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Scrambling the Nest Egg

How Well Do Teachers Understand Their Pensions, and What Do They Think about Alternative Pension Structures?

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Abstract

This paper addresses two questions: How well do teachers understand their current pension plans? And, what do they think about alternative plan structures? The data come from administrative records and a 2006 survey of teachers in Washington State. The results suggest Washington's teachers are fairly knowledgeable about their pensions, though new entrants and mid-career teachers appear to be less knowledgeable than veteran teachers. As for teachers' preferences for plan structure, the survey suggests that when it comes to investing additional retirement savings, a plurality of teachers favor defined contribution plans which offer more portability and choice, but more risk than traditional defined benefit plans. Perhaps unsurprisingly, all else equal, teachers newer to the profession are more likely than veteran teachers to favor a defined contribution structure.

Introduction

Education policy makers and researchers regularly debate a wide range of policies aimed at improving teachers and teaching. They argue over how pre-service training, certification policy, professional development, compensation and, more recently, human resource management practices can better impact the teacher workforce (Corcoran 2007; Ingersoll 2007; Odden, Milanowski, and Heneman 2007). But for the most part, they ignore the subject of teacher pensions and retirement. Whether this is because teacher pensions are relatively invisible policy mechanisms, difficult to understand, or politically inviolable is unclear. Nevertheless, there are reasons to believe that the general absence of pensions in these debates presents a lost opportunity. Pensions are an important part of teacher compensation. By some estimates, they constitute 6% of a teacher's total compensation (Allegretto, Corcoran, and Mishel 2008), and typically they provide about 60% salary replacement for retired teachers (Mitchell, McCarthy, and Zorn 2001).[1] At the same time, pensions offer a potentially important lever for shaping the teacher workforce. Research in the private sector suggests, for example, that pension incentives affect people's mobility behavior, decisions about retirement, and their choice of work (Gustman 1994; Dorsey 1995; Even and Macpherson 1996; Ippolito 2001; Asch, Haider, and Zissimopoulos 2005; Friedberg and Webb 2005).

Education researchers are just beginning to lay the groundwork for moving teacher pensions onto the policy agenda. For now, the evidence base is small. Recent empirical studies include Furgeson, Strauss, and Vogt's (2006) examination of teacher retirement behavior and Costrell and Podgursky's (2007, 2009) analyses of pension wealth accumulation. Elsewhere, Kimball, Heneman, and Kellor (2005) discuss how pensions might help attract teachers to the profession; more recently, Hansen (2009) and Loeb, Miller, and Strunk (2009) provide useful overviews. On balance, this and other emerging work

[1] The National Education Association's position is that retirement benefits should provide 75% salary replacement (National Education Association 2006).

underscore the fact that teacher pensions are complex systems whose effects—on both public finance and human capital—are intriguing and, at times, obscure.

In this paper we add to the nascent literature on pensions by exploring two questions: How well do teachers understand their current pension plans? And, what do they think about alternative plan structures? The first question begins to shed some light on whether teachers know enough about pensions to perhaps motivate labor market decisions. The second speaks to whether certain pension structures might make the profession more desirable for some types of teachers (secondarily, it speaks to whether teachers support reforms that some people argue could improve the financial sustainability of retirement policies).

For our analysis we use data from a 2006 survey of teachers in Washington State—the Washington State Teacher Compensation Survey. We link survey results on pension knowledge and preferences to detailed data on school and district characteristics so that we can analyze variation across individuals and workplaces.

The results suggest that Washington's teachers are fairly knowledgeable about their pensions. For the most part, they know which plan they are "in" (as we explain below, Washington has multiple pension plans). When it comes to understanding how their plans work, however, new entrants and mid-career teachers appear less knowledgeable than veterans. As for their preferences for pension structure, a plurality of teachers indicate a preference for investing additional retirement savings in an alternative to the status quo—a defined contribution structure that offers more portability and choice but also more risk than a traditional defined benefit structure. Again, perhaps unsurprisingly, our findings suggest that, all else equal, teachers newer to the profession are more likely than veterans to favor the defined contribution structure. To paraphrase Rufus Miles, Jr., where you stand on the issue appears to depend on how long you have been sitting.

In the next section we provide some background on teacher pensions and describe Washington

State's pension system. We then discuss the survey and our results, and conclude with some thoughts for future research.

Background on Teacher Pensions and Proposed Alternatives

Hansen (2010) highlights two dimensions of teacher pensions that warrant policy attention: the first is whether or not teacher pensions are financially sustainable; the second is whether or not they support effective staffing. Although the question of solvency raises some serious issues (Passantino and Summers 2005; Walsh 2007),[2] our investigation speaks primarily to how pensions might support (or hinder) effective staffing along three dimensions: by informing who decides to teach, when they teach, and where they teach.[3] Although many factors besides pensions affect these issues (such as regular salaries, working conditions, and individual teacher characteristics), research in the private sector suggests that pensions may provide some leverage as well.

First, there is the fairly straightforward argument that pension incentives influence worker mobility and retirement flows—that is, where and when people work (Burkhauser 1979; Stock and Wise 1990; Gustman, Mitchell, and Steinmeier 1994; Gustman and Steinmeier 1994). The inherent long-term compensation agreement at the heart of the pension promise encourages workers to pursue full careers with a single employer. Pensions may also encourage geographic commitments if workers have to forfeit retirement contributions or benefits when they move to a new location. Near the end of a worker's career, pensions may include separation incentives that encourage retirement at a particular age. Like

[2] Hansen (2010) provides a useful discussion about solvency, showing how unfunded liabilities can be framed in several different ways with different implications. On balance, she argues that solvency is far from a universal problem for teacher pensions.

[3] Without belaboring the point, it is worth saying that the who-when-where of the teacher labor market matters because of the growing recognition of two critical issues: the important role teachers play in student achievement and the inequitable distribution of teacher quality across students (see, for example, Lankford, Loeb, and Wyckoff 2002; Rivkin, Hanushek, and Kain 2005).

other workers, teachers appear to be sensitive to separation incentives. Furgeson, Strauss, and Vogt's (2006) analysis of Pennsylvania teachers, for example, suggests that a 1% increase in the present value of real pension benefits leads to a 2-3% increase in the probability of retirement.

A second way in which pensions might affect the workforce is through sorting effects (Salop and Salop 1976; Ippolito 2000, 2001). Simply by offering a pension (or a particular type of pension) employers might attract certain types of workers on the front end. Pensions may, for example, make a job relatively more attractive to workers who are "stayers" or "savers" (and who might be more effective at doing their jobs) (Ippolito 2001). Although there is some evidence to suggest that prospective teachers consider fringe benefits a high priority when weighing the attractiveness of a career in teaching, it is unclear how this preference varies by individual characteristics (Kimball, Heneman, and Kellor 2005).

Although there is not much research on how either of these two ideas—pension incentives and sorting effects—play out in public education, the available evidence suggests that the dominant pension arrangement for teachers involves some important trade-offs on both accounts.

