School Finance Redesign Project

center on reinventing public education

TEACHER ATTITUDES ABOUT COMPENSATION REFORM:

IMPLICATIONS FOR REFORM IMPLEMENTATION

Dan Goldhaber
Center on Reinventing Public Education

Michael DeArmond
Center on Reinventing Public Education

Scott DeBurgomaster
Center on Reinventing Public Education

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Daniel J. Evans School of Public Affairs
University of Washington

The School Finance Redesign Project

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Introduction

Today there is a growing chorus of education advocates, analysts, and policymakers for reforming teacher compensation (Center for Teaching Policy 2007; Committee for Economic Development 2004; Prince 2002; The Business Roundtable 2000; Hassell 2002; Ballou and Podgursky 1997; Kelley and Odden 1995). By contrast, public school teachers—and especially teachers unions—are often characterized as opponents of such reforms (Moe 2003; Paige 2007). Some opinion polls appear to bolster this view of teachers. For example, the well-regarded public opinion research organization Public Agenda surveyed 1,345 public school teachers in the spring of 2003 about their views on unions, merit pay, and other hot-button topics. The survey included a question about whether school districts should pay teachers for things (unspecified) besides experience and graduate credits. Half of the teachers said changing the compensation system would "open up a can of worms" (Farkas et al. 2003). In Public Agenda's focus groups, teachers expressed a "visceral resistance" to the idea of linking pay to student test scores (Ibid, 25).

On closer examination, however, teacher attitudes about compensation reform are not so simple. When Public Agenda asked whether teachers "who work in tough neighborhoods with low-performing schools" should receive extra pay, 70 percent of the teachers surveyed said yes, and 67 percent thought that teachers "who consistently work harder, putting in more time and effort than other teachers" also deserved extra pay. Twenty years earlier, in the 1980s, a poll by the National School Board Association found that 63 percent of teachers supported merit pay (Rist 1983). But a nearly contemporaneous poll, conducted by the Gallup Organization and Phi Delta Kappa in 1984, found just the opposite: 64 percent of teachers opposed merit pay (Elam 1989). Elsewhere, an analysis of late-1980's data on teacher attitudes from the U.S. Department of Education's *Schools and Staffing Survey* (SASS) found that "teachers of disadvantaged and low-achieving students are, if anything, more supportive of merit pay than the average teacher" (Ballou and Podgursky 1993, 60). More recently, Phi Delta Kappa's 2000 teacher poll found that a slim majority of teachers favor "tying pay to performance," but very few (3 percent) are willing to use student test scores as a factor in determining salaries (Langdon and Vesper 2000). A recent poll by the Teaching Commission (2005) found that two-thirds of the general public, and one-third of teachers, favor raising pay if the increases were tied to performance.

This presents a confusing picture about what teachers think of compensation reform—depending on the poll, they are either for or against it. Part of the problem, of course, is that it makes little sense to talk about reform in the abstract. When it comes to specific proposals—combat pay for difficult working conditions versus merit pay, for instance—teachers in some polls appear to draw distinctions. Public Agenda's teachers favor the former and oppose the later. Similarly, it makes little sense to refer to teachers in the abstract. Teacher opinions may vary by both individual and workplace characteristics. The interests of a young teacher working in a low-performing, high-poverty school may be different than those of a veteran teacher working in a high-performing, low-poverty school; a high school biology teacher's interests may be different than those of an elementary school teacher. And yet, except for Ballou and Podgursky's analysis of the SASS (1993), prior studies generally do not account for how individual and workplace contexts might influence teacher attitudes.[1] If individual and workplace characteristics

[1] Public Agenda does, however, break out its descriptive results by newcomers (<5 years) and veterans (>20 years).

differentially and systematically inform how teachers feel about compensation reform, attempts to gauge teacher opinion in general can tell policymakers only so much. If, however, policymakers have a sense of how teacher opinion varies by context, they may be able to move away from asking sweeping questions about which reforms are "implementable and will work" and toward more useful questions about which reforms are implementable and will work *under what conditions* (Honig 2006).

At the same time, the importance of teacher attitudes, contextualized or not, depends on the assumption that teachers' career decisions are, in fact, responsive to financial incentives. This may seem self-evident, but most people are also familiar with the popular counter-argument that "teachers aren't in it for the money." If that is the case, teacher opinions about compensation may be largely beside the point. Interestingly, although studies suggest that teachers do in fact respond to differences in wages (Baugh and Stone 1982; Dolton and van der Klaaw 1999; Murnane et al. 1991; Stinebrickner 2001), the effects are fairly small (Hanushek et al. 2005; Imazeki 2007). Some studies find no statistically significant wage effects on teacher mobility and instead suggest that teacher choices are influenced by working conditions and school culture (Ingersoll 2001; Smith and Ingersoll 2004).[2] And so, in the background of conflicting opinion polls about compensation reform is the broader question of whether or not the entire discussion is simply barking up the wrong tree.

In this paper, we present the results from our analysis of data from a recent survey of Washington State teachers merged with administrative data on individual and workplace characteristics. We consider how teachers view compensation reform, and whether they prefer improvements in compensation or improvements in working conditions. On balance we find that teachers prefer pay reforms that reward criteria over which they have more control, such as work location or subject area. Teachers are far less supportive of pay reforms that link rewards to performance, but they also express interesting differences of opinion. Veteran and female teachers are less supportive of pay reform in general, whereas secondary teachers are more supportive of certain reforms, including merit pay and subject-area bonuses. Interestingly, support for merit pay is higher among teachers who have positive impressions about their principals and negative impressions of their fellow teachers, and lower among teachers who hold their fellow teachers—but not their principals—in high regard. In sum, these findings suggest that pay reforms—especially wage differentials for working conditions or subject-area skills—may be more likely to be implemented successfully if they include opt-in provisions for veteran teachers and, in the case of merit pay and subject matter differentials, if they focus on secondary teachers. The findings also suggest that policymakers may want to consider experimenting with the most popular reform first: extra pay for difficult working conditions, or so-called combat pay.[3]

[2] Some argue that changes in working conditions, rather than compensation, might be a more effective way to affect teacher choices. Reed, Reuben, and Barbour (2006) found, for example, that a professional development program—California's *Beginning Teacher Support and Assessment* (BTSA) program—was more effective and efficient at increasing teacher retention than were increases in starting salaries. Based on a recent survey of California teachers, Futernick (2007) similarly argues that teachers are more concerned with working conditions than compensation when it comes to decisions to stay in or leave the profession.

[3] Although support for combat pay is high among teachers (favoring policy implementation) one can imagine that community politics might hinder policy adoption.

The paper is laid out as follows: the next section presents background on compensation reform and why teacher attitudes matter; then, we describe our data and methods; next, we present our results; and finally, we conclude with policy implications and thoughts about further research.

Background

Under the status quo, the overwhelming majority of local school districts (upwards of 90 percent) pay teachers according to published pay tables, known as single salary schedules (Strizek et al. 2006). These district-level schedules typically reward two characteristics: experience and degree level.[4] In addition, 21 states, including Washington, also have *statewide* salary schedules (Burke 2005). For the most part, these state-level schedules set a minimum teacher salary. Washington, however, also uses its state schedule to set the maximum average salary for each district and, importantly, to calculate state salary allocations to districts (Bergeson et al. 2004; Plecki 2001). Although teacher salaries in Washington are technically negotiated at the local level, the state's allocation method creates a *de facto* constraint on local salary variation. School districts, which get 70 percent of their funding from the state, receive only the amount of funding that their actual mix of teachers would garner on the state schedule.[5] According to state law, districts can exceed the state's limitations on salaries "only by separate contract for additional time, additional responsibilities, or incentives."[6] These supplemental contracts must use local dollars and cannot exceed one year in duration.

