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Evidence from Survey Experiments in Germany and the  
United States**

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## ABSTRACT

### **How Information Affects Support for Education Spending: Evidence from Survey Experiments in Germany and the United States\***

To study whether current spending levels and public knowledge of them contribute to transatlantic differences in policy preferences, we implement parallel survey experiments in Germany and the United States. In both countries, support for increased education spending and teacher salaries falls when respondents receive information about existing levels. Treatment effects vary by prior knowledge in a manner consistent with information effects rather than priming. Support for salary increases is inversely related to salary levels across American states, suggesting that salary differences could explain much of Germans' lower support for increases. Information about the tradeoffs between specific spending categories shifts preferences from class-size reduction towards alternative purposes.

JEL Classification: H52, I22, D72, D83

Keywords: policy preferences, cross-country comparison, Germany, United States, education spending, information, survey experiments

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## 1. Introduction

Citizens in Europe and the United States differ widely in their views on various policies. Such transatlantic differences in policy preferences have been attributed to differences in culture, social beliefs, and political regulations and institutions (e.g., Alesina and Angeletos (2005); Alesina, Glaeser, and Sacerdote (2006)). In this paper, we focus on another potential source of differing preferences for government spending reforms: differences in current spending levels across countries and the extent to which citizens are informed about these spending levels. To shed light on how information on spending levels affects policy preferences, we conduct the first parallel randomized experiments within representative surveys of public opinion in the two largest industrialized nations in the western world, Germany and the United States.

We focus on government spending on education, which comprises a large share of public sector budgets around the world. On average across developed countries, more than one in eight dollars that governments spend goes to education—more than on defense, public order and safety, and environmental protection combined (OECD (2014)).<sup>1</sup> The quality of education systems is a cornerstone for future national prosperity (Hanushek and Woessmann (2015)), and citizens' support for education spending is a critical factor in shaping public budgets.<sup>2</sup>

Germany and the U.S. differ in a number of features of education finance that might be expected to give rise to differences in public support for higher education spending. Among others, the U.S. has higher overall spending levels, but lower teacher salaries, than Germany. Ignoring any other differences, one might thus expect Americans to be less inclined to support overall spending increases, but more inclined to support higher teacher salaries. In addition, the majority of school funding comes from the local level in the U.S. but from the state level in Germany. If local control aligns actual spending levels more closely with citizens' preferences, one would expect smaller effects of informing about actual spending levels in the United States. Yet we know very little about the public's knowledge of current education spending levels, the extent of support for increased spending, and the role of information in shaping public views in the two countries.

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<sup>1</sup> In 2011, public spending on education was 12.9 percent of total public expenditure on average across the member countries of the Organisation for Economic Co-operation and Development (OECD (2014), p. 257). The figure is 11.0 percent in Germany and 13.6 percent in the United States.

<sup>2</sup> The importance for public budgets holds irrespective of the debate over whether higher spending levels are essential to improve school quality (e.g., Hanushek (2003); Jackson, Johnson, and Persico (2016)).

To investigate these issues, we surveyed representative samples of the adult populations in Germany and the U.S. and implemented three randomized experiments on how the provision of information affects support for education spending. The German and American surveys included more than 4,000 and 2,600 respondents, respectively. Within each survey, randomly selected subgroups were given different types of information before answering the same questions about the level and allocation of public spending on education. Earlier in both surveys, we asked respondents to estimate current levels of education spending and teacher salaries.

We find that a vast majority of the public in both countries underestimates current levels of school spending and teacher salaries. Absent the provision of information, an absolute majority in both countries supports increased government spending on education, with somewhat higher levels of support among Germans than Americans (71 percent vs. 60 percent).

Our first survey experiment shows that citizens of both countries also react similarly to two information treatments, with treatment effects (relative to the control mean) hardly differing. Informing respondents about the current level of annual public education spending per student reduces support for increased spending by more than one quarter (to 50 percent in Germany and 43 percent in the U.S.). Additionally stating that the spending increase would be financed through higher taxation reduces support by more than half compared to the control group (to 30 percent in Germany and 26 percent in the U.S.), with the shares in support no longer differing significantly between the two countries.

Our second survey experiment examines preferences for increases in teacher salaries. In both countries, staff compensation makes up 81 percent of total current school expenditure (OECD (2014), p. 284), making salary levels a crucial component of overall education spending levels. When respondents are informed about current salary levels, the share who support increases in teacher salaries declines sharply by about 40 percent (relative to the control mean) in both countries, although baseline support is much lower in Germany. The latter difference, the only notable divergence in preferences that we observe between the two countries, is consistent with the fact that current salaries are higher in Germany. In fact, based on an estimated negative relationship between salary levels and support for salary increases across U.S. states, we show that Germany's higher current salary levels could account for more than two thirds of the German-U.S. difference in support for salary increases.

Further analysis confirms that these treatment effects reflect actual information effects, rather than simply the effect of being primed to think about monetary values as opposed to, say, observable conditions in local schools before reporting support for spending increases (Iyengar et al. (1984); Krosnick and Kinder (1990)). In both countries, treatment effects are substantially larger for respondents who underestimated actual levels and are almost zero for respondents who had already been well informed prior to the information treatment. The fact that treatment effects vary with prior information levels indicates that they at least partly reflect genuine effects of being better informed, rather than just priming. The heterogeneity by prior information levels is more pronounced for teacher salaries than for school spending, in line with the hypothesis that people have a better anchor when estimating salaries compared to spending levels. It is also particularly noteworthy given that we find virtually no evidence of heterogeneous treatment effects across population subgroups defined by gender, age, education, income, employment, and parental and minority status.

Our third experiment examines how preferences for specific categories of education spending react to the provision of information on the tradeoffs involved when choosing among them. When asked how best to allocate new education spending, respondents' preferences shift away from class-size reductions towards alternative spending categories—teacher salaries (particularly in the U.S.) and materials such as new books and technology (particularly in Germany)—if they are informed about what could be achieved in each category with the same amount of additional spending.

The broad pattern of results across the three comparative survey experiments suggests that, despite numerous institutional and political differences between the two countries, citizens' knowledge of and preferences over education spending are quite similar in Germany and the U.S., as are reactions to the provision of information. The overall level of preferences for increases in government spending on education, their substantial reduction when mentioning current spending levels and tax financing requirements, and the shift away from preferences for class-size reductions towards other spending alternatives when informed about the quantitative tradeoffs involved are all comparable across the two countries. The lone exception is Germans' lower preference for teacher salary increases, which is consistent with existing salary differences between the two countries.

Our results contribute to at least three strands of literature. First, a substantial comparative literature examines transatlantic differences in the public's policy preferences in different areas. In particular, Alberto Alesina and coauthors have studied U.S.-European differences in preferences for inequality, redistribution, and working times, concluding that preference differences are not so much related to differences in utility functions or culture as to differences in social beliefs, political institutions, and regulations (see Alesina and Angeletos (2005) and Alesina, Di Tella, and MacCulloch (2004) on redistributive policies; Alesina, Glaeser, and Sacerdote (2001) on the welfare state; and Alesina, Glaeser, and Sacerdote (2006) on working times). Our results similarly suggest that the views of Americans and Germans about education spending may not be so different, after all.

Second, several recent papers use survey experiments in individual countries to study how policy preferences respond to the provision of different kinds of information. For example, Di Tella, Galiani, and Schargrodsky (2012) study effects of information treatments on preferences for privatization reforms in Argentina, Cruces, Perez-Truglia, and Tetaz (2013) and Kuziemko et al. (2015) for redistributive policies in Buenos Aires and the U.S., respectively, Elias, Lacetera, and Macis (2015) for payments for human organs in the U.S., Schueler and West (2016) for education spending in the U.S., Lergetporer et al. (2016) for public spending in general in Germany, and Bursztyn (2016) for the tradeoff between education spending and cash transfers in Brazil. To our knowledge, our paper is the first to use parallel survey experiments to compare how the same information treatments affect public opinion in two countries.

Third, our results advance our understanding of the political economy of education policy. They provide empirical underpinning for the mostly theoretical literature on the political economy of education spending (see, e.g., Glomm, Ravikumar, and Schiopu (2011)) and provide guidance as to the political feasibility of policies such as increasing teacher salaries or reducing class sizes (e.g., Woessmann and West (2006)).

In what follows, Section 2 provides a theoretical framework to guide interpretation of the information experiments, as well as background on the U.S. and German education systems. Section 3 introduces the data and the experimental design. Section 4 reports our main results concerning the effect of information provision on support for education spending and teacher salaries in the two countries. Section 5 demonstrates that German levels of support are consistent with the relationship between current salary levels and support for salary increases across

American states. Section 6 provides evidence of heterogeneous treatment effects by respondents' prior information. Section 7 examines the effects on preferences of highlighting the tradeoffs between different spending categories. Section 8 discusses our findings and concludes.

## **2. Background**

We start by providing theoretical and institutional context for the survey experiments described below. We first propose a theoretical framework based on a standard preference model that illustrates how the provision of information could influence policy preferences. We then offer background information on the American and German education systems and the sources and levels of education spending in the two countries.

### **2.1 Theoretical Framework**

As a framework for our analyses, let us consider a standard model that represents preferences as indifference curves for bundles of two goods between which a consumer is indifferent. In our case, the two goods are policies: spending on public education and other categories of government spending (see Figure 1 for a graphical exposition and Appendix A for a formal derivation). A budget line depicts how much of one good must be sacrificed to receive more of the other. Our analysis refers to the preferences of one individual who represents the median voter in a given country. There will be a distribution of preferences around that median voter, so changes in the size of preferred changes for this representative agent will ultimately translate into changes in the share of people in the country supporting spending increases or decreases.

#### ***The Effect of Status Information on Support for Policy Change***

We start with two assumptions about the median individual's knowledge and preferences, which are supported below by evidence from our survey data for both countries. First, the individual underestimates current levels of spending and teacher salaries. Second, without further information, what the person perceives to be the current levels of spending and salaries are below her personal optimal levels, so that she prefers spending and salaries to increase.

This simple framework allows us to analyze the effects of the two types of information treatments in our survey experiments. The first type is informing respondents about current

levels of education spending.<sup>3</sup> Let  $E_u$  in Figure 1 represent the individual's estimate of the current level of education spending. Her optimal policy choice is  $E_u^*$ , indicating that she favors a large increase in education spending ( $\Delta$  uninformed).

If the person now is informed that the actual level of education spending is in fact not  $E_u$  but rather the higher level  $E_i$ , her optimal policy choice would be  $E_i^*$ , and support for increasing education spending declines ( $\Delta$  informed  $<$   $\Delta$  uninformed). Put differently,  $E_i^*$  lies to the left of  $E_u^*$  projected onto the new budget line with constant levels of other spending. The intuition behind this shift in preferences is straightforward: The individual in the informed state is equivalent to an uninformed individual who received an increase in her budget and spent it all on education. Since under standard preferences she would prefer to spend a portion of this increase on other items, the allocation after the increase reduces her relative demand for additional education spending. In a setting of underestimation of current levels of education spending and preferences for increased education spending, one would therefore expect that informing about current levels of education spending would reduce support for spending increases.

If we change the axes in Figure 1 to represent teacher salaries (rather than overall education spending) vs. other spending (inside or outside the education system) and maintain the same assumptions, the analysis can similarly be interpreted in terms of providing information about current levels of teacher salaries, which is predicted to reduce support for salary increases.

Analyzing the effects of providing information on a single budget item like spending for schools or teacher salaries is useful in illustrating the potential consequences of transparency policies focused on these areas. More generally, the analysis illustrates how access to better information can shape citizens' policy preferences with respect to public spending, a topic that has been the subject of surprisingly little scholarly research. One should be cautious, however, in using such analysis to draw conclusions about how spending levels would need to change to better align with citizens' preferences. To the extent that respondents are also uninformed about areas of public spending beyond education, the analysis does not necessarily reveal the optimality of policy choices, and providing information on education spending may also affect estimates of spending levels on other items (see Appendix A).

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<sup>3</sup> We assume for now that the information treatment does not affect the individual's estimate of other spending or of the relative price of education.

## *The Effect of Tradeoff Information on Support for Policy Change*

The second type of information treatment informs about the tradeoffs between different categories of education spending, rather than about current spending levels. Consider the choice between the number of teachers per student (the inverse of class size) and other education spending in Figure 2. The dashed line shows the individual's uninformed beliefs about the tradeoff between class-size reduction and other spending categories. Informing the person about the actual tradeoff makes her aware that the true budget line has a steeper slope (i.e., smaller reductions in class size for increases in alternative spending than the person had expected). As a result, the optimal policy choice is one where class sizes are not reduced by as much as in the uninformed case ( $\Delta$  informed <  $\Delta$  uninformed). Support for class-size reduction decreases, while support for increasing spending in other categories increases.

If we redefine the axes in Figure 2 to capture overall education spending (rather than teachers per student) vs. non-education spending, the picture can also be used to analyze the additional treatment in our first survey experiment designed to raise the salience of taxation: mentioning the need to raise taxes heightens the person's awareness that increasing education spending requires taking money from other (in this case private) uses. Making this tradeoff salient is therefore expected to reduce support for spending increases.

## **2.2 Background on the U.S. and German Education Systems**

Education is currently the third largest category of government expenditure (after social protection and health care) in both Germany and in the U.S. (OECD (2015), p. 73). Each country's public school system enrolls the vast majority of students. In the U.S., the share of students who attend a private school is 8 percent from primary through to upper secondary school (OECD (2014), p. 416). In Germany, it is 4 percent in primary school, 9 percent in lower secondary, and 8 percent in upper secondary school. However, the American and German education systems also differ in a number of important respects, including the sources of education funding, spending levels, and teacher compensation.<sup>4</sup>

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<sup>4</sup> The education systems also differ in other aspects such as a reliance on comprehensive high schools versus a tracked secondary school system, the prevalence of central exit exams, methods of school finance, and the allocation of educational resources. See Henderson et al. (2015) for a more extensive description of the historical, institutional, and cultural contexts of the education systems in the two countries.