Most teachers are covered by defined benefit (DB) pension plans (Hansen 2010). Generally speaking, DB pension plans guarantee retiring teachers an annuity payment for life based on their years of service and final average salary. While this structure may promote longevity in a general sense, careful inspection of the retirement and mobility incentives in DB plans raises several interesting questions. On closer examination, for example, the retirement incentives in many state DB pension systems look somewhat chaotic. Costrell and Podgursky (2007, 2009) show that pension wealth accumulation in DB plans can, as in the case of Ohio, be characterized by erratic "peaks" and "cliffs"—substantial gains and losses that "have no underlying economic [or policy] rationale" (2007, p. 7). But even when retirement incentives are less complicated (e.g., a single spike), their implications are not straightforward. On the one hand, clear incentive spikes may help contain costs by removing more

expensive, experienced teachers from the system who can theoretically be replaced by less expensive, newer teachers. On the other hand, incentive spikes may, in some circumstances, make effective staffing more difficult by encouraging teachers to retire (in their mid-fifties), regardless of their individual productivity or the difficulty of hiring a replacement.

The mobility incentives embedded in DB plans also involve trade-offs that raise important questions about effective staffing. Under DB plans, individuals are typically eligible to receive benefits only when they have taught in a particular state long enough to become vested; in the majority of states, vesting occurs after five years (Loeb, Miller, and Strunk 2009). While this encourages longevity, it also discourages people from becoming teachers who do not plan to remain in teaching for a career (or at least long enough to be vested), or who think that they might move from one state to another. In effect, people who teach and leave prior to vesting subsidize those who stay and receive benefits; put another way, to the degree that compensation funds are fixed in each year, DB plans favor compensating older, less mobile teachers over younger and more mobile teachers. The lack of reciprocity between state DB plans and long vesting periods may also encourage teachers to stay in locations where their skills are in surplus and discourage them from moving to states that might be struggling with shortages (Hansen 2010).

Worries about the trade offs embedded in DB plans (not to mention worries about solvency) have led to calls for redesign. Some reformers suggest that states should consider replacing or augmenting DB plans with alternative structures, in particular defined contribution (DC) plans or cash balance (CB) plans. The survey data we consider in this paper only mentions DC plans, so we focus on them here.[4] DC plans provide tax-deferred 401(k)-style savings accounts funded by worker and employer contributions, where the value of an employee's account becomes his or her retirement

[4] Like DC plans, CB plans include contributions to retirement accounts (though these accounts are "hypothetical") but they place the risk of low market returns on the employer, not the employee. For an explanation of CB plans see Hansen (2010) and Costrell and Podgursky (2007).

benefit. As is often pointed out, DC plans are far more common in the private sector than they are in the public sector.[5]

Any restructuring of education pensions along the lines of a DC plan is bound to be complicated. Unlike in the private sector, pension reform is generally limited to future employees in the public sector and so it creates multiple pension plans that have to be administered in a state's pension system (Hansen 2010). Given that DC pension reform involves a redistribution of risk from the employer to the employee, it is also likely to be politically contentious (Pear 2004). While the administrative and political dimensions of pension reform are important to understand, the issues we address in this paper are far closer to the ground and, in some ways, more rudimentary: How well do teachers understand their pensions? What are their preferences for pension structures?

These basic questions matter for several reasons. As Gustman, Mitchell, and Steinmeier (1994) note, in order for pensions to affect worker behavior, workers must "understand the risks they face, and value the insurance the pension provides" (p. 425). There is little evidence about teacher pension knowledge, but research from other sectors suggests that workers may not know much about their pensions: only half of the respondents in the nationally representative Health and Retirement Study, for instance, knew whether they were covered by a DB or DC plan (Gustman and Steinmeier 2002). As for teacher preferences toward pension structures these matter because of the importance of employee acceptability in compensation systems (Milkovich and Newman 1990) and because teacher preferences for pensions may vary across teacher characteristics in ways that have important implications for teacher quality. As with pension knowledge, pension preferences are largely unexamined among teachers. To help fill these knowledge gaps, we report on the results of an original survey of teachers in Washington State.

[5] Hansen (2010) explains that the private sector's shift to DC plans occurred in the 1980s and 1990s in part because of rule changes associated with the federal Employee Retirement Income Security Act (ERISA) of 1974, which increased the cost of operating a private sector DB plan. DC plans may also be popular because they are more attractive to some workers, such as younger workers with higher mobility rates (U.S. Department of Labor 2006)

Background on Teacher Pensions in Washington State

Washington State's teacher pension system, known as the Teacher Retirement System (TRS), includes three different plans, called TRS1, TRS2, and TRS3 (unlike teachers in some states, Washington State teachers are also in the Social Security system). Washington's system is unusual in that TRS1 and TRS2 are both traditional DB plans while TRS3 is a 'hybrid' plan, with both a DB and a DC component.[6]

TRS1

TRS1 covers teachers who were hired before 1 October 1977. It is a traditional DB plan that guarantees teachers a pension payment for life (and optionally for a survivor) based on their years of service—called "service credit years"—and the average of the salary of their two highest consecutive paid fiscal years—called "Average Final Compensation." The TRS1 monthly benefit formula is:

(2% x Service Credit Years (up to 30 years) x Average Final Compensation)/12 months

TRS1 teachers become "vested" (entitled to benefits) after five years. They become eligible to collect retirement benefits after either 30 years of service, at age 55 with 25 years of service, or at age 60 with at least 5 years of service. This means that a teacher who retires at age 55 with 29 service credit years and an Average Final Compensation of $50,000 would receive a $2,416.67 per month benefit [(2% x 29 x $50,000) /12]. TRS1 benefits increase after retirement by an automatic cost of living adjustment (COLA) at age 66. As with most DB plans, if a teacher leaves employment before retiring, she can withdraw her contributions with interest, but by withdrawing, she forfeits any right to a future retirement benefit and all employer contributions. Retiring members can also withdraw all or part of

[6] For full descriptions of the plans, including the complications of survivor benefits and the purchase of service credit years etc., visit www.drs.wa.gov/publications/Member/pubsubjlist.htm#handbook. Washington is not alone in offering plans with DC components. Other states with hybrid plans or DC options include Indiana, Oregon, Florida, Ohio, South Carolina, Alaska, and West Virginia (Hansen 2010).

their contributions plus interest and receive a reduced monthly retirement benefit.

TRS2

Coverage under TRS2 is a bit more complicated. This plan currently covers two groups of teachers: 1) those hired on or after 1 October 1977 and before 1 July 1996 who opted not to transfer to TRS3 (the plan that started in 1996, described below) and 2) teachers hired on or after 1 July 2007 who opt for TRS2 rather than TRS3.[7]

Like TRS1, TRS2 is a traditional DB plan that guarantees teachers a pension payment for life. It follows the same basic formula (2% x Service Credit Years x Average Final Compensation) and its vesting requirement is also the same (five years). Unlike TRS1, TRS2 bases a teacher's Average Final Compensation on his or her 60 highest-paid consecutive service credit months (instead of the two years used in TRS1). TRS2 benefit eligibility also differs. Under TRS2, teachers are eligible for retirement benefits when they are 65 years or older with at least five years of service. If they are 55 and have 20 years of service they are eligible for early retirement with reduced benefits. TRS2 offers three different Early Retirement Factors (ERFs) to calculate the reduction: one for teachers with at least 20 years of service and two for teachers with 30 or more years of service.[8] As with TRS1, TRS2 includes a COLA that increases benefits after retirement. The COLA is effective on July 1 of every year following the retiree's first full year of retirement. Teachers who leave before retirement can withdraw their contributions with interest, but they forfeit any future benefits and all employer contributions.

[7] TRS2 became an option for this second post 1 July 2007 group of teachers when the state legislature repealed Washington's gain sharing program; if the courts invalidate this repeal, new teachers would automatically be assigned to TRS3.

