

# Great Expectations: The Effect of Unmet Labor Market Expectations after Higher Education on Political Behavior\*

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## Abstract

Higher education has massively expanded around the world, yet we know little about the political consequences of this expansion. Students generally have overly optimistic expectations about the returns to educational investment and unmet expectations may affect graduates' political behavior. I study this phenomenon in Chile using unique panel survey data collected from new graduates covering 72% of higher education enrolment. The survey tracks students before and after they enter the labor market and includes an experiment that induces variation in their expectations. The panel data reveals that 65% of students have unmet expectations, and both experimental and observational methods indicate that this induces a shift toward pro-equality/pro-government ideology. Unmet expectations are also associated with increased dissatisfaction with the incumbent government. Overall, this study shows that the gap between aspirations and reality upon graduation can be an important driver of political attitudes.

## 1. Introduction

Higher education is considered to be a key means of social mobility. Parents often encourage their children to pursue higher education based on the expectation that this will improve their quality of life. These hopes lead families and governments worldwide to make extraordinary efforts to pay for higher education for growing numbers of students. Tertiary graduation rates in the OECD countries increased from 31% in 1995 to 49% in 2017 (OECD 2017). Indeed, higher education does improve graduates' lives on average: tertiary graduates earn 56% more than high school graduates

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(OECD 2017). Yet there is great heterogeneity in outcomes and many graduates benefit less than they expected (or not at all) from their education.<sup>1</sup> Teichler (2007) found that 19% of European college graduates find their work situation four years after graduation worse than expected. Data collected for the current study shows that one year after graduation, 65% of Chilean graduates earn less than they expected when they finished their studies.

What are the political consequences of these unmet expectations? After years of investing effort and money, how does realizing that the labor market does not value their studies as expected affect graduates' political behavior? If large numbers of graduates are in this situation, this may have important repercussions. Ahead of his time, Huntington (1968) argued that education enhances expectations, which, when unsatisfied, galvanize individuals into politics, resulting in discontent and instability.<sup>2</sup> Pundits often relate unmet expectations after higher education to protests, suggesting they are a source of political discontent (e.g. Brannen, Haig, and Schmidt 2020, 20). Feierabend, Feierabend and Nesvold (1969) find that political instability is highest where education is rapidly expanding but economies are stagnant, and more recently, Campante and Chor (2014) link poor economic opportunities for educated people to protests. Yet to the best of my knowledge, my study is the first to examine the political effects of unmet expectations of education empirically, with a direct measure of expectations and providing causal evidence.

Expectations play a fundamental role in individual satisfaction (Inglehart 1990; Stutzer 2004), and are likely to matter in higher education – one of the largest investments in a person's life, even if only because of foregone earnings. Higher education is especially relevant from a political standpoint: it is considered a political priority, it is often funded or regulated by the government, it is supposed to foster skills that are relevant for political activity (Verba, Schlozman, and Brady 1995), and it is generally seen as a source of upward mobility and status. Thus, there are reasons to believe that unmet expectations about the benefits that higher education will bring may affect political behavior.

This paper investigates the effect of the gap between expected and actual outcomes from higher education on political behavior. I study the case of Chile, an OECD country that has experienced one of the world's greatest expansions of higher education enrolment since 1990. I use a large sample and novel two-wave panel with an embedded experiment that I designed and implemented with the collaboration of 49 higher education institutions, which together enroll 72% of the country's undergraduates. Using an innovative approach, the panel follows students as they enter the labor market, surveying 14,233 higher education students or recent graduates around the time of graduation in 2016 and administering a follow-up survey to 3,948 of these graduates one year later. My research strategy relies on two different empirical methods, a survey experiment and panel

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<sup>1</sup>For example, Goldin and Katz (2008, 89) and Mettler (2014). For Chile, see Urzúa (2012) and Reyes, Rodríguez, and Urzúa (2015).

<sup>2</sup>Relatedly, Galtung (1964) claimed that when occupational status and material rewards are substantially less than educational attainments, people are motivated to take aggressive political action, although Muller and Jukam (1983) find weak support for this hypothesis.

analysis, which produce consistent results.