In both the U.S. and Germany, the federal government plays only a secondary role in education governance. The distribution of responsibility for public education across different levels of government is reflected in the sources of education funding. In 2011, the federal government contributed 14 percent of total funding in the U.S. and 11 percent in Germany (OECD (2014), p. 259). While only 35 percent of funding for American schools came from the states, this share was 72 percent in Germany, underscoring the dominant role of the *Länder* in education policy. In the U.S., 51 percent of funding comes from the local level, compared to 17 percent in Germany, giving local school boards a larger role in education governance. If the local nature of funding aligns spending levels more closely with the local optimum or makes residents better informed, the theoretical framework presented above would predict smaller effects of information treatments on preferences for education spending in the United States.

In addition to funding sources, spending levels also differ between the countries. According to OECD estimates, spending for primary education is 45 percent higher in the U.S. than in Germany, and 24 percent higher for secondary education (OECD (2014), p. 215). In dollar terms, while the U.S. spent \$10,958 per student in primary education and \$12,731 in secondary education in 2011, expenditures in Germany were at \$7,579 and \$10,275, respectively. These numbers correspond to 3.7 percent of GDP in the U.S. and 3.0 percent of GDP in Germany (OECD (2014), p. 230). Public expenditure on non-tertiary education accounts for 9.2 percent of total public expenditure in the U.S. and 6.7 percent in Germany (OECD (2014), p. 257). All else equal, the theoretical framework would thus lead to the expectation of lower support for spending increases, as well as smaller absolute information treatment effects, in the United States.

The higher overall spending level in the U.S. is not reflected in higher average teacher salaries. Quite to the contrary, teacher salaries are substantially higher in Germany than in the U.S., both in absolute terms and relative to other workers with a post-secondary degree (OECD (2014), p. 467-471). In primary school, the average annual statutory salary of teachers (after 10 years of experience) is 33 percent higher in Germany (\$59,795) than in the U.S. (\$44,995). The difference is even more pronounced in secondary school, where German teachers earn 48 percent more than U.S. teachers at the lower secondary level and 55 percent more at the upper secondary level. Comparing teacher salaries to the earnings of other workers with a tertiary education yields a similar picture: At the primary, lower secondary, and upper secondary levels, German teachers

earn 88, 97, and 105 percent, respectively, compared to other college-educated workers. In the U.S., relative wages are substantially lower at 67, 68, and 70 percent, respectively. Average class sizes in the two countries are nonetheless quite similar in primary school at 21 students and slightly smaller in Germany (24 students) than in the U.S. (27 students) in lower secondary school (OECD (2014), p. 450). Moreover, as noted above, the total share of current education spending devoted to staff compensation is 81 percent in both countries. Together with the higher spending levels and lower teacher salaries in the U.S., this implies that the U.S. spends considerably more than Germany on non-teaching staff. All else equal, one would expect higher support for salary increases and larger absolute information treatment effects in the United States.

### **3. Data and Methods**

Our analysis draws on three randomized survey experiments embedded in representative surveys of public opinion on education policy that we conducted in the two countries.

#### **3.1 Comparative Opinion Surveys in Germany and the United States**

In spring 2014, we surveyed representative samples of the adult population in both countries about their opinions on education policy.<sup>5</sup> The German sample includes more than 4,000 respondents, and the U.S. sample used in this paper more than 2,600. Both surveys were conducted primarily online, with additional provisions undertaken in each country to ensure representativeness also for residents without internet access.

##### ***The German Survey***

The German survey drew a nationally representative, stratified sample of the German population aged 18 years and older.<sup>6</sup> Random sampling was conducted in two steps: Persons with internet access at home (75 percent) were selected from an online panel and polled with an online survey. Persons without internet access at home (25 percent) were polled at their homes by trained interviewers. These respondents were provided with a tablet computer for completing

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<sup>5</sup> For a descriptive depiction of general patterns of public opinion on education policy in Germany and the U.S., see Henderson et al. (2015).

<sup>6</sup> The survey was implemented by the polling firm TNS Infratest (now called Kantar Public Germany); see [www.tns-infratest.com/sofo/index\\_EN.asp](http://www.tns-infratest.com/sofo/index_EN.asp).

the survey autonomously. When necessary, the interviewer assisted with handling the device. The survey was conducted in German between April and July 2014.

Overall, the German survey comprised 39 questions on education policy. These included the questions on education spending used in this paper, which were coordinated with the U.S. survey. The exact wording of each question can be found at [www.cesifo-group.de/ifo-bildungsbarometer](http://www.cesifo-group.de/ifo-bildungsbarometer). Within the survey experiments, the maximum number of different treatment conditions was four.

The total number of observations in the German survey is 4,171 adults. The specific number of respondents to each question varies for two reasons. The first reason is item non-response, which is very low at 1 percent on average. The second reason is that on the spending question and on the tradeoff question, subgroups of respondents were assigned to additional Germany-specific treatment conditions that are not discussed here. Survey weights are employed throughout to ensure the sample's representativeness with respect to the national adult population.

### *The U.S. Survey*

The American survey drew a nationally representative, stratified sample of the U.S. population aged 18 years and older and representative oversamples of the following subgroups: public school teachers, African Americans, and Hispanics.<sup>7</sup> The sample was drawn from a nationally representative panel of adults, obtained via address-based sampling and list-assisted random digit-dialing sampling techniques, who agreed to participate in a limited number of online surveys. Individuals who do not have internet access were provided access by the polling firm. The survey was conducted in May and June 2014. Respondents could elect to complete the survey in English or Spanish.

Overall, the U.S. survey comprised 36 questions on education policy, including the questions coordinated with the German survey used in this paper. The exact wording of each question is displayed at [www.educationnext.org/edfacts](http://www.educationnext.org/edfacts). Within the survey experiments, the maximum number of different treatment conditions was three.

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<sup>7</sup> The survey was implemented by the polling firm Knowledge Networks (KN), a GfK company. Detailed information about the maintenance of the KN panel, the protocols used to administer surveys, and the comparability of online and telephone surveys is available at [www.knowledgenetworks.com/GANP](http://www.knowledgenetworks.com/GANP).

The total number of observations from the U.S. survey used in this paper is 2,669 adults.<sup>8</sup> The specific number of respondents varies from question to question due to item nonresponse and the fact that, in the cases of opinion about school spending and teacher salary, the sample was randomly divided into multiple groups in order to examine the effect of variations in the way questions were posed. Survey weights are employed throughout to account for nonresponse and the oversampling of teachers and other demographic subgroups.

### 3.2 Experimental Design

In order to identify the effect of the provision of information on public support for education spending in the two countries, we implemented the same three randomized survey experiments in both countries. Within each survey, randomly selected subgroups were given different types of information before answering the same questions about their views on specific aspects of public education spending. Randomization was independent across the three survey experiments. This design allows us to identify the causal effect of the provision of the specific information on the public's preferences for education spending in a survey setting.

The first experiment relates to a question on preferences for overall increases in education spending.<sup>9</sup> The control group (Uninformed) was simply asked about their support for increases or decreases in government funding for public schools in their school district (U.S.) or nationally (Germany). Respondents could choose one of the following five answer categories: greatly increase, increase, stay about the same, decrease, or greatly decrease. There are two treatment groups. One treatment group (Informed) was first informed about the actual level of spending per student in their district (U.S.: \$12,400 on average across the sample) or nationally (Germany: €6,400) and then asked the same question as the control group. After receiving the same information as the first treatment group, a second treatment group (Informed+tax) was asked whether taxes to fund public schools should increase or decrease. As is evident from Table 1, the samples are well balanced across the treatment conditions in terms of observable characteristics, indicating that randomization was successful in both countries.

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<sup>8</sup> The full U.S. survey had a sample size of 5,266 adults and included an additional experiment designed to estimate the impact of the provision of information on student achievement on policy views; the sample used in this paper comprises the control group from that experiment.

<sup>9</sup> The exact wording of the questions in the two countries can be found in Appendix B.

In the other two experiments, there is only one treatment group each. The second experiment asked about support for increases or decreases in the salaries of public school teachers. In contrast to the uninformed control group, the treatment group was informed about the current level of teacher salaries in their state (U.S.) or nationally (Germany). The third experiment examined preferences for different categories of education spending. The control group was simply asked whether a planned increase in government spending should go to class-size reductions, teacher salary increases, or new books and technologies. The treatment group was informed that in the U.S. (Germany), reducing average class sizes by 3 students would cost roughly the same amount as increasing teacher salaries by 13 (15) percent or buying \$10,000 (€20,000) in new books and technologies for each class every year before choosing one of these three options. The balancing table (Appendix Table A1) indicates that observable characteristics are again well balanced across control and treatment groups in the second and third experiments.

In addition to the survey experiments on opinions, we asked respondents in both countries to estimate the current levels of education spending and teacher salaries, respectively. These questions were asked much earlier in the surveys and were separated from the related opinion questions by a series of questions on other education policy topics.

In our analyses, we report results both with and without the following set of control variables available in both countries: gender, parental and employment status, income,<sup>10</sup> age,<sup>11</sup> and education.<sup>12</sup> As is evident from Table 1, a larger share of U.S. than German respondents are parents and employed. The U.S. population is also somewhat younger. In addition, it has a larger share of people with college degrees, whereas the German population has a larger share of apprenticeship degrees. The available information on minority status differs between the two countries: in the U.S., it refers to the non-white population, whereas in Germany, it refers to having a migration background (i.e., both parents not born in the country). We therefore report the minority variable in Table 1 but omit it as a control variable in our experimental analyses due to the lack of comparability across countries.

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<sup>10</sup> Income is measured as percentile rank within each country because income was surveyed in different ways in the two countries that correspond to the most common way of reporting income. In the U.S. survey, income refers to annual pre-tax household income. In the German survey, income refers to monthly household income net of taxes and social security contributions.

<sup>11</sup> To allow for non-linearities in the relationship between age and preferences, we collapse our age variable into four categories: 18-34, 35-49, 50-64, and 65+.

<sup>12</sup> To make the different degrees in the two countries comparable, education is measured in three categories: less than high school, high school but no B.A., and B.A. degree or higher.

## **4. The Effect of Information Provision on Support for Education Spending and Teacher Salaries in Germany and the U.S.**

Our first two experiments study the effect of information provision on support for increases in education spending and in teacher salaries, respectively. In both cases, respondents in the treatment and control conditions were asked to indicate their preferences on a five-point scale ranging from “greatly decrease” to “greatly increase,” with the middle category indicating that spending or salary levels should “stay about the same.” To simplify presentation, our main estimations of treatment effects are based on linear probability models where the top two and bottom three response options are collapsed to create a binary indicator of support for a spending or salary increase; we report conventional OLS standard errors. We also show results in which the outcome is defined as the probability of support for decreased spending or salaries.<sup>13</sup>

### **4.1 Preferences for Education Spending**

In the control group that did not receive any specific information, 60 percent of the U.S. population and 71 percent of the German population favors government funding for public schools to increase or greatly increase (Figure 3). Note that the lower support for increased spending in the U.S. compared to Germany is consistent with the fact that spending levels are currently higher in the U.S. than in Germany, independent of whether they are measured per student, relative to GDP, or as a share of total public spending. A descriptive analysis of who supports higher spending in Table 2 shows that in the U.S., females and poorer people are more likely to be in favor of spending increases and in Germany, respondents with university degrees are more supportive of spending increases.

Table 3 reports how the two information treatments affect support for education spending (see also Figure 3). In each country, both treatments substantially reduce support for increased spending. The strong majority in favor of spending increases turns into a minority of less than one third among those who are informed about current spending levels and told that increased spending would be financed through a tax increase. In this treatment group, preferences for spending increases no longer differ significantly between the two countries. Being informed about current spending levels reduces support for increased spending by 17 percentage points in

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<sup>13</sup> Supplemental analyses available upon request confirm that using ordered probit models with the dependent variable coded 1 for “greatly decrease” to 5 for “greatly increase” yields qualitatively identical results to those reported in Tables 2-6.

the U.S. (column 1) and by 20 percentage points in Germany (column 2). Treatment effects are even larger in the second treatment that also raises the salience of tax financing: This reduces support by 34 percentage points in the United States and by 41 percentage points in Germany. That is, in both countries the information treatment reduces support for increased spending by more than a quarter and the additional tax treatment reduces it by more than half.

Pooling the data from both countries (column 3) reveals that the effect of the information treatment does not differ significantly between the two countries, whereas the effect of the combined information and tax treatment is 7 percentage points larger in Germany than in the United States. If the willingness to accept marginal tax increases is negatively related to status quo tax levels, Germans' stronger reaction to the tax treatment could plausibly be related to the fact that the tax burden is higher in Germany than in the United States (OECD (2016)). Results do not change qualitatively when controls are included (column 4), indicating that neither the difference in support levels nor the differences in the treatment effect are due to underlying demographic differences in the populations of the two countries. The same is true when the controls are additionally interacted with a country indicator (column 5). This model allows the associations of the control variables with support for spending increases to differ across countries. Thus, to the extent that differences exist between the two countries, they cannot be attributed to differences in background characteristics such as age, gender, education, income, employment status, parental status, and migration status or in their association with opinions.

Column 6 reports the same model with an indicator for support for spending decreases (rather than increases) as dependent variable (with the residual being respondents who prefer spending levels to stay about the same). While the control mean is low in both countries (7 percent in the U.S. and 4 percent in Germany), the information treatment raises support for decreased spending by 3 percentage points on average in the two countries and the information-plus-tax treatment raises support for decreased spending by 11 percentage points. Neither of the two treatment effects differs statistically significantly between the two countries.

### ***Replication Study***

As a robustness check, we administered a slightly revised version of the experiment to new representative samples of respondents in both countries in a follow-up survey in 2015. We randomly assigned respondents in both countries (1,986 in the U.S. and 1,984 in Germany) either

to the control group or the information treatment group. In contrast to the 2014 survey, respondents in Germany were informed about the average annual spending levels per student in their respective *Land*, which varied between €5,800 (in North Rhine-Westphalia) and €8,700 (in Thuringia). The provision of state-level information is particularly relevant for Germany because of the *Länders'* dominant role for education policy and funding (see Section 2.2).

