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ABSTRACT

Information and Preferences for Public Spending: Evidence from Representative Survey Experiments*

The electorates' lack of information about the extent of public spending may cause misalignments between voters' preferences and the size of government. We devise a series of representative survey experiments in Germany that randomly provide treatment groups with information on current spending levels. Results show that such information strongly reduces support for public spending in various domains from social security to defense. Data on prior information status on school spending and teacher salaries shows that treatment effects are strongest for those who initially underestimated spending levels, indicating genuine information effects rather than pure priming effects. Information on spending requirements also reduces support for specific education reforms. Preferences on spending across education levels are also malleable to information.

JEL Classification: H11, D83, D72, H52, I22, P16

Keywords: public spending, information, preferences, education spending, survey experiment

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1. Introduction

Discussions of the proper role of the state versus the market are probably as old as the economics profession itself. Empirically, the size of government has grown substantially over the past century in democratic societies around the world. Political economists have studied the growth and role of the government as the outcome of elaborate processes of voting and collective choice (capably reviewed by Inman 1987 and Persson and Tabellini 2002). However, relatively little attention has been given to the aspect that citizens may not be well informed about the size of government. If citizens are imperfectly informed about the actual extent of public spending, the size of government may not be well aligned with their preferences. The recognition that information is imperfect has transformed many areas of economics (Stiglitz 2000), and a growing recent literature investigates how informing citizens affects their preferences in specific policy areas (e.g., Cruces, Perez-Truglia, and Tetaz 2013; Kuziemko et al. 2015). In this paper, we show that providing information on current levels of government spending reduces citizens' support for increased public spending and that this effect differs by citizens' prior information.

We devise a series of experiments in a survey of over 4,000 respondents that constitute a representative sample of the German voting-age population. Our main survey experiments consist of providing a randomly selected treatment group with information on current levels of public spending before asking them to report their preferences for increased spending. The control group answers the same question without receiving additional information. We start with preferences for public spending in areas with high financial involvement by the state – social security, education, public safety, defense, and culture. As public opinion surveys may better capture preferences for public spending when they refer to specific rather than abstract spending categories, we then focus on the specific area of school spending and teacher salaries, where we first elicit respondents' estimates of what current spending levels are. Finally, we conduct experiments on how providing information on spending requirements affects preferences for specific policy reforms and how providing information on current spending levels affects preferences when respondents have to trade off different spending categories against each other.

We find that providing information on current spending levels reduces support for public spending in all our experiments. Being told the current level of annual public spending in different areas reduces support for increased spending on education from 72 to 58 percent, on social security from 52 to 47 percent, on public safety from 50 to 44 percent, on culture from 22 to 18 percent, and on defense from 9 to 6 percent. Note that the treatment effect is negative even in areas where people learn that spending is comparatively low. Moreover, in the areas of social security and public safety, providing information on current spending levels turns a majority in favor of increased spending into a minority.

Next, we provide evidence that these information treatment effects do not hinge on the level of abstraction of the question. We present two experiments on specific activities of the government in the area of education spending, examining preferences towards public spending on schools as well as teacher salaries. On average, being informed that the state currently spends € 6,400 per student reduces support for increased public spending on schools from 71 to 50 percent, and being informed that public school teachers currently earn € 3,000 on average reduces support for higher teacher salaries from 29 to 17 percent. Thus, the significant negative treatment effect prevails for more specific as well as abstract questions on public spending.

We also use the setting of school spending and teacher salaries to test whether the effects of information provision in our survey experiments reflect genuine information effects or priming. To distinguish these two channels, we ask respondents to guess the current levels of school spending per student and of teacher salaries before we elicit preferences towards these spending options. It turns out that the vast majority of citizens underestimate public spending on both measures. Importantly, there is substantial heterogeneity in treatment effects by respondents' prior information. The heterogeneity is strongest in the teacher salary experiment, which is consistent with a greater capability of respondents to obtain plausible guesses of salaries than of per-student spending levels. The information treatment reduces support for teacher salary increases by 20 percentage points among those who underestimated current teacher salary levels, but does not affect those who guessed roughly correctly and even slightly (albeit insignificantly) raises support for salary increases among those who overestimated them. These heterogeneous treatment effects by the initial extent of information incompleteness suggest that results reflect effects of improved information status of citizens and rule out that they solely result from priming citizens to think about spending in money terms.

The generality and policy relevance of these findings is reinforced by the fact that information treatment effects hardly vary across subgroups defined on the basis of observable demographic characteristics. Importantly from a political economy point of view, treatment effects are homogenous for special interest groups – in particular, parents and those who work in the education sector. The effects also prevail for individuals who regularly vote at state elections and those who consider education topics important for their voting decisions.

Finally, we complement this evidence with experiments that employ information provision in contexts where funds are earmarked for specific policies. To relate the information treatment on spending requirements more directly to political reform proposals, we show that providing citizens with information on the cost of specific education policies reduces support for these policies, both in a case where an existing policy would be terminated (grade retention) and in a case where a new policy would be introduced (whole-day schooling). We also show that preferences for specific education spending categories are malleable to cost information in a setting where respondents have to make trade-offs between spending at different stages of the education system.

Our results contribute to several strands of economics research. A growing literature studies the effect of informing citizens on their policy preferences in different areas. In particular, Kuziemko et al. (2015) use survey experiments on information provision to study preferences for redistribution. In contrast to their finding of limited effects of providing information about income inequality on preferences for redistribution (with the exception of the estate tax), our results suggest that providing information about spending levels has substantial effects on preferences for public spending in general. In addition, our results refer to a representative sample of the voting-age population, thus allowing generalizable statements for the political economy of government spending – an aspect crucial, for example, in the framework of median voter models. We also extend their focus by showing that the effects of information provision depend on the prior information status of citizens. Our findings on heterogeneous effects are consistent with the survey experiments by Cruces, Perez-Truglia, and Tetaz (2013) on preferences for redistribution in Buenos Aires and by Schueler and West (2016) on preferences for local school spending in the United States. Further studies that document effects of information provision on policy preferences include Di Tella, Galiani, and Schargrodsky (2012) on preferences for privatization in Argentina and Elias, Lacetera, and Macis (2015) on preferences for markets for human organs in the United States.

More generally, our analysis informs the large literature on positive political economy theories of the size of government (Inman 1987; Persson and Tabellini 2002). Relatedly, a substantial literature on fiscal illusion argues that the electorate may misperceive the true tax costs of government services (Oates 1988), which may result in public overspending compared to a situation of perfect information (e.g., Turnbull 1998). While the empirical literature on the existence of fiscal illusion (Dollery and Worthington 1996) has produced mixed results, there is evidence that individuals are misinformed about the actual costs of publicly provided services (Kemp 2002). Our results suggest that if citizens have imperfect information about current spending levels, their preferences for increasing government spending may be higher than if they were informed about the actual situation. This result relates to recent evidence that voting patterns may deviate from rationality (Shue and Luttmer 2009) and that reduced voting costs may induce less informed citizens to vote (Hodler, Luechinger, and Stutzer 2015). Imperfectly informed voters also play an important role in political economy models of special-interest politics, lobbying, and campaign contributions (e.g., Grossman and Helpman 2001; Persson and Tabellini 2002), as they are more readily influenced by political advertisement (e.g., Coate 2004; Prat and Strömberg 2013). We complement this literature by showing that uninformed individuals are particularly responsive to information about underlying facts. Since imperfect information of the population can yield welfare-reducing political outcomes even with endogenous voter participation (Romer 2003), we consider this finding particularly important. A related political science literature documents that voters are often uninformed (e.g., Bartels 1996), with diverging discussions of implications for the optimality of collective voting outcomes (e.g., Page and Shapiro 1992; Gilens 2001).

Finally, our analysis brings insights from the economics of information about imperfect information (Stiglitz 2000) and from behavioral economics about bounded rationality under limited information (Harstad and Selten 2013) to bear on the question of preferences for government spending and their dependence on informational status.

In what follows, Section 2 introduces our opinion survey and the experimental designs. Section 3 presents and discusses our results. Section 4 concludes.

2. Data and Empirical Strategy

2.1 The Opinion Survey

To implement our survey experiments, we devised and implemented the Ifo Education Survey, an opinion survey on education policy in Germany. The survey covered a nationally representative sample of 4,171 respondents of the German voting-age population (18 years and older) between April and July 2014.[1] It comprised a total of 39 questions mostly related to education topics and collected a set of sociodemographic characteristics at the end of the survey. Respondents answered all questions on a computer, with a median completion time of 17 minutes. Item non-response was very low at 1 percent on average, and in none of our

[1] See the Appendix for details on the Ifo Education Survey and Appendix Table A1 for the exact wording of the questions used in this paper.

experiments does treatment status predict non-response in the dependent variable of interest (not shown).

The sample was drawn in two strata in order to represent the German population. Persons who use the internet (75 percent) were selected from an online panel and polled with an online survey. Persons who report not to use the internet (25 percent) were polled at their homes by trained interviewers. The interviewers provided these respondents with a tablet computer for completing the survey autonomously. Throughout the paper, we employ survey weights that are designed to match official statistics with respect to age, gender, parental status, school degree, federal state, and municipality size.

The first column of Table 1 presents descriptive statistics for our rich set of sociodemographic control variables. These include age, gender, family and parental status, employment status, income, education, parental education, migration status, region, city size, employment in the education sector, political party preference, and behavioral measures of patience and altruism.[2] These covariates allow us to perform extensive heterogeneity analyses.

To be able to generalize our findings towards the political economy literature on government spending, it is important that the sample represents the German voting-age population. Table 2 compares characteristics that are available both in our sample and in the German population census 2011. The characteristics in our sample are virtually identical to the census data, raising confidence in the generalizability of results.