The experiment estimates the causal effect of exogenous variation in anticipated gaps between expectations and outcomes on political behavior. Subjects were asked how much they expect to earn after graduation and then randomly received information on the average labor outcomes of past graduates of their institution who were awarded the same degree. Larger gaps between respondents' expectations and past graduates' outcomes resulted in more pro-equality/pro-government ideology and more identification with the political left. Moving from no gap to the 90th percentile induces a 3.8% standard deviation move toward pro-equality/pro-government ideology, and a 2.7% standard deviation to the left in political position. These results are robust to a variety of specifications and are asymmetric for positive and negative gaps, with a much stronger effect from unmet expectations, which is consistent with loss aversion (e.g. Kahneman and Tversky 1979).

Although the experiment permits causal estimation of the effect of anticipated unmet expectations on political behavior, it measures the effect of predicted gaps based on the outcomes of previous graduates, which may not be the same as those of future graduates; moreover, they are merely averages. The panel structure of the data allows me to calculate the gap between the expected and *actual* higher education outcomes for each individual. While the experiment reveals the causal relationship between the gap and political behavior in a controlled setting, the panel illuminates how subjects respond to real-life gaps.

I calculate actual expectation gaps for income, employment, and subjective job dimensions. There is substantive variation among the eight gap measures, and the share of graduates with unmet expectations ranges from 22 to 65%. These gaps are hard to predict based on a wide set of observable variables.

The analysis of the actual gaps yields similar results as the experiment for political ideology: individuals who fail to meet expectations in income and most non-income measures become more pro-equality/pro-government. Again, the results are asymmetric, with a stronger effect for unmet expectations than for exceeded expectations, and are robust to different specifications. The consistent experimental and panel results for political ideology appear to be based on a reduction in perceptions of social mobility: unmet expectations reduce perceived social mobility, which in turn implies a shift toward left-wing ideology. This is in line with research that posits that perceptions of social mobility are inversely related to support for redistribution (Piketty 1995; Alesina, Stantcheva and Teso 2018).

The panel results related to political position are mixed, unlike those found in the experiment. In some cases, unmet expectations move people rather to the right. This result is mainly driven by a negative association between unmet expectations and support for Nueva Mayoría, the leftist government coalition. This suggests that when unmet expectations materialize – and are not just a possibility, as in the experiment – respondents, despite becoming more left-wing in terms of ideology, punish the incumbent government for their misfortune even if it is also left leaning.

Theoretically, these findings add a new, previously unstudied dimension to the long-standing

association between material conditions and ideology: the role of expectations. Labor outcomes matter for their distance from expectations, and the gap between the two has political consequences: unmet expectations push graduates toward the ideological left and induce them to punish incumbent political leaders.

These findings have political implications in terms of the consequences of mass higher education, particularly in a context of rapid expansion and gaps between expected and actual outcomes. They may also help explain the emergence of protests among the young and educated, who often promote left-wing ideologies and anti-incumbent positions in Chile and elsewhere. Finally, future research can use the novel data set created for this study to examine other aspects of students' political behavior.

## **2. How Unmet Expectations After Higher Education May Affect Political Behavior**

Life outcomes, such as income, not only affect an individual's well-being in absolute terms; how they compare to expectations also matters. Indeed, for Inglehart (1990), well-being is determined by the size of the gap between expectations and achievement. Unmet income expectations have been found to reduce individual satisfaction using cross-sectional data (Stutzer 2004) and in experimental research (McBride 2010).

Individuals' unmet expectations about how much they will earn after graduating from higher education may be especially relevant for politics mainly for three reasons. First, education is generally considered a priority for governments: a survey of 48,000 individuals in more than 30 countries reveals that 77% think the government should spend more on education; it ranked second on a list of seven issues (ISSP 2006). As an investment, higher education is costly (in addition to tuition fees, it entails foregoing years of labor income), uncertain, and cannot be mortgaged. These features lead to important market failures in its funding. Besides, higher education is believed to have relevant externalities such as increasing general knowledge, promoting economic development (Romer 1994), and improving democracy (Lipset 1959). Governments around the world cite these reasons to justify their involvement in higher education's funding and regulation.