[8] One of the 30-year ERFs includes a slightly higher factor in exchange for stricter return-to-work rules.

TRS3

Until 30 June 2007, TRS3 covered all teachers hired on or after 1 July 1996 and teachers in the 1977-1996 window who opted to transfer from TRS2 to TRS3. New teachers hired on or after 1 July 2007 can select TRS2 instead of TRS3 (TRS3 remains the default).

Unlike TRS1 and TRS2, TRS3 is a "hybrid" plan that includes both a DB component and a DC component. The DB component is financed by employer contributions and its monthly benefit formula is similar to the other plans' formulas, except that the first term—the multiplier—is smaller:

1% x Service Credit Years x Average Final Compensation

Most of the other mechanics of the TRS3 DB component operate like those in TRS2. The plan provides normal retirement benefits at age 65 or reduced early retirement benefits at age 55 (using the same ERFs as in TRS2). However, TRS3 teachers have to wait longer for vesting: ten years instead of five.[9] The employer contribution to the traditional DB component changes to reflect the costs of the plan, following regular actuarial reviews (employer contribution rates have ranged from approximately 3% of pay in 2001 to 8% in 2008).[10]

The plan's DC component is, by contrast, employee-financed. Under this part of the plan, teachers choose how much of their compensation they want to contribute (they can choose from six contribution rates that range between 5% and 15% of their compensation), where their contributions

[9] Teachers with at least five service credit years are also eligible for normal benefits if they either earned 12 service credit months after their 44th birthday or earned the five service credit years in TRS2 prior to 1 July 1996.

[10] See www.drs.wa.gov/Employer/EmployerHandbook/default.htm. Although relatively invisible, the employer contribution rate may, depending on the underlying nature of the labor market, impact teacher wages: for example, if the contribution rate increases, the state legislature may decide to limit salary growth as it revises the state's salary schedule.

are invested,[11] and how and when they take payment. There is no benefit formula to calculate the value of the defined contribution account—it is simply based on the amount teachers contribute and the performance of their investments.

Despite Washington's complex participation rules, TRS3 is arguably the state's primary system looking forward (as already noted, TRS3 is the default choice for new hires). Accordingly, in the next section, we take a closer look at the wealth accumulation and incentives in its DB component.

Pension Wealth Accumulation in the DB component of TRS3

Figure 1 shows the inflation-adjusted pension wealth for the DB component of TRS3 for a hypothetical female teacher with a Bachelor of Arts degree who begins teaching at age 25 and works continuously until leaving service (recall that this same teacher would also have retirement savings under the DC component of TRS3, which are not shown here). Our underlying assumptions follow Costrell and Podgursky (2007, 2009).[12] We assume the teacher's salary follows the 2008-2009 salary schedule for Washington State and that over time it grows at 2.5% to adjust for inflation.[13] For discounting, we use a 5% interest rate[14] and the 'combined healthy' female mortality rates from the Society of Actuaries RP-2000 Mortality Tables. We discount back the value of future benefits for teachers who are eligible but too young to receive them.

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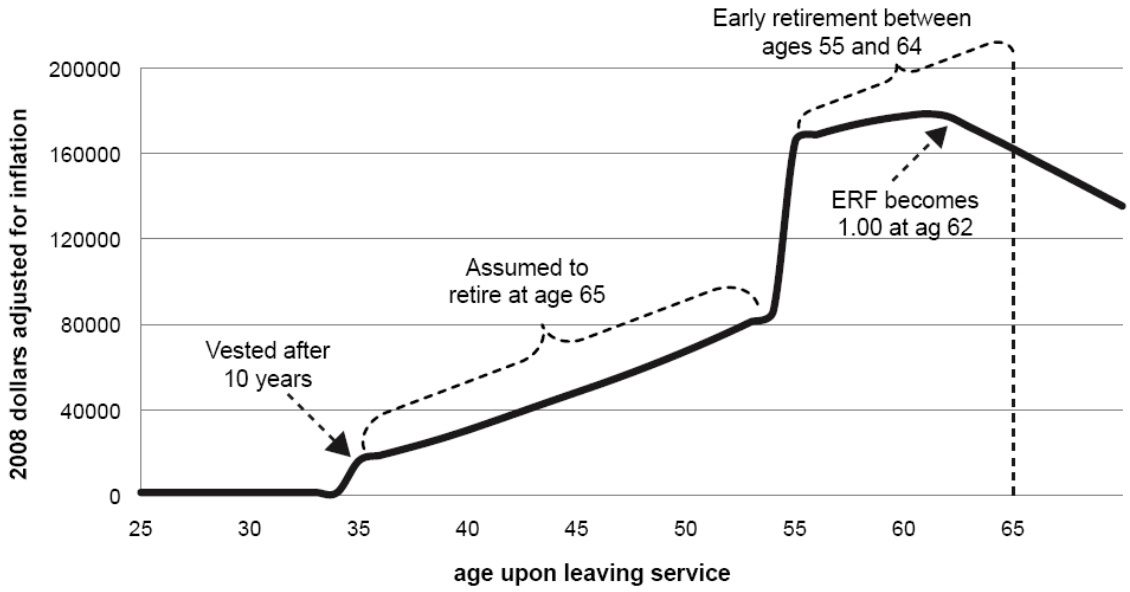
[11] Teachers can choose between two investment programs: a self-directed investment program or the default Washington State Investment Board (WISB) program.

[12] Here, pension wealth P at separation age a_s is: $P(a_s) = \sum_{a \geq a_s} (1+r)^{(a_s - a)} f(a \mid a_s) B(a \mid a_s)$ where $B(a \mid a_s)$ is the teacher's benefit at age a given that she separates at age a_s and $f(a \mid a_s)$ is the conditional probability that she survives to that age (the first term discounts the value of the benefit).

[13] Washington is among 21 states that have a statewide salary schedule (Burke 2005). For the most part state-level schedules are used to set minimum salaries; but Washington uses its schedule to set the maximum average salary for each district and to calculate state salary allocations to districts (Bergeson et al. 2004).

[14] Here we follow Costrell and Podgursky (2007, 2009). By way of further context, the U.S. government itself uses various official discount rates across different agencies (for the Office of Management and Budget, for example, see www.whitehouse.gov/omb/circulars/a094/a94_appx-c.html.

Figure 1. Pension Wealth in Washington State for the DB component of TRS3 with Early Retirement using ERF2008 (the most generous ERF)



Overall, figure 1 shows that pension wealth accumulation in the DB component of TRS3, like most DB plans, is uneven. Once vested, pension wealth climbs steadily during the first 20 years of teaching. Then, at age 55 and with 30 years of service, pension wealth rises sharply as the teacher becomes eligible for early retirement. The graph uses the state's most generous Early Retirement Factor (2008ERF), which allows teachers to collect full retirement benefits at age 62 with stricter rules about returning to work after retirement (i.e., "double dipping"). Teachers may also retire early if they have at least 20 years of service, with a variety of benefit reductions. Although we do not include such complexities in the figure, a teacher could theoretically work from age 25 to 45 and retire anywhere between the ages of 55 and 64 with a variety of early retirement reductions. In our simplified figure, the teacher's pension wealth plateaus after the early retirement period and eventually starts to decrease as the pension benefits that accrue from an additional year of work are more than offset by having one less year of expected benefits. By contrast, the pension wealth associated with the DC component of TRS3

would simply be a function of the teacher's contributions and the performance of his or her investments.