As with civil service compensation in general, a single salary schedule like Washington's has some straightforward advantages: everyone is rewarded equally based on objective criteria, and the system is predictable and easy to understand. These advantages notwithstanding, critics argue that such salary structures have several shortcomings: they reward characteristics that are only weakly connected to teacher quality (Hanushek 1986; Hanushek and Rivkin 1997), they fail to recognize that some teaching jobs are harder than others (Prince 2002), and they create high opportunity costs for people with special skills or abilities (Goldhaber et al. 2007; Goldhaber and Liu 2003).[7]

In response to these shortcomings, advocates, policymakers, and analysts have proposed several alternatives to the salary schedule, ranging from individual and school-based merit pay (perhaps the most well-known reform proposal), to compensating wage differentials for hard-to-

[4] First adopted to minimize racial or gender discrimination, the single salary schedule has now been in use in public education for almost a century (Odden and Kelly 2002).

[5] As of the 2006-07 school year, Washington's state schedule pays a teacher with a bachelor's degree and no experience $31,386; a teacher with a master's degree and no experience receives $37,386. The highest step on the schedule is $59,157 (16 years of service or more, plus a PhD or an MA+90 credits). Current WA state salary schedules (2005/06 and 2006/07) are available at http://www.k12.wa.us/safs/ under Frequently Asked Questions (FAQ). Of Washington's 296 school districts, 34 have "grandfathered" allocations that allow them to pay teachers slightly higher salaries than those delineated by the state salary schedule (our analysis suggests, however, that teaching in these districts does not have a strong relationship with one's attitudes about compensation reform).

[6] RCW 28A.400.200 (4)

[7] Some analyses suggest that the opportunity costs of teaching can approach $10,000 per year for a man with a technical major who graduated from a more-selective college (Goldhaber and Liu 2003). For both men and women, the opportunity costs of teaching grow over time; and while women may start their careers in teaching better off financially, they lose ground over time to women in the non-teacher labor market (Goldhaber et al. 2007).

hire subject areas, hard-to-staff schools, or special knowledge and skills. Governor Chris Gregoire's recent review of Washington's education system, called *Washington Learns*, puts many of these reforms on the policy agenda. The initiative's final report, for example, argues that the state should "compensate teachers for their performance" and "acknowledge assignments that are difficult [with extra compensation]" (Washington Learns 2006, 40).

Compensation reform proposals may be promising in the abstract—for instance, the higher marginal incentives associated with merit pay theoretically should attract higher-ability and less risk-averse people to teaching—but their actual effects are far from clear. A long line of studies highlights the difficulty of implementing merit pay in schools (Ballou 2001; Goldhaber 2002; Hatry, Greiner, and Ashford 1984; Murnane and Cohen 1986).[8] By contrast, there is little empirical evidence on the labor market effects of rewarding teachers for meeting certain standards or competencies, such as National Board for Professional Teaching Standards certification, or for providing extra pay for hard-to-staff schools or hard-to-hire subject areas, although new evidence suggests that higher salaries might be effective for retaining teachers in high-poverty schools (Clotfelter et al. 2006).

Regardless of their merits, whether or not districts and states can successfully adopt and implement any of these reforms ultimately depends on political dynamics and teacher attitudes. Teachers unions clearly play an important role when it comes to adopting reforms (Goldhaber et al. 2007; Koppich 2006; Moe 2006), either by forcing accommodations, blocking reforms, or actively encouraging and sustaining them. Union leaders also play an important role after adoption (they still hold the formal power to make binding decisions on behalf of teachers), but the actions and interests of individual teachers also become more relevant. As Boyd et al. (2003) note, teachers are the only school-based resources that actually have preferences about whether to teach, what to teach, and where to teach. As the targets of compensation policies, teachers and their preferences clearly inform policy. Local misgivings among teachers in Florida, for example, impeded the implementation of that state's merit pay plan, called *Special Teachers Are Rewarded* (STAR) (Fineout 2007). Even with $147.5 million dollars at stake, some Florida districts refused to carry out the STAR reforms and others reluctantly designed plans that they hoped would never be used (Ibid; Weber 2006). Eventually the state decided to rethink the entire initiative and replace it with a revised plan called the *Merit Award Program* (MAP).

On the whole, if we accept that teachers' views on compensation reform are important, and that their attitudes are influenced by individual and workplace characteristics, policymakers might be able to avoid problems like those encountered in Florida if they can make distinctions about the attitudes of sub-groups of teachers and schools. Knowing which types of teachers working under which conditions are more open to experimentation might increase the odds that reforms receive a fair trial. Contextualized information about teacher attitudes is not the only data that policymakers interested in experimentation need, but without it the prospects for compensation reform are arguably more uncertain.

[8] A smaller collection of studies suggests merit pay reforms have more potential (Clotfelter and Ladd 1996; Dee and Keys 2004; Lavy 2002).

What Affects Teacher Attitudes?

We take the straightforward view that individuals' attitudes about compensation reform are a function of their personal attributes as well as their work context. We expect, for example, that individuals will support various compensation proposals to the degree that the proposals aid or reward people like themselves (Katz 1960). As for work context, we expect that teachers working in low-performing schools will be more supportive of some compensation reforms. In particular, we expect they will support combat pay, as they are the likely targets for increased compensation due to job difficulty. In addition, because concerns about fairness are often cited as a reason that teachers oppose pay reforms (Hatry et al. 1984; Middleton 1989; Murnane and Cohen 1986; Porwoll 1979), and because research suggests that schools with high levels of social trust may be more likely to adopt innovations (Bryk and Schneider 2002), we also expect that individuals who work in schools with more trusting professional relationships will be more likely to support compensation reform.

Data and Methods

Data

Our analysis of teacher attitudes 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. The WSTCS utilized a stratified random sample of all public school teachers in the state. In order to explore how teacher attitudes vary by context, we merged the survey results with administrative data on teacher characteristics such as certification status and education from Washington State personnel files and with Washington State data on school characteristics such as student demographics and school performance. Appendix A provides a table describing our final sample of 3,120 full-time classroom teachers. A detailed discussion of the administrative data sets, the survey design, and our response rates is provided in Appendix B. We describe our variable coding in Appendix C.

The WSTCS asked teachers how they felt about giving extra pay to each of the following types of teachers: (1) teachers who specialize in hard-to-fill subjects, such as science and mathematics (subject-area pay); (2) teachers who work in tough neighborhoods with poorly performing schools (combat pay); (3) teachers whose students make greater gains on standardized tests than similar students taught by other teachers (merit pay); and (4) teachers who receive accreditation from the National Board of Professional Teaching Standards (NBPTS), a voluntary program of national certification (NBPTS incentive). Responses were measured on a 4-point Likert-type scale from 1 (strongly opposed) to 4 (strongly favor). These WSTCS questions mirror items in the 2003 Public Agenda survey and some of the 1987-88 SASS items analyzed by Ballou and Podgursky (1993), to allow for meaningful comparisons.

The WSTCS also included several items that went beyond prior surveys of teacher opinions. It asked how much of a differential (in dollars) respondents thought was fair for each type of teacher, and it forced them to rank their support for providing extra pay to each type of teacher. In addition, the survey included questions about preferences for guaranteed income versus cost-equivalent changes in working conditions (for example, $5,000 versus an additional 3.5 hours of prep time each week).