Second, higher education is believed to foster skills that are relevant for political activity. Verba, Scholzman, and Brady (1995) posit that higher education enhances communication skills that are useful for articulating and organizing demands, which in turn increases political participation. Prior studies examining a variety of contexts and countries have gathered empirical evidence of a relationship between higher education and political participation (Mettler 2005; Hillygus 2005), although the causal evidence is mixed (cf. Dee 2004; Berinsky and Lenz 2011; Solís 2012).

Finally, partly thanks to its high average economic returns, higher education is seen as a source of social mobility and status: most people go to higher education in hopes of improving their labor market outcomes. All of these reasons also apply to primary and secondary schooling, but

since higher education is voluntary, expectations are more important because they affect people's decisions about whether to pursue it.

## Two possible mechanisms

How does the gap between expectations and achievement affect political behavior? I propose two potential mechanisms: (1) unmet expectations undermine an individual's faith in the possibility of social mobility and thus push them toward left-wing ideology and (2) unmet expectations reduce support for the incumbent, due to either diminished satisfaction or blame attribution. This section explores each in turn.

First, an individual's failure to advance as far as anticipated may undermine their belief that education can facilitate social mobility, which may increase their identification with left-wing ideology. This may happen even if a graduate obtains a better social position than her parents but does not reach her personal expectations.

In general, social inequality is regarded as more morally acceptable if the society exhibits equality of opportunity. Thus, if a loss of faith in social mobility undermines an individual's belief that opportunities are in fact equal (Piketty 1995), this may reduce their tolerance of inequality. In addition, social mobility reduces support for redistribution. If social mobility is achievable, people can improve their livelihoods without government support. As well, self-interested people may oppose high levels of redistribution if they expect that in the future, they (or their children) will be better off (Bénabou and Ok 2001).

A vast literature links perceptions of social mobility to demands for redistribution. Piketty (1995) presents a model in which individuals learn the relative importance of effort and predetermined factors for economic success from their own personal experience of income mobility. Upwardly mobile groups will give more weight to effort and consequently demand less redistribution (see also Bénabou and Tirole 2006; Alesina and Angeletos 2005).

These insights have empirical support. Alesina and Giuliano (2011) find that social mobility in terms of occupational prestige is associated with less support for redistribution, while Alesina, Stantcheva and Teso (2018) induce experimental variation in mobility perceptions and demonstrate that it critically changes preferences for redistribution. Likewise, a belief that social mobility is less likely due to unmet expectations from higher education may undermine tolerance of inequality and increase support for redistribution.

A second potential mechanism is that unmet expectations may reduce support for the incumbent. Graduates may blame the government for their unmet expectations if they attribute them to labor market conditions, which are often regarded as part of a government's responsibility (e.g. Rudolph 2003). Several prior studies have linked personal dissatisfaction to decreased support for the incumbent (Ward 2020). This may be so even if the government bears no responsibility for the source of dissatisfaction. For example, Achen and Bartels (2016) argue that voters punish incumbents for natural disasters such as drought, flu, and shark attacks, while Liberini, Redoano,

and Proto (2017) find that spouse death reduces the chances of voting for the incumbent. These findings suggest that if unmet expectations reduce individual well-being, they may reduce support for the government even if they are unrelated to government actions.

Finally, the effects of the gap need not be symmetric for unmet and exceeded expectations. Asymmetric relationships are consistent with the fact that individuals tend to adjust their expectations faster upwards than downwards (Duesenberry 1949), and that they tend to be more averse to losses than to corresponding gains (Kahneman and Tversky 1979). Loss aversion has been empirically demonstrated in a wide range of settings. People consider actual losses to be more unfair than reduced gains (Kahneman et al. 1991), and negative changes in well-being are stronger predictors of government vote share than positive ones (Ward 2020).

### 3. The Chilean Case

Chile is a good case for studying the political consequences of unmet expectations after higher education. It has transitioned from an elite to a mass higher education system over the last decades: in 1981 there were eight higher education institutions and around 100,000 students, and today there are 141 institutions and 1.2 million students. More than half of those aged 19–20 now pursue higher education— a higher enrollment rate than that of several developed countries (OECD 2019).

Despite important expansions in access to higher education, Chile has the highest wage premium of any OECD country: graduates aged 25–34 earn, on average, 91% more than high school graduates (OECD 2019). This large premium explains an important part of Chile’s high levels of inequality (Beyer and Le Foulon 2002).