Washington's teacher pension system is, to put it mildly, complex, both in terms of its participation rules and in terms of its benefit rules and incentives. How well do Washington teachers understand their participation in this system? What are their preferences for a DB- versus a DC-style pension structure? How do knowledge and attitudes vary across teacher and school characteristics? To answer these questions we turn to a 2006 survey of teachers in Washington State.

Teacher Pension Knowledge and Preferences

The Washington State Teacher Compensation Survey

Our analysis is based on the Washington State Teacher Compensation Survey (WSTCS), an original survey sent to 5,238 teachers in the state of Washington during the spring of 2006. Teachers were selected using a stratified random sampling procedure based on the urbanicity of school districts in Washington State, the poverty level of schools, and the teacher's years of teaching experience (see the Appendix for administration details). Teachers were sent pre-notice letters (as were their principals) informing them of the study's purpose and that a survey would arrive within the week. Surveys were then mailed with a $10 incentive. Two weeks later, respondents were sent a postcard thanking them for their participation if they had already completed and returned the survey and if not, reminding them to return the survey. Four weeks after the initial survey mailing date, replacement paper surveys were sent to teachers who had not returned the survey. The survey included items (described below) that asked teachers about their pension plan—the TRS they participate in and how it works—and their opinion

about putting extra retirement dollars in a DB plan versus a DC plan.[15]

We include a total of 3,080 full-time classroom teachers in our analyses. This yields a survey response rate of just under 60% if we simply divide the number of completed surveys by the number of teachers sampled; however, when we take into account teachers' mobility and the fact that some teachers surveyed did not have classroom assignments (and so were ineligible for the survey), our upper bound response rate is closer to 75% (see Appendix for response rate details). In order to test the representativeness of the achieved sample to the sampling frame, t-tests for means were estimated for various teacher- and school-level characteristics; few significant differences were found. In the Appendix we present summary statistics for the teachers who responded to the survey and their schools.

Teacher Pension Knowledge

To gauge teacher pension knowledge we rely on two survey items. The first asks teachers to indicate their TRS plan.[16] The majority (68%) said they were in TRS3; 16% answered TRS1, and 11% answered TRS2 (4% were not sure). The second item asks teachers to describe how their plan works.[17] With this, our first take on teacher pension knowledge is to see whether or not teachers accurately describe how their self-reported plans work.

As table 1 shows, a majority of teachers in TRS1 and TRS2 describe their plan-type correctly. By contrast, less than half of teachers in the hybrid plan do (TRS3). In addition, relatively more of the TRS3

[15] For a full description of the survey administration see the Appendix.

[16] "Which of the following WASHINGTON STATE Teachers' Retirement Systems (TRS) do you belong to? TRS1; TRS2; TRS3; Not sure; Some other state system." (WSTCS Q29)

[17] "How does your WASHINGTON STATE TRS retirement plan work? (Circle One) A) It's a DEFINED BENEFIT plan that will provide me with a guaranteed monthly benefit when I retire (a traditional pension). My benefit depends on a formula that includes my years of service, multiplied by some measure of my salary (e.g., the average of my last two years of service), multiplied by some factor (e.g., 2%) B) It's a DEFINED CONTRIBUTION plan. My retirement benefit depends on how much I contribute to my account and how well my investments perform (similar to a 401(k) or 403(b) plan). C) My plan includes a COMBINATION of a defined benefit and defined contribution plan D) Not sure (WSTCS Q29).

members were not sure how to describe their plan (32% compared to 14% of TRS2 participants and only 8% of TRS1 participants).

Table 1. Percentage of Respondents that Correctly Described their Self-Reported Plans

	TRS1 (Traditional DB)	TRS2 (Traditional DB)	TRS2 (DB/DC Hybrid)
Correct	88.3%	73.7%	46.3%
Incorrect	4.2%	12.0%	21.7%
Not sure	7.5%	14.4%	32.0%
Observations	**495**	**336**	**2,042**

Note: Descriptive statistics are calculated using sampling weights; missing cases, people who are not sure about their plan membership, and people who report being in "Some other state system" are omitted and percentages rescaled.

It is worth keeping in mind, however, that we do not know whether teachers who answered "not sure" actually did not know how their pension worked, or whether they were not sure because of the way the survey asked the question (the same is true regarding plan membership on the previous item). Nevertheless, the marked differences in "not sure" results between the three groups are suggestive and not altogether surprising. Teachers in TRS1 are more likely to be advanced in their careers and relatively closer to retirement, so we might expect them to be more knowledgeable about their pensions. Moreover, some of the drop-off in knowledge among TRS3 teachers may be due to the fact that the mechanics of the "hybrid" plan are more complicated than the traditional DB plans.

Without data on the respondents' actual plan participation, we cannot directly evaluate whether they identified their plan participation correctly in the first place. We can, however, check on the accuracy of two sub-groups of respondents thanks to the participation requirements that were in place at the time of the survey.

At the time the survey was administered teachers hired prior to 1977 had to be enrolled in TRS1.

They could not participate in any other plan (no one hired post-1977 could join TRS1). Likewise, teachers hired after 1996 had to be enrolled in TRS3. At the time of the survey only teachers hired between 1977 and 1996 were allowed to choose either TRS2 or TRS3. To check whether or not the pre-1977 and post-1996 teachers identified their plan correctly, we place respondents in three different hiring windows: pre-1977; post-1996; and 1977-1996 (we infer hiring dates using state administrative data on their years of teaching experience in Washington). Looking at the responses in this way suggests that, for the most part, vast majorities of teachers in these two groups do know which plan they belong to (see table 2 below). But as we might expect, relatively more post-1996 hires were "not sure" about their plan participation (8.8% versus 1.5%). Surprisingly relatively more of the pre-1977 hires gave a wrong answer (18.8% versus 8.0%).

Table 2. Percentage of Pre-1977 and Post-1996 Hires that Correctly Identify their Plan

	Pre-1977 Hires (TRS1)	Post-1996 Hires (TRS3)
Correct	79.7%	83.3%
Incorrect	18.8%	8.0%
Not sure	1.5%	8.8%
Observations	**107**	**1,999**

Note: Descriptive statistics are calculated using sampling weights; missing cases and people who report being in "Some other state system" are omitted and percentages rescaled.

And so, somewhat contrary to the general notion that workers have low pension knowledge, teachers in Washington State appear relatively knowledgeable about their participation in the state's three pension plans; however, teachers enrolled in TRS3—the hybrid plan—were the least knowledgeable about how their plan functioned, perhaps because of the hybrid plan's complexity or perhaps because

these teachers were relatively farther from retirement than teachers in the state's two DB plans.[18]

Teacher Preferences for Plan Structure

To gauge teacher preferences for plan structure, we rely on an item from the WSTCS that asks teachers: "If you had an extra 10% of your current pay to invest in your retirement, would you prefer to put that money into a Defined Benefit plan (e.g., traditional pension) or a Defined Contribution plan (e.g., a 401(k) or 403(b))?" (WSTCS Q31). The question includes the statement, "Compared to a defined benefit plan, a defined contribution plan improves portability (you can take your retirement with you if you move) and increases investment choices, but it does not provide a guaranteed retirement benefit."

As the first column in table 3 shows, relatively more teachers preferred to invest in a DC plan (49%) than a DB plan (26%), though a large proportion (26%) were not sure.

Table 3. If Teachers Had an Additional 10% of Earnings to Invest in Retirement, what Type of Plan Would They Prefer to Invest In?