We also use data from a representative follow-up survey conducted in May 2015 that shares the basic features of the 2014 survey. Therein, as a robustness check we implemented a modified version of one of the experiments of the 2014 survey with 2,092 respondents (see below).

2.2 The Survey Experiments

Within the opinion survey, we administered a series of survey experiments in which respondents were randomly assigned to different versions of the respective question. Our six survey experiments aim to analyze different aspects of how the provision of information about current levels of public spending affects citizens' preferences for increased spending. In each experiment, we inform a randomly selected treatment group about current spending levels before eliciting preferences in the same way as in the uninformed control group.

[2] We use experimentally validated survey questions to elicit patience and altruism on an 11-point scale (higher numbers indicate more patience/altruism; see Falk et al. 2016).

Randomization in each experiment was independent so that treatment status is uncorrelated across the different questions by design.

Experiment 1: Support for Increased Public Spending

Our general goal in this paper is to use randomized information treatments to test whether preferences for public spending depend on information status. Our first experiment follows a basic attitudinal approach (Ferris 1983) by presenting respondents a list of government services and asking them if they favor spending more, the same, or less on each of these areas. We focus on the major areas of public expenditure: social security, education, public safety, defense, and culture.[3] Respondents were randomly assigned to a control group or a treatment group.

Members of the control group were asked for their preferences for increased public spending in each of the areas without any further information. The question was worded as follows: "In your opinion, how much should the government spend in the future in the following areas compared to today? Remember that increased public spending might have to be financed through an increase in taxes." For each area of public spending, respondents were asked to pick one of the following five answer categories: much more, more, about the same, less, and much less. All spending areas were presented simultaneously on one screen.[4] The ordering of the areas was randomized within both treatment and control group to prevent potential primacy effects in answering behavior.

Members of the treatment group were informed about the current levels of public spending per year in each area when answering the same question as the control group.[5] Respondents were informed of the following annual spending levels in each area (Statistisches Bundesamt 2014b): € 227 billion on social security, € 95 billion on education, € 38 billion on public safety, € 27 billion on defense, and € 10 billion on culture.

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[3] To harmonize the understanding of potentially problematic terminology, we provided examples for selected areas of public spending. In particular, we mentioned contributions to the public pension system and unemployment benefits for long-term unemployed as examples of spending on social security and the police as an example of spending on public safety.

[4] Because this experiment contains an item battery of five areas of public spending, answer categories for each spending area were presented horizontally. In all other experiments presented in this paper, answer categories were presented vertically. We implemented a series of methodological experiments in other survey questions and found that details in the question design, such as horizontal versus vertical presentation, the number or ordering of answer categories, or details in question wording did not change substantive results (not shown).

[5] In a second treatment group (not presented here), respondents were informed that relative public spending on education is lower in Germany than in most other industrialized nations before answering the same question as the control group.

Experiment 2: Support for Increased Public Spending on Schools

Our second experiment focuses on public spending on schools in order to address two potential concerns with the interpretation of the first experiment. First, the selected areas of government service in the first experiment are quite abstract, which is potentially problematic as responses in public opinion surveys can depend on the level of abstraction of the survey questions. The ambivalence between survey responses to abstract and specific questions has been widely documented in the literature. For instance, in their seminal work, Free and Hadley (1967) show that when asking general questions about the appropriate scope of government, half of the American public can be labeled "conservatives" while only 16 percent are classified as "liberal." In contrast, when asking survey questions about specific activities of the government, 65 percent are labeled "liberals" and only 14 percent are labeled "conservatives." Therefore, one obvious concern is that any treatment effects in the first experiment might not be readily transferable to more specific questions.

A second concern with the first experiment is that the size of reported spending levels in billions may be beyond imagination for many survey participants. Treatment effects might thus be due to an automated response to the "shock" of being confronted with such high spending figures rather than due to genuine information processing.

To alleviate these concerns, in additional experiments we focus on the effects of providing per-capita spending information on more specific public policies that most respondents are likely to care about and have made their own experiences with. Educational policies lend themselves particularly well for this purpose. Not only is education a major area of public policy and the second largest government spending item. It is also a topic that many respondents are likely to have a comparatively strong opinion on: Not least because everybody went to school, respondents have at least some experience with this area of public policy and hence a rough idea of its investment needs.[6] Additionally, Germany saw frequent educational reforms during the past decade that typically received high media coverage. Arguably, this increased public awareness of the importance of this area of public policy. Finally, the political economy relevance of this policy area is underlined by the fact that polling results consistently show that education policy is among the most important policy areas for citizens' vote choice at state elections in Germany (e.g., Hepp 2011).

[6] This is particularly the case for developed countries. For children aged between 5 and 14 years, the average enrolment rate in education among OECD countries (in Germany) is 98 percent (99 percent) (OECD 2014, p. 312). Therefore, practically every citizen in these countries has first-hand experience with the education system.

Our second experiment thus is on a key component of public spending, namely preferences for public spending on schools. Respondents who were randomly assigned to the control group were asked the following question: "In your opinion, should public spending for schools in Germany increase, decrease, or stay the same?" The following five answer categories were provided: greatly increase, increase, stay about the same, decrease, and greatly decrease. The treatment group was informed that on average, the government spends € 6,400 per student and year in Germany before eliciting their preferences for increased school spending in the same way as the control group.[7]

In order to disentangle the mechanisms through which the information treatment might impact preferences, earlier on in the survey we elicited all respondents' beliefs on current average public spending levels per student with an open-ended question (see Appendix Table A1 for the ordering of survey questions). This guessing question was placed in the survey well before the corresponding survey experiment on school spending in order to reduce the possibility of backfire effects where individuals might respond defiantly to belief corrections by reinforcing their initial position (Nyhan and Reifler 2010).[8]

As a robustness check, we implemented a slightly revised version of the same experiment among a new nationally representative sample of respondents in the 2015 follow-up survey. Instead of providing information on national average spending per student, we informed respondents about average spending levels in their respective federal state (*Land*). This may be particularly relevant because the legislative and executive power over public education, including funding responsibilities, is vested in the federal states in Germany.[9]

Experiment 3: Support for Increased Salaries of Public School Teachers

The third experiment keeps the focus on public spending on schools but is even less abstract by asking for preferences on teacher salaries as a specific use of public spending on schools. While respondents' personal experiences with the education system renders spending for schools in experiment 2 more accessible than other areas of government spending, it might still be relatively difficult for respondents to grasp the monetary requirements of the school

[7] This information, taken from Statistisches Bundesamt (2013), was provided directly above the question on the same screen. In two further treatments (not reported in this paper), we tested the effects of tax primes on preferences for school spending.

[8] Separating the belief elicitation from the information treatment makes the correction of false beliefs less immediate for the respondents and thus reduces the chance of such a behavioral response. In our survey, respondents did not have the option to go back in the survey to review or alter their responses to earlier questions.

[9] Across the 16 federal states, average public spending per student and year varies between € 5,800 in North Rhine-Westphalia to € 8,700 in Thuringia (Statistisches Bundesamt 2014a).

system. Since respondents' own experience with salaries provides a valuable anchor point for assessing teacher compensation, salary levels are arguably more tangible than per-student spending levels. In addition, salary levels are a key component of overall education spending, accounting for 81 percent of total current school expenditure (OECD 2014, p. 284).

Employing an experimental design similar to experiment 2, we elicit preferences for increases in teacher salaries. The control group was asked: "What do you think, should the salaries of teachers in Germany increase, decrease, or stay the same?"[10] The treatment group was informed that "In Germany, full-time teachers earn on average about € 3,000 net of taxes per month." before stating their preferences for teacher salary increases.[11] Again, early in the survey we asked all respondents with an open-ended question to guess average teacher salary levels.

Experiments 4 and 5: Support for Reforms of the Education System

Since much of the public debate on education policy concerns specific reforms, we next devised two complementary experiments to analyze whether public support for actual reform proposals depends on information about the fiscal costs associated with their implementation. This way, we can test whether provision of information on public spending requirements is relevant when respondents have to state their preferences for specific education reforms.

We chose two reform proposals that are currently under public debate in Germany: introducing a whole-day school system and abolishing grade retention. The former proposal implies the introduction of a new policy, whereas the latter implies the abolishment of a current practice, allowing us to investigate how cost information affects public policy preferences in both cases. Respondents were again randomly and independently assigned to a control group and a treatment group in both questions.

In the fourth experiment, the control group was asked: "Do you favor or oppose that Germany in general switches to a whole-day school system where all children are in school until 3 pm?" The treatment group was informed that this reform would cost more than € 9 billion per year.[12]

In the fifth experiment, the question on abolishing grade retention for the control group was worded as follows: "Do you favor or oppose that low-performing students have to repeat

[10] Answer categories are identical to the categories used in experiment 2.

[11] The teacher salary figure is based on own calculations based on data from the German microcensus.

[12] The cost estimate is taken from Klemm (2012). In two further treatments (not reported in this paper), we tested whether support depends on whether whole-day schooling is voluntary or compulsory for all students.

the grade?" The treatment group answered the same question after being informed that grade retention costs almost € 1 billion each year.[13] In both survey experiments on the support for reform proposals, respondents were asked to pick one of the following five answer categories: strongly favor, somewhat favor, somewhat oppose, strongly oppose, and neither favor nor oppose.

Experiment 6: Support for Increased Spending at Different Education Levels

Finally, we analyze the effect of providing spending information in a setting where respondents are directly forced to take into account the trade-offs that are inherent to any spending decision. Specifically, we turn to a topic of high relevance in the political economy literature on education funding (Glomm et al. 2011): allocating spending between different levels of education. By asking what level within the education sector should benefit from an increase in public spending, the trade-off between different spending options is directly salient.