Higher education is considered key for social mobility, which is consistent with its large average returns. More than three-quarters (81%) of Chileans believe that higher education allows people to have a better life than their parents (CEP 2017), and parents increasingly want their children to go to college. While 30% of the parents of ten-year-olds expected their child to graduate from university in 1999, 85% did so in 2013 (Ministerio de Educación 1999, 2013).

However, the returns to higher education, i.e. the increase in earnings generated, are very heterogeneous. Urzúa (2012) calculates returns for selected programs and finds that while law or business degrees have positive returns for all graduates, 56% of journalism graduates and 43% of psychology ones have negative returns, which vary widely by institution. Heterogeneity also appears in causal estimates of returns to higher education (Hastings, Neilson, and Zimmerman 2014; Reyes, Rodríguez, and Urzúa 2015).

The returns to higher education have also fallen over time. Sapelli (2016) estimates that for cohorts born around 1965, returns are 70–80%, compared to less than 30% for those born 20 years later. If people’s expectations about returns are based on those of previous generations and are slow to adjust, they will overestimate current returns. Indeed, there is evidence of a

systematic overestimation of the returns to higher education. Hastings et al. (2016) merge a survey of Chilean prospective students with administrative data and find that, compared to outcomes of past students in their target degrees, students had overly optimistic beliefs about their earnings prospects. Average overestimation was 39%, and was higher for low-income students and those with lower test scores.

Therefore, it is hard for prospective students to have realistic expectations about whether obtaining a particular degree will help them get a good job. In Chile’s highly specialized system, most students choose their program choice at age 18, before taking their first higher education class. In addition, most of their parents cannot give them first-hand advice: more than two-thirds of 18–24-year-old students are the first generation in their family to go to university (OECD 2017). Another source of insufficient information is that many higher education institutions are fairly new: in 2016, 35% were less than 20 years old.

Finally, higher education is a salient issue in Chilean politics. Education is the third-highest priority in public surveys, after crime prevention and health (CEP 2017), and has captured a great deal of attention over the last decade. In 2011, large-scale student protests demanded “free higher education” and an “end to profit” in education. This movement involved thousands of demonstrations, politicized the country’s inequality and had a major political impact (Roberts 2016). Bachelet’s second government (2014–2018) embraced the main movement’s demands as one of its most important reforms. Starting in 2016, the country began a gradual transition from higher education funding based on grants and loans, with a heavy private expenditure, towards free higher education. In a second round of social unrest, protests by high school students in 2019 over the rise in subway fares suddenly escalated into violence and a nationwide social upheaval unseen since the return of democracy in 1990. Supporters of this upheaval were overwhelmingly young and educated. Notably, the inability of higher education to live up to expectations is cited as a source of discontent for both waves of protests (e.g., Brunner 2020).

## 4. Research Design and Data

This study is based on a tailored two-wave online panel survey of Chilean students and recent graduates around the time of their graduation. The panel design allows me to measure the gap between labor *expectations* at graduation and labor *outcomes* one year later, and to analyze the correlation between this gap and individual-level changes in political behavior.

Such correlations are not necessarily causal, as some respondents’ characteristics may be correlated with both the gap and political behavior changes. For this reason, the first wave of the survey included an experiment in which half of the participants received a random “information shock,” about the labor outcomes of previous graduates who received the same degree from the same institution. This experiment allows me to estimate the causal effect of becoming aware of a possible gap between the expected and actual results of higher education on political attitudes.

I invited all Chilean universities, plus vocational institutions that are accredited or have at least 1,000 students to participate in this project. A total of 49 higher education institutions agreed to send an email with a link to the survey to qualifying students.<sup>3</sup> The project included an evaluation of the country's higher education system from the standpoint of students, and participating institutions were offered a customized report. The first survey asked respondents for their permission to contact them again one year later, and 97.4% agreed and provided their email addresses. Those respondents were contacted for the second wave. Both online surveys encouraged participation with prize raffles. For details on the ethics of this research, see Online Appendix A.1.<sup>4</sup>

The first wave (November 2016–January 2017) asked about the respondents' higher education experience, labor expectations, political behavior, and demographics. The second wave (November–December 2017) asked about their entrance into the labor market and political behavior. Both were pretested.<sup>5</sup>

The first wave surveyed 14,233 students, i.e. 4% of a full cohort of Chilean higher education students. While the sample was not randomly selected, since only institutions that agreed to participate were included, these institutions represent 72% of national higher education enrollment and are fairly representative in terms of public/private status, size, region, and quality (see Online Appendix A.2 for details).

