causes of inadequate school performance is the inability of schools to adequately staff classrooms with qualified teachers. It is widely believed that schools are plagued by shortages of teachers, primarily due to recent increases in teacher retirements and student enrollments. This report summarizes a series of analyses that have investigated the possibility that there are other factors - tied to the organizational characteristics and conditions of schools - that are behind school staffing problems. The data utilized in this investigation are from the Schools and Staffing Survey and its supplement, the Teacher Follow-up Survey conducted by the National Center for Education Statistics. These data indicate that school staffing problems are not primarily due to teacher shortages, in the sense of an insufficient supply of qualified teachers. Rather, the data indicate that school staffing problems are primarily due to a "revolving door" - where large numbers of qualified teachers depart their jobs for reasons other than retirement. The data show that the amount of turnover accounted for by retirement is relatively minor when compared to that associated with other factors, such as teacher job dissatisfaction and teachers pursuing other jobs. This report concludes that teacher recruitment programs - traditionally dominant in the policy realm - will not solve the staffing problems of such schools if they do not also address the organizational sources of low teacher retention.

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Is There Really a Teacher Shortage?

by

Richard M. Ingersoll
University of Pennsylvania

September, 2003

A Research Report
Co-sponsored by
The Consortium for Policy Research in Education and
The Center for the Study of Teaching and Policy

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ABSTRACT

Contemporary educational thought holds that one of the pivotal causes of inadequate school performance is the inability of schools to adequately staff classrooms with qualified teachers. It is widely believed that schools are plagued by shortages of teachers, primarily due to recent increases in teacher retirements and student enrollments. This report summarizes a series of analyses that have investigated the possibility that there are other factors—tied to the organizational characteristics and conditions of schools—that are behind school staffing problems. The data utilized in this investigation are from the Schools and Staffing Survey and its supplement, the Teacher Followup Survey conducted by the National Center for Education Statistics. These data indicate that school staffing problems are not primarily due to teacher shortages, in the sense of an insufficient supply of qualified teachers. Rather, the data indicate that school staffing problems are primarily due to a "revolving door"—where large numbers of qualified teachers depart their jobs for reasons other than retirement. The data show that the amount of turnover accounted for by retirement is relatively minor when compared to that associated with other factors, such as teacher job dissatisfaction and teachers pursuing other jobs. This report concludes that teacher recruitment programs—traditionally dominant in the policy realm—will not solve the staffing problems of such schools if they do not also address the organizational sources of low teacher retention.

INTRODUCTION

Few educational problems have received more attention in recent years than the failure to ensure that elementary and secondary classrooms are all staffed with qualified teachers. Severe teacher shortages, it is widely believed, are confronting our elementary and secondary schools. We have been warned repeatedly that "the nation will need to hire at least two million teachers over the next ten years" (e.g., National Commission on Teaching, 1997, p. 15-16), and our teacher training institutions are simply not producing sufficient numbers of teachers to meet the demand. At the root of this school staffing crisis, according to the conventional wisdom, are two converging macro demographic trends—increasing student enrollments and increasing teacher turnover due to a "graying" teaching force. The resulting shortfalls of teachers, the argument continues, force many school systems to resort to lowering standards to fill teaching openings, inevitably resulting in high levels of underqualified teachers and lower school performance.

The prevailing policy response to these school staffing problems has been to attempt to increase the supply of teachers. In recent years a wide range of initiatives have been implemented to recruit new candidates into teaching. Among these are career-change programs, such as "troops-to-teachers," designed to entice professionals into mid-career switches to teaching and Peace Corps-like programs, such as Teach for America, designed to lure the "best and brightest" into understaffed schools. Some school districts have resorted to recruiting teaching candidates from overseas. Many states have instituted alternative certification programs, whereby college graduates can postpone formal education training and begin teaching immediately. Financial incentives, such as signing bonuses, student loan forgiveness, housing assistance, and tuition reimbursement have all been instituted to aid teacher recruitment (Hirsch, Koppich & Knapp 2001; Feistritzer, 1997; Kopp, 1992). The "No Child Left Behind Act" passed in winter 2002 provides extensive federal funding for such initiatives.

Teacher shortages and subsequent teacher recruitment initiatives are not new to the K-12 education system. In the early and mid 1980s a series of highly publicized reports trumpeted an almost identical series of diagnoses and prescriptions (see, e.g., National Commission on Excellence in Education, 1983; Darling-Hammond, 1984; National Academy of Sciences, 1987; for reviews of this issue, see Boe & Gilford, 1992). Indeed, teacher shortages have been a cyclic threat for decades (Weaver, 1983).

Concern over teacher shortages in turn has spurred interest in empirical research on these issues, but until the past decade such efforts were limited by a lack of data. It was partly in order to address these data shortcomings that the U.S. Department of Education's National Center for Education Statistics conceived the Schools and Staffing Survey (SASS) and its supplement, the Teacher Followup Survey (TFS), beginning in the late 1980s (Haggstrom et al., 1988). This is now the largest and most comprehensive data source available on the staffing, occupational, and organizational aspects of schools.

Over the past decade I have undertaken a series of research projects using SASS/TFS to examine a range of issues concerned with teacher supply, demand, and quality (e.g., Ingersoll 1995, 1999, 2001a, 2003b). In this report I will summarize what these data tell us about the realities of school staffing problems and teacher shortages. The theoretical perspective I adopt in my research is drawn from organizational theory and the sociology of organizations, occupations, and work. My operating premise is that in order to fully understand the causes and consequences of these social problems it is necessary to examine them from the perspective of the organizations —the schools and districts—where these processes happen and within which teachers work. Employee supply, demand, and turnover are central issues in organizational theory and research. However, there have been few efforts to apply this theoretical

perspective to understanding school staffing problems and policy. As I will show, by "bringing the organization back in," these school staffing problems are reframed from macro-level issues, involving inexorable societal demographic trends, to organizational issues, involving manipulable and policy-amenable aspects of particular schools. A close look at the data from this perspective, I argue, shows that the conventional wisdom concerning teacher shortages is largely a case of a wrong diagnosis and a wrong prescription.

The Data

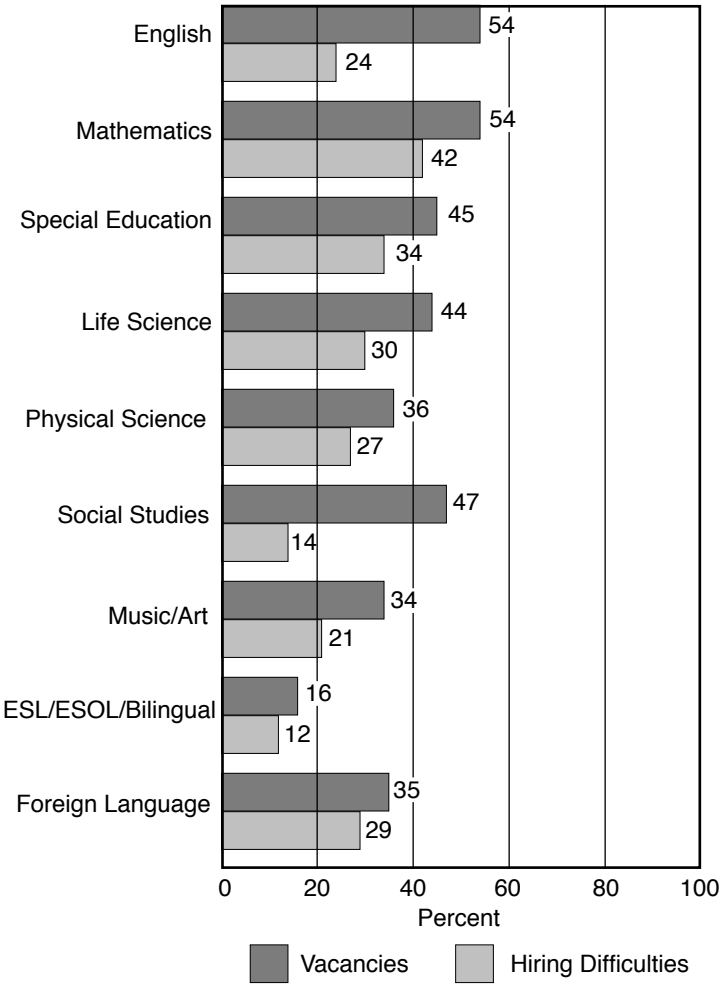
As mentioned, the primary data source for this research is the nationally representative Schools and Staffing Survey (SASS) and its supplement, the Teacher Followup Survey (TFS), both conducted by the National Center for Education Statistics of the U.S. Department of Education. To date, four independent cycles of SASS have been completed: 1987-1988; 1990-1991; 1993-1994; 1999-2000. SASS is an unusually large survey. Each cycle of SASS administers survey questionnaires to a random sample of about 53,000 teachers, 12,000 principals, and 4,500 districts, representing all types of teachers, schools, districts and all 50 states. In addition, one year later, the same schools are contacted again, and all those in the original teacher sample who had moved from or left their teaching jobs are given a follow-up second questionnaire to obtain information on their departures. This latter group, along with a representative sample of those who stayed in their schools, comprise the Teacher Followup Survey. The TFS sample contains about 7,000 teachers. Unlike most previous data sources on teacher turnover, the TFS is large, comprehensive, nationally representative, and includes the reasons teachers themselves give for their departures and a wide range of information on the characteristics and conditions of elementary and secondary schools. It is also unusual in that it does not solely focus on a particular subset of total separations, but includes all turnover: voluntary, involuntary, transfers, quits, retirements, etc. In this report, I present data from all four cycles of SASS and TFS. (as of summer 2003, the 2000-2001 TFS had only been partially released by NCES and data presented here from that cycle are preliminary estimates).