Thus, in our sixth experiment the control group was asked the following question: "Suppose the government plans an increase in education spending. If only one area of education can benefit from this increase, which area should it be in your opinion?" Respondents were asked to choose one of the following options: preschools, primary schools, secondary schools, vocational schools, and universities and colleges.

Respondents in the treatment group were informed about the following current annual public spending levels per child or student (Statistisches Bundesamt 2013, 2014a): € 6,100 in pre-schools, € 5,200 in primary schools, € 7,000 in secondary schools, € 4,000 in vocational schools, and € 8,300 in universities and colleges.

2.3 Econometric Model

We evaluate the impacts of our information treatments in a regression framework. In particular, we estimate versions of the following regression model:

$$y_i = \alpha_0 + \alpha_1 Treatment_i + \delta' X_i + \varepsilon_i \tag{1}$$

where y_i is the outcome of interest for individual i, $Treatment_i$ is an indicator of whether individual i received the information treatment, X_i is a vector of control variables, and ε_i is an

[13] The cost estimate is taken from Klemm (2009). In two further treatments (not analyzed here), we provided information that 150,000 students repeat a grade each year and emphasize the possibility of individual assistance as an alternative to grade retention.

error term. In this specification, the average treatment effect of information provision on the outcome variables is given by the parameter α_1.

For experiments 2 (on school spending) and 3 (on teacher salaries), we additionally analyze whether the effects of information provision depend on the prior information level of respondents. In our preferred specification, we categorize guesses into three categories: underestimated, (roughly) correct, or overestimated. Using these categories, we extend our basic regressions model to:

$$y_i = \beta_0 + \beta_1 Treatment_i + \beta_2 Treatment_i * Correct_i + \beta_3 Treatment_i * Overestimated_i + \beta_4 Correct_i + \beta_5 Overestimated_i + \delta' X_i + \eta_i \quad (2)$$

where $Correct_i$ ($Overestimated_i$) equals one if respondent i correctly estimated (overestimated) actual spending levels. In this specification, the effect of information provision for the baseline group of respondents who underestimated actual spending levels is given by β_1, while β_2 (β_3) measures the additional effect of the information treatment on those who correctly estimated (overestimated) actual spending levels.

Our parameters of interest, α_1, β_1, β_2, and β_3, are identified because of the random assignment of treatment status. Nevertheless, the inclusion of further covariates, X_i, may generate more precise estimates of the causal effect of information provision. Thus, throughout the paper we present estimation results with and without additional covariates.

2.4 Test of Randomization

To test whether the randomization in our information experiments successfully balanced respondents' characteristics across the treatment and control groups, we investigate whether our rich set of covariates can predict treatment status in each of our experiments. Table 1 reports coefficients and p-values of regressions of the form

$$Treatment_i = \gamma_0 + \gamma_1 Covariate_i + \varepsilon_i \quad (3)$$

for each experiment and each of the covariates separately.

It is reassuring that only five out of 180 regressions yield a coefficient γ_1 that is significant at the 5 percent level, which would be easily expected by pure chance. Likewise, regressing treatment status in each experiment on all covariates simultaneously yields p-values for joint significance ranging from 0.279 to 0.878 in our different experiments. Thus, the balancing tests suggest that random assignment worked as intended.

3. Results

We present our results in four steps. First, we analyze how information on public spending affects respondents' support for increased public spending in the major areas of public expenditure (experiment 1). Second, to reduce the level of abstraction we focus on the specific policy area of school spending and investigate how the effects of information provision depend on respondents' prior information on actual spending levels (experiments 2 and 3). Third, we analyze effects of cost information on support for two specific education reform proposals (experiments 4 and 5). Fourth, we study information effects in a setting where trade-offs between spending on different education levels are salient (experiment 6). To ease exposition, we dichotomize response categories into favoring vs. not favoring additional public spending in our analyses and refer to more detailed preference intensities when discussing our results.[14]

3.1 Information Provision and Preferences for Public Spending

Our main interest is whether citizens' preferences for public spending change when they are informed about current spending levels. Thus, experiment 1 provides information on current spending levels in each of the major areas of public expenditure: social security, education, public safety, defense, and culture. Table 3 reports the results based on the model of equation (1). The dependent variable in all regressions is a binary variable that takes the value one if the respondent favors "much more" or "more" public spending and zero otherwise. We report estimates without controls (odd-numbered columns) and estimates including our standard controls (even-numbered columns).[15]

The results, also depicted in Figure 1, carry a clear message: Providing information on current spending levels reduces support for increased spending. In all five areas, the coefficient on the treatment indicator is estimated to be negative and significantly different from zero. The inclusion of respondent-level control variables has no substantive impact on estimated treatment effects, consistent with the finding in Table 1 that the randomization of treatment status was successful.[16]

Social security is the largest area of public spending in Germany with € 227 billion spent each year. Column 1 shows that providing this information reduces the share of respondents

[14] That is, we summarize the first two answer categories in each of the respective questions: much more + more; greatly increase + increase; and strongly favor + somewhat favor.

[15] The controls are essentially those listed in Table 1. See notes to Table 3 for details.

[16] Standard errors of the estimated treatment effects are only marginally smaller when controls are included as these controls have relatively limited explanatory power for the outcome. Including control variables therefore reduces the residual variance only slightly.

who support increased spending by 5.1 percentage points. This turns a slight majority of 51.6 percent of respondents in the control group who favor increased spending for social security into a minority. This reduction in support is mostly due to an increase in the share of respondents who indicate that spending should stay roughly the same, rather than an increase in the share of respondents who favor spending cuts (not shown). As the magnitude of the absolute treatment effect hinges on the level of support in the control group, at the bottom of Table 3 we also report the treatment effect relative to mean support in the control group. Relative to the control mean, the treatment reduces the share of respondents supporting increased spending on social security by 9.8 percent.

Both the absolute and relative treatment effects are even larger for education expenditure (column 3). The information that € 95 billion of public funds are currently spent on education reduces the share of respondents supporting increased spending by 13.7 percentage points, or 19.1 percent of the control group share. Education is the area with the largest support for increased spending in the control group (72.1 percent), but also exhibits the largest negative treatment effect in absolute terms. In contrast to all other areas, the majority of respondents (58.4 percent) still favors increased spending in education after being informed about current spending levels. The treatment effect is not confined to individuals with relatively weak preferences; in fact, information provision reduces the share of respondents who state that "much more" should be spent on education significantly by 6.7 percentage points (not shown).

The information treatment also reduces support for increased spending in all other areas. The share of respondents who favor increased spending for public safety decreases from 49.8 percent to 43.7 percent when being informed that current spending levels are € 38 billion (column 5). Defense spending is the area with the lowest support for increasing spending (column 7). Only 9.1 percent of respondents in the control group advocate more spending in this area. The information that the government currently spends € 27 billion on defense each year reduces support even further to only 6.2 percent. Despite the fact that culture is the area with the lowest annual public spending level (€ 10 billion), the information still reduces support for additional spending from 21.6 to 17.5 percent (column 9). Relative to the respective control means, the treatment effect in culture is as large as in education, and it is largest in defense at 32.2 percent of the baseline support.

The magnitude of the treatment effects does not depend systematically on either the current level of spending or the baseline level of support for increased spending. Therefore, the way in which respondents evaluate the information on current spending seems to depend on the specific area. This is in line with an interpretation that the negative treatment effects are due to genuine information processing rather than an unconscious response to the "shock" of being confronted with large spending figures. One explanation for the different strength of treatment effects could be that the supporters of higher spending for social security differ systematically from the supporters of higher education spending, for instance by having different levels of prior knowledge about current spending levels. Focusing on the case of school finance, the next section will therefore examine whether treatment effects vary for respondents with different prior information.

3.2 Ignorance, Information Provision, and Preferences for School Spending

The significant effect of the information treatment presented in the previous section suggests that a non-negligible share of respondents holds incorrect beliefs about current spending levels, and thus reacts to the provision of new information. In this section, we test whether treatment effects indeed differ by respondents' prior level of information in order to distinguish genuine information effects from priming. For this analysis, we focus on spending on schools and teacher salaries primarily because these categories are less abstract and public awareness of these specific policies is arguably high. Moreover, the previous results reveal that education spending is the area with both the largest absolute treatment effect and the highest support for increased spending.[17]

3.2.1 Eliciting Prior Information Status

To elicit the prior information status on current spending levels, we asked all respondents to guess the current public spending per student and average teacher salaries early in the survey. These guesses provide interesting insight into the prior knowledge of the German population. For the first guessing question on the current level of public school spending, the mean estimate is € 5,702 with a standard deviation of € 12,342. The median of the distribution is € 1,500, a sizeable underestimate compared to the actual value of € 6,400 per student on average.[18]

For the second question, the median guess of average monthly pay for a full-time teacher is € 2,500. The mean guess was slightly higher at € 2,984 with a standard deviation of € 4,983. Compared to the spending question, the salary guesses are much closer to the actual value of

[17] See West et al. (2016) for comparative evidence on support for education spending in Germany and the United States.

[18] A closer inspection of the distribution of guesses reveals that respondents show a tendency to estimate in multiples of € 500. For example, the 25th percentile is € 500, the 75th percentile € 5,000.

€ 3,000. The fact that guesses of teacher salaries are much more accurate underlines the notion that respondents have a better grasp of teacher salaries than of per-student spending on schools.