Results of the follow-up survey are presented in Appendix Table A2. The control mean of support for increased school spending is 61 percent in the U.S. and 74 percent in Germany. As in the 2014 survey, being informed about current spending levels reduces support for spending increases substantially in both countries (columns 1 and 5). In the U.S., the information reduces support by 16 percentage points and in Germany by 15 percentage points. The fact that the information treatment effect for Germany, while still substantial and highly significant, is somewhat smaller in the follow-up survey than in the 2014 survey, might be due to the presentation of state information rather than national information. In any case, the 2015 survey results confirm that the negative effect of informing respondents about current spending levels on preferences for higher spending is replicated in both countries.

#### **4.2 Preferences for Teacher Salaries**

The second survey experiment examines how the provision of information influences public support for one specific category of education spending: teacher salaries. In contrast to the relatively abstract concept of per-pupil spending levels, people are likely to have clearer benchmarks drawn from their own personal experience when asked to evaluate whether a given level of compensation is appropriate (an assertion we will return to in section 6 below).

In the uninformed control group, 62 percent of Americans support increases in teacher salaries, as compared to just 29 percent of Germans (Figure 4). This difference is consistent with the evidence presented above that teacher salaries are substantially higher in Germany than the U.S., both in absolute terms and relative to other college graduates. Note that the pattern is exactly the opposite from that observed for spending levels (which were lower in Germany, with Germans more supportive of spending increases), suggesting that the between-country differences in public preferences do not reflect overall differences in the level of education spending or in the extent of support for increased educational inputs. In describing supporters for salary increases, Table 2 shows that minorities and those with a college degree are more likely to

support teacher salary increases in the U.S.; females and older people are less likely to support increases in Germany.

Table 4 reports the results of the survey experiment examining how informing respondents about current levels of teacher salaries affects support for salary increases (see also Figure 4). The information treatment reduces support for teacher salary increases by 24 percentage points in the U.S. and by 12 percentage points in Germany. The difference in the absolute magnitude of the treatment effects of 12 percentage points is statistically significant and unaffected by the inclusion of control variables (columns 3-5). Likewise, conditioning on the control variables does not qualitatively affect the German indicator, suggesting that the lower support for salary increases cannot be attributed to demographic differences between the two countries.

In the uninformed control group, relatively few people support decreases in teacher salaries (6 percent in the U.S. and 8 percent in Germany). In the U.S., this is unaffected by the information treatment (column 6). In Germany, however, support for decreasing teacher salaries grows by 8 percentage points when people are informed about current salary levels.

### **4.3 Heterogeneous Treatment Effects by Demographic Subgroups**

Table 5 reports the two treatment effects of the school spending experiment and the treatment effect of the teacher salary experiment for subgroups defined based on the following characteristics: gender, parental status, employment status, minority status, income, age, and education. There are hardly any significant treatment heterogeneities present either in the U.S. or Germany. In particular, treatment effects are significant in all cases, and they rarely differ across the subgroups. For example, none of the treatment effects differs in a noteworthy way for people with different levels of income, age, or education. Neither do the information treatments act differently for different ethnic groups in the United States. The only cases where treatment effects differ statistically significantly across subgroups are the combined information-plus-tax treatment in Germany by parental and minority status and the treatment effect in the salary experiment in the U.S. by parental status and income level. We refrain from offering substantive interpretations of these differences due to the large number of subgroup comparisons and the associated risk of false conclusions.

## 5. Explaining Differences between Germany and the United States

Both in Germany and the United States, informing citizens about current levels of education spending and teacher salaries significantly reduces support for spending and salary increases. Likewise, making tax financing requirements salient further reduces support for increased spending in both countries. However, in absolute terms, the tax treatment effect is significantly larger in Germany and the effect of the salary information treatment is significantly smaller. Does this reflect differences in the composition of the populations, differences in the status quo policies in the two countries, or genuine differences in public preferences? We have already shown that treatment effects hardly budge when controlling for demographic differences between the populations. We have also noted that the direction of the differences across countries is consistent with citizens of the two countries reacting in similar ways to divergent policy environments.

Here, we use two approaches to provide additional evidence suggesting that the differences between the two countries reflect differences in current policy. As indicated, current spending levels are lower, but teacher salary levels are higher, in Germany than in the United States. Consistent with this, Germans in the control conditions are more likely to support spending increases, but less likely to support salary increases.

Thus, a first approach is to look at treatment effects relative to the extent of baseline support for increases in the two countries in the absence of any treatment. As is evident from the bottom parts of Tables 3 and 4, treatment effects relative to control means are quite similar in the two countries: Informing about spending levels reduces support for spending increases by 28 percent of the untreated support level in the U.S. and by 29 percent in Germany. The combined information plus tax treatment reduces support for spending increases by 57 percent of the control mean in the U.S. and by 58 percent in Germany. And relative to the respective control means, the information treatment reduces support for teacher salary increases by 39 percent in the U.S. and by 42 percent in Germany. This pattern indicates that differences in absolute treatment effects are directly related to differences in uninformed levels of support for policy changes, which may in turn relate to differences in current policies.

To examine this possibility more formally, we link the analysis directly to current differences in policy levels. To do so, we make use of the variation across U.S. states. We focus the analysis on opinions on teacher salaries, where differences are starkest between the two

countries. The analysis proceeds in two steps: First, using our U.S. dataset, we estimate the association between current levels of teacher salaries and support for salary increases across U.S. states. Second, from that association we project the level of support we would expect at the German teacher salary level and compare this to Germans' actual support for salary increases.

Figure 5 illustrates this projection analysis. It confirms that higher average salary levels are systematically related to less support for salary increases across U.S. states. The underlying regression (which includes our standard set of control variables) indicates that an increase in average monthly teacher salaries by \$1,000 is associated with a decrease in support for increased salaries by 0.8 percentage points (*p*-value 0.015). In units equivalent to the U.S. salary data, current teacher salaries in Germany are at \$ 85,450.<sup>14</sup> Based on a linear projection from the association across U.S. states, at this salary level we would expect 39 percent support for salary increases, just 10 percentage points higher than the actual support of 29 percent. In other words, differences in current salary levels can account for as much as 69 percent of the difference between Germany and the U.S. in mean support for teacher salary increases.<sup>15</sup>

In this sense, even the German results on preferences for teacher salaries are consistent with the U.S. results: The lower uninformed support level for salary increases is in line with the higher current salary levels in Germany. And relative to this uninformed support level, the information treatment effect in Germany is very similar to the one in the United States. Differences in the absolute size of the treatment effects thus appear to be mostly attributable to differences in the policy status quo in the two countries.

## **6. Information vs. Priming: Heterogeneity by Prior Knowledge**

A potential concern with the evidence presented so far is that the apparent treatment effects of information could reflect respondents having been primed to think about the topic of education spending in terms of financial values, as opposed to respondents becoming better

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<sup>14</sup> To translate German salary levels into the units available for U.S. states (drawn from the U.S. Department of Education's Digest of Education Statistics 2012), we take the relative salary level of Germany compared to the U.S. on an internationally comparable scale from the OECD (2014), p. 467 (using the statutory salary for lower secondary teachers after 10 years), which stands at 148 percent of the U.S. level, and inflate the national average salary level in our U.S. data by this amount.

<sup>15</sup> Using salary levels at the upper rather than lower secondary level, where German salaries stand at 155 percent of the U.S. level, the expected support would be even closer to the true value at 36 percent, with salary differences accounting for 78 percent of the U.S.-German support difference.

informed. To shed light on this issue, we estimate whether treatment effects differ by respondents' prior knowledge of spending and salary levels.<sup>16</sup>

To be able to do so, we asked respondents to report their best estimates of current levels of school spending and teacher salaries. In both countries, these estimation questions were asked early in the survey and separated from the respective opinion questions by a number of questions on other education policy topics.

Figure 6 shows distributions of the public's estimates of spending and salary levels in the two countries (expressed relative to the respective actual levels). Two patterns stand out. First, a majority of the public in both countries tends to underestimate actual levels of school spending and teacher salaries. In the U.S., the median estimate of spending per student is \$3,000, which is 24 percent of the actual average spending level of \$12,400. In Germany, the median estimate is €1,500, or 23 percent of the actual average spending level of €6,400.<sup>17</sup> Second, in both countries the distribution of estimates of salary levels comes close to a normal shape, whereas the distribution of estimates of spending levels, in addition to being further from the actual value, is more diffuse.<sup>18</sup> This might indicate that people do not have a clear anchor when estimating current levels of educational spending per student, whereas they have a better anchor (from knowing their own salary or salary levels in general) when estimating what teachers earn. Therefore, estimates of teacher salary levels may be more informative and include less noise than estimates of school spending levels.

Thus, focusing first on the teacher salary experiment, we analyze whether the information treatment effect differs by respondents' prior knowledge of actual teacher salary levels. The key result is displayed in Figure 7, which plots a linear estimate of how the probability to support increased salaries depends on the prior guesses of teacher salary levels, separately for the control group and for the treatment group.<sup>19</sup> In the uninformed control group, there is a clear tendency

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<sup>16</sup> This approach to distinguishing information and priming effects was developed in an observational setting by Lenz (2009) and has been applied in survey experiments by Cruces, Perez-Truglia, and Tetaz (2013), Clinton and Grissom (2015), and Schueler and West (2016).

<sup>17</sup> In both countries, the leftmost bar of the histogram is the highest one, containing estimates below 8.8 percent of the actual value in the U.S. and below 8.3 percent in Germany.

<sup>18</sup> The spikes in the distribution of German estimates reflect that respondents tend to answer in multiples of 5000 (spending) or 500 (salary) and that the denominator (the actual levels) is a national constant in Germany (but not in the U.S.).

<sup>19</sup> So as not to be driven by extreme outliers, we trim observations whose guesses were below one third of and above three times the actual level in this analysis.

for respondents who had initially underestimated actual salary levels to be more likely to support salary increases. In the treatment group that is informed about actual salary levels, this association turns around.

The difference between the two lines illustrates the dependence of the information treatment on prior guesses. In both countries, the treatment effect is largest for those who had initially underestimated actual salary levels the most: Once these people learn that teachers actually earn much more than they had thought, their willingness to support salary increases drops by a large amount. This treatment effect of information in terms of decreasing support for increased salaries decreases (in absolute terms) as the extent to which people underestimate actual salary levels decreases.

For people who had roughly the correct guess about teacher salary levels, the treatment effect is no longer statistically significantly different from zero. For them, the information provided was already known, and indeed there is no treatment effect. Finally, for people who had initially overestimated teacher salaries, the treatment effect turns in the other direction: Having thought that teachers earned more, now being informed about the actual (lower) levels makes these people more willing to support salary increases, and significantly more so in Germany.

The right panel of Table 6 shows these results in regression form. The treatment effect of informing respondents about actual levels of teacher salaries shows a strong positive interaction with the extent to which respondents had initially underestimated salary levels in both countries. For respondents with low estimates of teacher salary levels, the information treatment (revealing that teachers in fact earn more than they had thought) significantly reduces the probability of favoring salary increases. For respondents who had roughly had the correct knowledge of actual teacher salaries (with an estimate roughly equal to the actual level), this information treatment effect is close to zero. And for respondents whose initial estimate was much higher than actual teacher salary levels, the information treatment (revealing that teachers in fact earn less than they had thought) turns positive, so that they are now more likely to favor salary increases. The pooled model indicates that both the negative treatment effect for under-estimators and the positive treatment effect for over-estimators are smaller (in absolute terms) in Germany than in the U.S. when under- and over-estimation is measured in percent of the actual salary level.

For the school spending experiment, results from a specification that includes a linear interaction between the information treatment variable and respondents' estimates of current

spending as a percentage of actual levels are less clear. This is consistent with our suggestion that estimates of spending levels—for which there is no readily available anchor on which to fix estimates—contain more noise than estimates of salary levels. However, the first three columns of Table 6 confirm that a similar pattern of heterogeneity emerges from a simple specification that interacts the treatment effect with an indicator of whether respondents’ initial guesses had been above the actual value. In both countries, the effect of information is strongly negative for the larger group of respondents who had initially underestimated spending levels, whereas it is significantly smaller (in absolute terms) and close to zero for those who had initially overestimated spending levels. In the pooled model, the treatment effect is 18 percentage points smaller (in absolute terms) for those who initially overestimated actual spending levels, and this difference by prior knowledge status does not differ significantly between the two countries.

A potential concern with asking respondents to guess spending levels is that doing so creates a situation in which the information treatment explicitly corrects the false initial guesses offered by most respondents. Since respondents might feel obliged to state spending preferences which are consistent with the new information, the reported treatment effects might be due to experimenter demand effects rather than genuine information effects. Presumably, this reaction to the correction of false beliefs should be particularly prevalent among individuals who were very sure about the accuracy of their estimate as compared to those who were very unsure. We test this proposition in our 2015 follow-up surveys (see section 4.1), where we again asked respondents for their best estimate of current spending levels and, in addition, asked how sure they were about their guess.<sup>20</sup> This allows us to test whether the information treatment effect differs by the degree of initial uncertainty about the guess. Columns 2-4 and 6-8 of Appendix Table A2 show that, in both countries, the information treatment effect does not vary significantly with the uncertainty of the prior guess. This finding is inconsistent with an interpretation where demand effects triggered by the correction of false beliefs are a main driver of the results.

In sum, in both countries treatment effects of informing people about actual levels of school spending and teacher salaries are strongly heterogeneous by respondents’ prior information status about spending and salary levels. If all that the treatment did was to prime respondents to think about spending and salaries in terms of dollar or euro values, treatment effects should not

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<sup>20</sup> Respondents indicated their certainty on a seven-point scale from “very unsure” to “very sure”.

differ by prior knowledge. The fact that they do indicates that they do not solely capture priming effects, but in fact also reflect effects of people becoming better informed. The stark heterogeneities in treatment effects by prior knowledge of spending and salary levels are especially noteworthy in light of the fact that treatment effects for the same experiments hardly differ across demographic groups.

## **7. Evidence on Tradeoffs between Different Spending Categories**

To study support for different categories of education spending in greater detail, our third survey experiment examines the effect of providing information on the tradeoff involved between different spending options. In particular, supposing that the government plans to increase spending in the school system, respondents are asked to choose one of the following three options: reducing class sizes, increasing teacher salaries, and purchasing new books and technologies.