There is also selection in individuals who participated in the survey. The response rate is at most roughly 5.4%.<sup>6</sup> Overall, and considering the sample is not random, it looks substantively similar to Chilean higher education students on most dimensions. Respondents are statistically different from the overall population in most regards,<sup>7</sup> but since the sample is large, small differences appear as significant. The main concern is an overrepresentation of students from private schools and private

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<sup>3</sup>Qualifying students were defined as undergraduate or master's students who: i) finished their class requirements or graduated in 2016, ii) were in the last year, or iii) were expected to finish their class requirements or graduate in the first semester of 2017. Master's students were included because in some Chilean universities all students graduate with a master's degree. Of the respondents, 27% expected to finish their studies during the semester the survey was administered, and 19% expected to finish in the first semester of the next year; 54% had already finished their studies, of whom 59% had finished the previous semester, and the rest earlier. Note that graduation requirements, such as theses or internships, often lead students to graduate years after finishing classes.

<sup>4</sup>This research was considered exempt after review by XXXXXX's Committee On the Use of Humans as Experimental Subjects (protocol #XXXXXXXXXX).

<sup>5</sup>The full questionnaire is available upon request.

<sup>6</sup>Since higher education institutions sent the emails, I do not have the exact number of emails sent: 40 of the 49 institutions provided data on emails sent, but in some cases these are likely to be wrong (e.g., much larger than the institution's enrollment). Response rates calculated based on emails sent was 0.8%. Calculated using total institution enrollment in the first year (an approximation of the cohort size), the response rate rises to 5.4%. This last measure is in line with similar studies of Chilean higher education students, like Solís (2012), who reports a response rate of 40% based on emails opened; when calculated using emails sent, it is around 5%.

<sup>7</sup>The sample of students is slightly biased towards women (54.2% vs. 52.2% overall) and older students. The sample is importantly biased toward students from private schools (27.3 vs. 12.6% overall), which serve the wealthiest 7% of the population. Students from non-traditional private universities are overrepresented (49.2 vs. 30.1%), mainly to the detriment of vocational institutions (14.1 vs. 30.8%). Those attending medium-sized institutions are also overrepresented (15.8 vs. 12.5%). The distributions of the sample by institutional quality and area of study appear to be representative. Note that the sample consists of final year students and recent graduates, while the available data describing the universe of students considers all students. This could explain some of the differences, for example if there is selective dropout. For details, see Online Appendix A.3.



universities, variables that may be associated with higher socioeconomic status. The robustness checks include weights that account for these differences.

The second wave included 3,948 respondents. This corresponds to 28% of the first-wave sample, raising questions of selective attrition, which are analyzed in Online Appendix A.4. Despite several statistically significant differences between the two samples, for most variables the differences do not seem substantively important, e.g. less than two percentage points for categorical variables. Variables that proxy for labor outcomes and predicted gaps, which are of special concern, do not display substantively large differences. The exceptions are the differences in type, size, and quality of higher education institutions, which can reach up to six points, and may be correlated with socioeconomic status.

However, for these differences to be a problem for this research, they need to be correlated with the dependent variables in ways that cannot be accounted for by observable variables. *A priori*, the extent to which this may be the case is unclear. At least in the experiment, there are no consistent heterogeneities by type of higher education institution. Nevertheless, the results are robust to the use of survey weights that account for the observable differences between both samples.

A key way of assessing the seriousness of the attrition is analyzing whether the experiment's results vary based on whether respondents dropped out of the panel. The test consists of comparing experimental responses to unmet expectations for individuals who did and did not participate in the second wave. Different responses in these two groups would suggest biases when studying the attrited sample. This test precisely captures whether individuals who attrited and those who did not differ in ways that are correlated with the dependent variables of interest, considering both observable and non-observable variables. Fortunately, the main experimental results are not statistically different by attrition status (see Online Appendix A.4). This test indicates that attrition, despite being non-random, is not problematic for the research question at hand.