As indicated, we categorize guesses into three categories to analyze whether the effects of information provision depend on the prior information level of respondents: underestimated, (roughly) correct, or overestimated. In our preferred specification, we consider all guesses within a range of plus/minus 10 percent of the actual value as (roughly) correct guesses. According to this categorization, 20.4 percent of all respondents estimated teacher salaries roughly correctly, but only 2.7 percent guessed annual spending roughly correctly. Our results do not depend on the specific choice of bandwidth for correct guesses. We document this by also reporting results for a larger bandwidth of plus/minus 25 percent of the actual spending level, according to which 13.0 percent of respondents guessed annual spending roughly correctly.

3.2.2 Preferences for School Spending

Results of experiment 2 on school spending are presented in Table 4. Estimates of the average effect of information provision based on equation (1) are shown in columns 1 and 2, while columns 3 to 6 report estimates based on the extended model of equation (2) that allows the treatment effect to differ by prior information status. We again report estimates without any controls (odd-numbered columns) and estimates including our standard set of controls (even-numbered columns). Estimates in columns 3 and 4 are based on our preferred categorization of correct guesses (± 10 percent), and estimates in columns 5 and 6 are based on the categorization with the extended bandwidth (± 25 percent).

The average effect of information provision reported in columns 1 and 2 is even larger than in experiment 1, and highly significant. Support for higher spending falls from a control group mean of 71 percent in favor to 50 percent in favor when respondents are informed of current annual spending.[19] The finding that information provision creates an even larger treatment effect in this case might be due to the fact that school spending is more specific than the spending options presented in experiment 1 and that spending information is reported per student, not in aggregate terms.

More importantly, the estimates of the extended model reported in columns 3 to 6 clearly suggest that prior information matters. In the control group, the spending preferences do not differ significantly between respondents who underestimated, correctly estimated, or

[19] This effect combines significant decreases in the shares of respondents who prefer school spending to greatly increase by 7 percentage points and to increase by 13 percentage points (not shown).

overestimated current spending levels. But the effect of information provision depends on prior information: compared to the baseline group who underestimated current spending levels, the coefficients on the interaction terms show that respondents who either guessed correctly or overestimated spending are less affected by the information treatment. The coefficient on the interaction of treatment status and correct guesses is sizeable but imprecisely estimated, reflecting the relatively small size of the group of those who guessed roughly correctly. However, the difference of 15.9 percentage points in the treatment effect between those who underestimated and those who overestimated spending is statistically significant (column 3). Information provision reduces support for higher spending by 24.1 percentage points among those who had thought that spending was in fact lower, but only by (a statistically insignificant) 8.2 percentage points among those who had guessed that spending was in fact higher (see bottom row). As columns 5 and 6 as well as Appendix Figure A1 show, results on the heterogeneity in treatment effects by prior information status do not depend on the specific bandwidth used to define correct guesses.

Appendix Table A2 presents results of our follow-up experiment conducted one year later, in which we provided spending information at the state rather than the national level. The share of correct guesses is even lower in this experiment (about 1 percent of guesses are within a range of plus/minus 10 percent of the actual value and about 5 percent within plus/minus 25 percent), rendering estimates for correct guessers highly imprecise. But the fact that qualitative results for those who underestimate and those who overestimate are very similar to those reported in Table 4 underlines the robustness of our results.[20]

3.2.3 Preferences for Teacher Salaries

Table 5 reports results of experiment 3 on preferences on teacher salaries. Baseline support for increases in teacher salaries is much lower than support for more school spending in experiment 2, with only 29 percent of respondents in the control group in favor of salary increases. Providing information on the current level of teacher salaries reduces this support further by 12 percentage points (column 1).

Compared to per-student spending levels, teacher salaries are an even more tangible concept for respondents, as they can anchor guesses and preferences on their own observations

[20] In our follow-up survey, we also randomized whether respondents were asked to guess spending levels before answering the preference question (only those respondents who were asked to guess spending levels are included in Appendix Table A2). This allows us to test whether asking respondents to guess alters the effect of providing spending information on preferences for school spending increases. This possibility is rejected, as treatment effects do not differ significantly between those who were asked to state their beliefs and those who were not (not shown).

and experiences of salary levels. Indeed, 20.4 percent of all guesses are within the range of plus/minus 10 percent of the actual average salary level used to define correct guesses in columns 3 and 4 (compared to only 2.7 percent for per-student spending). Given the greater accuracy of guesses, in columns 5 and 6 we alternatively define as correct guesses only those who in fact got the actual average salary level of € 3,000 exactly correct which, intriguingly, are 15 percent of all respondents.

Estimates based on the extended model reported in columns 3 to 6 reveal even more pronounced effect heterogeneity by prior information status than in the previous experiment. The average treatment effect is driven entirely by respondents who underestimated teacher salaries. Looking at average treatment effects within the three categories of prior information status, we find that in the baseline group of respondents who underestimated salaries, the share that supports higher teacher salaries falls by about 20 percentage points in response to receiving the information on actual salary levels. In contrast, the provision of information has no significant effect on the preferences of respondents who correctly guessed current teacher salaries (see bottom row). For respondents who overestimated current salary levels, there is in fact a small positive treatment effect, although it does not reach statistical significance. The same conclusions hold when controls are included and/or the bandwidth of the category of correct guesses is varied (see Appendix Figure A1).

The finding that information treatment effects are heterogeneous by prior information status in both experiments 2 and 3 indicates that treatment effects do indeed at least partly capture genuine effects of receiving new information, rather than pure priming effects. In the literature on political preferences, a common concern with providing information in survey experiments is that results might be driven by priming respondents on certain, for example monetary, aspects and not by true processing of information (e.g., Miller and Krosnick 1996; Krosnick 2002; Simon 2011). On the other hand, recent evidence suggests that what might have appeared as priming is indeed the effect of changed preferences based on learning new information (Lenz 2009).

In our setup, it is possible that the fact that we make current spending and salary levels salient might have pushed monetary considerations to the forefront of respondents' minds in a way that influences their responses (although this is true for the control group as well as for the treatment group). Therefore, we implemented an experimental design that allows us to gain some insights into the effects of new information on spending preferences. In experiment 2, we see a drop in support for higher spending even for those respondents whose previous estimate was relatively close to the reported value of € 6,400. Hence, in the treatment condition, these respondents receive no new information on spending levels, except for a possible reduction in their uncertainty about their guesses. The decrease in support for higher spending among these respondents (a statistically insignificant 7.8 percentage points for the narrow definition of correct guesses and a significant 18.6 percentage points for the wider definition in Table 4) may therefore be due to priming effects. However, it may also reflect the reduced uncertainty in their knowledge of annual per-student spending on schools, which may be very challenging to estimate.

In contrast, respondents appear to have much better information on the average salary levels in society. The guess for average teacher salaries can then be derived from the benchmark salary levels the respondents know. Therefore, we would expect priming effects to play a smaller role in experiment 3. And indeed, the effect of information provision is close to zero for those who correctly estimated salary levels, speaking against the prevalence of priming. In addition to the fact that the treatment effect is negative only for those who underestimated actual levels and (insignificantly) positive for those who overestimated, this finding is consistent with the notion that respondents use the provided information to update their beliefs on current spending and adjust their choice of answer accordingly (Schueler and West 2016). This evidence suggests that salience effects are less prevalent in more familiar circumstances.

3.2.4 Effect Heterogeneity of Information Treatments

Results so far highlight that the effect of providing information varies with respondents' prior knowledge. To document potential other effect heterogeneity of the information treatments and to put the heterogeneous treatment effects by prior information into perspective, we next analyze differences in treatment effects across sociodemographic subgroups.

Table 6 reports results on school spending and on teacher salaries (experiments 2 and 3) for various subgroups of our sample. We focus on the following observable characteristics of respondents: gender, age, parental status, region of residence, income, school track attended, employment status, party preference, and working in the education sector. We look at each characteristic separately and split our sample into two or three groups based on the respective characteristic. For each characteristic, we estimate regression models that are similar to equation (2), but interact the treatment indicator with indicators for the respective subgroups. In the table, the baseline coefficients on the treatment indicators measure the average effect for the respective omitted category, and the coefficients on the interaction terms measure whether the treatment effect differs for the other categories of the respective subgroup indicator.

We find little evidence for effect heterogeneity across subgroups. Only in two cases are coefficients on interaction terms statistically significant. First, the information treatment effect on support for increased teacher salaries is significantly larger (in absolute terms) for respondents aged between 45 and 65 years. Second, the information treatment leads respondents who hold an intermediate school degree to reduce their support for increased school spending marginally significantly more than respondents who hold a low school degree. Coefficients on all other interaction terms are statistically insignificant.

In our 2015 follow-up survey, we surveyed two additional background characteristics that provide information on respondents' voting behavior and the importance of education topics for their personal voting decisions. For respondents who usually cast a vote at elections and those who consider education topics important for their vote choice, we find that treatment effects are smaller but remain large and significant (Appendix Table A3). This highlights the importance of our results for the overall political economy of majorities for public spending.

The robustness of our results implied by the prevalence of treatment effects in different subgroups shows that information provision has profound effects on the preferences of those who are most likely represented in the political process such as special interest group members (parents and individuals who work in the education sector) and those who turn out to vote. Apart from highlighting the policy relevance of our results, the evidence of homogeneous treatment effects across sociodemographic subgroups also strengthens the interpretation that effects of information provision are larger among those who underestimate actual spending levels because of information updating. It further reduces the concern that an unobserved correlate of prior knowledge and not a true information effect is responsible for the results presented in the previous section.

3.3 Cost Information and Preferences for Specific Policy Reforms

Results so far are based on experiments that refer to general spending areas without higher spending being earmarked for any specific use. However, political debates usually revolve around specific reform proposals. Therefore, this section tests whether the information treatment effects carry over to a setting where expenses are tied to well-defined education policy proposals. We experimentally investigate preferences for whole-day schooling and abolishing grade retention. Both policies have been discussed widely in the German context.