In the uninformed control group, a plurality of respondents in each country favors class-size reductions over the other options: 46 percent in the U.S. and 64 percent in Germany (Figure 8). Consistent with the second experiment, fewer Germans (4 percent) than Americans (24 percent) favor teacher salary increases. Roughly one third of respondents in both countries favor the purchase of new books and technologies.

The treatment group is informed that in the U.S. (Germany), reducing average class sizes by 3 students would cost roughly the same amount as increasing teacher salaries by 13 (15) percent or buying \$10,000 (€20,000) in new books and technologies for each class every year before choosing one of these three options.<sup>21</sup> This treatment reduces support for class-size reductions in both countries, to 35 percent in the U.S. and 48 percent in Germany. While in the U.S. support mainly shifts towards increasing teacher salaries (33 percent), in Germany it mainly shifts towards buying new books and technologies (46 percent).

Table 7 reports treatment effects on support for the different spending options as relative risk ratios estimated by multinomial logit models. In both countries, the tradeoff information significantly reduces the relative risk of choosing class-size reductions over teacher salary increases. While the treatment effect is larger in Germany, the difference between the two

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<sup>21</sup> The differences in the calculated tradeoffs in the two countries are consistent with slightly smaller class sizes and substantially higher teacher salaries in Germany (see section 2.2 above).

countries is not statistically significant. Given the difference in baseline support for teacher salary increases, the treatment effect of tradeoff information on the relative support for increased teacher salaries compared to new books and technologies also does not differ significantly between the two countries. Only the difference in the reduction in support for class-size reductions over new books and technologies between the two countries reaches statistical significance, with the relative risk ratio being smaller in Germany.

In sum, support for education spending is affected not only by information on spending levels, but also by information on the tradeoffs involved between different categories of education spending. In particular, once aware of these tradeoffs, the public in both countries expresses far less enthusiasm for class-size reductions. In the informed group, support is rather evenly distributed over the three options in the U.S. and closely split between class-size reductions and purchase of new teaching material in Germany.

## **8. Discussion and Conclusions**

In a series of survey experiments, we examine how various forms of information affect public opinion concerning education spending in Germany and the United States. Our results show that in both countries, providing the public with information on current spending levels and clarifying the tradeoffs involved in allocating educational resources changes preferences on education spending. In particular, information on current levels of education spending and teacher salaries reduces support for spending and salary increases for the public as a whole and within virtually all demographic subgroups. In both countries, these effects are confined largely to individuals who had underestimated actual spending and salary levels, indicating that they reflect genuine effects of becoming better informed. In addition, telling the public that increased education spending would be financed through higher taxes further reduces support. Finally, informing the public about the tradeoffs involved between different spending options reduces support for class-size reductions in favor of teacher salary increases (mostly in the U.S.) and purchase of new teaching material (mostly in Germany).

These experimental results are consistent with the preference model presented in our theoretical framework. Our descriptive data indicates that, in both countries, the public on average underestimates current levels of spending and salaries and—in the absence of information treatment—tends to favor spending and salary increases. The preference model

therefore predicts that providing information about current levels of spending and salaries will reduce support for increases; that making the implications of increasing education spending for resource uses outside education salient will also reduce support for increases; and that information on tradeoffs between spending options will affect their relative popularity.

In this general sense, the public in Germany and the U.S. responds quite similarly to the provision of information on education spending. Relative to the baseline support for spending and salary increases in the uninformed group, the information treatment effects are remarkably consistent across the two countries. The country with higher current levels differs for overall education spending and teacher salaries—and so do our results on which country exhibits greater support for increasing these levels. And while current teacher salary levels are substantially higher in Germany than in the U.S. on average, Germans' level of support for salary increases is very much in line with what would be predicted based on the negative relationship between salary levels and support for increases observed across American states.

These similarities in citizens' reactions to information treatments may be surprising in light of research emphasizing transatlantic differences. For example, the two countries we study have adopted very different institutional structures for their societies, with Germany considered to be the leading exemplar of the conservative welfare state and the U.S. the prototype of liberal capitalism (e.g., Esping-Andersen (1990); Hall and Soskice (2001)). Other work has emphasized how differences between the U.S. and Europe in political institutions, market regulations, and social beliefs about matters such as the extent to which effort influences economic outcomes lead to sharp differences in policy preferences (see Alesina, Glaeser, and Sacerdote (2001, 2006); Alesina, Di Tella, and MacCulloch (2004); Alesina and Angeletos (2005); Linos and West (2003)). Despite these differences, our results suggest that German and American citizens' preferences with respect to education spending are quite similar, as are their responses to the provision of information.

The provision of more direct evidence for the notion that public preferences are the same across countries is of course complicated by the fact that preferences are likely to be influenced by the policies that are currently in place, which differ across countries. However, our surveys indicate that Germans and Americans provide very similar responses when asked about the importance of student performance to future prosperity: fully 97 percent of the public in both countries stated that the academic performance of high school students is “very” or “somewhat”

important for the country's future prosperity (on a four-point-scale ranging from "not important at all" to "very important"). This similarity in perspective on academic performance lends credibility to our suggestion that preferences are, in fact, similar across countries and that the differences in documented policy preferences are largely due to differences in the policy status quo.

In terms of policy implications, our results first illustrate how information matters in shaping policy preferences. Citizens in both countries systematically underestimate what is currently spent on education and, once provided with accurate information, update their preferences accordingly. Our results therefore cast doubt on whether uninformed opinions accurately reflect public preferences concerning the size of the education budget. At the most basic level, this implies that public opinion polls are likely to be an unreliable guide for policymakers seeking information on citizens' true preferences with respect to education spending (Althaus (1998)). Surveys that incorporate information about status quo spending levels across multiple policy domains and clarify the implications of proposed changes for tax burdens are apt to produce a more reliable barometer of public sentiment.

The results also shed light on the potential consequences of proposals prevalent in both countries to improve information levels by increasing transparency about education spending, for example by incorporating spending information into educational accountability systems (see, e.g., Boser (2011)). In the U.S., a new requirement to publish school-level data on per-pupil spending in annual school report cards was incorporated into the federal Elementary and Secondary Education Act in its 2015 reauthorization in an effort to promote efficiency in the use of public resources and expose inequities in the distribution of spending across schools. Providing citizens with more information on education policy is also high on the agenda in Germany. In 2006, the meeting of the federal and state ministers of education has instituted a biannual national education report that reports on leading indicators in different educational areas, including education spending, in increasing detail. Over recent years, several of the individual *Länder* have also started to publish their own education reports. For example, the government of Schleswig-Holstein announced that it will start to publish a biannual education report again starting in fall 2016.

Our results suggest that such proposals to increase transparency may make it more difficult to sustain public support for increased education spending. The importance of information does

not mean, however, that efforts to improve transparency about government budgets would necessarily undermine public support for education budgets. First, in no case do we see a majority emerge in favor of decreasing overall spending levels. Second, citizens may be equally misinformed about spending levels in other policy domains. Providing them with similar information on how much the government spends for other purposes (e.g., health care or incarceration) might well lead to substitution effects towards education. Our results do indicate, however, that equipping the public with better information about government budgets could alter their views and help align spending levels with citizen's preferences.

Our results also have a bearing on policies governing the allocation of education resources. Specifically, they suggest that in the absence of information on the relative cost of different spending options, people in both countries will support greater investment in class-size reduction than would be the case if they understood its opportunity costs. In that sense, informing the public about the tradeoffs between different forms of education spending may provide politicians with leverage to reallocate resources within the education system.

## References

- Alesina, Alberto, George-Marios Angeletos (2005). Fairness and Redistribution. *American Economic Review* 95 (4): 960-980.
- Alesina, Alberto, Rafael Di Tella, Robert MacCulloch (2004). Inequality and Happiness: Are Europeans and Americans Different? *Journal of Public Economics* 88 (9-10): 2009-2042.
- Alesina, Alberto, Edward Glaeser, Bruce Sacerdote (2001). Why Doesn't the United States Have a European-Style Welfare State? *Brookings Papers on Economic Activity* (2): 187-254.
- Alesina, Alberto, Edward Glaeser, Bruce Sacerdote (2006). Work and Leisure in the United States and Europe: Why So Different? *NBER Macroeconomics Annual* 2005: 1-64.
- Althaus, Scott L. (1998). Information Effects in Collective Preferences. *American Political Science Review* 92 (3): 545-558.
- Boser, Ulrich (2011). *Return on Educational Investment: A District-by-District Evaluation of U.S. Educational Productivity*. Washington, DC: Center for American Progress.
- Bursztyn, Leonardo (2016). Poverty and the Political Economy of Public Education Spending: Evidence from Brazil. *Journal of the European Economic Association* 14 (5): 1101-1128.
- Clinton, Joshua D., Jason A. Grissom (2015). Public Information, Public Learning and Public Opinion: Democratic Accountability in Education Policy. *Journal of Public Policy* 35 (3): 355-385.
- Cruces, Guillermo, Ricardo Perez-Truglia, Martin Tetaz (2013). Biased Perceptions of Income Distribution and Preferences for Redistribution: Evidence from a Survey Experiment. *Journal of Public Economics* 98: 100-112.
- Di Tella, Rafael, Sebastian Galiani, Ernesto Schargrotsky (2012). Reality Versus Propaganda in the Formation of Beliefs About Privatization. *Journal of Public Economics* 96 (5-6): 553-567.
- Elias, Julio J., Nicola Lacetera, Mario Macis (2015). Sacred Values? The Effect of Information on Attitudes toward Payments for Human Organs. *American Economic Review* 105 (5): 361-365.
- Esping-Andersen, Gøsta (1990). *The Three Worlds of Welfare Capitalism*. Princeton, NJ: Princeton University Press.
- Glomm, Gerhard, B. Ravikumar, Ioana C. Schiopu (2011). The Political Economy of Education Funding. In *Handbook of the Economics of Education, Vol. 4*, edited by Eric A. Hanushek, Stephen Machin, Ludger Woessmann. Amsterdam: North Holland: 615-680.
- Hall, Peter A., David Soskice, eds. (2001). *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*. Oxford: Oxford University Press.
- Hanushek, Eric A. (2003). The Failure of Input-Based Schooling Policies. *Economic Journal* 113 (485): F64-F98.

- Hanushek, Eric A., Ludger Woessmann (2015). *The Knowledge Capital of Nations: Education and the Economics of Growth*. Cambridge, MA: MIT Press.
- Henderson, Michael B., Philipp Lergetporer, Paul E. Peterson, Katharina Werner, Martin R. West, Ludger Woessmann (2015). Is Seeing Believing? How Americans and Germans Think About Their Schools. PEPG Working Papers Series 15-02. Cambridge, MA: Harvard University, Program on Education Policy and Governance.
- Iyengar, Shanto, Mark D. Peters, Donald R. Kinder, Jon A. Krosnick (1984). The Evening News and Presidential Evaluations. *Journal of Personality and Social Psychology* 46 (4): 778-787.
- Jackson, C. Kirabo, Rucker C. Johnson, Claudia Persico (2016). The Effects of School Spending on Educational and Economic Outcomes: Evidence from School Finance Reforms. *Quarterly Journal of Economics* 131 (1): 157-218.
- Krosnick, Jon A., Donald R. Kinder (1990). Altering the Foundations of Support for the President through Priming. *American Political Science Review* 84 (2): 497-512.
- Kuziemko, Ilyana, Michael I. Norton, Emmanuel Saez, Stefanie Stantcheva (2015). How Elastic Are Preferences for Redistribution? Evidence from Randomized Survey Experiments. *American Economic Review* 105 (4): 1478-1508.
- Lenz, Gabriel S. (2009). Learning and Opinion Change, Not Priming: Reconsidering the Priming Hypothesis. *American Journal of Political Science* 53 (4): 821-837.
- Lergetporer, Philipp, Guido Schwerdt, Katharina Werner, Ludger Woessmann (2016). Information and Preferences for Public Spending: Evidence from Representative Survey Experiments. CESifo Working Paper 5938. Munich: CESifo.
- Linos, Katerina, Martin West (2003). Self-Interest, Social Beliefs, and Attitudes to Redistribution: Re-Addressing the Issue of Cross-National Variation. *European Sociological Review* 19 (4): 393-409.
- OECD (2014). *Education at a Glance 2014: OECD Indicators*. Paris: Organisation for Economic Co-operation and Development.
- OECD (2015). *Government at a Glance 2015*. Paris: Organisation for Economic Co-operation and Development.
- OECD (2016). Personal Income Tax: All-in Average Rates by Family Type. OECD Tax Statistics. Doi: [http://Dx.Doi.Org/10.1787/Data-00805-En](http://dx.doi.org/10.1787/Data-00805-En) (Accessed March 7, 2016).
- Schueler, Beth E., Martin R. West (2016). Sticker Shock: How Information Affects Citizen Support for Public School Funding. *Public Opinion Quarterly* 80 (1): 90-113.
- Woessmann, Ludger, Martin R. West (2006). Class-Size Effects in School Systems around the World: Evidence from between-Grade Variation in TIMSS. *European Economic Review* 50 (3): 695-736.

## Appendix A: A Simple Model of the Effect of Information Provision on Preferences for Increased Education Spending

Consider a representative individual deciding between spending on education  $E$  and spending on other items  $O$  in order to maximize the following expression of her preferences subject to a budget constraint:

$$\max_{E,O} E^\alpha O^{1-\alpha} \quad s.t. \quad pE + O = B \quad (1)$$

where the parameter  $\alpha \in (0,1)$  reflects the relative importance of education in preferences,  $p$  is the relative price of education, and  $B$  is the budget. Optimal spending levels on the two categories can be derived as

$$E^* = \alpha \frac{B}{p}, \quad O^* = (1-\alpha)B \quad (2)$$

Subscripts  $u$  and  $i$  refer to uninformed and informed, respectively. Let us assume that in the uninformed state, the individual underestimates spending on education ( $E_u < E_i$ ), whereas providing information on education spending does not affect the individual's estimates of spending on other items ( $O_u = O_i = O$ ) or of the price of education ( $p$ ). Optimal spending on education,  $E_u^*$  and  $E_i^*$ , is given by (2) for the respective budget,  $B_u = pE_u + O$  and  $B_i = pE_i + O$ . Then, the difference in desired increases in spending on education between the informed and the uninformed status is given by:

$$\begin{aligned} \Delta_i - \Delta_u &= (E_i^* - E_i) - (E_u^* - E_u) \\ &= \left( \alpha \frac{pE_i + O}{p} - E_i \right) - \left( \alpha \frac{pE_u + O}{p} - E_u \right) \\ &= (\alpha - 1)(E_i - E_u) < 0 \end{aligned} \quad (3)$$

That is, the informed individual is closer to her optimal spending. Her support for increased spending is reduced by being informed about the actual spending, as depicted in Figure 1.