Demand for Teachers Has Risen

What do the data tell us about school staffing problems and teacher shortages? The data show that the conventional wisdom on teacher shortages is correct in some respects. Consistent with shortage predictions, data from SASS and other NCES data sources show that demand for teachers has indeed increased in recent years. Since 1984, student enrollments have increased, most schools have had job openings for teachers, and the size of the teaching workforce (K-12) has increased, although the rate of these increases began to decline slightly in the late 1990s (Gerald & Hussar, 1998; Snyder & Hoffman 2001, pp. 11). Most importantly, many schools with teaching openings have experienced difficulties with recruitment. Overall, the data show that in the 1999-2000 school year, 58% of all schools reported at least some difficulty filling one or more teaching job openings, in one or more fields. However, the data also show that in any given field less than half of the total population of schools actually experienced recruitment problems (see Figure 1). For instance in 1999-2000, 54% of secondary schools had job openings for English teachers and about one half of these indicated they had at least some difficulty filling these openings—representing one quarter of all secondary schools. Similarly, 54% of secondary schools had job openings for math teachers and about four fifths of these indicated they had at least some difficulty filling these math openings—representing about 40% of all secondary schools. Likewise, 45% of secondary schools had job openings for special education

teachers and about three quarters of these indicated they had at least some difficulty filling these openings—representing 34% of secondary schools.[1]

Figure 1. Percent Secondary Schools with Vacancies and Percent with Difficulties Filling those Vacancies, 1999-2000.



How Adequate is the Supply of Teachers?

While demand has increased and many schools have had hiring difficulties, the data do not show, contrary to the conventional wisdom, that there is overall an insufficient supply of teachers being produced. National data on the overall supply of teachers trained, licensed, and certified each year are difficult to obtain. One source is NCES' Integrated Postsecondary Educational Data System (IPEDS). This source collects data on the numbers of post-secondary degree completions by field and by year. The IPEDS data indicate that, for example, at the end of the 1998-99 academic year there were over 220,000 new recipients of education degrees at the undergraduate and graduate levels (IPEDS 2001). But, the SASS data show that only about 86,000 of those hired for the following school year were drawn from this group of recent college graduates. Indeed, large proportions of those who train to become teachers do not ever become teachers. For example, data from the nationally representative 1993 Baccalaureate and Beyond Survey show that, of new recipients of bachelor's of education degrees who graduated in 1993, after one year out of college only 42% had taught and after four years out of college only 58% had taught. Many of those

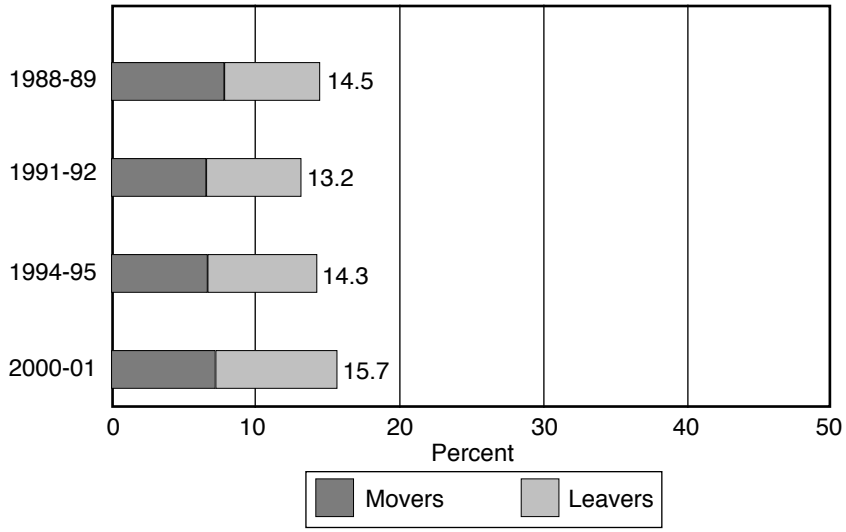
who decided not to pursue teaching indicated that they needed more education, or wanted another occupation (for a more detailed presentation of the B&B data, see Henke et al. 2000).

In short, the data appear to indicate that, overall, there are more than enough prospective teachers produced each year in the U.S. But, there are also some important limitations to these data. An overall surplus of newly trained teachers does not, of course, mean there are sufficient numbers of graduates produced in each field. A large proportion of education degree completions are in elementary education. The data are unclear on whether a sufficient quantity of teachers are produced each year in such fields as math, science, and special education.

But, on the other hand, the IPEDS database on degree completions underestimates the supply of newly qualified teachers because it does not include recipients of non-education undergraduate degrees who also completed the requirements for certification. Moreover, newly qualified candidates, as counted in the IPEDS data, are only one source of new hires in schools. Far more of those newly hired into schools each year are from what is often referred to as the "reserve pool." These include delayed entrants—those who completed teacher training in prior years, but who have never taught, and re-entrants—former teachers who left teaching for a period to later return. The addition of these other types and sources of teachers could well mean that there are more than enough teachers produced each year.

However, from an organizational perspective, the key question is not whether the overall national supply of teachers is adequate or inadequate, instead it is which schools have staffing problems and teacher supply and demand imbalances? Even in the same jurisdiction, the degree of staffing problems varies greatly among different types of schools, and sites ostensibly drawing from the same teacher supply pool can have significantly different staffing scenarios. Some analysts have found, for example, that in the same metropolitan area in the same year some schools have extensive waiting lists of qualified candidates for their teaching job openings, while other nearby schools have great difficulty filling their teaching job openings with qualified candidates (National Commission on Teaching, 1997). Consistent with this, I have found in an analysis of variance of the SASS data that the variation in school hiring difficulties is far greater within, than between, states.[2] This suggests that to be fully understood imbalances between demand and supply must be examined at the level of the organization—an issue to which I return.

Figure 2. Percent Annual Teacher Turnover.



THE IMPORTANCE OF TEACHER TURNOVER FOR SCHOOL STAFFING PROBLEMS

There is another problem with the conventional wisdom on shortages. The data show that the demand for new teachers and subsequent staffing difficulties are not primarily due to student enrollment and teacher retirement increases, as widely believed, but these are largely due to teacher turnover—teachers moving from or leaving their teaching jobs—and most of this turnover has little to do with a graying workforce.

The TFS data show that teaching has a relatively stable annual turnover rate: 14.5% in 1988-89; 13.2% in 1991-92; 14.3% in 1994-95; 15.7% in 2000-2001. (See Figure 2). There are two types of total turnover included in Figure 2: movers—those who move to teaching jobs in other schools (often and hereafter referred to as teacher migration)—and leavers—those who leave the teaching occupation altogether (often and hereafter referred to as teacher attrition). Total teacher departures are fairly evenly split between them. Much of the existing research on teacher turnover does not include the former. Teacher cross-school migration is a form of turnover that does not decrease the overall supply of teachers because departures are simultaneously new hires. As a result, many assume that teacher migration does not contribute to the problem of staffing schools and to overall shortages. From a macro and system level of analysis, this is probably correct and for this reason educational researchers have often de-emphasized or excluded movers. However, from an organizational perspective and from the viewpoint of those managing at the school-level, movers and leavers have the same effect—in either case it results in a decrease in staff, which usually must be replaced. Hence, research on employee turnover in other occupations and organizations almost always includes both movers and leavers—and for this reason I include them here. As illustrated in Figure 2, adopting a system-level or an organizational-level of analysis makes a difference—if one excludes cross-school moves, total turnover would appear far less than it is—from the viewpoint of those managing schools.