On the topic of grade retention, experiment 4 asks respondents whether they favor that low-performing students have to repeat a year in schools. This is a practice very common in German schools, but there are regular proposals to end this practice. The treatment group is informed that a study has estimated that grade repetitions cost the German school system almost € 1 billion each year. As can be seen from the left panel of Table 7, this information treatment reduces support for the policy, albeit only slightly by 4 percentage points from the control mean of 78 percent who are in favor of grade repetition (marginally significant).

Grade retention is a policy that has long been an integral part of the German education system, and its abolition would reduce education spending. In contrast, the results from experiments 1 to 3 relate to questions that suggest an increase (rather than reduction) in education spending. Therefore, experiment 5 elicits support for the introduction (rather than abolition) of a specific measure in education policy, which would result in increased education spending. In particular, one proposal that is debated heatedly in the German context where children usually attend school only until lunchtime is to extend the school day into the afternoon. According to one study, the implementation of whole-day schooling across the whole of Germany would cost more than € 9 billion a year. The right panel of Table 7 shows that providing this information reduces support for the introduction of a whole-day school system from 61 to 55 percent. Overall, we therefore find that cost information does not only affect general spending preferences, but also preferences for specific policy proposals to which the spending relates.

3.4 Trade-offs and Preferences for Spending at Different Education Levels

A final aspect that we aim to study is whether providing spending information can also change policy preferences when citizens have to take into account the trade-offs that exist between different spending areas. Thus far, we have focused on support for general or specific government spending without explicitly referring to the trade-offs that are involved between alternative spending options. In this section, we investigate the effects of information about current spending levels when trade-offs are salient.

In experiment 6, respondents were asked to suppose that the government plans to increase spending for education. They are then asked to allocate these hypothetical additional funds to one level of the education system: preschools, primary schools, secondary schools, vocational schools, or universities. The treatment group received information on current levels of expenditure per child or student in each of these areas.

As is evident from the results reported in Table 8, the information treatment leads to considerable change in the preferences for how funds should be allocated across the different levels of the education system. On the one hand, support for further investments in preschools and secondary schools falls significantly by 4 and 5 percentage points, respectively. On the other hand, increased spending for primary schools (7 percentage points) and for vocational schools (3 percentage points) becomes more popular.

Thus, spending preferences are also malleable to spending information when citizens have to trade off different spending categories against each other. While our experiment was not devised to shed light on the specific mechanisms that lead to increased support in one area and decreased support in another, one possible aspect that could underlie the pattern of results is that respondents show a tendency to equalize spending per student across the different areas. In case respondents indeed have equalizing tendencies, areas with relatively low per-capita spending benefit from the treatment, while areas with relatively high spending gather less support in the treatment condition compared to the control group.

4. Conclusions

The long-term growth in government spending in democratic societies has been the subject of intensive investigation, but evidence on the potential role of citizens' incomplete information about the size of the government is scarce. If citizens underestimate the actual extent of public spending, providing accurate spending information may be expected to lower their support for increased government spending. We test this hypothesis in a series of survey experiments with more than 4,000 respondents that are representative of the German voting-age population.

Our results suggest that in general, providing information on current spending levels causes public opinion on government spending to shift notably. We find negative effects for all major areas of public spending. Effect sizes range from a reduction in support for increased spending of 9 percent for social security spending to a reduction of 35 percent for national defense spending. In absolute terms, the largest effect is in the area of public education where the information treatment turns a huge support of 72 percent for more education spending into a more modest support of 58 percent. In the areas of social security and public safety, spending increases even lose majority support due to information provision.

We present further evidence that the effects of information provision differ by respondents' prior level of information. After eliciting respondents' guesses of current levels of school spending per student and of teacher salaries, we devise two further experiments on the support for increased spending for public schools and increased salaries for public school teachers. Results show that the reduction in support for increased public spending in these areas due to the information treatment are largest among those who underestimated current levels of school spending and teacher salaries. By contrast, there is no effect of information provision on those who had estimated roughly the correct level of teacher salaries, and even an insignificant positive effect for those who had overestimated salary levels.

These results are informative about the mechanisms through which the information treatments affect preferences for public spending. The fact that in the case of school spending, we observe small treatment effects for well-informed respondents who had correctly guessed per-student spending may be an indication that solely priming citizens to think about spending may have some impact. However, the finding that treatment effects strongly depend on prior knowledge is a clear indication that the provision of new information indeed affects how participants respond. This conclusion is reinforced by the finding that, apart from the effect heterogeneity observed with respect to different levels of prior knowledge, treatment effects are otherwise very similar across different sociodemographic subgroups of the population.

We complement the picture by showing that our results also extend to preferences for introducing whole-day schooling and abolishing grade retention, two specific policy proposals. Providing information on the spending requirements of these proposals significantly reduces their public support. Moreover, when investigating the decision of how to allocate public funds across different stages of education, we find that respondents' preferences for how additional funds should be allocated are also malleable to being informed about the respective current spending levels per student. It should also be noted that it is not the case that the provision of any kind of information affects respondents' expressed preferences. For example, in contrast to the spending information treatment, another treatment that informed respondents that more than 150,000 students repeat a grade each year did not affect their expressed preferences in the grade retention experiment.

While survey experiments are certainly subject to some artificiality, several pieces of evidence suggest that our experimental evidence contains relevance for and generalizability to political decision processes in the real world. First, investigating the generalizability of experimental survey evidence, Barabas and Jerit (2010) find that the information effects in their survey experiment are also found, to a somewhat smaller extent, in a natural experiment based on variation in the exposure to news that cover the same information. Relatedly, it has been argued that survey responses are a good proxy for actual voting behavior (Kemp 2002). Second, Blinder and Krueger (2004) argue that the fact that politicians devote tremendous resources to assessing public opinion implies that public opinion surveys are important for the political process. Thus, even if survey experiments would not accurately simulate how information is acquired in the real world, their results are likely to influence politicians. Third, our subgroup analysis shows that information treatment effects are equally strong among special interest group members such as parents and individuals who work in the education sector. Similarly, information treatment effects are prevalent among frequent voters and those who consider education topics important for their vote decisions. Individuals in these subgroups are most likely represented in the political process. Fourth, we find strong treatment effects for those with strong preferences, so information provision does not only shift the opinion of those who are relatively indifferent towards the policy. Finally, in contrast to prior research on preferences for such policies as redistribution or payments for human organs (Kuziemko et al. 2015; Elias, Lacetera, and Macis 2015), our results refer to a representative sample of the voting-age population, allowing generalizable statements for the political economy of government spending.

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Appendix: The Ifo Education Survey

The results presented in this paper are based on an opinion survey that we devised and implemented in Germany. Our database covers the responses of 4,171 adults. In order to represent the German voting-age population, the sample includes respondents aged 18 years and above, and no upper age limit is enforced. As a result, respondents in our sample are between 18 and 97 years old.

The survey was conducted between April and July 2014 by the polling firm TNS Infratest, which has access to a nationally representative panel of adults and administered random sampling in two steps. First, 75 percent of respondents were recruited through an online panel and answered the survey online. Second, those participants in a randomized household survey conducted in their homes who previously stated that they do not use the Internet were asked to answer our survey questions on a tablet device that was provided to them. The trained interviewers who conducted the household survey were instructed to assist respondents in case these had difficulties using the tablet device, which was the case for about 80 percent of respondents.[21] Overall, the offline respondents constitute 25 percent of our sample.

The survey comprised a total of 39 questions on education policy and 19 questions on sociodemographic background. Overall, the survey had a median response time of 17 minutes (16 minutes online, 19 minutes with tablet device). Within the questionnaire, several survey experiments were administered in which randomly selected subgroups of respondents were asked different versions of the respective question. The maximum number of treatments was three (plus control group), resulting in a sample size per treatment condition of about a quarter of the total sample size. Computerized administration allowed us to randomize each experiment independently. An exhaustive descriptive summary of survey responses, including the exact German wording of each question, can be found at www.cesifo-group.de/ifo-bildungsbarometer.

In the survey, respondents did not have the option to go back to a previous question to change their answer or to look up information given in an earlier treatment. Whenever a question was left blank, a pop-up window encouraged respondents to answer the question. If respondents still failed to provide an answer after this reminder, they were able to continue the survey without a valid response. Overall, item non-response was very low at 1 percent on average.

[21] In our follow-up survey in 2015, interviewers were asked to report the type of difficulty respondents faced if they asked for assistance. The vast majority of respondents required help because of unfamiliarly with the tablet device.

Survey weights are employed to ensure representativeness of the German adult population. TNS Infratest provided these survey weights to match official statistics with respect to age, gender, parental status, school degree, federal state, and municipality size. For quality reasons, 87 respondents were assigned a survey weight of 0: These respondents either completed the survey in less than five minutes (79) or were younger than 18 years (8). The sample size ensures that the margin of error for responses ranges from roughly 1.5 percentage points for the full sample to roughly 3 percentage points if the sample is randomly divided into four equally sized subgroups (for questions on which opinion is evenly split).