	(1) All respondents	(2) Respondents who correctly described how their current plan works	(3) Respondents who incorrectly described how their current plan works	(4) Respondents who were not sure how to describe how their current plan works
DB	25.9%	33.2%	21.9%	12.4%
DC	48.6%	48.2%	56.1%	44.2%
Not sure	25.6%	18.6%	22.1%	43.4%
Observations	**2,843**	**1,613**	**499**	**731**

Note: Descriptive statistics are calculated using sampling weights; missing cases (generally 1-2%) are omitted and percentages rescaled.

[18] As a practical matter, however, pension knowledge may not need to be very high in order for a teacher to gauge the costs and benefits of working versus retiring. This is because Washington's Department of Retirement Services (DRS) offers on-line benefit estimators that help teachers estimate their expected benefits. This is not to say that teacher knowledge is unimportant. Clotfelter et al. (2008), for example, show that the turnover effects of a targeted incentive program in North Carolina may have been diluted because teachers misunderstood eligibility requirements.

Columns 2, 3, and 4 in table 3 show these preferences broken out by how well teachers understand the way their self-reported pension plans work (i.e., could they describe them correctly?). Together, these results suggest that teachers who correctly understand the way their plans work (Column 2) may have a relatively higher preference for DB plans compared to those who misunderstand their plans or who were unsure about how their plan works.[19] Even so, the general pattern holds: teachers prefer the DC plan to the DB plan. Below we conduct multivariate analyses to explore more fully how these preferences vary across teacher characteristics. But before doing that, we want to mention several reasons to be cautious about these initial impressions. First, we must remember that the survey question asked about a marginal change—that is, where would teachers prefer to invest *additional* dollars? Teachers might have very different answers if asked to move away from a DB system wholesale. Second, it is worth noting that three months before the survey was administered, the Dow Industrial average closed at 11,011.90—the first close above 11,000 since 7 June 2001 (see www.djaverages.com/). Investing in the stock market looked like a very different bet in the spring of 2006 than in the spring of 2009.

Multivariate Analyses

In order to provide a more contextualized picture of teacher opinions, we conducted multivariate analyses that include measures of individual and workplace characteristics. In addition to the survey, we gathered secondary data on Washington State schools and teachers from several administrative sources: the Washington State S-275 personnel report; the Washington State Report Card, produced by the Office of Superintendent of Public Instruction (OSPI); and the Common Core of Data (CCD) produced by the National Center for Education Statistics (NCES).

[19] This is true for both teachers who understand the mechanics of their self-reported plan as well as those who correctly identified their plan participation (not shown here).

The S-275 is an annual personnel-reporting process that provides a record of certificated and classified employees working in Washington State's school districts and educational service districts (ESDs). The Washington State Report Card offers school-level achievement data, largely assessed by the Washington State Assessment of Student Learning (WASL), and student and teacher demographics. The CCD provides school- and district-level information for all public elementary and secondary schools in the United States, including general building information as well as student and staff counts. All three administrative sets of data were merged with our survey results (for more detailed data descriptions, see the Appendix.)

The WSTCS includes items that allow us to gauge teachers' satisfaction with the profession and their implicit discount rates, both of which theoretically may affect pension preferences. As a measure of teacher satisfaction, the WSTCS included a verbatim question from the U.S. Department of Education's Schools and Staffing Survey (SASS) (Q67a from the 2003-2004 SASS Teacher Questionnaire), which asked, "If you could go back to your college days and start over again, would you become a teacher or not?" with five possible responses ranging from "Certainly would become a teacher" to "Certainly would not become a teacher."[20] All else equal, we would expect that more satisfied teachers would be more likely to remain in teaching and would therefore prefer a DB plan.

To gauge teacher's time preferences (i.e., are they future-oriented or present oriented) we use an item from the WSTCS that asked: "Imagine that you have 20 more years left before retiring from teaching. If the state offered you the following options for a holiday bonus, which one would you prefer?" Respondents were given three sets of paired options; for each they were asked, "Which option do you prefer, 1 or 2?" (WSTCS Q32), as shown in table 4:

[20] Answers include (1) Certainly would become a teacher; (2) Probably would become a teacher; (3) Chances are about even for and against; (4) Probably would not become a teacher; (5) Certainly would not become a teacher. Although we do not present the results here, we also experimented with a second SASS question used by the WSTCS that asked teachers how long they intended to remain in teaching.

Table 4. Paired Options Used in Individual Discount Rate Question

Option 1		Option 2
An extra $10,000 that you will get in your first pension paycheck when you retire.	OR	An extra $2,100 that you will get in your next paycheck.
An extra $10,000 that you will get in your first pension paycheck when you retire.	OR	An extra $3,100 that you will get in your next paycheck.
An extra $10,000 that you will get in your first pension paycheck when you retire.	OR	An extra $4,500 that you will get in your next paycheck.

The amounts shown in column 2 correspond to three different implicit discount rates. For $2,100 *i*=.08, for $3,100 *i*= .06, and for $4,500 *i*=.04.[21] We use this question to categorize teachers into three bands: those with individual discount rates of *i*=.08 or higher (the most present-oriented group); those with individual discount rates lower than *i*=.04 (the most future-oriented group); and those with rates in between *i*=.04 and *i*=.06. All else equal, we would expect the most future-oriented group to prefer the DB plan—where the pay off is only accessible far into the future—and the most present-oriented group to prefer the DC plan—where the pay off is more immediately accessible for spending down, if taken as a lump sum, for example. As table 5 shows, proportionally more women than men fell into the most future-oriented group (with an implicit discount rate less than .04).

[21] Using the standard formula for present value: $PV = \frac{FV}{(1+i)^n}$, $i = (FV/PV)^{1/n} - 1.$

Consistent with most economic literature, this approach—exponential discounting—assumes that people have constant discount rates over time. In theory we could explore alternative models of discounting such as hyperbolic discounting which assumes a declining rate of time preference (Frederick, Loewenstein, and O'Donoghue 2002); such extensions, however, are beyond the scope of the paper.

Table 5. Implicit Discount Rate Responses by Gender

	Female	Male
.08 or higher	35.0%	40.3%
Between .04 and .06	31.8%	34.5%
Less than .04	33.2%	25.3%
Observations	**2,062**	**922**

Note: Descriptive statistics are calculated using sampling weights; missing cases as well as people who reported logically inconsistent answers (e.g., they selected Option 2 when choosing between $10,000 and $2,100 and Option 1 when choosing between $10,000 and $4,500) are omitted and percentages rescaled.

Although merging these various data sources allows us to connect information on teacher opinions to rich contextual data across a large sample of teachers, the usual cautions and caveats about the validity of cross-sectional survey research clearly apply (Babbie 2001).