Table 1 shows WSTCS respondents' support for various types of incentive pay. Of the four different types of incentive pay, respondents were most in favor of giving extra pay to teachers who work in tough neighborhoods with low-performing schools (72 percent favor, 28 percent strongly favor). This strong support mirrors the results of both the 2003 Public Agenda survey (70 percent net favor) and Ballou and Podgursky's 1987-88 SASS analysis (77.2 percent net favor), although the SASS items they used referred to, "a high-priority situation (e.g., in an inner-city school)" rather than work in "a tough neighborhood with low-performing schools." Surprisingly, very few of the teachers that we surveyed (only 0.1 percent) reported being in a district that offered combat pay, suggesting (at least anecdotally) that teacher opposition is not the primary explanation for the lack of combat pay in Washington State.[9]

Compared with their attitudes toward combat pay, WSTCS respondents were far less inclined to favor subject-area pay, merit pay, and NBPTS incentives, and, in general, they showed lower levels of support for all of these reforms than the Public Agenda survey and 1987-88 SASS respondents did. For example, 41 percent of the WSTCS teachers favored subject-area pay, versus 42 percent of Public Agenda teachers and 54 percent of the SASS teachers. Only 17 percent of the WSTCS teachers favored merit pay, versus 38 percent of Public Agenda teachers and 55 percent of the SASS teachers. Regarding merit pay, it is worth noting that the while the WSTCS and Public Agenda survey items framed teacher performance in terms of student test scores, the 1987-88 SASS question asked teachers if they favor "*A merit pay bonus for exceptional performance in a given year*?*"* without specifying what "performance" means or how it might be measured. NBPTS did not yet exist in the late 1980s, and so we can only compare WSTCS support (46.8 percent net favor) to Public Agenda support (57 percent net favor).

WSTCS respondents' attitudes about what would be a "fair" incentive under each scenario reflect these general patterns of support and opposition, with higher values for combat pay (a mean of $4,280), lower values for merit pay (a mean of $1,195) and middling values for subject-area pay ($2,317) and NBPTS incentives ($2,136). If we exclude those who thought no amount of extra pay was fair (they answered $0), all of the values increase: merit pay rises to $3,125, subject-area pay rises to $3,922, combat pay rises to $5, 232, and NBPTS incentives rises to $3,201. By way of comparison, Denver Public School's *ProComp* compensation system offers teachers in hard-to-staff subject areas and schools a 3 percent bonus ($1,026 for a teacher earning $34,200) as well as an array of performance bonuses that, based on a $34,000 salary, would total around $2,000 (Denver Public Schools 2007).

[9] In fact, teachers reported that none of the incentives mentioned in the survey are widely used: only 0.4 percent said their districts offered incentives for hard-to-fill subjects; 0.1 percent said their districts offered merit pay; and 35 percent said their districts offered NBPTS bonuses (Washington offered a state NBPTS bonus of $3,500 during the 2005-2006 school year).

Table 1. Teachers' Attitudes Toward Different Pay Structures[a]

	Attitude Toward Incentives in General				Attitude Toward Incentive Amounts			
	Strongly Favor (%)	Somewhat Favor (%)	Somewhat Oppose (%)	Strongly Oppose (%)	Receive Incentive (%)	"Fair" Amount With "$0" (Mean/Med)	"Fair" Amount Without "$0" (Mean/Med)[b]	N
Subject-Area Pay	10.37	30.68	27.07	31.88				3,081
					0.28			3,120
						$2,317 / 1,000		2,848
							$3,922 / 3,000	1,780
Combat Pay	28.04	44.37	15.61	17.97				3,085
					0.03			3,120
						4,280 / 5,000		2,857
							5,232 / 5,000	2,378
Merit Pay	3.23	14.00	22.65	60.12				3,078
					0.04			3,120
						1,195 / 0		2,830
							3,125 / 2,000	1,115
NBPTS Incentive	12.17	34.60	23.34	29.90				3,074
					1.11			3,120
						2,136 / 1,500		2,837
							3,201 / 3,000	1,965

[a] Descriptive statistics are calculated using sampling weights.

[b] Excludes respondents who thought no amount of extra pay was fair.

Table 2 further explores the WSTCS results by showing how respondents ranked the four types of incentive pay. The findings for combat and merit pay are unambiguous: combat pay received the most-preferred ranks (1) and the least-unfavorable ranks (4). The opposite is true for merit pay. Only about 5 percent of respondents gave merit pay the top rank; 56 percent gave it the lowest. The direction of the other two types of incentive pay is less consistent. Respondents' preference for NBPTS incentives is fairly equally distributed among all four ranks, but slightly skewed toward the low ranking. Subject-area pay appears to be a middling preference: the responses are mostly in the middle (2s and 3s), with relatively few responses in the top and bottom ranks.

Table 2. Teachers' Rankings of Pay Structures[a]

	Rankings (%)				
	1	2	3	4	
	Most-Preferred			Least-Preferred	N
Subject-Area Pay	12.21	39.70	34.41	13.69	3,002
Combat Pay	63.19	24.37	9.94	2.50	3,021
Merit Pay	5.45	12.95	25.46	56.14	2,984
NBPTS Incentive	20.28	22.26	28.40	29.05	3,000

[a] Descriptive statistics are calculated using sampling weights.

Table 3 depicts the trade-offs between salary increases and working conditions, and shows that the WSTCS respondents generally preferred increases in salary.[10] Eighty-three percent of respondents said they preferred a salary increase of $5,000 to having two fewer students in all of the classes they teach, 88 percent preferred the increase to having a full-time teacher's aide who they share with four other teachers, and 69 percent preferred the increase to an additional 3.5 hours of prep time each week.

Table 3. Teachers' Preferences for Annual Pay Increases Versus Workplace Change[a]

	Prefer a $5,000 Increase (%)	N
Two fewer students in all of the classes you teach	82.70	3,066
A new full-time teacher's aide who splits time between your class and four other teachers at your school	88.04	3,057
3.5 more hours of prep time each week	69.34	3,056

[a] Descriptive statistics are calculated using sampling weights.

While these findings are suggestive, they treat all teachers and teaching jobs as the same. For a more contextualized picture of teachers' opinions, we need to account for both individual and workplace characteristics.

Methods

First, we consider how context affects teacher support for the four types of incentives described above: merit pay, subject-area pay, combat pay, and NBPTS incentives. For each incentive type we estimate an ordered probit model,

$$(1)\quad y^* = \beta_0 + \beta_1 X_i + \beta_2 S_{ij} + \beta_3 T_{ij} + u_{ij}$$

where support for each incentive is reflected in high values of y^* and opposition is reflected in low values of y^*; X_i is a vector of individual teacher characteristics; S_{ij} is a vector of school characteristics for school j; and T_{ij} is a vector of the teacher's impression of the level of trust and collegiality in his or her workplace. Following the ordinal nature of the dependent variable, y^* crosses three unknown "thresholds" as survey responses move from "strongly oppose" to "somewhat oppose" to "somewhat favor" to "strongly favor". Estimation is by maximum likelihood with β being estimated along with the unknown boundary values that define the ranges of support captured in the index y^*.

[10] For the class-size trade-off, we assume that $5,000 is 10 percent of the average teacher salary ($50,000), translating into a 10 percent reduction in class size. The average class size in Washington State is 19.2, so our cost equivalent reduction included two students. For a teacher's aide, we assume that an aide makes $25,000, so $5,000 would buy 20 percent of his or her time—that is, splitting an aide between with four other teachers. Finally, we assume that a teacher works a 180-day year for 7 hours a day and earn $50,000, therefore an extra $5,000 would buy 3.5 hours of that teacher's time per week.