Table A1: Wording of survey questions

No.	Group	Wording	Type of question
9	All	What do you guess, how much is spent on average each year per student on public general schools in Germany?	Open-ended
10	All	What do you guess, how much do teachers earn on average in Germany? Please estimate the monthly net salary (that is, after deduction of taxes and social security contributions) for a full-time teacher.	Open-ended
16	Control	In your opinion, should public spending for schools in Germany increase, decrease, or stay the same?	Closed-ended, 5 answer categories: Greatly increase; Increase; Stay about the same; Decrease; Greatly decrease
	Treatment	Public education spending in Germany amounts on average to 6,400 Euro per student annually. In your opinion, should public spending for schools in Germany increase, decrease, or stay the same?	
17	Control	Do you favor or oppose that low-performing students have to repeat the grade?	Closed-ended, 5 answer categories: Strongly favor; Somewhat favor; Somewhat oppose; Strongly oppose; Neither favor nor oppose
	Treatment	According to a study, grade repetitions cost almost one billion Euro each year in total. Do you favor or oppose that low-performing students have to repeat the grade?	
18	Control	Do you favor or oppose that Germany in general switches to a whole-day school system where all children are in school until 3 pm?	Closed-ended, 5 answer categories: Strongly favor; Somewhat favor; Somewhat oppose; Strongly oppose; Neither favor nor oppose
	Treatment	It would cost more than 9 billion Euro per year to offer whole-day schools across Germany. Do you favor or oppose that Germany in general switches to a whole-day school system where all children are in school until 3 pm?	
26	Control	What do you think, should the salaries of teachers in Germany increase, decrease, or stay the same?	Closed-ended, 5 answer categories: Greatly increase; Increase; Stay about the same; Decrease; Greatly decrease
	Treatment	In Germany, full-time teachers earn on average about 3,000 Euro net of taxes per month. What do you think, should the salaries of teachers in Germany increase, decrease, or stay the same?	

(continued on next page)

Table A1 (continued)

No.	Group	Wording	Type of question
35	Control	In your opinion, how much should the government spend in the future in the following areas compared to today? Remember that increased public spending might have to be financed through an increase in taxes. Social security, e.g. contributions to pension or unemployment benefits; Education; Public safety, e.g. police; Defense; Culture[a]	Closed-ended, 5 answer categories per spending area: Much more; More; About the same; Less; Much less
	Treatment	In your opinion, how much should the government spend in the future in the following areas compared to today? In parentheses, you see how much public budgets (without Sozialversicherung) currently spend per year for the individual areas. Remember that increased public spending might have to be financed through an increase in taxes. Social security, e.g. contributions to pension or unemployment benefits (ca. 227 billion); Education (ca. 95 billion); Public safety, e.g. police (ca. 38 billion); Defense (ca. 27 billion); Culture (ca. 10 billion)[a]	
36	Control	Suppose the government plans an increase in education spending. If only one area of education can benefit from this increase, which area should it be in your opinion?	Closed-ended, 5 answer categories: Preschools; Primary schools; Secondary schools; Vocational schools; Universities and colleges
	Treatment	Suppose the government plans an increase in education spending. In parentheses, you see how high the expenditures per child or student currently are per year. If only one area of education can benefit from this increase, which area should it be in your opinion?	Closed-ended, 5 answer categories: Preschools (6,100 Euro); Primary schools (5,200 Euro); Secondary schools (7,000 Euro); Vocational schools (4,000 Euro); Universities and colleges (8,300 Euro)

Notes: No.: indicates position of question in the Ifo Education Survey 2014. [a] Randomized ordering of items.

Table A2: Ignorance, information provision, and preferences for public spending on schools in the follow-up survey

	Support for higher school spending					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-0.149***	-0.107***	-0.195***	-0.145***	-0.197***	-0.146***
	(0.028)	*(0.032)*	*(0.033)*	*(0.038)*	*(0.034)*	*(0.038)*
Treatment × Correct guess			-0.150	-0.246	-0.010	-0.123
			(0.185)	*(0.184)*	*(0.089)*	*(0.104)*
Treatment × Overestimated			0.183***	0.172**	0.200***	0.197***
			(0.067)	*(0.071)*	*(0.070)*	*(0.073)*
Correct guess			0.124	0.203***	0.189***	0.202***
			(0.096)	*(0.045)*	*(0.044)*	*(0.048)*
Overestimated			0.051	0.062	0.050	0.058
			(0.047)	*(0.050)*	*(0.050)*	*(0.052)*
Covariates	No	Yes	No	Yes	No	Yes
Observations	2,078	1,590	1,940	1,511	1,940	1,511
R^2	0.025	0.071	0.051	0.102	0.057	0.107
Control mean	0.740					
Bandwidth of correct guesses			± 10%		± 25%	
Share of correct guesses			0.014		0.051	
Treatment (correct guess)			-0.345*	-0.391**	-0.207**	-0.268***
Treatment (overestimated)			-0.012	0.027	0.003	0.052

Notes: OLS regressions. Treatment: Information on current school spending in respondent's federal state (*Land*). Control: No information. Dependent variable: dummy variable coded 1 if respondent prefers public school spending to (greatly) increase. Correct: respondent's guess of current school spending level is within a range of plus/minus 10% (25%) of actual spending level in columns 3 and 4 (columns 5 and 6). Covariates: age, gender, born in Germany, living with partner, education, employment status, working in education sector, parent status, household income, West Germany, living in large city, parental education level, patience, altruism, and political attitude. Regressions weighted by survey weights. Robust standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1. Data source: Ifo Education Survey 2015.

Table A3: Effect heterogeneity of information treatment by voting behavior in the follow-up survey

	Support for higher school spending			
	(1)		(2)	
Voter: Baseline (non-frequent voter)	-0.256***	*(0.059)*	-0.225***	*(0.066)*
Treatment × frequent voter	0.139**	*(0.067)*	0.150**	*(0.075)*
Education important for voting decision: Baseline (no)	-0.237***	*(0.057)*	-0.175***	*(0.064)*
Treatment × yes	0.107*	*(0.065)*	0.075	*(0.072)*
Interaction Voter and Education important: Baseline (non-frequent voter x no)	-0.224***	*(0.046)*	-0.164***	*(0.052)*
Treatment × frequent voter and yes	0.117**	*(0.057)*	0.081	*(0.064)*
Controls	No		Yes	

Notes: OLS regressions. Treatment: Information on current school spending. Control: No information. Baseline: treatment effect for omitted subgroup. Dependent variable: dummy variable coded 1 if respondent prefers spending to (greatly) increase. Estimates are based on equation (1) extended by respective interactions indicated in each row. Regressions weighted by survey weights. Robust standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1. Data source: Ifo Education Survey 2015.

Figure A1: Effect heterogeneity with varying bandwidths for correct guesses

Notes: Sensitivity of estimated interaction effects between prior information and treatment status with respect to the definition of correct guesses. The figures depict the point estimates and confidence intervals of the coefficients on $\mathrm{Treatment}_i * \mathrm{Correct}_i$ (left panels) and $\mathrm{Treatment}_i * \mathrm{Overestimated}_i$ (right panels) for varying bandwidths used for the definition of correct guesses. The graph on correct estimates for school spending (upper left panel) does not start immediately after bandwidth 0 due to no observations with correct guesses for very small bandwidths. Estimates are based on equation (2) without controls. Regressions weighted by survey weights. Data source: Ifo Education Survey 2014.

Table 1: Summary statistics and balancing tests

Covariate	Mean	Covariates predicting treatment status in experiment no.					
	[SD]	1	2	3	4	5	6
Age	50.210	-0.000	-0.000	0.000	-0.001**	-0.000	-0.000
	[18.246]	*(0.001)*	*(0.001)*	*(0.000)*	*(0.001)*	*(0.001)*	*(0.000)*
Female	0.512	0.008	-0.019	-0.021	-0.007	0.005	-0.003
		(0.021)	*(0.024)*	*(0.017)*	*(0.024)*	*(0.024)*	*(0.017)*
Born in Germany	0.945	0.029	-0.023	0.009	-0.022	-0.003	-0.048
		(0.043)	*(0.052)*	*(0.037)*	*(0.051)*	*(0.052)*	*(0.036)*
Lives in former West Germany	0.796	-0.014	-0.007	-0.001	0.002	-0.030	0.021
		(0.025)	*(0.028)*	*(0.020)*	*(0.028)*	*(0.029)*	*(0.020)*
City size ≥ 100,000	0.321	-0.014	-0.018	-0.007	0.010	-0.031	0.009
		(0.022)	*(0.025)*	*(0.018)*	*(0.025)*	*(0.026)*	*(0.018)*
Monthly household income (in €)	2,108	-0.014*	-0.002	-0.005	0.001	-0.001	0.009
	[1.332]	*(0.008)*	*(0.009)*	*(0.006)*	*(0.009)*	*(0.009)*	*(0.006)*
Partner in household	0.569	-0.022	0.033	-0.022	-0.014	0.013	-0.004
		(0.021)	*(0.024)*	*(0.017)*	*(0.024)*	*(0.025)*	*(0.017)*
At least one parent holds university degree	0.251	-0.038	-0.017	-0.004	0.040	-0.041	0.014
		(0.025)	*(0.029)*	*(0.020)*	*(0.029)*	*(0.028)*	*(0.020)*
Works in education sector	0.063	0.033	0.024	0.028	0.071	0.047	-0.037
		(0.044)	*(0.056)*	*(0.036)*	*(0.053)*	*(0.052)*	*(0.036)*
Patience	6.722	-0.003	-0.000	-0.000	0.003	0.001	-0.002
	[2.814]	*(0.004)*	*(0.004)*	*(0.003)*	*(0.004)*	*(0.004)*	*(0.003)*
Altruism	7.278	-0.002	0.006	-0.002	-0.003	-0.009*	-0.004
	[2.347]	*(0.004)*	*(0.005)*	*(0.004)*	*(0.005)*	*(0.005)*	*(0.004)*
Highest educational attainment							
No degree/basic degree	0.409	-0.005	0.010	0.014	-0.026	-0.022	-0.022
		(0.021)	*(0.024)*	*(0.017)*	*(0.024)*	*(0.024)*	*(0.017)*
Middle school degree or equivalent	0.306	0.007	-0.003	-0.035*	0.039	0.019	0.027
		(0.022)	*(0.026)*	*(0.018)*	*(0.026)*	*(0.026)*	*(0.018)*
University entrance degree	0.285	-0.002	-0.009	0.020	-0.009	0.006	-0.003
		(0.024)	*(0.029)*	*(0.020)*	*(0.029)*	*(0.028)*	*(0.020)*
Employment status							
Full-time employed	0.348	0.004	0.014	0.007	-0.002	-0.020	0.011
		(0.022)	*(0.025)*	*(0.018)*	*(0.026)*	*(0.025)*	*(0.018)*
Part-time employed	0.109	-0.002	0.022	0.002	0.086**	-0.014	0.022
		(0.031)	*(0.035)*	*(0.026)*	*(0.036)*	*(0.036)*	*(0.026)*