One question that naturally arises concerns how rates of teacher turnover from schools compare to those in other organizations, occupations, and industries. There has never been much empirical research on this issue. In earlier work I compared the TFS data with data from one of the better known sources of information on employee turnover in a range of occupations and organizations, the Bureau of National Affairs (2002). This comparison showed that teaching has a slightly higher annual turnover rate than the nationwide level for total employee departures—which over the past decade averaged 11.9% annually (Ingersoll 2001a). But, this comparison provided only a crude benchmark. The BNA data represent an organizational rate of employee turnover, which ostensibly includes the whole range of employees on the payroll—from clerical staff to senior management—within a given organization. Far more informative would be comparisons of *occupational* rates of turnover, i.e., how do rates of teacher turnover compare to those in other occupations? But, such data are difficult to obtain and suffer from serious issues of measure comparability (Price 1977, 1997).[3] In more recent work I have found that, as one might expect, teaching has higher turnover than some higher-status professions (professors at 9.3%; technology and scientific professionals from 3.6% to 9.2%), about the same as other female semi-professions (nurses at 18%) and less turnover than some lower-status, lower-skill occupations (federal clerical workers at 30%).[4]

But, from an organizational perspective the key question is not whether teaching has higher or lower turnover than other occupations, but rather is teacher turnover a problem for schools themselves. The data indicate it is. There is a strong link between teacher turnover and the difficulties schools have adequately staffing classrooms with

qualified teachers—as shown in Table 1 which presents data on the flows in and out of schools from all four cycles of the SASS/TFS data.

Reading down the column for the 1993-94 school year, for example, Table 1 indicates there were just under three million teachers in the K-12 education system that year, including both public and private schools. About 377,135 of these teachers entered their schools at the beginning of the 1993-94 school year. Of these, 192,550 had not taught the prior year. This latter group included newly qualified candidates fresh out of college, delayed entrants who had completed their training in a prior year but had not previously taught, and re-entrants who had taught previously, stopped for a while and then returned. Another 184,585 of these hires to schools had moved from another school. By the following school year, 417,588 teachers had moved from or left their school jobs. Just under half of these departures—204,680—moved to other schools to teach. Another 212,908 left the occupation altogether. Of the latter, 50,242 were retirees.

Table 1 documents two important points. First, the data show that the demand for new teachers is not primarily due to student enrollment increases, nor to teacher retirement increases, but to pre-retirement teacher turnover. That is, most of the hiring of new teachers is simply to fill spots vacated by teachers who just departed. For instance, about 191,000 individuals entered teaching at the beginning of the 1990-91 school year. However, by the following school year 12 months later, about 174,000 teachers (equivalent to 91% of those just hired) left the occupation altogether. At the beginning of the1993-94, three years later, about 192,500 teachers entered teaching, but by the following school year, about 213,000 (equivalent to 110% of those just hired) left the occupation. At the beginning of the1999-00, six years later, about 232,000 teachers entered teaching, but by the following school year, about 287,000 (equivalent to 124% of those just hired) left the occupation.

Table 1: Trends in Teacher Flows In and Out of Schools

	1987-88 School Year	1990-91 School Year	1993-94 School Year	1999-00 School Year
1.) Total Teaching Force – during school year	2,630,335	2,915,774	2,939,659	3,451,316
2.) Total Hires - at beginning of school year	361,649	387, 807	377, 135	534, 861
A.) Entrants	178,344	191,179	192,550	232,232
B.) Movers from other schools	183, 305	196, 628	184, 585	302,629
3.) Total Departures – by following school year	390,731	382,879	417,588	539,778
A.) Movers to other schools	218,086	208,885	204,680	252,408
B.) Leavers from occupation	172,645	173,994	212,908	287,370
Retirees	35,179	47,178	50,242	NA

Notes:

- Entrants: includes new, delayed, and re-entrants. This refers to those who did not teach the prior year; some did teach in the past.
- These data are calculated at the level of the school. Hence, “hires” and “departures” refer to those newly entering or departing a particular school. “Movers” includes transfers among schools within districts. Reassignments within a school are not defined as hires or as departures.
- As of summer 2003, teacher retirement data for the 2000 school year were not yet available.

Second, although teacher retirements have increased in recent years, they account for only a small portion of the above total turnover. For example, from 1994 to 1995 there were about 50,000 retirees, accounting for only 24% of the 213,000 leavers and only 12% of the total turnover of 417,588 during that period. In sum, the data show that the demand for new teachers, and subsequent staffing difficulties, is not primarily due to student enrollment increases, nor to teacher retirement increases, but to pre-retirement teacher turnover. That is, most of the hiring of new teachers is simply to fill spots vacated by teachers who just departed. And, most of those departing are not doing so because of gray hair.

The Revolving Door

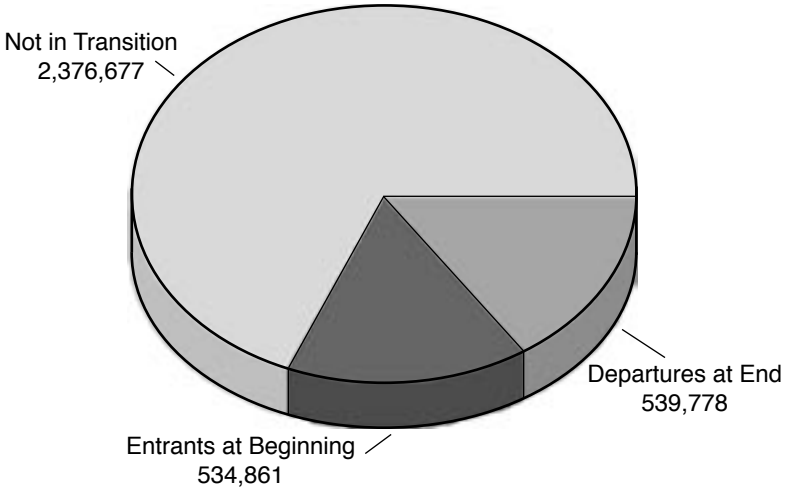
It is also important to note that teaching is a relatively large occupation—it represents 4% of the entire civilian workforce. There are, for example, over twice as many K-12 teachers as registered nurses and five times as many teachers as either lawyers or professors (U.S. Bureau of the Census, 2002).[5] The sheer size of the teaching force combined with its relatively high annual turnover means that there are large flows in, through, and out of schools each year. The image that these data suggest is one of a "revolving door,"—which I have tried to capture in Figure 3. It shows that for the 1999-2000 school year, 534,861 teachers entered schools, while by the following school year an even larger number—539,778—had moved from or left their schools.[6] Hence, in a 12-month period over one million teachers—almost a third of this relatively large workforce—were in job transition into, between, or out of schools. This revolving door is a major factor behind school staffing problems.

Table 1 and Figure 3 also provide a context to interpret the widely used statistic, introduced earlier, that the nation "will need to hire at least two million teachers over the next 10 years." This statistic was drawn from an NCES analysis (Gerald & Hussar 1998; Hussar 1998) that projected the numbers of teachers that would need to be hired from 1998 to 2008 in order to replace those who had left teaching and to account for student enrollment increases. These analyses themselves did not examine supply, nor changes in hiring needs over time. But, a wide variety of commentators, researchers, and policy makers have interpreted this statistic to mean that hiring two million new teachers is an unusually large number and assumed to be evidence that we face an alarmingly inadequate supply of new teachers being produced. A close look at the data reveals that neither is the case.

The Importance of Teacher Turnover for Organizations

Of course, not all teacher turnover is detrimental. There is an extensive research literature on employee turnover conducted by those who study organizations and occupations in general (e.g., Price 1977, 1989; Mueller & Price, 1990; Bluedorn, 1982; Halaby & Weakliem, 1989; Hom & Griffeth, 1995; Kalleberg & Mastekaasa, 1998; March & Simon, 1958; Mobley, 1982; Steers & Momday, 1981). On the one hand, researchers in this tradition have long held that a low level of employee turnover is normal and efficacious in a well-managed organization. Too little turnover of employees is tied to stagnancy in organizations; effective organizations usually both promote and benefit from a limited degree of turnover by eliminating low-caliber performers and bringing in "new blood" to facilitate innovation. Moreover, some job and career changes are, of course, normal and inevitable in any occupation. On the other hand, researchers in this tradition have also long held that high levels of employee turnover are both cause and effect of performance problems in organizations.