Second, we use Tobit and OLS models[11] to explore respondents' support for the various types of incentives as measured by the amount of money they think would be "fair" to give as extra pay to each of the four types of teachers,

$$(2)\ I_i = \beta_0 + \beta_1 X_i + \beta_2 S_{ij} + \beta_3 T_{ij} + u_{ij}$$

where I_i is the incentive amount a respondent thinks is fair. As before, we run models separately for each type of incentive/teacher and include vectors of teacher characteristics, X_i, school characteristics, S_{ij}, and teacher impression about workplace trust and collegiality, T_{ij}.

Finally we explore respondents' opinions about the trade-offs between improvements in pay and cost-equivalent improvements in working conditions using a logit model,

$$(3)\ SI_i = \beta_0 + \beta_1 X_i + \beta_2 S_{ij} + \beta_3 T_{ij} + u_{ij}$$

where SI_i is a binary measure of whether teacher i prefers a sure income increase of \$5,000 ($SI = 1$) or a cost-equivalent improvement in working conditions ($SI = 0$).

For each of the three model equations, the error term capturing teacher and school effects not included among our independent variables, u_{ij}, is assumed to be independent and identically distributed (i.i.d. N(0,1). Since teachers and schools are also situated within school districts, we implemented a fixed-effect strategy for teachers' school district to control for potential district-specific effects on teachers' preferences.[12] However, across the 255 school districts in our sample, there were too few teachers per district to get stable estimates.[13]

For our independent variables, we rely on data from both the WSTCS as well as Washington State's S-275 administrative dataset on individual teacher characteristics, including gender, race/ethnicity (measured separately by black and Hispanic), years of teaching experience, whether the teacher has a master's degree or higher, whether the teacher has a bachelor's degree in mathematics (mathematics or statistics) or the natural sciences (biology/life sciences, chemistry, geology/earth science, or physics), the selectivity of the college the teacher attended (selective, competitive, less competitive),[14] whether the teacher's assignment is in mathematics or the natural sciences, and whether the teacher receives the incentive in question. We rely on data from Washington State's *School Report Card* as well as the *Common Core of Data* published by the National Center for Education Statistics (NCES) for information on school characteristics, including the percent of FRL-eligible students, percent of students in special

[11] We utilize a Tobit model when we classify individuals who said they do not support any incentive as supporting a value of \$0 in order to account for zero-inflation. We use an OLS model when we restrict our sample to those individuals who support some positive incentive.

[12] For the Ordered Probit and Tobit models, a dummy variable for all but one of the districts was included in the model equation.

[13] The average number of teachers per district in our sample is 12.14, with a maximum of 173 and a minimum of 1.

[14] Our college selectivity measures come from Barron's Profiles of American College's rankings for the year 1986, when the mean teacher surveyed would have entered college. We collapse Barron's six rankings - most competitive; highly competitive; very competitive; competitive; less competitive; and non-competitive - into three categories for our analyses: selective, competitive, and less competitive. Our "selective" category collapses Barron's top three rankings because of the small number of teachers graduating from these schools. Barron's rankings also list some schools as highly competitive (+) and very competitive (+) if they are on the border of the next category. We included them in the listed category, not the next-highest category.

education programs, an indicator for school type (elementary, middle, and high school), the school's urbanicity (urban, suburban, and rural), school enrollment, student-teacher ratio, and the percent of students passing the *Washington Assessment of Student Learning* (measured separately for math and for reading). Finally, we rely on the WSTCS for teachers' impressions regarding the amount of trust and collegiality at their school, measured separately with regards to (1) their fellow teachers and (2) their principal. We explain these two trust measures in more detail in Appendix C.[15]

Results

Support for Pay Reforms

Table 4 shows results for the ordered probit models for all four types of incentive plans.[16] Several findings are consistent with Ballou and Podgursky's (1993) analysis of attitudes toward merit pay (column 1): both women and teachers with more experience appear to be less supportive of merit pay, Hispanic teachers are more supportive than whites (the omitted group), and the coefficient for Black teachers is positive, but not statistically significant. We also find, unsurprisingly, that teachers who identify themselves as members of teachers unions are less supportive of merit pay. However, unlike Ballou and Podgursky's (1993) finding that attitudes about merit pay were independent of student poverty, we find that teachers in schools with higher proportions of students eligible for free/reduced-price lunch (FRL) are more supportive of merit pay. We also find that high school teachers, relative to elementary school teachers, are more supportive of merit pay. The two trust measures indicate that teachers who have a higher sense of trust and respect regarding their fellow teachers are *less* supportive of merit pay, while those who have a higher sense of trust and respect regarding their principal are *more* supportive of merit pay. This result may reflect that when teachers feel connected to their colleagues, they are wary of a pay system that raises the specter of teachers "competing with one another," especially if a school culture values egalitarianism. Conversely, to the degree that teachers have confidence in their principal, they appear more willing to support merit pay. Although the question did not define performance in terms of the principal's evaluation of the teachers (it defined it in terms of students' test-score growth), teachers may nevertheless see merit pay as a proposal that somehow involves principals' judgments.

Column 2 suggests that teacher opinions about extra pay for hard-to-fill subject areas, such as mathematics and science, are both similar to and different from their opinions about merit pay. As with the merit pay findings, veteran teachers and women are less supportive of subject-area incentives, and Hispanic teachers are more supportive. Unlike merit pay, however, teachers with middle and high school assignments in mathematics and science are more supportive of subject-area bonuses—which is consistent with their self-interest. When it comes to the trust factors, however, it appears that a teachers' support for subject-area incentives is not systematically related to impressions of his or her coworkers.

[15] Note, however, that these attitudinal measures may be endogenous, as teacher attitudes may be shaped in part by the type of compensation structure used in their schools.

[16] We ran models with and without the teacher's impressions of his or her fellow teachers and principal (Teacher Trust Index and Principal Trust Index); these measures had little impact on the other estimated coefficients, so we only report the full models here.

Table 4. Factors Influencing Teachers' Attitudes About Compensation Reform

Variable	Merit Pay (1)	Subject-Area Pay (2)	Combat Pay (3)	NBPTS Incentive (4)
School Factors				
Community Type [a]				
Suburban	-.026	-.024	-.011	-.017
	(.052)	(.049)	(.049)	(.048)
Rural	-.111	-.084	-.091	-.128*
	(.066)	(.061)	(.062)	(.061)
School Type [b]				
High School	.239**	.000	.042	.105
	(.089)	(.083)	(.084)	(.083)
Middle School	.029	-.290***	-.047	-.018
	(.071)	(.066)	(.065)	(.065)
School Enrollment	$1.550e^{-5}$	$-8.830e^{-5}$	$6.510e^{-5}$	$-3.770e^{-5}$
	($6.090e^{-5}$)	($5.830e^{-5}$)	($5.850e^{-5}$)	($5.760e^{-5}$)
Ratio of Students to Teachers	-.005	-.003	-.002	-.006
	(.008)	(.007)	(.007)	(.007)
Eligible for Free/Reduced-Price Lunch (%)	.004*	-.000	.005**	-.000
	(.002)	(.001)	(.002)	(.001)
Special Education Students (%)	-.002	.002	.001	-.002
	(.005)	(.005)	(.005)	(.005)
Math Proficiency (%)	-.346	-.175	-.691*	-.125
	(.317)	(.298)	(.299)	(.296)
Reading Proficiency (%)	.326	-.364	.225	-.081
	(.360)	(.342)	(.346)	(.342)
Teacher Factors				
Experience (years)	-.009**	-.020***	-.019***	-.023***
	(.003)	(.002)	(.002)	(.002)
Master's Degree or Better	-.021	.002	-.028	.038
	(.044)	(.041)	(.041)	(.041)
Female	-.120*	-.213***	.073	.149**
	(.048)	(.045)	(.045)	(.045)
Black	.051	.235	.341	-.068
	(.194)	(.186)	(.192)	(.186)
Hispanic	.290*	.436**	.227	.028
	(.141)	(.138)	(.143)	(.137)
College Selectivity [c]				
Selective	-.061	-.034	.035	.025
	(.086)	(.080)	(.080)	(.079)
Competitive	.022	-.052	-.081	-.057
	(.076)	(.071)	(.071)	(.070)