(continued on next page)

Table 1 (continued)

Covariate	Mean	Covariate's prediction of treatment status in experiment no.					
		1	2	3	4	5	6
Self-employed	0.033	0.031	0.019	0.074*	-0.030	0.036	0.075*
		(0.054)	*(0.063)*	*(0.044)*	*(0.060)*	*(0.066)*	*(0.044)*
Unemployed	0.062	0.017	-0.024	-0.055*	0.002	-0.025	0.021
		(0.041)	*(0.048)*	*(0.033)*	*(0.046)*	*(0.050)*	*(0.033)*
House wife/husband	0.069	0.015	0.047	-0.062**	0.008	-0.041	-0.045
		(0.037)	*(0.041)*	*(0.031)*	*(0.045)*	*(0.044)*	*(0.031)*
Retired or ill	0.297	-0.006	-0.023	0.013	-0.025	0.009	-0.014
		(0.022)	*(0.026)*	*(0.018)*	*(0.025)*	*(0.026)*	*(0.018)*
Student, apprentice, in training	0.082	-0.032	-0.044	0.004	-0.030	0.090*	-0.035
		(0.046)	*(0.057)*	*(0.038)*	*(0.054)*	*(0.053)*	*(0.038)*
Parent status							
No children	0.380	0.017	0.014	-0.005	0.042	0.023	-0.022
		(0.022)	*(0.026)*	*(0.018)*	*(0.026)*	*(0.026)*	*(0.018)*
At least one child below 18	0.224	0.009	-0.020	-0.000	-0.012	-0.022	0.058***
		(0.025)	*(0.029)*	*(0.020)*	*(0.029)*	*(0.029)*	*(0.020)*
All children older than 18	0.395	-0.023	0.001	0.005	-0.032	-0.006	-0.021
		(0.021)	*(0.024)*	*(0.017)*	*(0.024)*	*(0.025)*	*(0.017)*
Political party preference							
CDU/CSU	0.251	0.010	-0.051*	0.003	-0.017	-0.048*	0.007
		(0.024)	*(0.028)*	*(0.020)*	*(0.029)*	*(0.028)*	*(0.020)*
SPD	0.211	0.033	0.014	-0.005	-0.009	-0.020	0.000
		(0.026)	*(0.030)*	*(0.021)*	*(0.030)*	*(0.031)*	*(0.021)*
Linke	0.057	0.071	0.031	0.028	0.085*	0.004	0.024
		(0.045)	*(0.049)*	*(0.037)*	*(0.051)*	*(0.052)*	*(0.037)*
Grüne	0.092	-0.010	-0.012	-0.026	-0.042	0.016	0.016
		(0.035)	*(0.041)*	*(0.029)*	*(0.043)*	*(0.041)*	*(0.029)*
Other	0.063	-0.105**	0.046	0.030	0.017	0.023	0.017
		(0.043)	*(0.050)*	*(0.037)*	*(0.052)*	*(0.052)*	*(0.036)*
None	0.326	-0.019	0.017	-0.004	0.009	0.042*	-0.023
		(0.022)	*(0.025)*	*(0.018)*	*(0.025)*	*(0.025)*	*(0.018)*
Observations	4,171	2,812	2,102	4,171	2,083	2,054	4,171

Notes: First column: sample means; standard deviations in brackets (for non-dummy variables). Subsequent columns: Each row reports the coefficients from regressions of the form $Treatment_i = \gamma_0 + \gamma_1 Covariate_i + \varepsilon_i$ for the respective experiment (*p*-values in parentheses). Regressing treatment status in each experiment jointly on all covariates yields *p*-values for joint significance of 0.687, 0.878, 0.740, 0.280, 0.677, and 0.346, respectively. Regressions weighted by survey weights. Significance levels: *** p<0.01, ** p<0.05, * p<0.1. Data source: Ifo Education Survey 2014.

Table 2: Comparison of survey sample characteristics to census data

	Sample mean	Census data
	(1)	(2)
Age	50.210	51.193
	(0.288)	
Female	0.512	0.517
	(0.008)	
Lives in former West Germany	0.796	0.789
	(0.007)	
Lives in metropolitan area[a]	0.264	0.266
	(0.007)	
Highest educational attainment		
No degree/basic degree	0.409	0.393
	(0.008)	
Middle school degree r equivalent	0.306	0.316
	(0.008)	
University entrance degree	0.285	0.291
	(0.008)	
Observations	4,171	61,521,397

Notes: Column 1: sample means and standard errors (in parentheses) of our survey data. Column 2: means based on census data from 2011. Survey weights are employed. Data source: Ifo Education Survey 2014 and German population census 2011. [a] For ease of comparison, this variable definition differs slightly from our standard control variable for city size.

Table 3: The effect of informing citizens about current spending levels on their support for increased public spending in different areas

	Support for higher public spending									
	Social security		Education		Public safety		Defense		Culture	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment	-0.051**	-0.048**	-0.137***	-0.147***	-0.061***	-0.057***	-0.029***	-0.032***	-0.041**	-0.042***
	(0.021)	*(0.021)*	*(0.019)*	*(0.019)*	*(0.021)*	*(0.020)*	*(0.011)*	*(0.011)*	*(0.016)*	*(0.016)*
Covariates	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	2,773	2,641	2,770	2,639	2,772	2,639	2,773	2,640	2,772	2,640
R^2	0.003	0.052	0.021	0.085	0.004	0.073	0.003	0.029	0.003	0.077
Control mean	0.516		0.721		0.498		0.091		0.216	
Relative effect	-9.8%	-9.3%	-19.1%	-20.4%	-12.2%	-11.4%	-32.2%	-35.2%	-19.2%	-19.4%
Spending level	€ 227 billion		€ 95 billion		€ 38 billion		€ 27 billion		€ 10 billion	

Notes: OLS regressions. Treatment: Information on current annual spending levels for each area. Control: No information. Dependent variable: dummy variable coded 1 if respondent prefers (much) more spending in area indicated in column header, 0 otherwise. Control mean: mean of outcome variable in control group. Relative effect: treatment effect divided by control mean. Spending level: current annual spending in respective area. Covariates: age, gender, born in Germany, living with partner, education, employment status, working in education sector, parent status, household income, West Germany, living in large city, parental education level, patience, altruism, and political attitude. Regressions weighted by survey weights. Robust standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1. Data source: Ifo Education Survey 2014.

Table 4: Ignorance, information provision, and preferences for public spending on schools

	Support for higher school spending					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-0.203***	-0.210***	-0.241***	-0.242***	-0.240***	-0.239***
	(0.023)	*(0.023)*	*(0.027)*	*(0.026)*	*(0.029)*	*(0.028)*
Treatment × Correct guess			0.164	0.073	0.054	0.016
			(0.137)	*(0.137)*	*(0.068)*	*(0.067)*
Treatment × Overestimated			0.159***	0.143**	0.154**	0.138**
			(0.059)	*(0.057)*	*(0.062)*	*(0.059)*
Correct guess			0.000	0.053	0.045	0.031
			(0.086)	*(0.080)*	*(0.045)*	*(0.045)*
Overestimated			-0.022	-0.019	-0.011	-0.008
			(0.043)	*(0.042)*	*(0.045)*	*(0.043)*
Covariates	No	Yes	No	Yes	No	Yes
Observations	2,079	1,986	1,948	1,899	1,948	1,899
R^2	0.043	0.107	0.052	0.119	0.053	0.118
Control mean	0.705					
Bandwidth of correct guesses			± 10%		± 25%	
Share of correct guesses			0.029		0.139	
Treatment (correct guess)			-0.078	-0.169	-0.186***	-0.223***
Treatment (overestimated)			-0.082	-0.099**	-0.086	-0.101*

Notes: OLS regressions. Treatment: Information on current school spending. Control: No information. Dependent variable: dummy variable coded 1 if respondent prefers public school spending to (greatly) increase. Correct: respondent's guess of current school spending level is within a range of plus/minus 10% (25%) of actual spending level in columns 3 and 4 (columns 5 and 6). Covariates: age, gender, born in Germany, living with partner, education, employment status, working in education sector, parent status, household income, West Germany, living in large city, parental education level, patience, altruism, and political attitude. Regressions weighted by survey weights. Robust standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1. Data source: Ifo Education Survey 2014.