We experimented with several models, including binary models that considered only those teachers who preferred DB or DC plans, and multinomial models that considered teachers' preferences for the two plans as well as the possibility that they were "not sure." Here we focus on the latter. We estimated a multinomial logit model where the dependent variable Y_i for each of the $i = 1.....3{,}080$ teachers in the sample indicated where they would invest an extra 10% of their pay for retirement so that:

$Y_i = 1$ if the teacher preferred a Defined Benefit (DB) plan

$Y_i = 2$ if the teacher preferred a Defined Contribution (DC) plan

$Y_i = 3$ if the teacher answered "Not sure"

The basic model is of the form,

$$Logit(P(Y = J) = \ln\left(\frac{P(Y = J)}{P(Y = 1)}\right) = \alpha_j + \beta_{j1} * X_i + \beta_{j2} * S_{ik}. \quad (1)$$

Teachers face J choices: a DC plan (J=2), "not sure" (J=3), and the default category, a DB plan (J=1). The dependent variable is the probability of choosing choice J versus preferring a DB plan, the ostensible status quo. In the baseline, we model the teacher's preference as a function of individual teacher characteristics X_i. The vector X_i represents a teacher's experience, college degree, gender, race, college selectivity, whether she has a math or science certificate, whether she has a math or science teaching assignment, household income, marital status, and whether or not she is a union member. Next we introduce the characteristics of the teacher's school *k*, S_{ik}. The vector S_{ik} represents urbanicity, grade level (e.g., high school), enrollment, student-teacher ratio, the percentage of students who are eligible for the free/reduced-price lunch program, and measures of student achievement in reading and math.

Finally, we experiment with additional controls (not included in equation 1) that include a teacher's satisfaction toward the profession, a teacher's individual discount rate, and a teacher's self-reported plan participation. In each case, the results correspond to two equations, one in which the dependent variable is the log of the ratio of the two probabilities P(J=2)/P(J=1) and one in which the dependent variable is the log of the ratio of the two probabilities P(J=3)/P(J=1). Coefficients represent the change in the log of the ratio of the two probabilities for a one-unit change in the predictor. For a more straightforward interpretation, however, we exponentiate the coefficients and present the results in terms of relative risk ratios.

Table 6 shows estimate results for three models. Although we might expect teachers with individual characteristics or work environments that are generally associated with attrition to prefer DC plans (i.e., those with math or science degrees and selective colleges or those working with larger proportions of poor and minority students or in low-performing schools), none of these factors is statistically significant. In the interest of space, our discussion and table 6 focus only on the main

variables of interest.[22] The model in column (1) includes only individual teacher characteristics as predictors; the model in column (2) adds school characteristics; and the model in column (3) adds dummies for satisfaction, a teacher's implicit discount rate, and her self-reported plan participation. Across all three models, the more experience a teacher has, the more he or she prefers the DB plan relative to the DC plan and relative to being not sure.

Table 6. Multinomial Logistic Regression Models Predicting Preference for Investing Additional Retirement Income, Expressed in Terms of Relative Risk Ratios

A. Outcome is Defined Contribution vs. Defined Benefit Key Variables[a]	(1)	(2)	(3)
Years of Experience 4-8	0.715*	0.722*	0.749
	(0.107)	(0.109)	(0.114)
Years of Experience 9-15	0.493***	0.486***	0.572***
	(0.068)	(0.068)	(0.083)
Years of Experience 15+	0.303***	0.295***	0.435***
	(0.042)	(0.042)	(0.067)
			(0.208)
Implicit Discount Rate 4-6%	…	…	0.900
			(0.106)
Implicit Discount Rate Less Than 4%	…	…	0.771*
			(0.078)
TRS2	…	…	1.105
			(0.213)
TRS3	…	…	2.215***
			(0.344)
TRS Not Sure	…	…	2.475**
			(0.702)

Table 6 cont'd on next page

[22] We also experimented with a reduced model that included only experience and teaching assignment as predictors. We wanted to see if math or science teachers might have different preferences than other subject-matter teachers (after all, given that they are more likely to leave the profession, we might expect them to prefer the DC plan). The results, however, do not suggest there are any differences by subject-area assignment. We also conducted sub-analyses of teachers with different levels of pension knowledge by running separate regressions for those who described their self-reported plan correctly, for those in the pre-1977 and post-1996 hiring windows who correctly identified and described their plans, and for teachers in these hiring windows who correctly identified their plan but did not correctly describe how it works. The results of these sub-analyses, however, were not substantively different from the full sample shown here. Finally, we also ran separate regressions for men and women given the differences in discounting shown in table 6. The results were qualitatively similar to the combined sample, but the magnitude of the experience predictors differed between men and women. However, based on post-estimation Wald tests these differences are not statistically different, so we present the combined results here.

B. Outcome is Not Sure vs. Defined Benefit Key Variables	(1)	(2)	(3)
Years of Experience 4-8	0.657*	0.650*	0.674*
	(0.108)	(0.109)	(0.114)
Years of Experience 9-15	0.349***	0.345***	0.417***
	(0.061)	(0.061)	(0.078)
Years of Experience 15+	0.254***	0.245***	0.344***
	(0.039)	(0.039)	(0.059)
Implicit Discount Rate 4-6%	…	…	1.000
			(0.131)
Implicit Discount Rate Less Than 4%	…	…	0.855
			(0.100)
TRS2	…	…	1.014
			(0.235)
TRS3	…	…	1.693**
			(0.327)
TRS Not Sure	…	…	3.993***
			(1.241)
Observations	3,080	3,038	2,985
Wald chi2(48)	245.68	301.91	568.07
Prob>chi2	0.000	0.000	0.000
Pseudo R^2	0.0295	0.0333	0.0456
Log pseudolikelihood	-3122.381	-3064.8169	-2970.1445

[a]Referent group for experience is 3 years or less; referent group for the discount rates is 8%; the referent group for TRS2, TRS3, and TRS Not Sure is TRS1.

*significant at 5%; **significant at 1%; ***significant at .1%

Notes: Robust standard errors in parentheses. The models include the following additional predictors not shown: Model 1: Master's Degree or Better; Female; Black; Hispanic; Asian; Native American; College Selectivity; BA in math or science; School Type/Assignment Interactions (e.g., High school*Teaching assignment in math or science); household income; female*married interaction; member of teachers union; Model 2: same predictors as Model 1, plus the following school characteristics: urbanicity; school type (e.g., high school); school enrollment; ratio of teachers to students; % free/reduced price lunch; % special education students; % math proficient; % reading proficient; Model 3: same predictors as Model 2 plus teacher satisfaction index from the WSTCS.

Panel A, Column (1), for example, shows that teachers with 4-8 years of experience are about 29 percent less likely to prefer the DC plan to the DB plan than teachers with 0-3 years of experience, who are the referent group (the 29% comes from the difference between the coefficient and 1.00); teachers with 9-15 years of experience are 51 percent less likely to prefer the DC plan to the DB plan than teachers with 0-3 years of experience; and the most experienced teachers—those with 15 or more years

of experience—are 70 percent less likely to prefer the DC plan over the DB plan than teachers with 0-3 years of experience.

The same pattern of preferences holds in Columns (2) and (3); the pattern also holds for the comparison between Not Sure and DB plan in panel B. The results in Column (3) also suggest that teachers who are members in TRS3 and teachers who are not sure about their plan participation prefer the DC plan (Panel A) and are more likely to be unsure relative to the DB plan (Panel B). Teachers in TRS3, for example, are 122 percent more likely than those in TRS1 (the referent group) to prefer the DC plan over the DB plan; those who are not sure about their plan participation are 148 percent more likely to prefer the DC plan over the DB plan (Panel B shows that both groups are also more likely to be unsure about the option they prefer relative to the DB plan). Finally, as we might expect, teachers with low discount rates (less than 4%) are 23 percent less likely to prefer the DC plan to the DB plan relative to teachers with high discount rates (8% or higher, the referent group).