Table 4 (cont'd). Factors Influencing Teachers' Attitudes About Compensation Reform

Variable	Merit Pay (1)	Subject-Area Pay (2)	Combat Pay (3)	NBPTS Incentive (4)
Teacher Factors (cont'd)				
Bachelor's in Math or Science	-.142	.042	-.100	.077
	(.090)	(.087)	(.088)	(.085)
Teaching Assignment in Math or Science	-.110	.212	.297	-.070
	(.286)	(.258)	(.266)	(.256)
School Type x Assignment Interaction				
High School–Math Science Assign.	.492	1.178***	.236	.236
	(.302)	(.275)	(.283)	(.273)
Middle School–Math Science Assign.	.440	.849**	.076	.280
	(.302)	(.274)	(.282)	(.273)
Receives Pay Incentive	-.279	.531	.603	1.891***
	(.702)	(.548)	(.814)	(.243)
Household Income (per $1,000)	.001	.000	-.001	-.001
	(.001)	(.001)	(.001)	(.001)
Married	-.004	-.067	-.022	-.023
	(.058)	(.054)	(.054)	(.053)
Member of Teachers Union	-.346**	-.026	.091	.116
	(.112)	(.109)	(.109)	(.109)
Teacher Trust Index	-.183***	.007	-.004	.017
	(.039)	(.036)	(.037)	(.036)
Principal Trust Index	.146***	.035	.048	.133***
	(.029)	(.027)	(.027)	(.027)
Threshold 1	-.144	-1.324	-1.321	-.585
	(.329)	(.311)	(.314)	(.310)
Threshold 2	.595	-.542	-.730	.068
	(.329)	(.311)	(.313)	(.310)
Threshold 3	1.548	.700	.543	1.230
	(.331)	(.311)	(.313)	(.311)
-Log-likelihood	3,157.9	3,770.6	3,669.9	3,949.1
Sample Size	3,077	3,080	3,084	3,073

a Referent group is urban community; b Referent group is elementary school; c Referent group is less competitive

*p <.05, **p <.01, ***p <.001

When looking at the most-popular incentive plan—combat pay—in column 3, we find that only the positive coefficients for experience and student poverty, as well as the negative coefficient for mathematics performance, are statistically significant, suggesting that, with these exceptions, support for combat pay is not systematically related to the individual or workplace characteristics included in the model.

Finally, column 4 looks at incentive pay for teachers who are certified by the National Board for Professional Teaching Standards (NBPTS). It is no great surprise that teachers who receive this incentive support the idea of giving extra pay to NBPTS-certified teachers (Washington State provides a stipend for NBPTS certification). As we find with the other incentives, experienced teachers are less supportive of NBPTS incentives, but women, by contrast, are more supportive. Teachers located in rural schools are less supportive, a finding that may reflect the geographic distribution of NBPTS-certified teachers and the extent to which teachers in these settings know someone personally who might benefit from the incentive. When we add the trust measures, respondents' impressions of their fellow teachers are not statistically significant, but those who feel more trust and respect toward their principal are more supportive of NBPTS incentives.

We should note that contrary to our expectation that teachers in low-performing schools would be more supportive of incentives, the coefficients for mathematics and reading performance are not statistically significant across all four incentives, with one exception: teachers in schools with higher math scores appear to be less supportive of combat pay, an incentive for which they are unlikely to qualify.

Table 5 provides a more intuitive interpretation of some of the results in table 4, by presenting predicted probabilities for several hypothetical ideal teacher-types and their support for pay incentives, using merit pay for our example. Table 5 shows the predicted probability of supporting merit pay for a veteran teacher (25 years of experience) and a novice teacher (2 years of experience) at the high school level who is a white woman and who otherwise has the mean characteristics of the sample. As the first two rows of the table show, both ideal types are overwhelmingly opposed to merit pay, but the novice teacher is slightly more likely to be supportive (.22 versus .17). If, however, we redefine our hypothetical teachers to have extreme values on the trust index, the picture changes significantly. As the third and forth rows show, the probability of a novice teacher supporting merit pay when he or she has a *high* level of trust toward his or her principal and a *low* level of trust toward his or her fellow teachers rises to .43, almost double the base example. Conversely, if the same teacher's principal-trust index is *low* and his or her teacher-trust index is *high*, the probability of supporting merit pay drops to .12, less than the base example's veteran teacher. Although not shown here, the predicted probabilities for the other incentives suggest that novice high school teachers are about twice as likely as veteran high school teachers to "strongly favor" subject-area pay, combat pay, and NBPTS incentives.

Table 5. Predicted Probabilities for Female Teachers' Support for Merit Pay

	Predicted Probability			
	Strongly Favor	Somewhat Favor	Somewhat Oppose	Strongly Oppose
Teachers whose students make greater gains on standardized tests than similar students taught by other teachers				
Basic Ideal Types				
Veteran High School Teacher	0.03	0.14	0.24	0.59
Novice High School Teacher	0.04	0.18	0.27	0.51
Ideal Types with varying regard for coworkers				
Veteran High School Teacher *Low teacher trust/High principal trust*	0.09	0.26	0.29	0.37
Veteran High School Teacher *High teacher trust/Low principal trust*	0.01	0.07	0.18	0.74
Novice High School Teacher *Low teacher trust/High principal trust*	0.13	0.30	0.28	0.29
Novice High School Teacher *High teacher trust/Low principal trust*	0.02	0.10	0.21	0.67

How Much Money is Fair?

Table 6 shows the results of our Tobit and OLS models for each of the four incentive plans. Here, the dependent variable is the amount of money (in dollars) that teachers think is fair to give each type of teacher. The overall patterns are broadly consistent with those found in table 4. Beginning with the Tobit results, which include respondents who think no amount of extra pay is fair, the coefficient for experience is negative and statistically significant across all four incentive types. Likewise, the coefficient for female is negative and significant for merit pay and subject-area pay. The teacher-trust and principal-trust indices also mirror the earlier findings: for a one-point gain, the "fair" value of the merit pay reward increases by $375 on the principal-trust index and decreases by $897 on the teacher-trust index. As before, high school mathematics and science teachers favor subject-area incentives (by $3,057) and teachers who receive an NBPTS incentive think a fair bonus would be $4,786. As with the ordered probit, the coefficient for suburban and rural teachers is negative (relative to urban teachers) for merit pay and subject-area pay, but here it is statistically significant.

When we restrict the sample to only those who gave a positive "fair" value and run OLS models, the signs of the coefficients remain unchanged, but some are no longer statistically significant (for example, the negative coefficient for experience is statistically significant only for NBPTS incentives). Unlike the ordered probit results, in this case household income is statistically significant, but the coefficients are relatively small (a $1,000 rise in household income translates into a $12 increase in respondents' estimation of a fair merit pay bonus). Also, unlike the prior results, respondents who work in schools with higher math proficiency scores support larger bonuses: for every 1 percentage point gain in math proficiency, teachers think a fair combat pay incentive would be $3,322.