Figure 3. Numbers of Teachers in Transition Before, During, and After the 1999-2000 School Year.



Organizational analysts have also noted that the consequences of employee turnover vary among different types of employees and among different types of organizations. Labor process analysts, for instance, have argued that a major issue, from the viewpoint of organizational management, is the extent to which the organization is, or is not, dependent on particular types of employees and, hence, vulnerable to the disruption caused by their turnover (e.g. Braverman 1974; Burawoy 1979; Edwards 1979). For just this reason the issue of employee "substitutability," or the ease with which organizations can replace employees, is a central concern in organizational management and a central theme in organizational research. In this perspective, employee turnover is especially consequential for work that involves uncertain and non-routine technologies and which requires extensive interaction among participants. Such organizations are often unusually dependent upon the commitment and cohesion of employees and, hence, especially vulnerable to turnover (e.g., Burns & Stalker, 1961; Kanter, 1977; Likert, 1967; Porter, Lawler & Hackman, 1975; Turner & Lawrence, 1964; Walton, 1980).

Schools are an example of this type of organization. Education theory and research have long shown that, while education is a mass "industry" involving large complex formal organizations, in important ways schools do not fit standard input-output, economic-production models in either theory or practice (Bidwell, 1965; Lortie, 1975; Ingersoll, 2003a). The "raw materials" in schools are children and youth; the "technology" of teaching and learning is often uncertain, ambiguous, and non-routine; and the "product" is youngsters' growth. As a result while schools in some ways resemble economic-production organizations, in other ways they resemble another kind of institution altogether—the family. Student test outcomes are one of the important output functions of school production. But not surprisingly, similar to families the presence of a positive sense of community, belongingness, communication, and cohesion among members has long been held by education theory and research to be one of the most important indicators and aspects of effective schools (e.g., Durkheim, 1925/1961; Waller, 1932; Parsons 1959; Grant, 1988; Coleman & Hoffer, 1987; Kirst 1989; Rosenholtz 1989).

Hence, from an organizational perspective, some teacher turnover, especially of ineffective teachers, is necessary and beneficial. But from this perspective, turnover

of teachers from schools is of concern not simply because it may be an indicator of sites of potential staffing problems and so-called teacher shortages, but because of its relationship to school cohesion and, in turn, performance. Moreover, from this perspective this relationship runs both directions. That is, high rates of teacher turnover are of concern not only because they may be an outcome indicating underlying problems in how well schools function, but also because they can be disruptive, in and of themselves, for the quality of school community and performance.

Some of these costs and consequences of turnover are more easily measured and quantified than others. In contrast to the corporate sector, however, there has been very little attention paid to the costs and consequences of employee turnover in education. One notable exception was a recent attempt to quantify the costs of teacher turnover in Texas—this study concluded these costs run into the hundreds of millions of dollars each year to the state. (Texas Center for Educational Research, 2000).

Teacher and School Differences in Turnover

The data also show that the revolving door varies greatly among different kinds of teachers and different kinds of schools. As found in previous research (Murnane et al. 1991; Huling-Austin 1990; Hafner & Owings 1991), the SASS data show that teaching is an occupation that loses many of its newly trained members very early in their careers—long before the retirement years. I used these data to provide a rough estimate of the cumulative attrition of beginning teachers from the occupation in their first several years of teaching. The data suggest that after just five years, between 40 and 50% of all beginning teachers have left teaching altogether. (see Figure 4).[7] Of course, not all of this attrition results in a permanent loss of teachers. One form of this revolving door is represented by temporary attrition—teachers who leave teaching but return in later years, as discussed earlier (also see Murnane et al. 1991). But again, from the viewpoint of those managing at the school-level, temporary and permanent attrition have the same effect—in either case it results in an immediate decrease in staff, which usually must be replaced.

Annual teacher turnover also varies according to the teachers' main field. Math, science, and elementary special education teachers have higher rates of turnover, and social studies and English have lower rates (see Figure 5). Moreover, a number of studies have found that teachers with higher ability, as measured by test scores such as the SAT, the National Teacher Exam, and teacher licensure tests, are more likely to turn over (e.g., Weaver 1983; Murnane et al. 1991; Schlecty & Vance 1981; Stinebrickner 2001; Henke et al. 2000).

The data also show that the revolving door varies greatly among different kinds of schools, as illustrated in Figure 6.[8] For example, high-poverty public schools have far higher turnover rates than do more affluent public schools. Urban public schools have slightly more turnover than do suburban and rural public schools. Private schools have higher turnover rates than public schools, but there are also large differences among private schools. On one end of the continuum lie larger private schools with among the lowest average turnover rate—about 13.5%. On the other end of the continuum lie smaller private schools with among the highest average levels—about 22%.

Figure 4. Beginning teacher attrition (cumulative percent teachers having left teaching occupation, by years of experience).

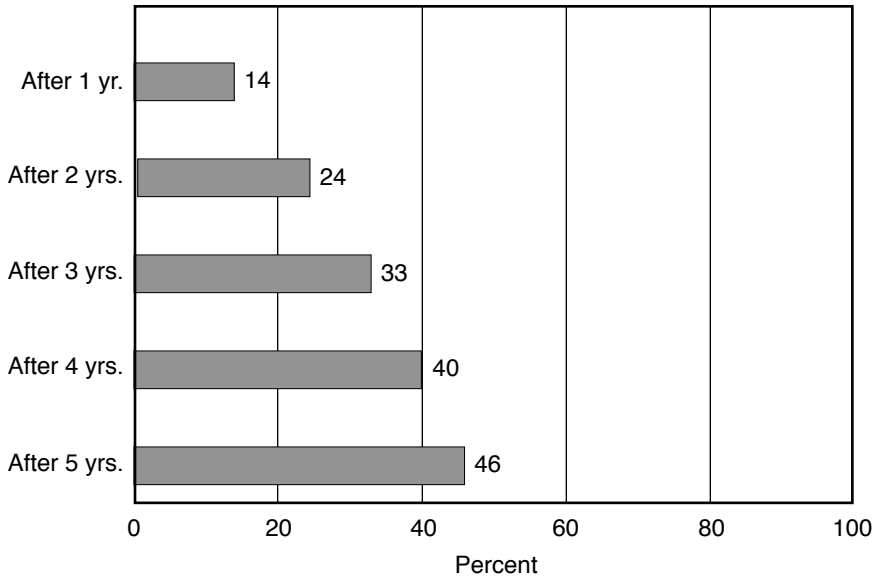


Figure 5. Percent annual teacher turnover, by field (1994-95).