## 5. Measurement

### Predicted and actual gaps

For the experiment, I estimate the gap between individuals' expected labor conditions after graduation and the average outcomes of past graduates from their institution who obtained the same degree, according to data from the Chilean Ministry of Education.<sup>8</sup> I call these measures *predicted* gaps. Note that the outcomes of past graduates may not be the same as those of future graduates, and they correspond to averages rather than individual predictions. Only respondents who wanted to enter the labor market within the following year (92.4%) were asked about labor expectations. The ministry has employment data for one year after graduation for 72.4% of the sample and earnings data for four years after graduation for 63.2%.

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<sup>8</sup>Data available at <http://www.mifuturo.cl/>. To ensure confidentiality, the ministry provides data for combinations of institution/degree for which there are at least 11 observations for each of the last three cohorts.

For the panel analysis, I measure the gap between expectations in wave 1 and the actual situation in wave 2 in several dimensions. These are *actual* gaps.

For both predicted and actual gaps, I calculate three income measures. First, the dollar gap measures the difference in dollars between the respondent’s revealed expectations<sup>9</sup> and either the average outcomes of past graduates (predicted gap) or the individual’s actual situation in wave 2 (actual gap). Second, the percent gap estimates the dollar difference as a percentage of the individual’s expectations. Third, the standard-deviation-adjusted (or SD-adjusted) gap takes into account that the variance of higher education outcomes in the labor market differs by area of study and institution, which may affect the subjective importance of the gap. For example, earning less than expected probably has a different effect when there is great variation in peers’ earnings than when all peers earn more or less the same. Thus, this gap is deflated by a measure of variance.<sup>10</sup>

I also calculate employment expectation gaps. The predicted gap considers the absolute difference between the individual’s declared probability of having a job in one year (in tenths) and the employment rate of past graduates one year after graduation. The actual gap compares expectations of employment with an indicator of being employed in wave 2.

For actual gaps, I construct additional measures comparing expectations in wave 1 with the actual situation in wave 2 for how long the respondent was unemployed before finding a job,<sup>11</sup> how closely the job relates to her studies, how much she likes her job, and how she thinks she is performing with respect to her program peers in terms of job opportunities.<sup>12</sup>

All gaps are constructed so that positive values imply unmet expectations and negative values imply expectations were surpassed.<sup>13</sup> I also refer to positive gaps as “underperforming gaps,” and to negative gaps as “outperforming gaps.” Table 1 shows the definitions and unit of measures for all gap measures.<sup>14</sup>

Table 2 reports the means for each gap measure, the means for positive gaps, plus the share of observations with gaps equal to zero (exactly correct expectations) and greater than zero (unmet

<sup>9</sup>The answers for the expectation and income questions were in 50,000 Chilean pesos intervals, equivalent to around US\$76. Dollar value corresponds to the first week of December 2017 (CLP\$656).

<sup>10</sup>While the gap is calculated using degree/institution averages, the variance deflator uses area of study instead of degree due to data availability. Cases for which there were fewer than 15 observations in the same area/institution in the sample are omitted, losing 262 observations.

<sup>11</sup>The question for time spent finding a job uses intervals (less than a month, 1–2 months, 3–6, etc.). The gap measure uses the median value of each interval.

<sup>12</sup>For this gap, I assigned values of -1, 0, and 1 to worse, similar, and better than peers, respectively, and calculated the gap as the difference between this variable in the two waves. Note that the actual outcome corresponds to the *perception* of the comparison with peers.

<sup>13</sup>They were constructed as expectations minus actual outcomes. The exception is the gap in time spent finding a job; since greater values correspond to worse labor outcomes, it was constructed as outcome minus expectations.