If the provision of information on education spending also affects the individual's estimates of spending on other items ( $O_u \neq O_i$ ),  $\Delta_i - \Delta_u$  is given by the following expression:

$$\Delta_i - \Delta_u = (\alpha - 1)(E_i - E_u) + \frac{\alpha}{p}(O_i - O_u) \quad (4)$$

and  $\Delta_i - \Delta_u < 0$  holds as long as:

$$E_i - E_u > \frac{\alpha}{(1-\alpha)p} (O_i - O_u) \quad (5)$$

That is, all else equal, the likelihood that informing the individual about the true level of education spending will reduce her support for higher education spending increases with the relative extent to which the information affects spending estimates in education compared to other items, increases with the relative price of education, and decreases with the importance of education in her preferences.

## **Appendix B: Wording of the Survey Questions**

### ***Estimate of spending level:***

U.S.: Based on your best guess, what is the average amount of money spent each year for a child in public schools in your local school district?

Germany: Was schätzen Sie, wie viel wird durchschnittlich jedes Jahr pro Schülerin/Schüler an öffentlichen allgemeinbildenden Schulen in Deutschland ausgegeben?

### ***Estimate of teacher salary level:***

U.S.: Based on your best guess, what is the average yearly salary of a public school teacher in your state?

Germany: Was schätzen Sie, wie viel verdienen Lehrerinnen und Lehrer im Durchschnitt in Deutschland? Bitte schätzen Sie das Netto-Monatsgehalt einer Vollzeitstelle.

### ***Support for higher education spending:***

U.S.: *Uninformed [Informed]*: [As it turns out, according to the most recent information available \${value} is being spent each year per child attending public schools in your district.] Do you think that government funding for public schools in your district should increase, decrease, or stay about the same? *Informed+tax*: As it turns out, according to the most recent information available \${value} is being spent each year per child attending public schools in your district. Do you think that taxes to fund public schools in your district should increase, decrease, or stay about the same?

Germany: *Uninformed [Informed]*: [Die staatlichen Bildungsausgaben in Deutschland betragen im Durchschnitt jährlich 6400 Euro pro Schülerin/Schüler.] Sollten die staatlichen Ausgaben für Schulen in Deutschland Ihrer Meinung nach steigen, sinken oder unverändert bleiben?

*Informed+tax*: Die staatlichen Bildungsausgaben in Deutschland betragen im Durchschnitt jährlich 6400 Euro pro Schülerin/Schüler. Sollten Steuern für die staatliche Finanzierung von Schulen in Deutschland Ihrer Meinung nach steigen, sinken oder unverändert bleiben?

***Support for higher teacher salaries:***

U.S.: *Uninformed [Informed]*: [As it turns out, public school teachers in your state are paid an average annual salary of \${value}.] Do you think that public school teacher salaries should increase, decrease, or stay about the same?

Germany: *Uninformed [Informed]*: [In Deutschland verdienen vollzeitbeschäftigte Lehrerinnen und Lehrer im Durchschnitt rund 3000 Euro netto im Monat.] Was meinen Sie, sollten die Gehälter von Lehrerinnen und Lehrern in Deutschland steigen, sinken oder unverändert bleiben?

***Support for different spending categories:***

U.S.: *Uninformed*: Suppose the government plans to increase spending in the school system. Which one of the following options do you favor? Reducing class sizes – Increasing teacher salaries – Purchasing new books and technologies. *Informed*: Suppose the government plans to increase spending in the school system. Reducing average class sizes by 3 students would cost roughly the same amount as increasing teacher salaries by 13 percent or buying \$10,000 in new books and technologies for each class every year. Among these options, which do you favor? Reducing class sizes by 3 students – Increasing teacher salaries by 13 percent – Purchasing \$10,000 in new books and technologies for each class every year.

Germany: *Uninformed*: Stellen Sie sich vor, die Regierung plant, die Ausgaben für das Schulsystem zu erhöhen. Für welche der folgenden Möglichkeiten sind Sie? Schulklassen verkleinern – Lehrergehälter erhöhen – Neue Schulbücher, Computer und andere Lehrmittel anschaffen. *Informed*: Stellen Sie sich vor, die Regierung plant, die Ausgaben für das Schulsystem zu erhöhen. Die Schulklassen um drei Schülerinnen/Schüler zu verkleinern, würde in etwa so viel kosten, wie die Lehrergehälter um 15 Prozent zu erhöhen oder neue Lehrmittel im Wert von jährlich 20000 Euro für jede Klasse anzuschaffen. Für welche dieser Möglichkeiten sind Sie? Schulklassen um 3 Schüler verkleinern – Lehrergehälter um 15 Prozent erhöhen – Neue Schulbücher, Computer und andere Lehrmittel im Wert von jährlich 20.000 Euro für jede Klasse anschaffen.

## Appendix C: Appendix Tables

**Table A1: Descriptive statistics and balance across treatment conditions: Teacher salary and spending options experiments**

	Teacher salary experiment				Spending options experiment			
	U.S.		Germany		U.S.		Germany	
	Uninformed (1)	Informed (2)	Uninformed (3)	Informed (4)	Uninformed (5)	Informed (6)	Uninformed (7)	Informed (8)
Female	0.527	0.538	0.523	0.502	0.515	0.550	0.508	0.493
Parent	0.323	0.279**	0.185	0.186	0.289	0.312	0.181	0.187
Employed	0.585	0.572	0.483	0.499	0.588	0.568	0.498	0.482
Minority	0.350	0.344	0.077	0.074	0.340	0.354	0.077	0.071
Income (percentile)	52.86	54.65	53.81	52.77	53.32	54.24	53.64	54.28
Age								
18-34	0.287	0.304	0.235	0.248	0.295	0.296	0.233	0.241
35-49	0.246	0.202**	0.263	0.257	0.223	0.223	0.268	0.251
50-64	0.305	0.307	0.265	0.238**	0.312	0.300	0.263	0.253
65+	0.162	0.187	0.237	0.257	0.170	0.180	0.236	0.255
Education								
Less than high school	0.090	0.125**	0.098	0.09	0.109	0.107	0.090	0.110
High school but no B.A.	0.631	0.566***	0.765	0.754	0.601	0.596	0.771	0.753
B.A. degree or higher	0.277	0.310	0.137	0.156	0.290	0.298	0.140	0.147
Refused	0.012	0.016	0.011	0.010	0.013	0.018	0.009	0.013
Observations	1,322	1,347	2,083	2,088	1,331	1,338	986	1,068

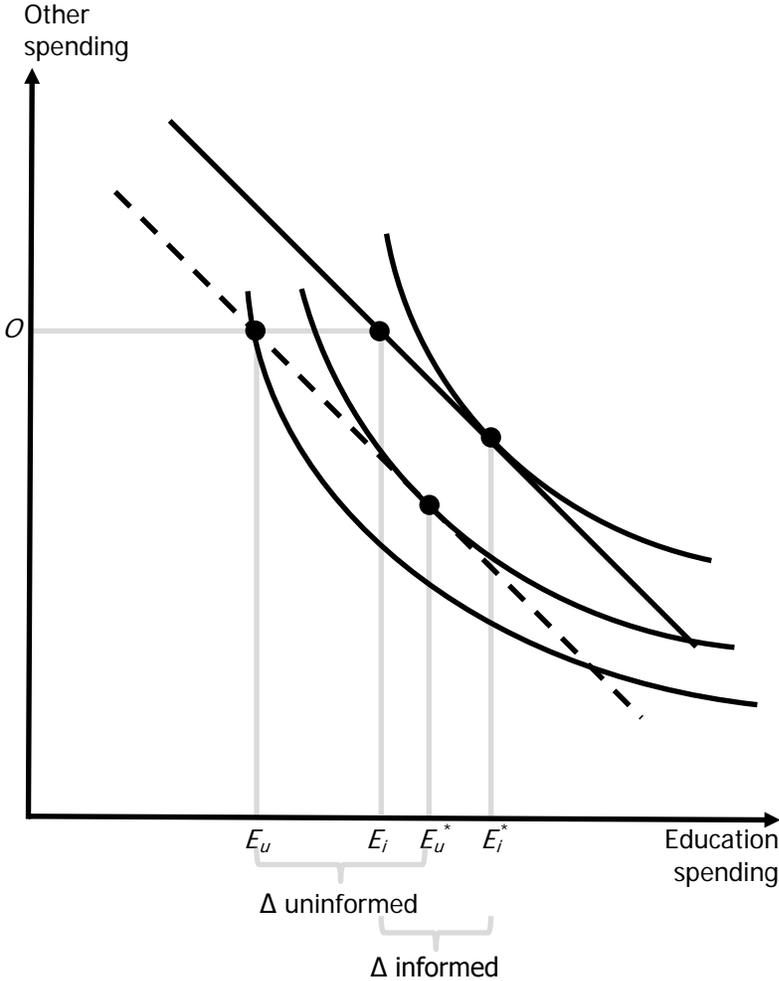
Notes: Means. Significance tests indicate whether the mean for the informed treatment group differs from the mean for the uninformed control group. Observations weighted by survey weights to ensure national representativeness. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.10. Source: The 2014 EdNext Survey and Ifo Education Survey 2014.

**Table A2: Heterogeneity of information effect with respect to certainty of prior guess in the follow-up survey**

	U.S.				Germany			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Informed	-0.159*** (0.022)	-0.185*** (0.024)	-0.181*** (0.027)	-0.196*** (0.029)	-0.149*** (0.0282)	-0.197*** (0.033)	-0.163*** (0.034)	-0.212*** (0.039)
Estimate (Spending: >Actual)		-0.123*** (0.045)		-0.023 (0.064)		0.042 (0.045)		0.018 (0.056)
Informed X Estimate		0.148** (0.064)		0.121 (0.085)		0.180*** (0.065)		0.217*** (0.076)
Certain			-0.107*** (0.034)	-0.058 (0.038)			-0.006 (0.044)	-0.0260 (0.052)
Certain X Informed			0.066 (0.047)	0.042 (0.052)			0.023 (0.064)	0.053 (0.074)
Certain X Estimate				-0.155* (0.092)				0.076 (0.095)
Certain X Informed X Estimate				-0.059 (0.132)				-0.124 (0.148)
Control mean	0.577				0.740			
Observations	2,010	1,986	1,986	1,972	2,078	1,984	1,984	1,984
R <sup>2</sup>	0.025	0.031	0.31	0.038	0.025	0.048	0.028	0.049
F (Certain X Informed, Certain X Informed X Estimate): p value				0.715				0.665

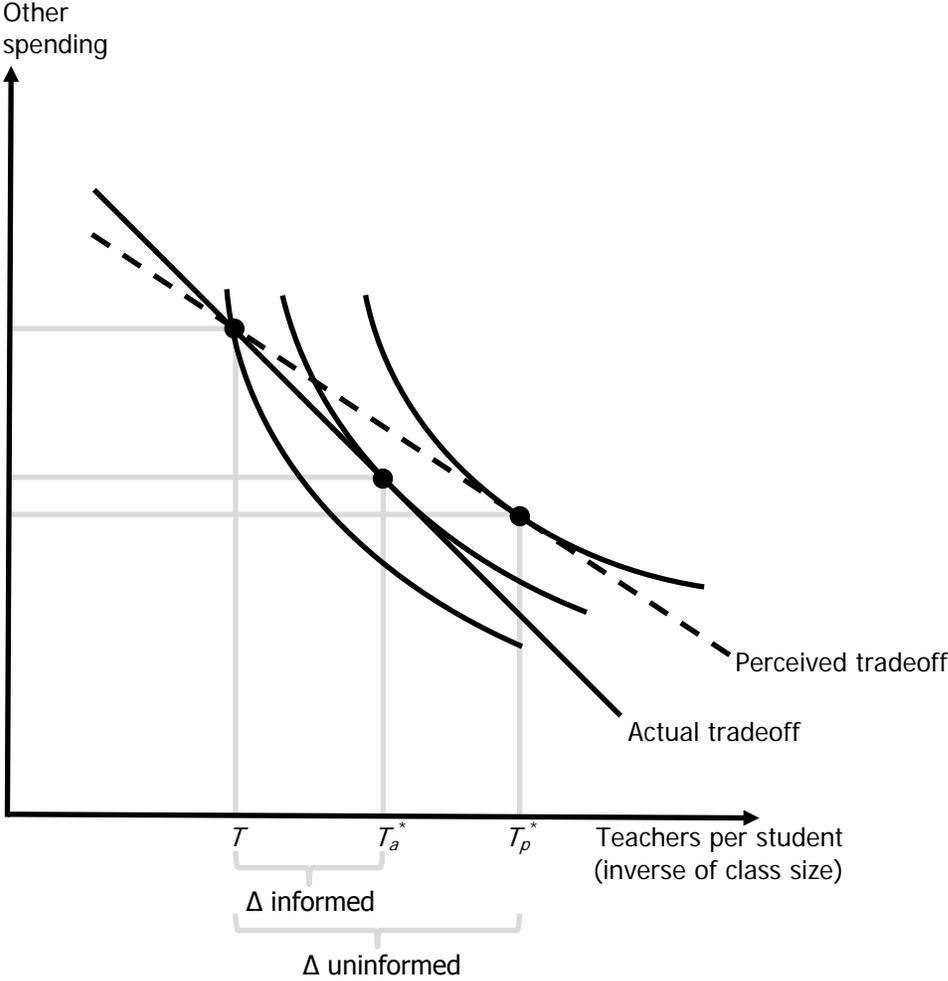
Notes: Linear probability models. Dependent variable: binary outcome of support for increased school spending. Estimate: binary variable indicating estimate of spending level is larger than actual spending level. Certain: binary variable indicating respondent was reasonably sure about his/her estimate of the spending level, as indicated by the top four points on a seven-point scale ranging from very unsure to very sure. Randomized experimental group: Informed = respondents informed about current spending level. Regressions weighted by survey weights to ensure national representativeness. Standard errors in parentheses. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.10. Source: The 2015 EdNext Survey and Ifo Education Survey 2015.