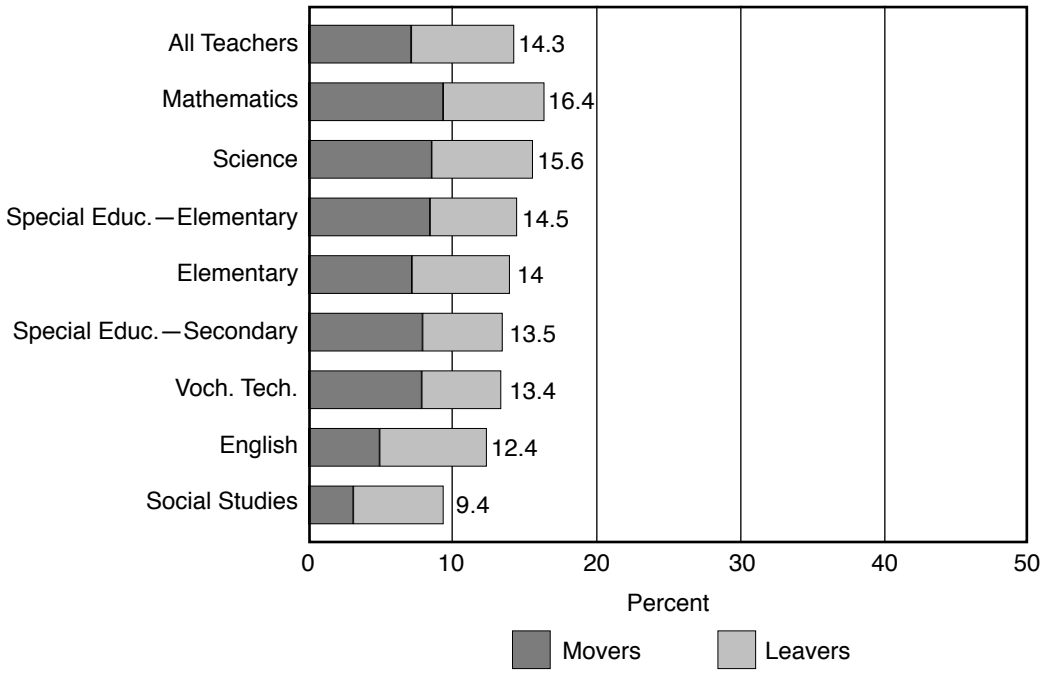
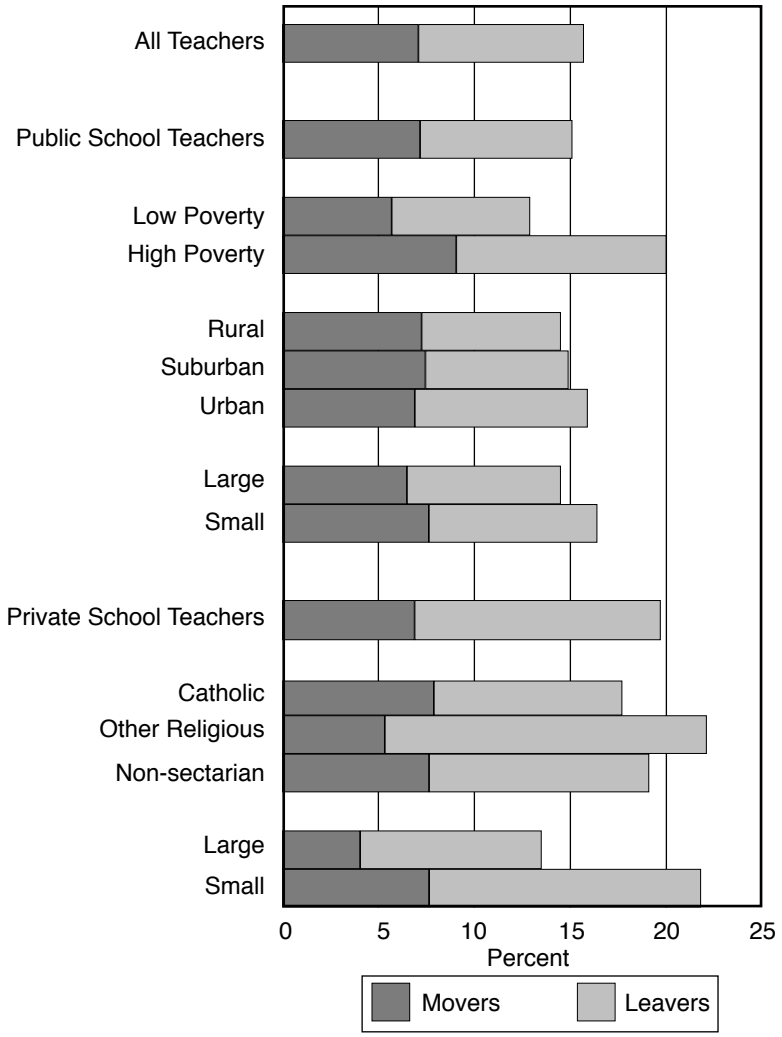


Figure 6. Percent annual teacher turnover, by selected school characteristics (2000-2001).



THE SOURCES OF TEACHER TURNOVER

These data raise another important set of questions: why do teachers depart at relatively high rates and why are these rates so dramatically different among schools? To answer these questions I conducted multivariate statistical analyses of data from different cycles of SASS/TFS to determine which characteristics of teachers and schools are associated with the likelihood of teacher turnover, after controlling for background factors (Ingersoll 2001b). I also examined data on the reasons teachers themselves give for their turnover. Such self-report data are useful because those departing are, of course, often in the best position to know the reasons for their turnover. But, such self-report data are also retrospective attributions, subject to bias and, hence, warrant caution in interpretation. Nevertheless, I found a great deal of consistency among these different types of data and from different cycles of the survey. The following section summarizes my principal findings. Along with the annual rates of turnover, Table 2 presents self-report data on teachers' reasons for both migration and attrition. In addition, for all teachers who departed because of job dissatisfaction, the bottom portion of the table presents data on the reasons for their dissatisfaction.[9] (definitions of these reasons can be found in the Appendix)

Table 2. Percent Teacher Turnover and Percent Teachers Giving Various Reasons for their Turnover, 1994-95.

	All	Movers	Leavers
Rates of Turnover	14.3	7	7.3
Reasons for Turnover			
Retirement	13	-	25
School Staffing Action	20	34	8
Family or Personal	40	36	44
To Pursue other Job	27	29	25
Dissatisfaction	29	32	25
Reasons for Dissatisfaction			
Poor Salary	54	49	61
Poor Administrative Support	43	51	32
Student Discipline Problems	23	22	24
Lack of Faculty Influence & Autonomy	17	18	15
Poor Student Motivation	15	12	18
No Opportunity for Professional Advancement	6	8	5
Inadequate Time to Prepare	6	5	6
Intrusions on Teaching Time	7	5	11
Class Sizes too Large	7	3	11

Contrary to conventional wisdom, retirement is not an especially prominent factor. The latter was listed by only 25% of leavers and 13% of total departures. School staffing cutbacks due to lay-offs, terminations, school closings, and reorganizations account for a larger proportion of turnover than does retirement. These staffing actions more often result in migration to other teaching jobs rather than leaving the teaching occupation altogether. But, the data also show that, overall, staffing actions, like retirement, account for only a small portion of total turnover from schools—about 20%.

A third category of turnover—that for personal reasons—includes departures for pregnancy, child rearing, health problems, and family moves. These account for more turnover than either retirement or staffing actions and they are probably common to all occupations and all types of organizations. The two final sets of reasons are directly related to the organizational conditions of teaching. Individually each of these categories accounts for more turnover than does retirement. Together these are the most prominent source of turnover. Almost half of all departures report as a reason either job dissatisfaction or the desire to pursue a better job, another career, or to improve career opportunities in or out of education.

Of those who depart because of job dissatisfaction, most often link their turnover to low salaries, lack of support from the school administration, student discipline problems, poor student motivation, and lack of teacher influence over decision-making. In general, similar kinds of dissatisfactions lie behind both teacher migration and teacher attrition. Interestingly, several factors stand out as *not major reasons* behind turnover, according to those who departed: large class sizes, intrusions on classroom time, and lack of planning time.

In sum, the data indicate that teachers depart their jobs for a variety of reasons. Retirement accounts for a relatively small number of total departures, a moderate number of departures are due to school staffing actions, a large proportion indicate

they depart for personal reasons, and a large proportion also report they depart either because they are dissatisfied with their jobs or in order to seek better jobs or other career opportunities. I have found these reasons for turnover to be highly consistent across different types and cycles of the data, across different kinds of schools, and across different subsets of teacher turnover. These findings are important because of their policy implications. Unlike explanations that focus on external demographic trends "out there," these findings suggest there is a role "in here" for the internal organization and management of schools.

IMPLICATIONS FOR POLICY

It is widely believed that shortfalls of teachers resulting primarily from two converging demographic trends—increasing student enrollments and increasing teacher retirements—are leading to problems staffing schools with qualified teachers and will, in turn, lower educational performance. In response school districts, states, and the federal government have developed a variety of recruitment initiatives designed to recruit more candidates into teaching.

However worthwhile these efforts may be, the data suggest that, alone, they will not solve school staffing problems. The data suggest that school staffing problems are not solely or even primarily due to teacher shortfalls resulting from either increases in student enrollment or increases in teacher retirement. In contrast, the data suggest that school staffing problems are to a large extent a result of a "revolving door"—where large numbers of teachers depart teaching for reasons other than retirement. From the framework of supply and demand theory, the data show that the problem is not primarily shortages, in the sense of an insufficient supply of teachers being recruited and trained. Some economists would still call this a shortage—in the technical sense that there is an inadequate quantity of teachers supplied—those willing to continue to offer their services at a given wage and given working conditions in given schools. This diagnostic and terminological distinction has crucial implications for prescription. It is also a distinction that is almost always overlooked in research and policy on the teacher shortage.