Table 6. Placing a Monetary Value as Opposed to Subjective Attitude

	Merit Pay		Subject-Area Pay		Combat Pay		NBPTS Incentive	
Variable	Tobit	OLS	Tobit	OLS	Tobit	OLS	Tobit	OLS
School Factors								
Community Type [a]								
Suburban	-434.81	-791.97*	-687.49*	-421.75	-126.38	-114.24	-60.75	-162.18
	(332.40)	(332.79)	(266.15)	(256.37)	(249.40)	(232.55)	(169.39)	(147.36)
Rural	-1166.63**	-1169.77**	-744.59*	-467.31	-220.78	-311.99	-506.92*	-217.86
	(421.08)	(426.11)	(266.15)	(319.65)	(312.44)	(288.90)	(214.54)	(189.01)
School Type [b]								
High School	677.56	-375.51	718.64	876.52*	993.61*	1042.07**	437.92	445.86
	(559.49)	(550.91)	(449.61)	(434.68)	(420.23)	(391.13)	(286.38)	(249.22)
Middle School	251.53	-51.49	-718.75*	-26.55	77.95	34.68	32.57	-13.99
	(452.03)	(463.38)	(362.79)	(363.37)	(333.51)	(313.74)	(227.37)	(199.61)
School Enrollment	0.01	0.05	-0.70*	-0.07	-0.31	-0.09	-0.12	-0.09
	(0.38)	(0.36)	(0.31)	(0.30)	(0.29)	(0.27)	(0.20)	(0.17)
Ratio of Students to Teachers	-5.79	-47.95	16.98	-18.84	23.90	-4.02	-23.46	-35.92
	(47.47)	(45.94)	(38.39)	(36.86)	(35.91)	(34.24)	(24.41)	(21.29)
Eligible for Free/Reduced Lunch (FRL) (%)	15.70	6.17	0.90	5.83	14.95	10.21	-2.17	-4.85
	(10.08)	(9.86)	(8.09)	(7.79)	(7.54)	(7.05)	(5.15)	(4.52)
Special Education Students (%)	-56.29	-1.23	-8.79	-8.53	-25.22	-1.27	-28.85	-17.89
	(35.88)	(38.89)	(26.84)	(25.16)	(25.33)	(23.51)	(17.18)	(14.72)
Math Proficiency (%)	-2451.16	-1631.97	505.44	2132.13	1906.93	3322.19*	628.48	634.85
	(2018.06)	(1982.85)	(1624.06)	(1563.05)	(1517.12)	(1410.44)	(1036.09)	(910.15)
Reading Proficiency (%)	2105.23	2747.88	-829.00	-1119.10	-674.58	-2578.58	-1140.41	-1280.55
	(2294.10)	(2220.14)	(1852.37)	(1761.16)	(1741.22)	(1617.50)	(1192.68)	(1060.68)
Teacher Factors								
Experience (years)	-57.22**	-9.42	-64.36***	-9.94	-55.42***	-7.29	-82.94***	-40.78***
	(17.04)	(17.43)	(13.52)	(13.36)	(12.48)	(11.82)	(8.64)	(7.71)
Master's Degree or Better	-294.61	-116.47	-242.00	-302.45	-459.70*	-405.27*	-35.67	-48.91
	(282.11)	(283.49)	(225.22)	(217.76)	(209.93)	(195.42)	(143.05)	(125.11)
Female	-1122.20***	-369.63	-1121.23***	-513.66*	-378.82	-361.18	269.08	266.51
	(305.81)	(305.20)	(244.72)	(234.95)	(229.22)	(213.66)	(156.91)	(137.67)
Black	-1210.20	-588.96	1427.73	2412.84*	1006.66	1626.13	-254.03	450.92
	(1372.91)	(1441.75)	(1036.76)	(1021.67)	(978.08)	(928.10)	(673.37)	(616.38)
Hispanic	154.13	230.85	1690.92*	577.29	-3.59	294.89	-570.07	-518.27
	(917.19)	(903.67)	(724.07)	(654.47)	(700.78)	(656.81)	(478.42)	(420.85)

Table 6 (cont'd). Placing a Monetary Value as Opposed to Subjective Attitude

	Merit Pay		Subject-area Pay		Combat Pay		NBPTS Incentive	
Variable	Tobit	OLS	Tobit	OLS	Tobit	OLS	Tobit	OLS
College Selectivity [c]								
Selective	-633.99	230.65	70.21	-21.52	341.09	488.31	54.07	-22.15
	(542.88)	(544.09)	(433.05)	(418.12)	(403.86)	(372.46)	(275.47)	(240.19)
Competitive	-0.22	321.2	-176.44	-242.21	-192.38	177.03	-283.13	-262.16
	(476.53)	(470.31)	(385.84)	(373.25)	(359.86)	(331.86)	(245.53)	(215.14)
Bachelor's in Math or Science	48.63	290.36	406.66	523.06	-122.16	-64.41	116.39	211.74
	(560.65)	(536.24)	(446.13)	(395.87)	(429.70)	(388.90)	(294.32)	(257.04)
Teaching Assignment in Math or Science	-1264.06	-1480.28	1189.84	662.24	79.43	-421.89	-122.53	-534.37
	(1916.02)	(2039.24)	(1419.92)	(1336.22)	(1348.37)	(1231.91)	(910.98)	(772.30)
Assignment x School Type Interaction								
High School—Math Science Assign.	3245.21	2018.02	3057.03*	994.83	1189.79	611.94	754.26	378.18
	(2004.53)	(2106.98)	(1498.05)	(1400.16)	(1424.99)	(1299.66)	(964.39)	(819.73)
Middle School—Math Science Assign.	2210.95	2628.37	2260.47	666.79	1394.61	1147.75	358.22	640.07
	(2013.69)	(2128.82)	(1503.99)	(1412.24)	(1428.03)	(1304.85)	(966.42)	(821.19)
Receives Pay Incentive	-1010.93	-992.80	2878.35	1594.42	1193.11	-46.22	4786.50***	3432.02***
	(4823.54)	(4522.63)	(2466.50)	(2201.53)	(3726.40)	(3234.18)	(614.36)	(475.01)
Household Income (per $1,000)	11.52*	11.07*	5.48	7.28*	1.82	2.39	-2.31	-0.79
	(4.65)	(4.62)	(3.73)	(3.63)	(3.48)	(3.25)	(2.37)	(2.07)
Married	-338.90	-230.10	-280.11	-64.90	-156.20	-86.99	-125.68	-7.88
	(371.63)	(379.25)	(294.74)	(285.77)	(274.37)	(255.34)	(186.24)	(161.37)
Member of Teachers Union	-1349.17	-1148.29	-269.42	-1117.23	-452.53	-562.99	178.31	-79.67
	(732.70)	(710.35)	(611.15	(607.76)	(561.20)	(524.49)	(389.38)	(349.48
Teacher Trust Index	-897.52***	-489.35*	-40.72	20.71	-266.36	-78.90	-157.77	36.58
	(249.24)	(248.49)	(199.92)	(193.77)	(185.87)	(171.56)	(126.60)	(109.58)
Principal Trust Index	374.85*	-86.44	-98.45	-275.78	-93.70	-208.49	203.04*	-71.19
	(183.43)	(181.83)	(146.58)	(142.17)	(136.66)	(127.13)	(93.71)	(83.23)
Constant	1462.07	5265.22	3353.42	5506.72	5198.86	6534.35	3780.24	5614.48
	(2118.32)	(2141.98)	(1691.77)	(1638.11)	(1577.63)	(1477.97)	(1074.67)	(355.45)
- Log-likelihood	-12,188.1		18,562.7		-24,203.0		19,527.4	
Sample Size	2,830	1,115	2,848	1,780	2,857	2,378	2,837	1,965
Left-Censored	1,715		1,068		479		872	

[a] Referent group is urban community ; [b] Referent group is elementary school; [c] Referent group is less competitive

* p <.05, ** p <.01, ***p <.001

These differences aside, the results in table 6 generally reinforce our previous findings about the types of teachers who support compensation reforms and suggest that there are some important differences among teachers hidden beneath the means presented in table 1. Whereas the mean "fair" amount for a subject-area bonus in table 1 was $2,317, table 6 shows that high school mathematics and science teachers, all else equal, put the amount at $3,057; but for every additional year of experience, that amount drops by $64.