**Figure 1: The effect of status information on support for policy change**



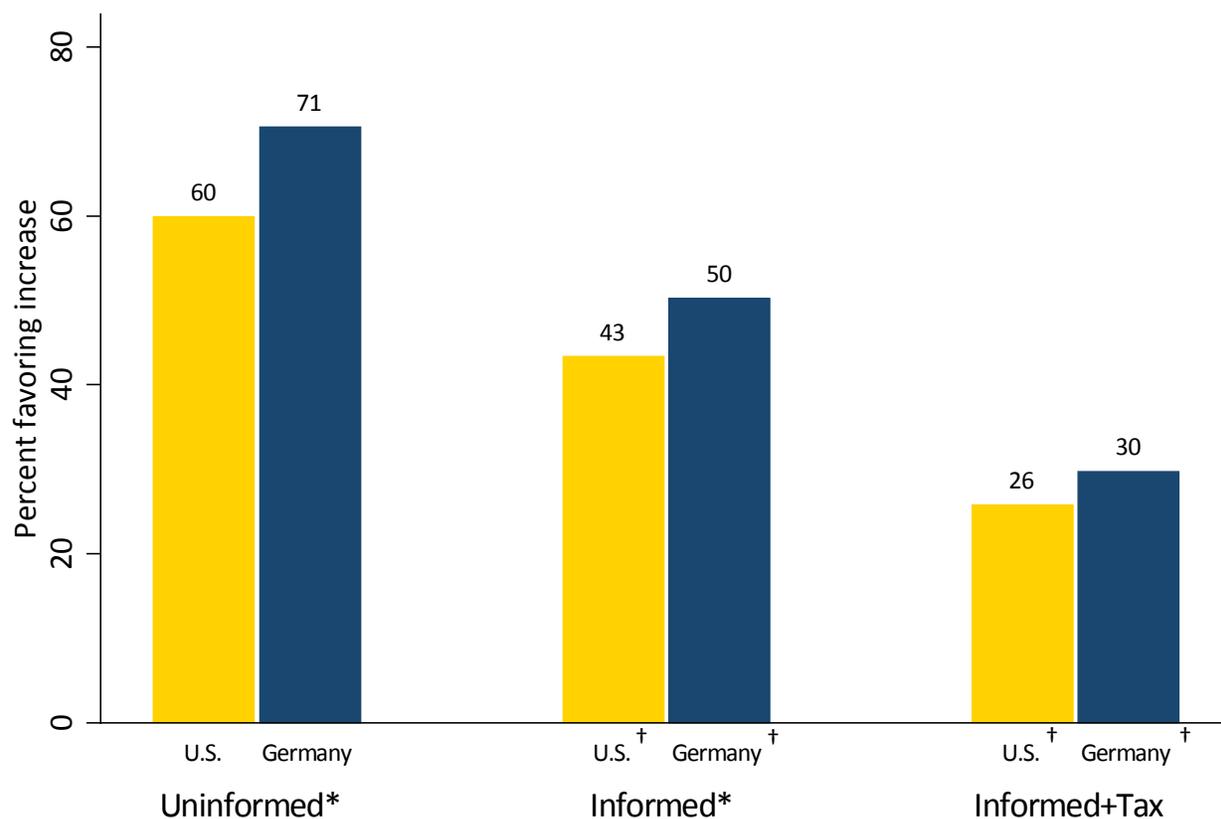
Notes:  $E_u$  = education spending (uninformed);  $E_i$  = education spending (informed);  $E_u^*$  = optimal education spending (uninformed);  $E_i^*$  = optimal education spending (informed);  $O$  = other spending.

**Figure 2: The effect of tradeoff information on support for policy change**



Notes:  $T$  = teachers per student (status);  $T_p^*$  = optimal teachers per student (perceived tradeoff);  $T_a^*$  = optimal teachers per student (actual tradeoff).

**Figure 3: Support for higher spending: Information on spending and reference to taxes**



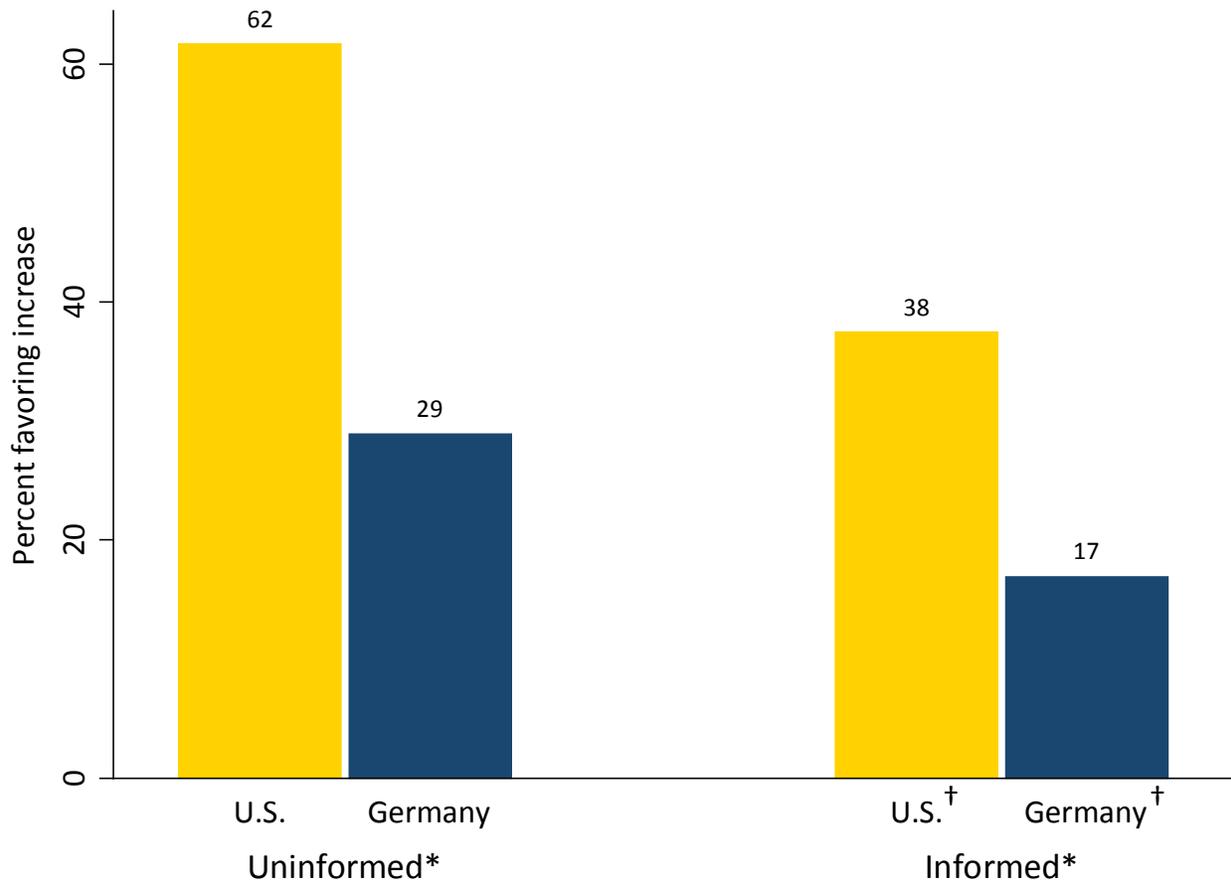
Notes: Share of respondents who favor government funding for public schools to either “greatly increase” or “increase”; other categories are “stay about the same,” “decrease,” and “greatly decrease”. Three randomized experimental groups. Control group (Uninformed) did not receive further information. First treatment group (Informed) was informed about current spending levels. Second treatment group (Informed+tax) was additionally referred to tax financing requirements. See Appendix B for wording of the question in the two countries.

\* Difference between the two countries is statistically significant at the 5 percent level.

† For the country, difference to the control group is statistically significant at the 5 percent level.

Source: The 2014 EdNext Survey and Ifo Education Survey 2014.

**Figure 4: Support for higher teacher salaries depending on current salary information**



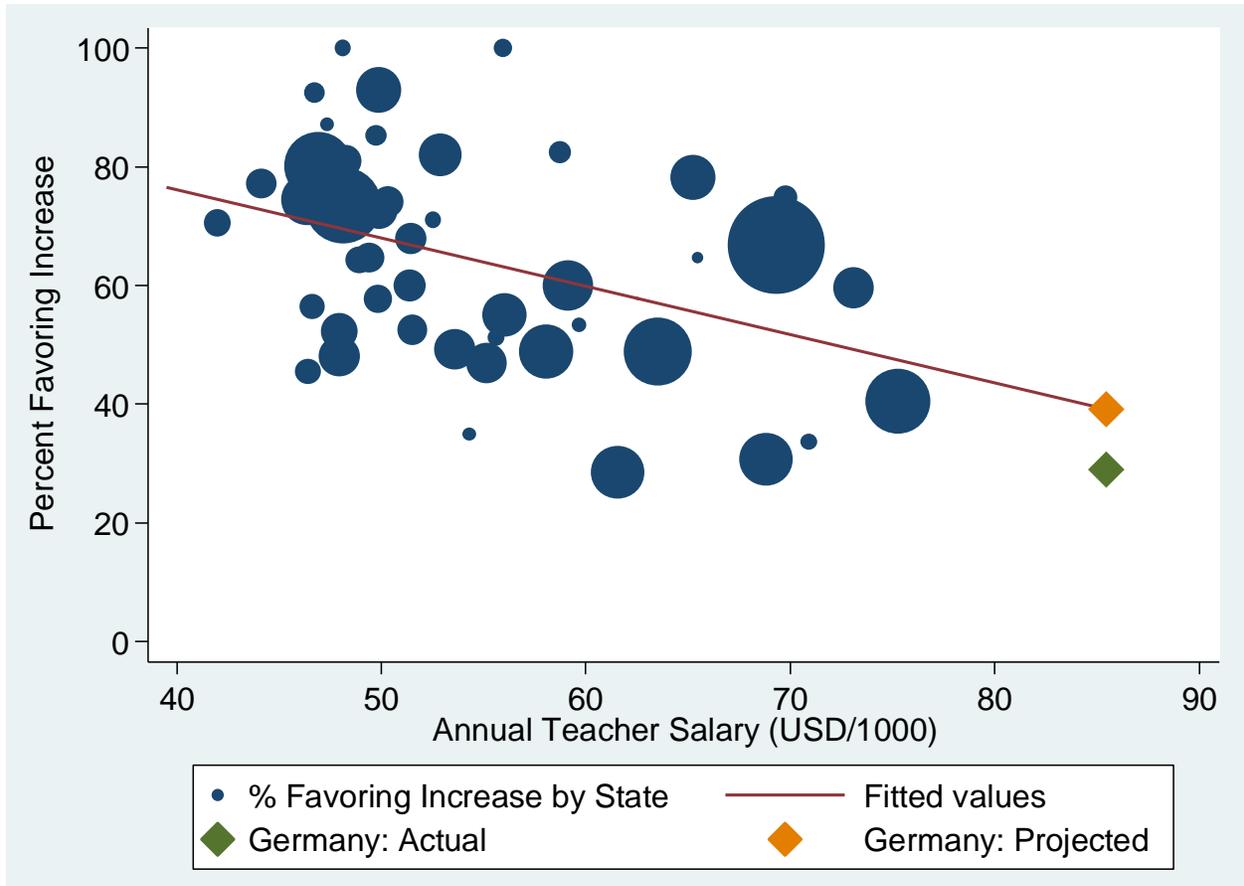
Notes: Share of respondents who favor teacher salaries to either “greatly increase” or “increase”; other categories are “stay about the same,” “decrease,” and “greatly decrease”. Two randomized experimental groups. Control group (Uninformed) did not receive further information. Treatment group (Informed) was informed about current teacher salary levels. See Appendix B for wording of the question in the two countries.

\* Difference between the two countries is statistically significant at the 5 percent level.

† For the country, difference to the control group is statistically significant at the 5 percent level.