Supply and demand theory holds that where the quantity of teachers demanded is greater than the quantity of teachers supplied, there are two basic policy remedies: increase the quantity supplied or decrease the quantity demanded. The first approach —the traditionally dominant approach—is to increase the quantity of teachers supplied through recruitment. However, this analysis cautions that recruitment programs alone will not solve the staffing problems of schools if they do not also decrease turnover. States such as California, where class-size-reductions have strained the supply of new teachers pose exceptions. But, for just these reasons, California, like other states, must pay close attention to retention. In short, recruiting more teachers will not solve the teacher crisis if 40 to 50% of such teachers then leave within five years. The image that comes to mind is a bucket rapidly losing water because of holes in the bottom. Pouring more water into the bucket will not be the answer if the holes are not first patched.

Recruitment and other supply-side solutions may not only fail to solve the problem but could also make the situation worse. If recruitment strategies involve lowering teacher standards, or if the effect of increasing teacher supply is to deflate salaries or erode working conditions, then these measures may simply exacerbate the root factors behind school staffing problems.

This situation is analogous to aspects of management-labor conflict in industry. Critics of business practice argue that industrialists have long used labor supply recruitment as a strategy to undermine worker and union efforts to improve

working conditions and wages (e.g. Braverman 1974; Burawoy 1979; Edwards 1979). For example, by bringing in immigrant laborers from eastern and southern Europe at the turn of the 19th century, industrialists, the critics hold, were able to keep wages down, undermine union power, and increase profits. One of the downsides with this strategy, from a management perspective, is that it can decrease employee quality and increase employee turnover. Hence, one of the objectives behind the design of the assembly-line model of production used in industry was to increase the ease of substitutability and, hence, insulate the organization from disruption caused by employee turnover.

Similarly, social scientists have long characterized K-12 teaching as a lower status, easy-in/easy-out, high turnover occupation that has relied historically on recruitment, and not retention, to solve its staffing problems (e.g., Tyack 1974; Lortie 1975). Since the inception of the public school system in the late 19th century, teaching was socially defined and treated as a temporary line of work suitable for women, prior to their "real" career of child rearing. For men, teaching was socially defined as a stepping stone, prior to their "real" career in one of the male-dominated skilled blue-collar occupations or white-collar professions. Indeed, historically there was an ambivalence toward persistors in teaching, especially males—who had to account for why they continued to be "merely" a teacher. Low pre-service training standards and requirements, relatively unselective entry criteria, and front-loaded salaries that paid newcomers relatively high salaries compared to veterans all tended to favor recruitment over retention. Moreover, low pay, isolated job conditions, little professional autonomy, and a faint sense of a career ladder all undermined longer-term commitment to teaching as a career and profession. Attempts to upgrade the status of the occupation through more rigorous training and licensing standards or more selective entry gates often resulted in decreases in male entrants to teaching, who were more attracted to occupations with better rewards attached to rigorous standards (Strober & Tyack 1980).

It appears that school districts continue to favor teacher recruitment strategies for many of the same reasons and with many of the same consequences. By widening the entry gate and increasing the quantity of teachers supplied, districts are able to control labor costs and, hence, control local property taxes. The downside of this strategy in schools, as in industry, is that it can decrease employee quality and increase employee turnover. Treating workers as interchangeable, expendable, low-skill workers cuts some expenses, but it is not cost-free. If turnover is at the root of school staffing problems and if the quality of the teaching job is a large factor behind turnover, then policies that further erode the low status of teaching, that undermine salary increases, or that undermine working conditions may simply backfire by increasing turnover.

In short, the data suggest that school staffing problems are rooted in the way schools are organized and the way the teaching occupation is treated and that lasting improvements in the quality and quantity of the teaching workforce will require improvements in the quality of the teaching job.

CONCLUSION: WHAT IS TO BE DONE?

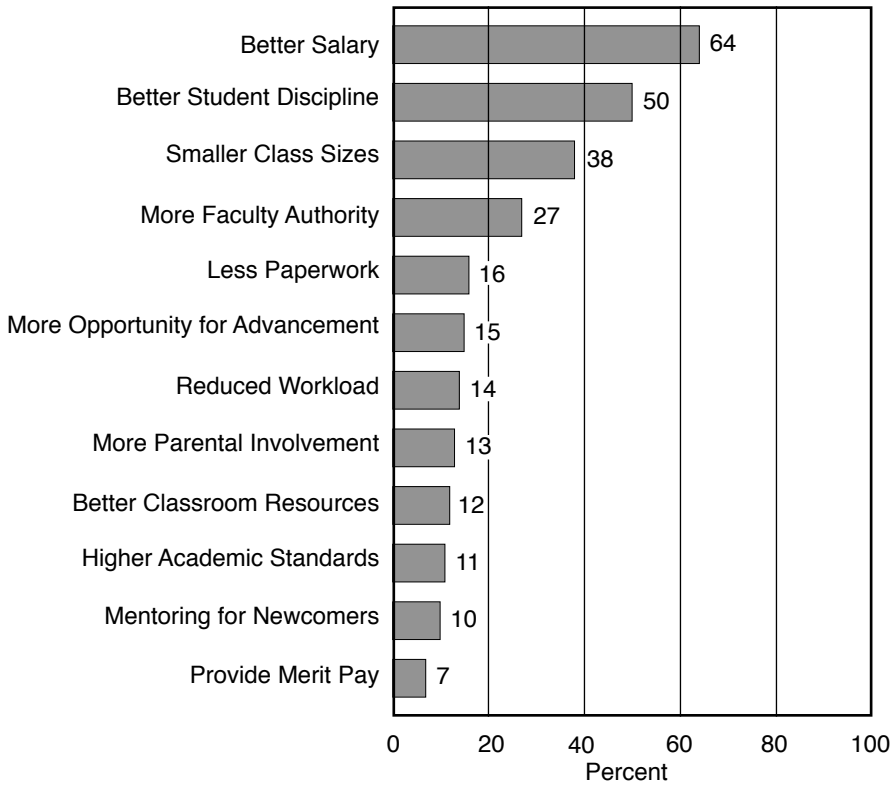
How do schools improve the teaching job? Teachers themselves have offered some ideas. The 1994-95 TFS asked teachers who had moved from or left their teaching jobs since the prior year to suggest possible steps schools might take to encourage teachers to remain in teaching. Their responses are summarized in Figure 7.[10]

One strategy suggested by departed teachers to aid retention is *increasing salaries*, which are, not surprisingly, strongly linked to teacher turnover rates. But, salaries are not the only issue, which is important from a policy perspective because increasing overall salaries is expensive given the sheer size of the occupation.

Reduction of *student discipline problems* is a second factor frequently suggested by departed teachers. Multivariate analysis of the data also document that this factor is strongly tied to the rates of teacher turnover; again, not surprisingly, schools with more student misbehavior problems have more teacher turnover (Ingersoll 2001b). But, the data also tell us that, regardless of the background and poverty levels of the student population, schools vary dramatically in their degree of student misbehavior.

One of the factors tied to both student discipline and teacher turnover is how much *decisionmaking influence* teachers themselves have over school policies that affect their jobs, especially those concerned with student behavioral rules and sanctions. In a separate multivariate analysis of data from SASS, I have found that, on average, teachers have little say in many of the key decisions that concern and affect their work, but schools where teachers are allowed more input into issues, such as student discipline in particular, have less conflict between staff and students and less teacher

Figure 7. Of those teachers who moved from or left their jobs, percent giving various steps schools might take to encourage teachers to remain in teaching, 1994-95.



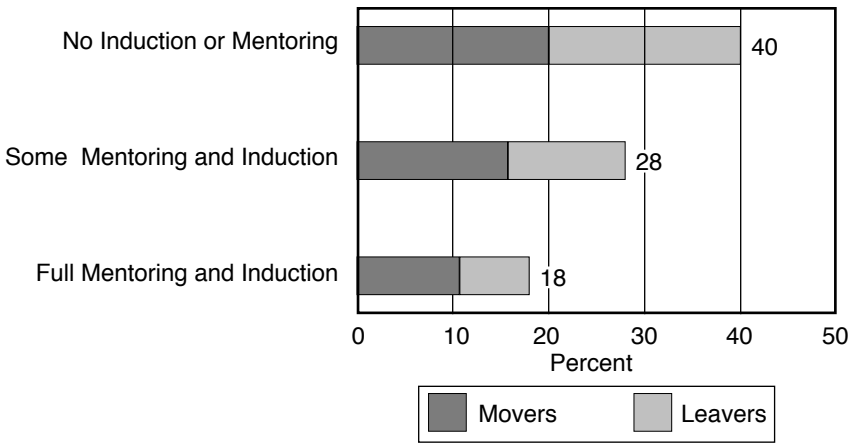
turnover (Ingersoll 2003a). Increasing teacher decisionmaking power and authority is also, not surprisingly, suggested by teachers as a step to aid retention.