Salary Versus Working Conditions

As noted previously, whether or not teacher attitudes about compensation reform matter rests on the assumption that teachers will respond to financial incentives. Others would argue that if policymakers want to affect teacher behavior they should focus on improving working conditions, not finances. Money may matter, the argument goes, but teachers are really more concerned about improved working conditions. We estimate parameters for teacher preferences regarding the trade-off between increases in pay and roughly cost-equivalent improvements in working conditions (we explain how the working condition improvements were calculated in footnote 10). We use an admittedly restricted set of alternatives—reduced class size, a teacher's aide, and more preparation time—which ignores other important working conditions that teachers may care about, such as the amount of support they get from their principal. Nevertheless, we think these alternatives provide useful comparisons because they are working conditions that are amenable to policy change. All things considered, it is more straightforward to imagine using policy to reduce class size or increase preparation time than to improve a principal's leadership ability.

Although teachers in general appear to prefer money instead of the changes in working conditions presented in the survey (see table 3), the logit results suggest that high school and middle school teachers are more likely than elementary school teachers to prefer money instead of smaller classes or a teacher's aide.[17] By contrast, women appear more likely to prefer improvements in working conditions to increases in salary. On balance, however, the results on teacher preferences for salary increases versus working conditions shown in table 3 do not appear to be systematically related to individual or school characteristics.

Conclusion

In the spring of 2007, *The Future of Children* (FOC) devoted an entire issue to teacher quality. Among its key recommendations is a clear call to reform pay structures in education—indeed, the FOC authors mention many of the reforms covered in the WSTCS: working condition and skill differentials, pay for performance, and so on (The Future of Children 2007). Importantly, the authors frame their argument by recommending the pursuit of "carefully designed and implemented pilot programs," in order to better understand the likely impact of these reforms (12). We would argue that a crucial part of any careful design and implementation strategy is the identification of promising sites for experimentation, and part of what makes a site promising is a willingness among teachers to work under a new pay structure. After all, proposals to reform teacher compensation rest on the assumption that teachers are receptive to and motivated by tangible payoffs.

[17] Although not shown, the logit results are available from the authors upon request.

The results presented here about contextualized teacher opinion suggest that such assumptions may be more or less valid, depending on the targets of the reform. Veteran teachers, for example, appear less supportive of compensation reform. It may be that after a career in teaching, one's beliefs preclude the differentiation at the heart of all forms of incentive pay. Or it may be that non-random attrition from teaching results in veterans who are more risk averse or more egalitarian in their outlook. For instance, one teacher wrote this unsolicited comment on her returned survey:

> *$5,000 is one month's pay for me. I have 36 years of experience and a Master's plus 120 hours [class credits]. I have been at the very top of the salary schedule in my district for 11 years. $5,000 more a year would allow me to pay off my mortgage by retirement, to clean up my home improvement loan, maybe do some repairs that are needed, maybe take a vacation, buy some classroom materials, take a class. But I will not do it at the expense of my friends.*

In any event, our findings suggest that policymakers interested in piloting compensation reform would do well to follow the lead of Denver Public Schools, where compensation reform packages are optional for veteran teachers but mandatory for younger teachers, and to include a range of reforms, not just pay-for-performance. In addition, it appears that secondary school teachers may be more supportive of various pay reforms, especially merit pay and subject-area pay. It is worth noting, however, that women in general oppose merit pay and subject-area incentives. Given that the overwhelming majority of the teacher workforce is female, differentials for skills and working conditions (which women are either indifferent to or supportive of) may prove easier to implement.

We conclude with a reminder that this analysis says nothing of the politics of adoption. Whether a district is able to successfully adopt compensation reform clearly depends on its relationship with its teachers union, not just the attitudes of individual teachers. And while the WSTCS presents these various incentive plans as if they are separate from each other, if compensation reform is to have the types of effects that advocates and reformers hope for, various combinations of incentives may need to be considered: not just merit pay alone but merit-pay combined with subject-area pay and/or combat pay and/or NBPTS incentives. Teacher opinions about such combinations are an important topic for future research.

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Appendix A. 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= 3,120) [a]	
Experience (years)	13.73
Household Income (per $1,000)	88.45
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	.65
Less Competitive	.09
International/Unknown	.03
Teacher Trust Index (1=low, 4=high)	3.30
Principal Trust Index (1=low, 4=high)	2.95
Female (=1)	.67
Black (=1)	.01
Hispanic (=1)	.02
Married (=1)	.74
Member of Teachers Union (=1)	.96

[a] Calculated using sampling weights.

Appendix B. Administrative Data, Survey Design, and Response Rates

The education landscape in Washington State provides a useful case for exploring teacher attitudes in context. As in most states, Washington's teacher shortages are more acute in specific subject areas, such as mathematics, science, and special education (Lashway and Maloney 2004), and turnover rates are higher in schools with higher concentrations of poverty (Plecki et al. 2005). Furthermore, teachers in Washington work under a standards system that includes alignment between standards in core subjects, grade-level expectations, and a criterion-referenced test to measure student achievement known as the *Washington Assessment of Student Learning*, or WASL. Although Washington's accountability system does not include sanctions or rewards for performance, school, district, and state performance on the WASL is widely publicized in local newspapers and the state's on-line School Report Card system. Teachers and schools in Washington also face performance pressure under the federal *No Child Left Behind Act.* Finally, the state's districts and schools represent a wide range of size, student populations, and performance, in a range of settings (urban, suburban, and rural). To date, teachers in Washington State arguably have little first-hand exposure to compensation reform, but, as we noted earlier, this may change in the near future (Washington Learns 2006).

Administrative Data

Secondary data gathered on Washington State schools and teachers are from three sources: the Washington State S-275 personnel report; the *Washington State Report Card*, prepared 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 S-275 is an annual personnel-reporting process, which provides a record of certificated and classified employees of the school districts and educational service districts (ESD) of the state of Washington. 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. This database reports general building information as well as student and staff counts.

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, etc.), 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.[18] 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.

Sampling Procedures

The sampling frame of Washington State teachers was generated from the S-275 report for the 2003-04 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.[19] In order to identify "current" teachers, the sampling frame was restricted to only school facilities listed as operational or "open" for the 2003-04 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*, district urbanicity is a 3-level collapse of the CCD's 2003-04 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.[20] Using the measure of the percentage of students receiving free/reduced-price lunch (FRL) from the 2004-05 Washington State Report Card, we defined three levels of school poverty by dividing the FRL distribution into thirds.[21] This procedure produced three categories: low poverty (0 to 27 percent receiving FRL), moderate poverty (28 to

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

[19] 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.

[20] 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.

[21] The 2004-05 wave of the Washington State Report Card was used instead of the 2003-04 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.

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 (e.g., juvenile detention center). An additional 268 teachers were later sampled to replace teachers working "ineligible" assignments (see section on 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. 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.[22] 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.

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".[23] In order to determine the eligibility of non-respondents, we consulted current (2005-06 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 (e.g., 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

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

[23] 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".

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).