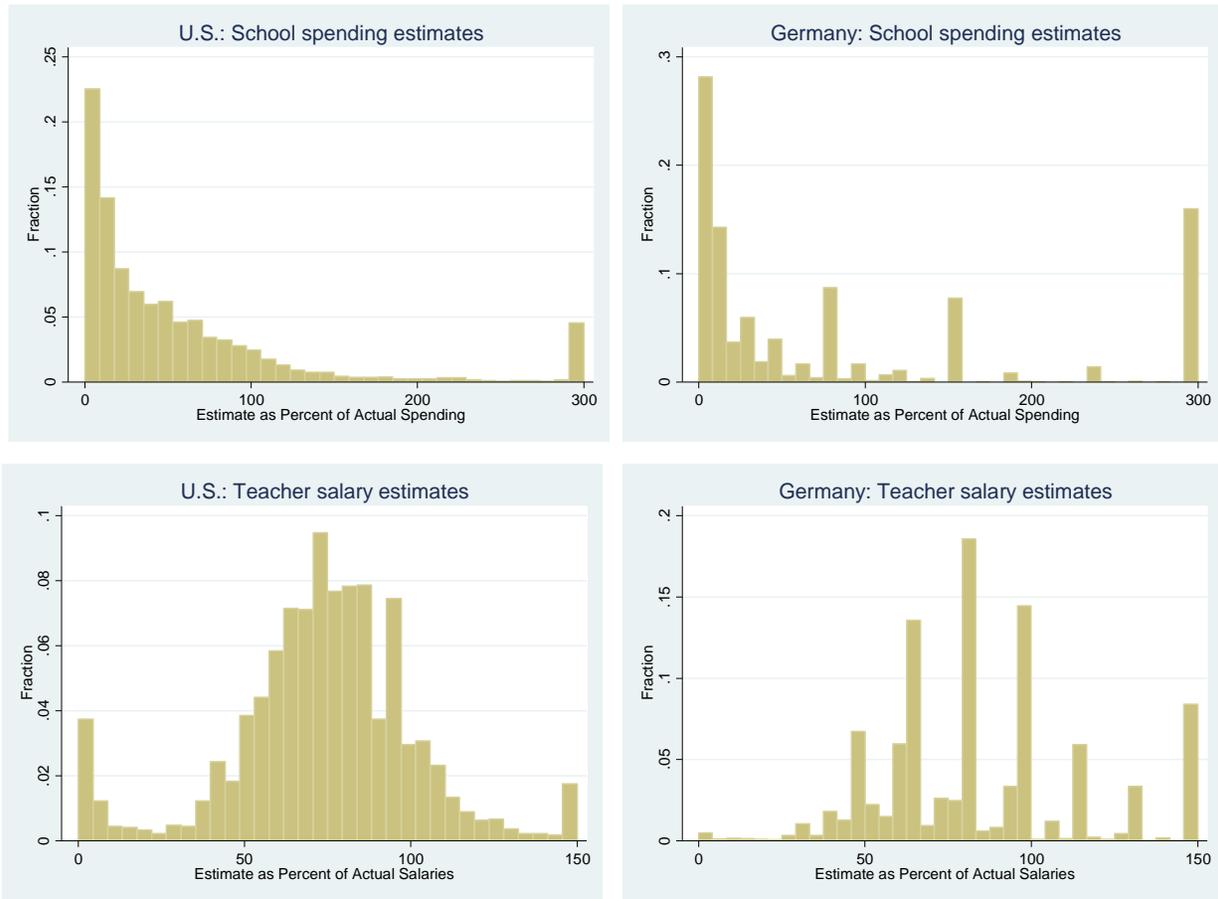
Source: The 2014 EdNext Survey and Ifo Education Survey 2014.

**Figure 5: Teacher salary levels and support for increases: Projecting from U.S. states to Germany**



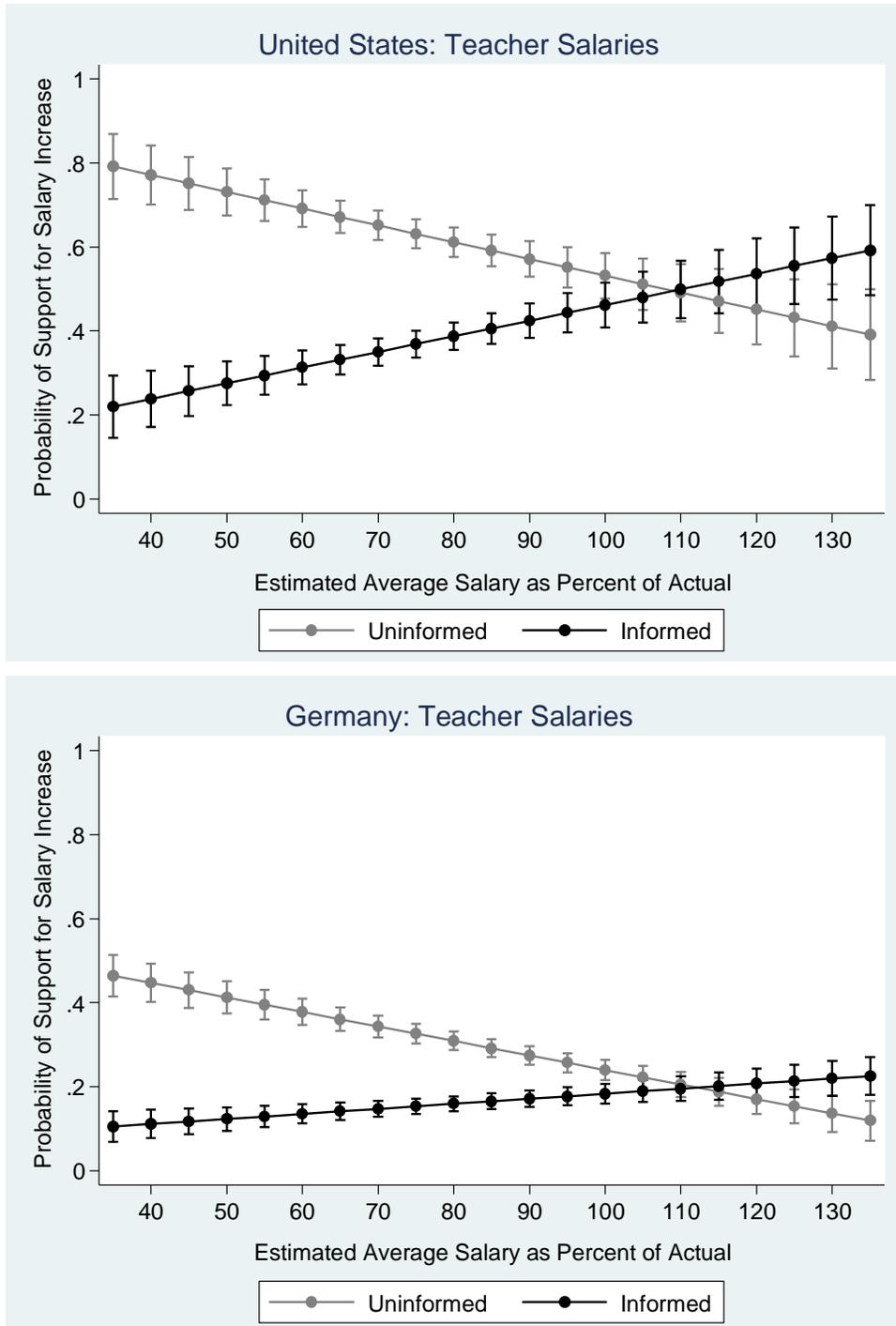
Notes: Scatterplot of mean support for increasing teacher salaries against average teacher salaries across U.S. states. State observations are weighted by the number of respondents. Three states with mean support for salary increases below 10 percent are omitted as outliers; results are substantively identical if they are included. Projection of German support is based on the (weighted) linear regression line between support and salary levels across U.S. states. Source: The 2014 EdNext Survey and Ifo Education Survey 2014.

**Figure 6: The public's estimates of spending and salary levels**



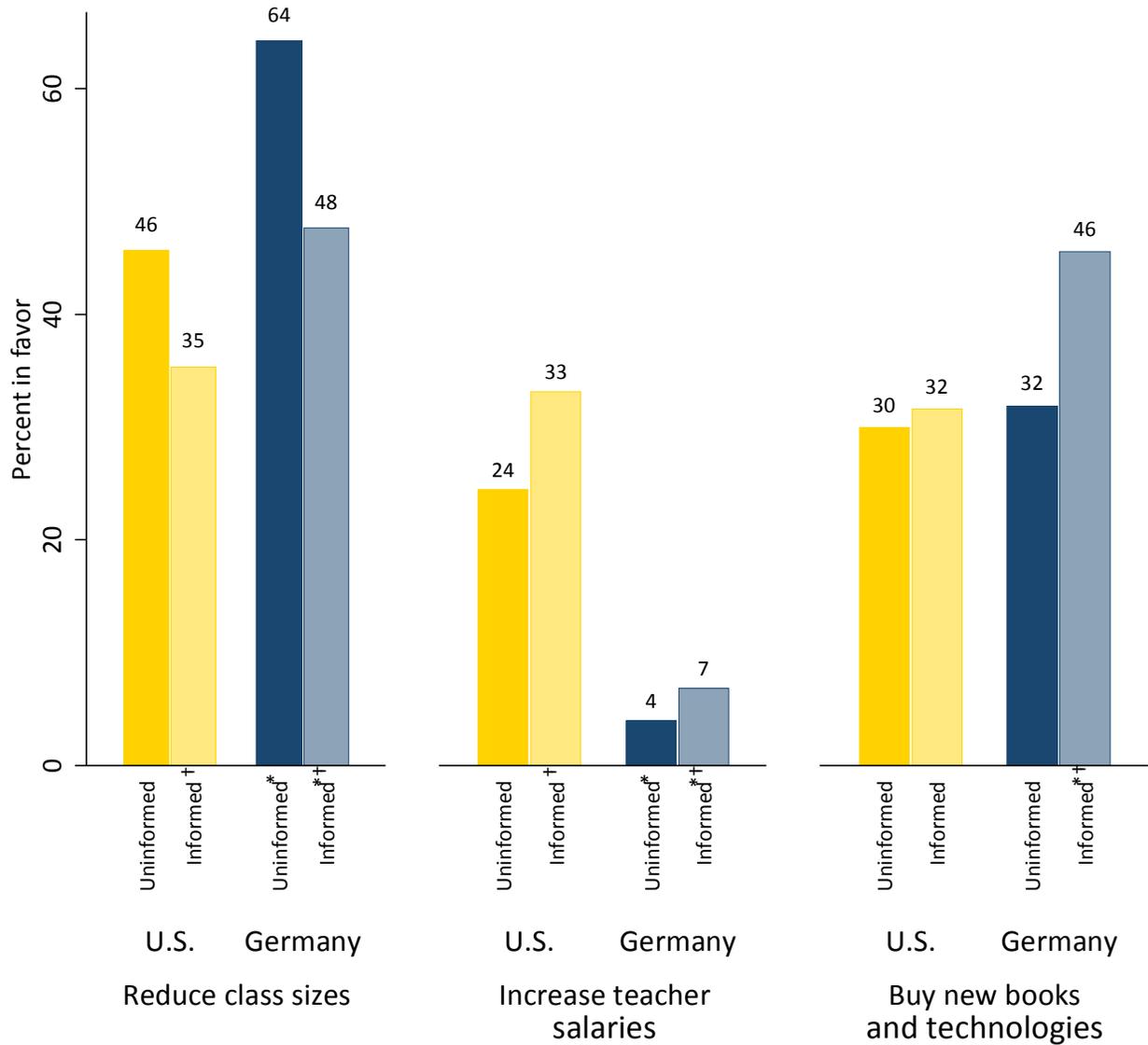
Notes: Histograms of respondents' best guesses of current levels of school spending and teacher salaries, respectively, relative to the respective actual levels. Spending (salary) estimates above 300 (150) percent of actual levels were first replaced by 300 (150). Source: The 2014 EdNext Survey and Ifo Education Survey 2014.

**Figure 7: Heterogeneity of information effects in teacher salary experiment with respect prior knowledge**



Notes: Predicted support for increasing teacher salaries (and 95 percent confidence intervals) by experimental condition depending on respondents' prior estimates of current salaries (as a percentage of actual salaries) based on linear probability models reported in Table 6, columns 4 (U.S.) and 5 (Germany). Randomized experimental group: Informed: respondents informed about current teacher salary levels in their state (U.S.) or nation (Germany). Respondents with salary estimates greater than 300 percent or less than 33 percent of actual salaries are excluded from the estimation sample. Source: The 2014 EdNext Survey and Ifo Education Survey 2014.

**Figure 8: Support for spending on smaller classes, higher salaries, and teaching material**



Notes: Share of respondents favoring the specific spending option over the other two options. Two randomized experimental groups. Control group (Uninformed) did not receive further information. Treatment group (Informed) was informed that reducing average class sizes by 3 students would cost roughly the same amount as increasing teacher salaries by 13 (15) percent or buying \$10,000 (€20,000) in new books and technologies for each class every year in the U.S. (Germany). See Appendix B for wording of the question in the two countries.

\* Difference to the same category in the U.S. is statistically significant at the 5 percent level.

† For the country, difference to the control group is statistically significant at the 5 percent level.

Source: The 2014 EdNext Survey and Ifo Education Survey 2014.

**Table 1: Descriptive statistics and balance across treatment conditions: School spending experiment**

	U.S.			Germany		
	Uninformed (1)	Informed (2)	Informed+tax (3)	Uninformed (4)	Informed (5)	Informed+tax (6)
Female	0.502	0.551	0.545	0.522	0.504	0.516
Parent	0.297	0.318	0.288	0.185	0.175	0.187
Employed	0.577	0.581	0.576	0.473	0.496	0.505
Minority	0.336	0.339	0.365	0.056	0.083	0.069
Income (percentile)	54.25	53.98	53.12	53.24	53.50	52.88
Age						
18-34	0.276	0.309	0.304	0.237	0.241	0.255
35-49	0.217	0.228	0.225	0.241	0.269	0.266
50-64	0.335	0.270*	0.312	0.272	0.247	0.232**
65+	0.173	0.194	0.159	0.250	0.244	0.248
Education						
Less than high school	0.103	0.106	0.114	0.102	0.103	0.085
High school but no B.A.	0.612	0.581	0.601	0.745	0.767	0.744
B.A. degree or higher	0.285	0.312	0.285	0.153	0.129	0.171
Refused	0.008	0.013	0.015	0.012	0.011	0.015
Observations	897	869	903	1,010	1,092	1,066

Notes: Means. Significance tests indicate whether the mean for the informed or informed+tax treatment groups differs from the mean for the uninformed control group. Joint  $F$ -tests in regressions of each variable on both treatment dummies are statistically insignificant except for minority status for Germany ( $p=0.077$ ); age 50-64 for the United States ( $p=0.037$ ); and BA degree or higher for Germany ( $p=0.042$ ). Observations weighted by survey weights to ensure national representativeness. Significance levels: \*\*\*  $p<0.01$ , \*\*  $p<0.05$ , \*  $p<0.10$ . Source: The 2014 EdNext Survey and Ifo Education Survey 2014.