Class size reduction was also frequently suggested by teachers as a step to increase retention, although interestingly, it was not frequently given by departing teachers as one of the sources behind turnover related to dissatisfaction (Table 2).

Also surprising in Figure 7 is how few teachers suggested increasing support, such as *mentoring*, for new teachers as one of the main steps necessary for retention.

In a separate multivariate analysis of the 1999-2000 SASS data, we explored the impact of mentoring and induction programs on the turnover of new teachers. After controlling for the background characteristics of teachers and schools, we found a strong link between participation by beginning teachers in induction and mentoring programs and their likelihood of moving or leaving after their first year on the job (Smith & Ingersoll 2003). The data showed that the predicted probability of turnover of first year, newly hired, inexperienced teachers, who did not participate in any induction and mentoring programs was 40% (see Figure 8). In contrast, after controlling for the background characteristics of teachers and schools, the turnover probability of beginning teachers who received what I labeled as "some" induction (had a helpful mentor from their same field; had common planning time with other teachers in their subject area; and had regularly scheduled collaboration with other teachers on issues of instruction) was 28%. Twenty-two percent of beginning teachers received just these three components. Finally, a very small number (less than 1% of beginning teachers in 1999-00) experienced what I label as a "full" induction experience that included the above three components, plus five more: participated in a general induction program; participated in a seminar for beginning teachers; had regular or supportive communication with their principal, other administrators, or department chair; participated in an external network; and had a reduced number of course preparations. Participation in these activities, collectively, had a very large and statistically significant impact – the probability of a departure at the end of their first year for those getting this package was less than half of those who participated in no induction activities.

Figure 8. Percent turnover after first year of newly hired, inexperienced teachers, according to whether they participated in induction and mentoring programs, 2000-01.



Source: T. Smith and R. Ingersoll. 2003. "Reducing Teacher Turnoer: What are the Components of Effective Induction?" Paper presented at the annual meeting of the AERA.

It is important to recognize that none of these data suggests adopting any of the above steps will be inexpensive or easy. But, from the perspective of this analysis, the data suggest that schools are not simply victims of inexorable demographic trends and that there is a significant role for the management and organization of schools in both the genesis of, and the solution to, school staffing problems. The data suggest that improvements in the above aspects of the teaching job would contribute to lower rates of turnover, in turn, diminish school staffing problems and, hence, ultimately, aid the performance of schools.

ENDNOTES

[1] The data on school hiring difficulties from the 1999-2000 SASS school questionnaire asked school officials "how difficult or easy it was to fill the vacancies for this school year" in each field. I counted as having "difficulty filling teaching vacancies" all those schools reporting either: "somewhat difficult," "very difficult," or "could not fill."

[2] Using a one-way random effects ANOVA model, the data show that the variance component within states was 44 times the size of the variance component between states. Intraclass correlation = .022.

[3] One example of a cross-occupational comparison that appears to have measurement shortcomings is an analysis of Baccalaureate and Beyond data by Henke et al. (2001). This analysis looked at beginning teacher attrition in comparison to other recent college grads. It followed 1993 grads who became teachers in the 1993-1994 year and then calculated how many of them were gone by April 1997. The analysis found a 18% rate of new teacher attrition for the three year span from April 1994 to April 1997. But the analysis did not appear to count all types of attrition. It appears that it only counted as attrition those who moved to full-time, non-teaching careers and jobs. It did not count those who went back to college, or those who left the workforce to, for example, do family caregiving. But other data, such as the SASS/TFS, tell us these other flows are substantial and are certainly counted as attrition in existing research. Not including them would make the overall attrition look smaller than it really is. Indeed, elsewhere in that report it appeared that 12% of new teachers left the full-time workforce for these other things; adding this 12% to the 18% attrition, the analysis did count, brings the B&B 3 year attrition rate to something close to 30% after three years—which is quite consistent with many other studies on beginning teacher attrition. It is unclear what this undercounting might mean for the cross-occupation comparisons made in the report, but it certainly casts doubt on them.

[4] Data for professors are from a study sponsored by the American Association for University Professors (1989) and represent annual averages for the period from 1972 to 1989. (Ehrenberg et al. 1991) Data on technology and science professionals, such as engineers, research scientists, and software designers represent the 2000 year and are from Kochanski and Ledford (2001). Data for nurses are from the March 2000 National Sample Survey of Registered Nurses conducted by the American Hospital Association. Data for federal employees are from the Office of Personnel Management (2003).

[5] The most recent data from the US Census Bureau are from 2001: 5,473,000 teachers/135,073,000 total workforce = 4.05%. "Teachers" include all Pre-K, K, Elementary, Secondary and Special education teachers. College and university instructors and professors are not counted as teachers. Counselors and librarians are not counted as teachers.

[6] As in Table 1, the data in Figure 3 are calculated at the level of the school. Hence "hires" and "departures" refer to those newly entering or departing a particular school. "Movers" includes transfers among schools within districts. Reassignments within a school are not defined as hires or as departures.

[7] I calculated these cumulative rates of beginning teacher attrition using preliminary data from the 2000-2001 TFS. The results are similar to what I've found using each of the other three cycles of the TFS—1988-89; 1991-92; 1994-95. It should be recognized that the data shown in Figure 4 are only

a rough approximation. The SASS/TFS data do not follow a particular cohort of newly hired teachers to ascertain how many remain in teaching after five years. Instead I approximated the cumulative loss of beginning teachers by multiplying together the probabilities of staying in teaching for teachers with experience from 1 to 5 years. (i.e. yr 1 probability of staying in teaching x yr. 2 probability x yr. 3 probability x yr. 4 probability x yr. 5 probability). These cumulative estimates also do not account for those who later re-enter teaching—which has been found to be as much as 25 %.

[8] In Figure 6, large schools are defined as those with 600 or more students; small schools are those with fewer than 300 students. High-poverty refers to schools with a poverty enrollment of 80% or more; low-poverty refers to schools with a poverty enrollment below 10%. Middle categories of size and poverty are omitted in the figure.

[9] The data in Table 2 are from the 1994-95 TFS because the relevant data from the 2000-2001 TFS were not released as of summer 2003. Note that the column segments in Table 2 displaying percentages reporting various reasons for turnover each add up to more than 100%, because respondents could indicate up to three reasons for their departures. The same applies to the column segments displaying reasons for dissatisfaction. See Appendix for definitions of these reasons.

[10] The data in Figure 7 are from the 1994-95 TFS, because the relevant data from the 2000-2001 TFS were not released as of summer 2003. Note that the estimates add up to more than 100%, because respondents could indicate up to three steps.

REFERENCES

American Association of University Professors. (1989). The annual report on the economic status of the profession, 1988-89. *Academe, 75*(2), 3-74.

Bidwell, C. (1965). The school as a formal organization. In J. March (Ed.), *Handbook of organizations* (pp. 973-1002). Chicago, IL: Rand McNally.

Bluedorn, A. C. (1982). A unified model of turnover from organizations. *Human Relations, 35*, 135-153.

Boe, E., & Gilford, D. (1992). *Teacher supply, demand and quality*. Washington, DC: National Academy Press.

Braverman, Harry. (1974). *Labor and monopoly capitalism*. New York: Monthly Review Press.

Burawoy, Michael. (1979). *Manufacturing consent: Changes in the labor process under monopoly capitalism*. Chicago: University of Chicago Press.

Bureau of National Affairs. (2002). BNAs quarterly report on job absence and turnover. *Bulletin to Management*. Washington DC: Bureau of National Affairs.

Burns, T., & Stalker, G. M. (1961). *The management of innovation.* London: Tavistock.

Coleman, J., & Hoffer, T. (1987). *Public and private schools: The impact of communities*. New York: Basic.

Darling-Hammond, L. (1984). *Beyond the commission reports: The coming crisis in teaching*. Santa Monica, CA: Rand Corporation.

Durkheim, E. (1961/1925). *Moral education: A study in the theory and application of the sociology of education*, translated by E. K. Wilson and H. Schnurer. NewYork: Free Press.

Edwards, Richard. (1979). *Contested terrain*. New York: Basic Books.

Ehrenberg, R., Kasper, H., & Rees, D. (1991). Faculty turnover at American colleges and universities: analyses of AAUP data. *Economics of Education Review, 10*(2) 99-110.