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 59.56 percent (3,120/ 5,238). A complete-eligible survey refers to a returned survey from a sampled participant who identified herself as a classroom teacher and responded to the remaining survey questions. A total of 256 surveys were classified as "complete-*in*eligible", whereby a sampled participant identified herself 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 2003-04 school. When removing these known ineligible surveys from the total number of teachers sampled, our response rate increases to 63.32 percent (3,120/4,927).

While this readjusted rate is above the acceptable threshold, we suspect our response rate is considerably 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 that was 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 *School and Staffing Survey* and the related 2000-2001 *Teacher Follow-up Survey*, 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.[24] 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 (i.e., 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 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 (2005-06 academic year) staff/teacher rosters on school and district websites. Identifying teachers by first

[24] Research suggests that teachers in low-paying, poor-performing schools serving large numbers of racial and ethnic minorities are more likely to switch schools or leave the profession altogether, particularly teachers early in their careers (Hanushek, Kain, and Rivkin 2004).

and last name, a participant was classified as ineligible if he or she was listed as working a non-classroom assignment (e.g., 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 (e.g., specifically identify the staff as 2005-06, staff/teacher websites and profiles, teacher email addresses), the likelihood of misidentifying a teacher is high. Thus, our count of 760 teachers as no longer working in the same school should be interpreted cautiously.[25]

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 75.62 percent. Again, 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.

[25] 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.

Appendix C. Variable Coding

Coding of Dependent Variables

Support for incentive pay: We used a four-category variable—strongly oppose, somewhat oppose, somewhat favor, strongly favor—to measure teachers' support for providing extra pay to four types of teachers: (1) teachers who specialize in hard-to-fill subjects such as science or mathematics, (2) teachers who work in tough neighborhoods with low-performing schools, (3) teaches whose students make greater gains on standardized tests than similar students taught by other teachers, and (4) teachers who receive accreditation from the National Board for Professional Teaching Standards (NBPTS). *Source: WSTCS*

Ranking of incentive pay: For teachers' rankings of the different incentive pay plans we used a four-category variable that forced respondents to rank the four types of teachers relative to one another. Respondents were asked to give a rank of 1 to the teacher they would most support giving extra pay to, a 2 to the one they would support the next most, and so on until they ranked all four teachers. *Source: WSTCS*

Fair incentive amount: We used a continuous variable to measure the amount of extra pay teachers think is fair to give each of the four types of teachers, compared to otherwise similar teachers (e.g., same experience and degrees). If respondents thought that no amount of extra pay was fair, they were instructed to record their answer as "0." *Source: WSTCS*

Coding of Independent Variables

Community type: We used three dummy variables measuring school-level location: (1) urban; (2) suburban; and (3) rural. Using the CCD's 2003-04 categorization of school locale, urban is defined as schools serving a large or mid-size central city classified as urban; suburban is defined as schools in an urban fringe or large town; and rural is defined as schools in a small town or rural locale. *Source: CCD 2003-04*

High school: Dummy variable indicating respondent's school is a high school (grade levels between PK-12 and must include grade 11). *Source: OSPI Report Card 2005-06*

Middle school: Dummy variable indicating respondent's school is a middle school (grade levels between PK-10 and must include at least grade 7). *Source: OSPI Report Card 2005-06*

Elementary school: Dummy variable indicating respondent's school is an elementary school (grade levels between, but not exceeding, PK-6). *Source: OSPI Report Card 2005-06*

School Enrollment: Total number of student enrollments at respondent's school. *Source: OSPI Report Card 2005-06*

Ratio of students to teachers: Continuous variable of the total number of students divided by the

total teacher FTE (full-time equivalent) count in a respondent's school. *Source: OSPI Report Card 2005-06*

Eligible for free/reduced-price lunch: Percentage of students at respondent's school eligible for free/reduced-price lunch program. *Source: OSPI Report Card 2005-06*

Special education: Percentage of students at respondent's schools served by programs for students with disabilities. *Source: OSPI Report Card 2005-06*

School performance: Continuous measure using two variables: the percentage of students in grades 3-8 and 10 passing the Washington Assessment of Student Learning for mathematics and reading. A dummy variable was included for schools missing performance scores due to grade spans outside the assessed range (e.g., PK-2) *Source: OSPI Report Card 2005-06*

Years of teaching experience: Continuous variable indicating the number of certificated years the teacher has taught in Washington State. *Source: 2003-04 S-275 Personnel Report*

Household Income: Continuous measure of respondent's total household income, including all earners in their household. We collapsed the response options, presented to respondents in ranges from $20,000–$29,999 to $90,000–$99,999, $100,000–$149,999, and more than $150,000, to the midpoint of each range with the exception of the "more than $150,000" option, which was capped at $180,000. *Source: WSTCS*

Master's degree or higher: Dummy variable indicating whether respondent has a master's degree or higher. *Source: 2003-04 S-275 Personnel Report*

Technical degree: Dummy variable indicating whether respondent has a bachelor's degree in mathematics (mathematics or statistics) or the natural sciences (biology/life sciences, chemistry, geology/earth science, or physics). *Source: WSTCS*

Technical assignment: Dummy variable indicating whether respondent's main teaching assignment is in either mathematics (algebra, basic and general mathematics, business and applied math, calculus and pre-calculus, computer science, geometry, pre-algebra, statistics and probability, trigonometry) or natural sciences (general science, biology/life science, chemistry, earth sciences, integrated science, physical science, physics). *Source: WSTCS*

College selectivity: A series of dummy variables indicating whether the respondent attended a Selective or a Competitive college (Less Competitive is the omitted group). Our college selectivity measures come from Barron's Profiles of American College's rankings for the year 1986, when the mean teacher surveyed would have graduated college. We collapse Barron's six rankings—most competitive, highly competitive, very competitive, competitive, less competitive, and non-competitive—into three categories: selective, competitive, and less competitive. Our "selective" category collapses Barron's top three rankings because of the small number of teachers graduating from these schools. Barron's rankings also list some schools as highly competitive (+) and very competitive (+) if they are on the border of the next category.

We included them in the listed category, not the next highest category. *Source: Created from WSTCS*

Teacher trust: Constructed from responses to questions about how strongly the respondent agrees or disagrees (coded on four point scale: Strongly Disagree, Disagree, Agree, Strongly Agree) with the following two statements: "Teachers at my school think of each other as partners in educating children," and "Teachers in my school respect those colleagues who are expert at their craft." Given the high correlation between the two questions (r = .64), responses were averaged to produce an index measure with a minimum value of 1 (= low trust) and maximum value of 4 (= high trust). *Source: WSTCS*

Principal trust: Constructed from responses to questions about how strong the respondent agrees or disagrees (coded on four point scale: Strongly Disagree, Disagree, Agree, Strongly Agree) with the following two statements: "The principal at my school is an effective manager who makes the school run smoothly," and "The principal looks out for the personal welfare of the faculty members." Given the high correlation between the two questions (r = .76), responses were averaged to produce an index measure with a minimum value of 1= low trust and maximum value of 4 = high trust. *Source: WSTCS*

Receiving Pay Incentive: Dummy variable indicating whether a respondent receives the pay incentive in question. *Source: WSTCS*

Gender: Dummy variable indicating the respondent is female. *Source: WSTCS*

Race/Ethnicity: Dummy variable indicating whether the respondent is black and a dummy variable indicating whether the respondent is Hispanic. *Source: 2003-04 S-275 Personnel Report*

Marriage Status: Dummy variable indicating whether respondent is currently married. *Source: WSTCS*

Teacher Union: Dummy variable indicating whether respondent is a member of a teachers' union. *Source: WSTCS*