Table 5: Ignorance, information provision, and preferences for increased teacher salaries

	Support for higher teacher salaries					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-0.120***	-0.126***	-0.199***	-0.205***	-0.191***	-0.197***
	(0.014)	*(0.014)*	*(0.018)*	*(0.018)*	*(0.017)*	*(0.017)*
Treatment × Correct guess			0.203***	0.196***	0.192***	0.184***
			(0.037)	*(0.037)*	*(0.041)*	*(0.040)*
Treatment × Overestimated			0.235***	0.236***	0.250***	0.251***
			(0.041)	*(0.041)*	*(0.040)*	*(0.040)*
Correct guess			-0.114***	-0.109***	-0.112***	-0.109***
			(0.027)	*(0.027)*	*(0.030)*	*(0.030)*
Overestimated			-0.139***	-0.148***	-0.136***	-0.144***
			(0.029)	*(0.029)*	*(0.028)*	*(0.028)*
Covariates	No	Yes	No	Yes	No	Yes
Observations	4,127	3,926	3,998	3,854	3,998	3,854
R^2	0.020	0.056	0.036	0.074	0.036	0.074
Control mean	0.290					
Bandwidth of correct guesses			± 10%		± 0%	
Share of correct guesses			0.212		0.149	
Treatment (correct guess)			0.004	-0.009	0.002	-0.013
Treatment (overestimated)			0.036	0.031	0.059	0.054

Notes: OLS regressions. Treatment: Information on current average teacher salary. Control: No information. Dependent variable: dummy variable coded 1 if respondent prefers teacher salaries to (greatly) increase. Correct: respondent's guess of current average teacher salary level is within a range of plus/minus 10% (0%) of actual salary level in columns 3 and 4 (columns 5 and 6). Covariates: age, gender, born in Germany, living with partner, education, employment status, working in education sector, parent status, household income, West Germany, living in large city, parental education level, patience, altruism, and political attitude. Regressions weighted by survey weights. Robust standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1. Data source: Ifo Education Survey 2014.

Table 6: Effect heterogeneity of information treatments across subgroups

Subgroup	Support for higher school spending		Support for higher teacher salaries	
	(1)		(2)	
Gender: Baseline (male)	-0.192***	*(0.033)*	-0.110***	*(0.022)*
Treatment × female	-0.025	*(0.046)*	-0.024	*(0.028)*
Age: Baseline (45-65)	-0.181***	*(0.034)*	-0.167***	*(0.021)*
Treatment × under 45	-0.018	*(0.052)*	0.064**	*(0.032)*
Treatment × over 65	-0.066	*(0.058)*	0.085**	*(0.035)*
Parental status: Baseline (no children)	-0.175***	*(0.040)*	-0.122***	*(0.026)*
Treatment × at least one child below 18	0.005	*(0.063)*	0.013	*(0.039)*
Treatment × only children above 18	-0.077	*(0.053)*	0.002	*(0.033)*
Region: Baseline (East)	-0.210***	*(0.045)*	-0.164***	*(0.031)*
Treatment × West	0.009	*(0.052)*	0.055	*(0.035)*
Household income: Baseline (below median)	-0.172***	*(0.032)*	-0.127***	*(0.020)*
Treatment × above median	-0.071	*(0.046)*	0.015	*(0.029)*
School track: Baseline (low)	-0.147***	*(0.035)*	-0.125***	*(0.021)*
Treatment × intermediate	-0.096*	*(0.053)*	-0.013	*(0.031)*
Treatment × high	-0.084	*(0.057)*	0.023	*(0.037)*
Employment status: Baseline (employed)	-0.199***	*(0.032)*	-0.118***	*(0.020)*
Treatment × non-employed	-0.033	*(0.046)*	-0.010	*(0.029)*
Treatment × student	0.131	*(0.102)*	0.026	*(0.071)*
Party preferences: Baseline (CSU/CDU)[a]	-0.249***	*(0.046)*	-0.070**	*(0.028)*
Treatment × SPD	0.090	*(0.068)*	-0.069	*(0.043)*
Job in education sector: Baseline	-0.207***	*(0.024)*	-0.120**	*(0.014)*
Treatment × Job in education	0.026	*(0.094)*	-0.014	*(0.069)*

Notes: OLS regressions. Treatment in column 1 (column 2): Information on current school spending (current average teacher salary). Control: No information. Baseline: treatment effect for omitted subgroup. Dependent variable in column 1 (column 2): dummy variable coded 1 if respondent prefers spending (teacher salaries) to (greatly) increase. Estimates are based on equation (1) without controls extended by respective interactions indicated in each row. [a] Respondents who usually vote for any other party and non-partisans are excluded from this analysis. Regressions weighted by survey weights. Robust standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1. Data source: Ifo Education Survey 2014.

Table 7: Cost information and preferences for specific policy reform proposals

	Grade retention		Whole-day schooling	
	(1)	(2)	(3)	(4)
Treatment	-0.038*	-0.029	-0.054**	-0.051**
	(0.021)	*(0.021)*	*(0.024)*	*(0.023)*
Covariates	No	Yes	No	Yes
Observations	2,071	1,965	2,042	1,940
R^2	0.002	0.028	0.003	0.071
Control mean	0.775		0.605	
Estimated fiscal costs	€ 1 billion		€ 9 billion	

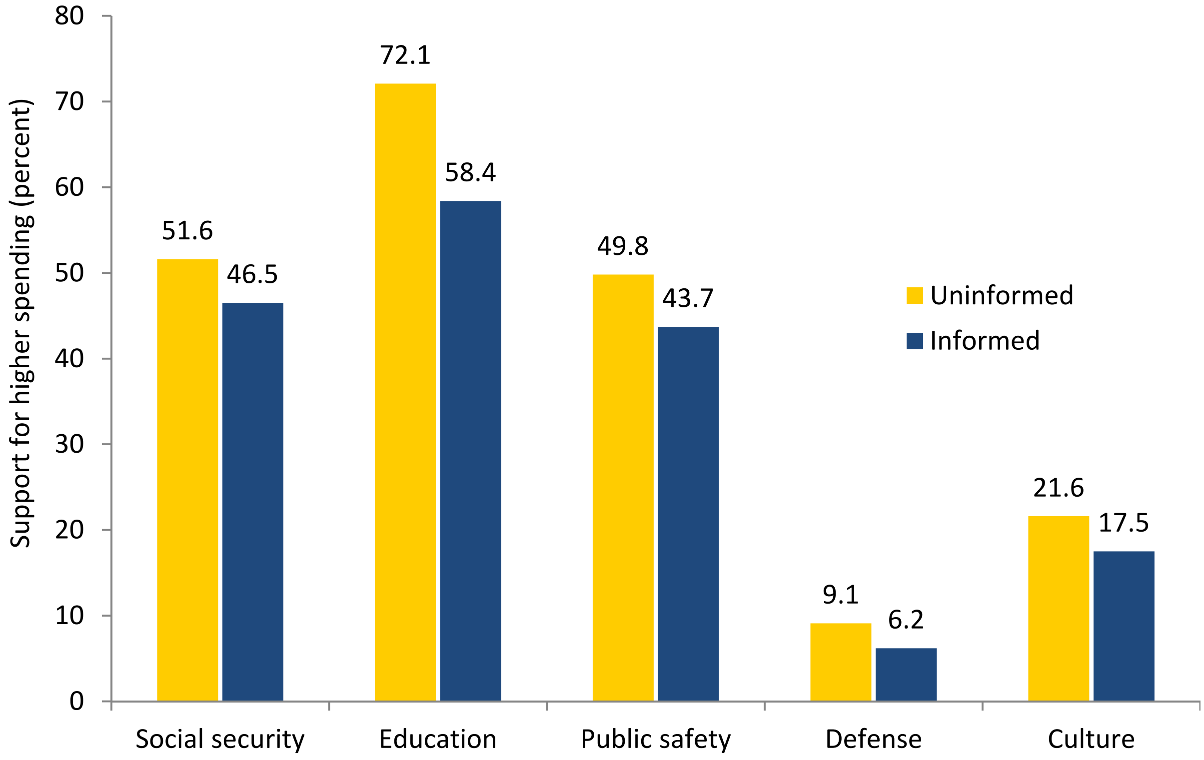
Notes: OLS regressions. Treatment: Information on estimated fiscal cost of policy/proposal. Control: No information. Dependent variable: dummy variable coded 1 if respondent (strongly) favors the policy/proposal. Covariates: age, gender, born in Germany, living with partner, education, employment status, working in education sector, parent status, household income, West Germany, living in large city, parental education level, patience, altruism, and political attitude. Robust standard errors in parentheses. Significance levels: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Data source: Ifo Education Survey 2014.

Table 8: Information provision and preferences for public spending at different education levels

	Preschool		Primary school		Secondary school		Vocational school		University	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment	-0.043***	-0.040**	0.074***	0.075***	-0.045***	-0.051***	0.028***	0.023**	-0.013	-0.008
	(0.015)	*(0.016)*	*(0.015)*	*(0.016)*	*(0.016)*	*(0.016)*	*(0.009)*	*(0.009)*	*(0.008)*	*(0.008)*
Covariates	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	4,098	3,907	4,098	3,907	4,098	3,907	4,098	3,907	4,098	3,907
R^2	0.002	0.016	0.007	0.024	0.003	0.024	0.003	0.020	0.001	0.048
Control mean	0.308		0.258		0.310		0.063		0.060	
Annual spending per student	€ 6,100		€ 5,200		€ 7,000		€ 4,000		€ 8,300	

Notes: OLS regressions. Treatment: Information on current public spending per child/student in each category. Control: No information. Dependent variable: dummy variable coded 1 if respondent wants additional spending to benefit the respective category. Covariates: age, gender, born in Germany, living with partner, education, employment status, working in education sector, parent status, household income, West Germany, living in large city, parental education level, patience, altruism, and political attitude. Regressions weighted by survey weights. Robust standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1. Data source: Ifo Education Survey 2014.

Figure 1: Support for increased public spending: Uninformed vs. informed citizens



Notes: Share of respondents who think that the government should spend (much) more in the respective area. Uninformed: control group that did not receive additional information. Informed: treatment group that received information on current annual spending levels for each area. See Tables 3 and A1 for details. Data source: Ifo Education Survey 2014.