On balance, these results support the intuition that veteran teachers have different pension preferences than new entrants into the profession: compared to newer teachers, more-experienced teachers are more apt to say they would invest additional retirement income in a DB plan, rather than a DC plan. By contrast, newer entrants enrolled in TRS3 are more apt to prefer investing in a DC plan relative to a DB plan (and are more apt to say they are unsure, relative to preferring a DB plan). As we noted above, when we performed separate analyses on subgroups of teachers with different amounts of pension knowledge, the results were substantively similar.

Conclusion

When a new teacher is hired, her (his) retirement seems far in the future. The rules governing plan participation and benefits may be confusing. From a policy maker's perspective, a teacher's retirement is easy to ignore when faced with pressing concerns about teacher recruitment, hiring, and development. And yet, over the course of a career, the deferred compensation associated with a teacher's pension represents a substantial benefit and may carry substantial and uncertain costs for his state; it may make it less attractive for a teacher to move to another state to teach; it may encourage him to leave teaching when he still has many good years left. Although these and other aspects of the pension promise are often in the background, policy makers concerned about the solvency of pension plans and desperate for ways to impact the teacher workforce may inevitably start paying more attention to them.

Our analysis considers two fundamental questions about the issue: How well do teachers understand their pensions? What do they think of alternative pension structures? The results suggest that teachers in Washington State actually have a fair understanding of their pensions. For the most part, they know which plan they are in. However, when it comes to describing how their plans work, newer hires appear less knowledgeable than veterans, and teachers who participate in the state's TRS3 hybrid pension plan appear less knowledgeable than those who participate in the state's traditional DB plans. This is not all that surprising given that new entrants into the labor market are likely to have different expectations about the nature of their careers and retirement options than more senior teachers, and also given the complexity of the hybrid plan. As for preferences for plan type, we find that teachers may be willing to entertain alternatives to the status quo, at least when they think about investing additional retirement savings, but that teachers with more experience show a preference for DB plans.

Some might take these findings to suggest that DC-style pensions may make teaching more attractive to future teachers but many questions about the relationship between teachers and pensions remain. Barring a direct test of how teachers respond to different pension arrangements (e.g., altering pensions by design and observing the results on teacher quality and retention), there is potentially much to learn from studying states like Washington, where teachers can choose from a variety of pension systems and, at least within TRS3, can even choose different retirement contribution rates. New data systems that support value-added estimations of teacher effects in Washington make it possible, for example, to investigate the relationship between pension preferences and estimates of teacher effectiveness. If combined with data on actual retirement plan participation, these longitudinal data systems would make it possible to look at how a teacher's revealed preferences for pension plans change over time and how they relate to her (his) mobility and attrition behavior. Understanding these relationships matters because they speak to a core assumption behind many calls for reforming teacher compensation: that more varied pay structures will be more appealing to productive teachers. Despite all of the attention paid to teacher quality and teacher pay, there is much to learn about the way this fundamental idea actually plays out in public education.

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Appendix

Sampling Procedures

The sampling frame of Washington State teachers was generated from the S-275 report for the 2003-4 school year. From the database, we identified 48,136 full-time public school classroom teachers based on school building codes, contracted hours per day and number of days, percentage of contract actually worked, and assignment duty codes for teaching staff (31, 32, or 33) out of 56,412 personnel.[23] In order to identify "current" teachers, the sampling frame was restricted to only school facilities listed as operational or "open" for the 2003-4 school year, according to the Washington State OSPI and the U.S. Department of Education. The resulting sampling frame was comprised of 47,229 classroom teachers and 1,903 school buildings.

To arrive at our sample of classroom teachers, we generated a stratified sample based on district, school, and teacher characteristics reported in the secondary data sources. Specifically, teacher selection was based on the metropolitan status of the district, poverty level of the school, and experience level of the teacher. Our district metropolitan-status measure classified a district as serving either an urban, suburban, or rural locale. Following a similar variable construction scheme as the Schools and Staffing Survey (SASS), district urbanicity is a 3-level collapse of the CCD's 2003-4 categorization of district locale with districts serving a large or mid-size central city classified as urban, urban fringe or large town designated as suburban, and small town or rural locales defined as rural districts.[24] Using the measure of the percentage of students receiving free/reduced-price lunch (FRL) from the 2004-5 Washington State Report Card, we defined three levels of school poverty by dividing

[23] Full-time status was defined as personnel contracted to work at least six hours a day and 180 days during the school year and actually worked within one week of their assignment contract.

[24] The CCD categorizes districts' metropolitan status according to the location of school buildings and uses eight designations: large city [1], mid-sized city [2], urban fringe of a large city [3], urban fringe of a mid-sized city [4], large town [5] and small town [6], rural outside Core Based Statistical Area (CBSA) [7], and rural inside CBSA [8]. CBSA refers to a geographic area with a population of between 10,000 and 50,000.

the FRL distribution into thirds.[25] This procedure produced three categories: low poverty (0 to 27 percent receiving FRL), moderate poverty (28 to 46 percent), or high poverty (47 to 100 percent). Finally, teachers taken from the S-275 personnel file are grouped according to three experience levels: 0 to 5 years of experience, 5 to10 years of experience, and 10 or more years of experience. These stratification variables generated a sampling grid containing 27 cells (total possible combination of teachers in each of these categories).

Using SAS PROC SURVEYSELECT procedures, teachers who fit the appropriate criteria were randomly selected to fill each cell in the sampling grid. Our project budget allowed us to sample 185 teachers per cell, generating a stratified random sample of 4,995 teachers. Prior to mailing the surveys, 25 teachers were pulled from the original sample due to teaching assignments in non-traditional schools (for example, juvenile detention center). An additional 268 teachers were later sampled to replace teachers working "ineligible" assignments (see Survey Administration below for details). The total sample included 5,238 Washington State teachers.

Survey Administration

The WSTCS was conducted in March 2006 based on a stratified random sample of all teachers in Washington State. As noted in the text, teachers were sent pre-notice letters (as were their principals) informing them of the study's purpose and that a survey would arrive within the week.[26] Surveys were then mailed, each of which included a $10 incentive. Two weeks later, respondents were sent a postcard thanking them for their participation if they had already completed and returned the survey and if not, reminding them to return the survey. Four weeks after the initial survey mailing date, replacement paper surveys were sent to teachers who had not returned the survey.

[25] The 2004-5 wave of the Washington State Report Card was used instead of the 2003-4 reporting due to a high proportion of missing values in the proceeding year (roughly 20 percent missing compared to 8 percent). Given the high correlation between the two measures (0.89), we were confident in substituting the later year.

[26] All survey-related materials were mailed to the teacher's school.

At the time of the second mailing of the paper surveys, a second wave of teachers was randomly selected from our sampling pool to replace "ineligible" respondents from the first sample. A teacher was classified as ineligible if the response to the survey question, Are you a classroom teacher? was "No."[27] In order to determine the eligibility of non-respondents, we consulted current (2005-6 academic year) district and school websites for teacher rosters from which participants were identified by first and last name. Identified participants were deemed ineligible for the survey if they were listed as working in a non-classroom teacher assignment (for example, Learning Center, Resource Room, Special Services, Reading Specialist, and so on).

In total, 268 teachers were sampled as part of the second wave of teachers (219 ineligible respondents and 49 identified via on-line rosters). Following the procedures of the first wave, teachers were mailed pre-notice letters, followed by a survey with a $10 incentive a week later. Unlike the first wave of teachers, participants selected for the second wave were not sent a reminder postcard or a second paper survey.