**Table 2: Who supports school spending and teacher salary increases? Descriptive evidence**

	School spending				Teacher salaries			
	U.S.		Germany		U.S.		Germany	
	(1)		(2)		(3)		(4)	
Female	0.070*	(0.040)	-0.026	(0.032)	0.016	(0.034)	-0.065***	(0.022)
Parent	0.073	(0.050)	0.019	(0.044)	0.041	(0.042)	-0.034	(0.030)
Employed	0.002	(0.048)	0.013	(0.037)	-0.033	(0.039)	-0.027	(0.026)
Minority	0.071	(0.043)	-0.098	(0.068)	0.137***	(0.036)	-0.029	(0.042)
Income (percentile)	-0.001*	(0.000)	0.001	(0.001)	0.000	(0.001)	-0.001	(0.000)
Age								
35-49	0.061	(0.063)	-0.010	(0.050)	-0.016	(0.050)	-0.019	(0.034)
50-64	0.015	(0.057)	0.018	(0.044)	-0.023	(0.049)	-0.022	(0.032)
65+	0.023	(0.069)	0.004	(0.052)	-0.001	(0.057)	-0.072*	(0.037)
Education								
High school but no B.A.	-0.054	(0.081)	0.095	(0.060)	0.018	(0.069)	-0.050	(0.039)
B.A. degree or higher	0.007	(0.088)	0.226***	(0.068)	0.148**	(0.074)	0.043	(0.049)
Constant	0.604***	(0.098)	0.551	(0.077)	0.053	(0.088)	0.436***	(0.051)
Observations	894		997		1,306		2,062	
R <sup>2</sup>	0.042		0.034		0.047		0.020	

Notes: Linear probability models. Dependent variable: binary outcome of support for increased spending. Sample: control group. Regressions weighted by survey weights to ensure national representativeness. Standard errors in parentheses. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.10. Source: The 2014 EdNext Survey and Ifo Education Survey 2014.

**Table 3: Effects of information treatment on support for school spending**

Support for school spending to:			Increase			Decrease
	U.S.	Germany	Pooled			Pooled
	(1)	(2)	(3)	(4)	(5)	(6)
Informed	-0.165 <sup>***</sup> (0.029)	-0.203 <sup>***</sup> (0.023)	-0.165 <sup>***</sup> (0.029)	-0.167 <sup>***</sup> (0.029)	-0.169 <sup>***</sup> (0.029)	0.028 <sup>*</sup> (0.016)
Informed+tax	-0.341 <sup>***</sup> (0.027)	-0.408 <sup>***</sup> (0.022)	-0.341 <sup>***</sup> (0.027)	-0.341 <sup>***</sup> (0.027)	-0.344 <sup>***</sup> (0.027)	0.111 <sup>***</sup> (0.019)
Germany			0.107 <sup>***</sup> (0.026)	0.122 <sup>***</sup> (0.026)	Included	Included
Germany X Informed			-0.038 (0.037)	-0.034 (0.037)	-0.031 (0.037)	0.011 (0.019)
Germany X Informed+tax			-0.067 <sup>*</sup> (0.035)	-0.068 <sup>**</sup> (0.035)	-0.065 <sup>*</sup> (0.035)	-0.010 (0.023)
Controls	No	No	No	Yes	Yes	Yes
Controls interacted with country	No	No	No	No	Yes	Yes
Control mean	0.599	0.705	-	-	-	-
Information effect/Control mean	-0.276	-0.288	-	-	-	-
Information+tax effect/Control mean	-0.570	-0.578	-	-	-	-
Observations	2,646	3,128	5,774	5,774	5,774	5,774
R <sup>2</sup>	0.081	0.110	0.100	0.106	0.116	0.116

Notes: Linear probability models. Dependent variable: binary outcome of support for increased (column 6: decreased) spending. Randomized experimental groups: Informed = respondents informed about current school spending levels. Informed+tax = respondents additionally referred to tax financing requirements. Controls include gender, parental and employment status, income, age (four categories), and education (three categories). Regressions weighted by survey weights to ensure national representativeness. Standard errors in parentheses. Significance levels: <sup>\*\*\*</sup> p<0.01, <sup>\*\*</sup> p<0.05, <sup>\*</sup> p<0.10. Source: The 2014 EdNext Survey and Ifo Education Survey 2014.

**Table 4: Effects of information treatment on support for teacher salary**

Support for teacher salaries to:	Increase					Decrease
	U.S.	Germany	Pooled			Pooled
	(1)	(2)	(3)	(4)	(5)	(6)
Informed	-0.242 <sup>***</sup> (0.023)	-0.120 <sup>***</sup> (0.014)	-0.242 <sup>***</sup> (0.023)	-0.246 <sup>***</sup> (0.023)	-0.247 <sup>***</sup> (0.023)	0.006 (0.013)
Germany			-0.327 <sup>***</sup> (0.020)	-0.314 <sup>***</sup> (0.021)	Included	Included
Germany X Informed			0.122 <sup>***</sup> (0.027)	0.123 <sup>***</sup> (0.027)	0.122 <sup>***</sup> (0.027)	0.076 <sup>***</sup> (0.017)
Controls	No	No	No	Yes	Yes	Yes
Controls interacted with country	No	No	No	No	Yes	Yes
Control mean	0.617	0.290	-	-	-	-
Information effect/Control mean	-0.392	-0.415	-	-	-	-
Observations	2,639	4,127	6,766	6,766	6,766	6,766
R <sup>2</sup>	0.059	0.020	0.115	0.126	0.128	0.031

Notes: Linear probability models. Dependent variable: binary outcome of support for increased (column 6: decreased) teacher salaries. Randomized experimental group: Informed = respondents informed about current teacher salary levels. Controls include gender, parental and employment status, income, age (four categories), and education (three categories). Regressions weighted by survey weights to ensure national representativeness. Standard errors in parentheses. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.10. Source: The 2014 EdNext Survey and Ifo Education Survey 2014.

**Table 5: Heterogeneous treatment effects by demographic subgroups**

	School spending experiment								Teacher salary experiment			
	Informed				Informed+tax				Informed			
	U.S.		Germany		U.S.		Germany		U.S.		Germany	
	No/Low	Yes/High	No/Low	Yes/High	No/Low	Yes/High	No/Low	Yes/High	No/Low	Yes/High	No/Low	Yes/High
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
Female	-0.156*** (0.041)	-0.179*** (0.040)	-0.191*** (0.033)	-0.217*** (0.031)	-0.302*** (0.039)	-0.380*** (0.040)	-0.416*** (0.033)	-0.401*** (0.030)	-0.230*** (0.034)	-0.253*** (0.032)	-0.110*** (0.022)	-0.134*** (0.018)
Parent	-0.151*** (0.034)	-0.204*** (0.054)	-0.212*** (0.026)	-0.161*** (0.052)	-0.325*** (0.032)	-0.378*** (0.050)	-0.390*** (0.025)	-0.494*** (0.048)	-0.208*** (0.028)	-0.322*** (0.042)	-0.129*** (0.016)	-0.083*** (0.031)
Employed	-0.177*** (0.044)	-0.157*** (0.038)	-0.206*** (0.033)	-0.202*** (0.032)	-0.360*** (0.042)	-0.338*** (0.036)	-0.377*** (0.032)	-0.441*** (0.031)	-0.260*** (0.036)	-0.229*** (0.031)	-0.123*** (0.020)	-0.117*** (0.020)
Minority	-0.189*** (0.035)	-0.117*** (0.050)	-0.199*** (0.024)	-0.218** (0.085)	-0.348*** (0.033)	-0.336*** (0.047)	-0.419*** (0.023)	-0.250*** (0.092)	-0.224*** (0.029)	-0.273*** (0.039)	-0.123*** (0.015)	-0.080 (0.054)
Income	-0.160*** (0.040)	-0.169*** (0.041)	-0.169*** (0.035)	-0.229*** (0.030)	-0.367*** (0.037)	-0.317*** (0.039)	-0.371*** (0.035)	-0.436*** (0.029)	-0.280*** (0.032)	-0.203*** (0.034)	-0.124*** (0.022)	-0.117*** (0.019)
Age	-0.200*** (0.046)	-0.134*** (0.036)	-0.186*** (0.034)	-0.222*** (0.031)	-0.349*** (0.044)	-0.337*** (0.032)	-0.420*** (0.033)	-0.394*** (0.030)	-0.279*** (0.037)	-0.206*** (0.029)	-0.125*** (0.021)	-0.115*** (0.019)
Education	-0.154*** (0.036)	-0.191*** (0.046)	-0.186*** (0.025)	-0.282*** (0.057)	-0.354*** (0.033)	-0.308*** (0.045)	-0.406*** (0.024)	-0.436*** (0.054)	-0.246*** (0.029)	-0.245*** (0.037)	-0.128*** (0.015)	-0.090** (0.042)

Notes: Subgroup estimations by characteristic indicated in first column. Binary variables (female, parent, employed, minority): No = subgroup where the status is wrong; Yes = subgroup where the status is true. Income, age: Low = subgroup where variable is below sample mean; High = subgroup where variable is above sample mean. Education: Low = below B.A. degree; High = B.A. degree or higher. Linear probability models. Dependent variable: binary outcome of support for increased spending (columns 1-8) resp. increased teacher salaries (columns 9-12). Randomized experimental groups: Informed = respondents informed about current levels of school spending (columns 1-4) resp. teacher salaries (columns 9-12). Informed+tax = respondents additionally referred to tax financing requirements. Treatment effects do not differ significantly between the respective subgroups, with the exceptions that the Informed+tax treatment effect on support for spending increases differs significantly by parental ( $p=0.050$ ) and minority ( $p=0.074$ ) status in Germany and that the Informed treatment effect on support for salary increases differs significantly by parental status ( $p=0.023$ ) and income level ( $p=0.098$ ) in the United States. Regressions weighted by survey weights to ensure national representativeness. Standard errors in parentheses. Significance levels: \*\*\*  $p<0.01$ , \*\*  $p<0.05$ , \*  $p<0.10$ . Source: The 2014 EdNext Survey and Ifo Education Survey 2014.

**Table 6: Heterogeneity of information effects with respect to prior knowledge**

	Spending			Salaries		
	U.S. (1)	Germany (2)	Pooled (3)	U.S. (4)	Germany (5)	Pooled (6)
Informed	-0.189 <sup>***</sup> (0.077)	-0.239 <sup>***</sup> (0.051)	-0.185 <sup>***</sup> (0.031)	-0.846 <sup>***</sup> (0.094)	-0.527 <sup>***</sup> (0.050)	-0.848 <sup>***</sup> (0.094)
Estimate (Spending: >Actual; Salaries: % of Actual)	-0.098 <sup>*</sup> (0.058)	-0.023 (0.042)	-0.106 <sup>*</sup> (0.059)	-0.401 <sup>***</sup> (0.088)	-0.346 <sup>***</sup> (0.044)	-0.401 <sup>***</sup> (0.087)
Informed X Estimate	0.175 <sup>**</sup> (0.083)	0.153 <sup>***</sup> (0.057)	0.176 <sup>**</sup> (0.085)	0.777 <sup>***</sup> (0.121)	0.471 <sup>***</sup> (0.057)	0.780 <sup>***</sup> (0.121)
Germany			0.125 <sup>***</sup> (0.029)			-0.328 <sup>***</sup> (0.078)
Germany X Informed			-0.057 (0.041)			0.316 <sup>***</sup> (0.106)
Germany X Estimate			0.085 (0.072)			0.052 (0.096)
Germany X Informed X Estimate			-0.014 (0.103)			-0.301 <sup>**</sup> (0.133)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,722	1,904	3,626	2,426	3,833	6,259
R <sup>2</sup>	0.052	0.070	0.055	0.103	0.068	0.154

Notes: Linear probability models. Dependent variable: binary outcome of support for increased spending (columns 1-3) and teacher salaries (columns 4-6). Estimate: binary variable indicating estimate of spending level is larger than actual spending level (columns 1-3) or continuous variable measuring salary estimate as a percentage of actual salaries (columns 4-6). Randomized experimental group: Informed = respondents informed about current spending (columns 1-3) or teacher salary (columns 4-6) levels. Controls include gender, parental and employment status, income, age (four categories), and education (three categories). Observations with teacher salary estimates greater than 300 percent and less than 33 percent of actual salaries excluded. Regressions weighted by survey weights to ensure national representativeness. Standard errors in parentheses. Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.10. Source: The 2014 EdNext Survey and Ifo Education Survey 2014.

**Table 7: Effect of information treatment on preferences for spending options**

	Class size vs. teacher salary			Class size vs. books/technologies			Teacher salary vs. books/technologies		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Informed	0.570 <sup>***</sup> (0.048)	0.559 <sup>***</sup> (0.048)	0.562 <sup>***</sup> (0.048)	0.734 <sup>***</sup> (0.060)	0.722 <sup>***</sup> (0.060)	0.722 <sup>***</sup> (0.060)	1.287 <sup>***</sup> (0.115)	1.292 <sup>***</sup> (0.117)	1.285 <sup>***</sup> (0.116)
Germany	8.713 <sup>***</sup> (1.603)	8.918 <sup>***</sup> (1.654)	Included	1.323 <sup>***</sup> (0.126)	1.462 <sup>***</sup> (0.142)	Included	0.152 <sup>***</sup> (0.029)	0.164 <sup>***</sup> (0.032)	Included
Germany X Informed	0.754 (0.183)	0.755 (0.183)	0.718 (0.178)	0.706 <sup>***</sup> (0.093)	0.704 <sup>***</sup> (0.094)	0.704 <sup>***</sup> (0.094)	0.936 (0.233)	0.933 (0.232)	0.981 (0.248)
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Controls interacted with country	No	No	Yes	No	No	Yes	No	No	Yes
Observations	7,230	7,230	7,230	7,230	7,230	7,230	7,230	7,230	7,230
Information effect for Germany	0.430 <sup>***</sup> (0.098)	0.422 <sup>***</sup> (0.096)	0.403 <sup>***</sup> (0.094)	0.518 <sup>***</sup> (0.053)	0.508 <sup>***</sup> (0.053)	0.508 <sup>***</sup> (0.053)	1.206 (0.280)	1.205 (0.279)	1.260 (0.298)

Notes: Relative risk ratios of multinomial logit models. Randomized experimental group: Informed = respondents informed about financial tradeoffs involved between options. Controls include gender, parental and employment status, income, age (four categories), and education (three categories). Regressions weighted by survey weights to ensure national representativeness. Standard errors in parentheses. Significance levels (of difference from 1): <sup>\*\*\*</sup> p<0.01, <sup>\*</sup> p<0.05, <sup>\*</sup> p<0.10. Source: The 2014 EdNext Survey and Ifo Education Survey 2014.