Feistritzer, E. (1997). *Alternative teacher certification: A state-by-state analysis (1997)*. Washington, DC: National Center for Education Information.

Gerald, D., & Hussar, W. (1998). *Projections of education statistics to 2008*. Washington, DC: National Center for Education Statistics.

Grant, G. (1988). *The world we created at Hamilton High*. Cambridge, MA: Harvard University Press.

Hafner, A., & Owings, J. (1991). *Careers in teaching: Following members of the high school class of 1972 in and out of teaching* (NCES Report No. 91-470). Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Haggstrom, G. W., Darling-Hammond, L., & Grissmer, D. (1988). *Assessing teacher supply and demand*. Santa Monica, CA: Rand Corporation.

Halaby, C., & Weakliem, D. (1989). Worker control and attachment to the firm. *American Journal of Sociology, 95*, 549-591.

Henke, R., Chen, X., & Geis, S. (2000). *Progress through the pipeline: 1992-93 college graduates and elementary/secondary school teaching as of 1997*. Washington, DC: National Center for Education Statistics.

Henke, R., Zahn, L & Carroll, D. (2001). *Attrition of new teachers among recent college graduates*. Washington, DC: National Center for Education Statistics.

Hirsch, E, Koppich, J,. & Knapp, M.(2001). *Revisiting what states are doing to improve the quality of teaching: An update on patterns and trends*. Center for the Study of Teaching and Policy, University of Washington.

Hom, P., & Griffeth, R. (1995). *Employee turnover*. Cincinnati: South-Western Publishing.

Huling-Austin, L. (1990). Teacher induction programs and internships. In Houston, W., R. *Handbook of research on teacher education*. Reston, VA: Association of Teacher Educators.

Hussar, W. (1998). *Predicting the need for newly hired teachers in the United States to 2008-09*. Washington, DC: National Center for Education Statistics.

Ingersoll, R. (1995). *Teacher supply, teacher qualitications and teacher turnover*. Washington, DC: National Center for Education Statistics.

Ingersoll, R. (1999). The problem of underqualified teachers in American secondary schools. *Educational Researcher, 28*, 26-37.

Ingersoll, R. (2001a). *Teacher turnover, teacher shortages and the organization of schools*. Center for the Study of Teaching and Policy, University of Washington.

Ingersoll, R. (2001b). Teacher Turnover and Teacher Shortages: an Organizational Analysis. *American Educational Research Journal, 38*(3), 499-534.

Ingersoll, R. (2003a) *Who controls teachers' work?: Power and accountability in America's schools*. Cambridge, MA: Harvard University Press. <http://www.hup.harvard.edu/catalog/INGWHO.html>

Ingersoll, R. (2003b) Is there a shortage among mathematics and science teachers? *Science Educator 12*(1), 1-9.

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

Integrated Postsecondary Educational Data System (IPEDS). (2001). *Data File*. Washington, DC: National Center for Education Statistics.

Kalleberg, A., & Mastekaasa, A. (1998). Organizational size, layoffs and quits in Norway. *Social Forces, 76*, 1243-73.

Kanter, R. (1977). *Men and women of the corporation*. New York: Basic.

Kirst, M. (1989). Who should control the schools? In T. J. Sergiovanni & J. Moore (Eds.), *Schooling for tomorrow*. Boston: Allyn and Bacon.

Kochanski, J. & Ledford, G. (2001). How to keep me—Retaining technical professionals. *Research-Technology Management*. May–June: 31-38.

Kopp, W. (1992). Reforming schools of education will not be enough. *Yale Law and Policy Review, 10*, 58-68.

Likert, R. (1967). *The human organization*. New York: McGraw-Hill.

Lortie, D. (1975). *School teacher*. Chicago: University of Chicago Press.

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

Mobley, W. (1982). *Employee turnover: Causes, consequences and control*. Reading, MA: Addison-Wesley.

Mueller, C., & Price, J. (1990). Economic, psychological and sociological determinants of voluntary turnover. *Journal of behavioral economics, 19*, 321-335.

Murnane, R., Singer, J., Willett. J., Kemple, J., & Olsen, R. (Eds.). (1991). *Who will teach?: Policies that matter*. Cambridge, MA: Harvard University Press.

National Academy of Sciences. (1987). *Toward understanding teacher supply and demand*. Washington, DC: National Academy Press.

National Commission on Excellence in Education. (1983). *A nation at risk: The imperative for educational reform*. Washington, DC: Government Printing Office.

National Commission on Teaching and America's Future. (1997). *Doing what matters most: Investing in quality teaching*. New York: NCTAF.

Office of Personnel Management, (2003). *Central Personnel Data File (CPDF)*. Washington, DC: OPM. <http://www.opm.gov/feddata/index.asp>

Parsons, Talcott. (1959). The school class as a social system: Some of its functions in American society. *Harvard Educational Review 29*, 297-318.

Porter, L. W., Lawler, E. E., & Hackman, J. R. (1975). *Behavior in organizations*. New York: McGraw-Hill.

Price, J. (1977). *The study of turnover*. Ames, IA: Iowa State University Press.

Price, J. (1989). The impact of turnover on the organization. *Work and Occupations, 16*, 461-473.

Price, J. (1997). Handbook of organizational measurement. *International Journal of Manpower*. 18: no. 4-6.

Rosenholtz, S. (1989). *Teacher's workplace: The social organization of schools*. New York: Longman.

Schlecty, P., & Vance, V. (1981). Do academically able teachers leave education? The North Carolina case. *Phi Delta Kappan, 63*, 105-112.

Smith, T & Ingersoll, R. (2003). Reducing teacher turnover: What are the components of effective induction? Paper presented at the annual meeting of the American Educational Research Association, Chicago. IL.

Snyder, T., & Hoffman, C. (2001). *The digest of education*. Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Steers, R. M., & Momday, R. T. (1981). Employee turnover and the post-decision accommodation process. In B. M. Shaw and L. L. Cummings (Eds.), *Research in organizational behavior*. Greenwich: JAI Press.

Stinebrickner, T.R. (2001). A dynamic model of teacher labor supply. *Journal of Labor Economics, 19*(1), 196-230.

Strober, M. and Tyack, D (1980). Why do women teach and men manage? *Signs, 5*, 499-500.

Texas Center for Educational Research. (2000). *The cost of teacher turnover*. Austin, TX: Texas State Board for Educator Certification.

Turner, A. N., & Lawrence, P. R. (1964). *Industrial jobs and the worker*. Cambridge, MA: Harvard University Press.

Tyack, D. (1974). *The one best system*. Cambridge, MA: Harvard University Press.

U.S. Bureau of the Census. (2002). *Statistical abstract* (117th Edition). Washington,

DC: U.S. Department of Commerce.

Waller, W. (1932). *The sociology of teaching*. New York: Wiley.

Walton, R. E. (1980). Establishing and maintaining high commitment work systems. In J. Kimberly & R. Miles (Eds.), *The organization life cycle*. San Francisco: Jossey-Bass.

Weaver, T. (1983). *America's teacher quality problem: Alternatives for reform*. New York: Praeger Publishers.

APPENDIX

Definitions of Measures of Reasons for Turnover

In the Teacher Followup Survey, teachers could list up to 3 choices from a list of 12 reasons for their departures. I grouped the 12 reasons into 5 categories, as follows:

- **Retirement**
- **School Staffing Action**: reduction-in-force/lay-off/school closing/reassignment.
- **Family or Personal**: family or personal move; pregnancy/child rearing; health; other family or personal reason.
- **To Pursue other Job**: to pursue another career; to take courses to improve career opportunities in or outside the field of education; for better teaching job.
- **Dissatisfaction**: dissatisfied with teaching as a career; dissatisfied with the school; for better salary or benefits.

Of those teachers who indicated dissatisfaction, as defined above, as a reason for their departure, they could list up to 3 choices from a list of 12 reasons for their dissatisfaction. I grouped the 12 reasons into 9 categories, as follows:

- **Poor Salary**
- **Poor Administrative Support**: lack of recognition and support from administration; lack of resources and material/equipment for your classroom; inadequate support from administration
- **Student Discipline Problems**
- **Lack of Faculty Influence and Autonomy**: lack of influence over school policies and practices; lack of control over own classroom
- **Poor Student Motivation**: poor student motivation to learn
- **Poor Opportunity for Professional Advancement**
- **Inadequate Time to Prepare**: inadequate time to prepare lesson/teaching plans
- **Intrusions on Teaching Time**: intrusions on teaching time (i.e. not enough time working directly with teaching students)
- **Class Sizes too Large**