Response Rates

Survey designers have increasingly called for great transparency in reporting response rates, noting that few researchers explain how rates are calculated or estimate inflated rates by simply eliminating units from the denominator (Lohr 1999). Following this advice, we report several different response rates for the WSTCS. Generally, survey research standards purport a 60 percent response rate as a standard for "acceptability," although higher rates are clearly better (Dillman 2000).

[27] A classroom teacher was defined for participants as "teachers who have responsibility for instructing a full class of students on a daily basis. Other teachers, who instruct small groups of exceptional or remedial students in pull-out programs or specialist teachers, such as art, science, or computer science teachers who move from classroom to classroom to teach a particular subject, need not complete the survey".

For this study, the most conservative estimate—dividing the number of "complete-eligible" surveys by the total number of teachers sampled—places our response rate at 59 percent (3,121/ 5,238) (See table A1 for Descriptive Statistics).

A complete-eligible survey refers to a returned survey from a sampled participant who identified herself or himself as a classroom teacher and responded to the remaining survey questions. A total of 256 surveys were classified as "complete-ineligible" whereby a sampled participant identified herself (himself) as a non-classroom teacher. In addition to these complete-ineligible respondents, 55 of the sampled teachers were identified by the school's staff as no longer working at their 2003-4 school. When removing these known ineligible surveys from the total number of teachers sampled, our response rate increases to 63 percent (3,121/4,927).

While this readjusted rate is above the acceptable threshold, we suspect our response rate may be better given that our sampling frame of Washington State teachers represents a difficult-to-reach population. First, despite using the most-recent S-275 Personnel Report available for the WSTCS, the list of teachers was two years removed from the onset of the project. This lag between teachers' location in the teaching profession and start of the survey project is noteworthy when considering the rate at which teachers switch schools or exit the teaching profession entirely. Drawing on data from the 1999-2000 SASS and the related 2000-1 Teacher Follow-up Survey (TFS), the National Center for Education Statistics reports that 15 percent of public school teachers did not teach in the same school from one school year to the next, with 8 percent transferring to a new school, 3 percent taking a job outside of teaching, and almost 2 percent retiring. Applying this mobility rate to our sample of teachers, taking into account a two-year lag, we can conservatively anticipate 2.25 percent of our sample, or nearly 120 teachers, experiencing some movement in the teaching profession.

Second, there is reason to believe a portion of non-respondents worked assignments considered ineligible for the study (such as 'non-classroom teacher') and thus chose not to return their survey. A

number of returned surveys from ineligible teachers were accompanied with a written note expressing displeasure with being excluded from the study. For instance, one respondent wrote, "It has taken me some time to return this survey to you because I have really struggled with what to do. I am a special education teacher and, therefore, I am not supposed to answer the survey. I was tempted to do so anyway, however, in the end my personal ethics would not allow me to do so." Another teacher commented, "I still am assigned classrooms. I am required to submit grades for them—why isn't my workload being considered in this study?" Other teachers, who worked eligible assignments in previous school years, expressed similar dissatisfaction. Overall, these comments were typical of ineligible respondents and suggest some propensity toward not responding.

In order to gain some purchase on teachers' mobility in and out of the profession and eligibility for the study among the 1,770 non-respondents, we consulted current (2005-6 academic year) staff/teacher rosters on school and district websites. Identifying teachers by first and last name, a participant was classified as ineligible if he or she was listed as working a non-classroom assignment (for example, Learning Center, Resource Room, Special Services, or Reading Specialist). A total of 41 teachers were identified as working an ineligible assignment. Determining if a teacher no longer worked at a school posed a greater challenge, whereby identification was made if a participant's name was not found on the current school or district roster. While taking great pains to classify a sampled teacher as no-longer-working-in-the-same-school only if rosters were up-to-date (for example, specifically identify the staff as 2005-6, staff/teacher websites and profiles, teacher email addresses), the likelihood of misidentifying a teacher is high. Thus, our count of 760 teachers classified as no-longer-working-in-the-same-school should be interpreted cautiously.[28]

Taking into consideration teachers' mobility and assignment eligibility among non-respondents along with the known-respondents places our response rate at an upper limit of 75 percent. Again,

[28] A total of 969 non-respondents could not be identified as either ineligible or no longer working at their same school. Only 37 of the surveyed teachers directly refused to participate.

given the high degree of uncertainty regarding our estimate of teachers no-longer-working-in-the-same-school, our response rate likely falls closer to 65 percent.

Administrative Data

Our secondary data on Washington State schools and teachers come from three sources: the Washington State S-275 personnel report; the Washington State Report Card, produced by the Office of Superintendent of Public Instruction (OSPI); and the Common Core of Data (CCD) produced by the National Center for Education Statistics (NCES).

The data items in the S-275 report fall into four categories: demographic information, state Legislative Evaluation and Accountability Program (LEAP) placement information, contract information, and assignment information. Demographics collected on each employee include the individual's name, certification number, age, gender, and ethnicity. LEAP placement information is collected for individuals with at least one duty assignment as a certificated employee. The data reported include highest degree type (bachelor's, master's, doctorate, vocational, and so on), year highest degree was awarded, academic and eligible in-service credits, and certificated years of experience. The contract information provides data on the certificated-based contract hours per full-time equivalent (FTE) day and the contracted number of days, final salary, and annual insurance and mandatory benefits. Assignments are distinguished by five variables: building, program, activity, duty, and grade group (PK, K, elementary, middle, and secondary).

Data contained in the Washington State Report Card include student performance information on the WASL, a summary of each school's adequate yearly progress, and student and staff demographics. The WASL scores are reported as the percent of students meeting state standards on

subjects of mathematics, reading, writing, and science, respectively.[29] Adequate yearly progress, as required by No Child Left Behind (NCLB), reflects a school's performance on the WASL in mathematics and reading according to a state-set level of proficiency. Generally demographics are also provided and include student group counts and staff experience and education data.

The CCD database on public schools reports general building information and student and staff information. General building data encompass names, addresses, and telephone numbers; types of schools (regular, special education, vocational, and alternative); operational status; school flags (charter, magnets, Title I, and Title I School-wide); and level of school. Student demographic data include items such as membership counts by Pre-K-12 and ungraded, counts of FRL-eligible and migrant students, and counts by race/ethnicity. The staffing information includes FTE classroom teacher counts and pupil-to-teacher ratio.

[29] Reading and mathematics performance is assessed for grades 3-8 and 10, while writing and science performance is assessed intermittently during these grades.

Table A1. Descriptive Statistics

Variable	Mean
School Factors (N =1,316)	
Community Type:	
Urban	.27
Suburban	.52
Rural	.20
School Type:	
High School	.23
Middle School	.22
Elementary School	.55
School Enrollment	582.97
Ratio of Students to Teachers	16.73
Eligible for Free/Reduced-Price Lunch (%)	41.82
Special Education Students (%)	12.54
Math Proficiency (%)	53.36
Reading Proficiency (%)	73.32
Teacher Factors (N= 3,121)[a]	
Experience (years)	13.72
Household Income (per $1,000)	88.46
Master's Degree or Better (=1)	.62
Bachelor's in Math or Science (=1)	.08
Teaching Assignment in Math or Science (=1)	.15
College Selectivity[a]	
Selective	.23
Competitive	.66
Less Competitive	.09
International/Unknown	.03
Female (=1)	.67
Black (=1)	.01
Hispanic (=1)	.02
Married (=1)	.74
Member of Teachers Union (=1)	.96

[a]Calculated using sampling weights.