<sup>14</sup>Where  $Exp_{Y_4}^{i,d,I}$  is the income expectation after four years for individual  $i$  with degree  $d$  from institution  $I$ , in dollars, and  $Mean_{Y_4}^{d,I}$  is the income mean after four years for degree  $d$  from institution  $I$ .  $SD(Exp.Y^{a,I})$  is the standard deviation of students expectations from area of study  $a$  of degree  $d$  from institution  $I$ .  $Exp_e^{i,d,I}$  is the expected probability of having a job one year later for individual  $i$  with degree  $d$  from institution  $I$  and  $Mean_e^{d,I}$  is the employment rate for degree  $d$  at institution  $I$ .  $Exp.$  corresponds to expectations, and  $Act.$  to actual outcomes of the variable.  $Y$  is income one year after graduation,  $SD$  is the standard deviation,  $Prob.Emp$  is the probability of being employed and  $I(employed)$  is an indicator of whether the individual is employed.

Table 1: Definitions of gap measures

Measure	Definition	Unit
<b>Predicted gaps</b>		
Income USD (year 4)	$Exp_{Y_4}^{i,d,I} - Mean_{Y_4}^{d,I}$	USD, monthly
Income percent (year 4)	$100 * (Exp_{Y_4}^{i,d,I} - Mean_{Y_4}^{d,I}) / Exp_{Y_4}^{i,d,I}$	Percentage of expectations
Income SD-adjusted (year 4)	$(Exp_{Y_4}^{i,d,I} - Mean_{Y_4}^{d,I}) / SD(Exp.Y^{a,I})$	Area/institution st. devs.
Employment (year 1)	$Exp_e^{i,d,I} - Mean_e^{d,I}$	Probability points, in tenths
<b>Actual gaps (year 1)</b>		
Income USD	$Exp.Y^i - Act.Y^i$	USD, monthly
Income percent	$100 * (Exp.Y^i - Act.Y^i) / Exp.Y^i$	Percentage of expectations
Income SD-adjusted	$100 * (Exp.Y^i - Act.Y^i) / SD(Exp.Y^{a,I})$	Area/institution st. devs.
Employment	$Exp.Prob.Emp.^i - I(employed)^i$	Probability points, in tenths
Time spent finding a job	$Act.Time^i - Exp.Time^i$	Months
Relationship of job to studies	$Exp.Relation^i - Act.Relation^i$	1-7 scale
Likes job	$Exp.Liking^i - Act.Liking^i$	1-7 scale
Comparison with peers	$Exp.Peers^i - Act.Peers^i$	1-3 scale

expectations). Online Appendix Panel B.1 shows the distribution of gap measures, while Online Table B.1 shows their quantiles. Note that except for the employment gap, all actual gaps are only available for individuals who are working.

Expectations were generally overoptimistic compared to past graduates. On average, expectations for four years after graduation were US\$345 above past graduates' monthly income, which corresponds to 4.4% lower than expectations. Employment expectations at one year are better adjusted: only 0.65 percentage points above average past graduates' probabilities. Still, all measures show that around 60% of respondents have underperforming gaps. There is great variation in measures, and the minimums and maximums are extreme values. Predicted gaps are close to zero around the 40th percentile.

Expectations are also overoptimistic compared to actual individual outcomes. On average, graduates earn US\$200 less than they expected one year earlier, which corresponds to 12% of their expectations.<sup>15</sup> Overall, 65% of graduates earn less than they expected, and on average they overestimated the amount by US\$440. Income measures of the actual gap are perfectly adjusted around the 30th percentile and have extreme values. For the rest of the actual gaps, the share of graduates with unmet expectations ranges from 22–37%, and expectations are perfectly well adjusted around the 50th percentile. All actual gaps show variation, and in most cases there is a big mass around zero (correct expectations).

In most cases, predicted and actual measures of the gap are positively correlated (Table B.2 in Online Appendix B). This implies that individuals who are overoptimistic with respect to previous graduates tend to be overoptimistic about their own future earnings too. Mostly positive correlations among actual gap measures reveal that different dimensions of the job situation tend to move

<sup>15</sup>On average, predicted gaps are larger than actual gaps. Recall that predicted gaps are for four years after graduation, whereas actual gaps are one year later.

Table 2: Descriptive statistics of gap measures

	<b>n</b>	<b>Mean</b>	<b>Mean if Gap&gt;0</b>	<b>Gap=0 (%)</b>	<b>Gap&gt;0 (%)</b>
<b>Predicted gaps</b>					
Income (USD)	8,307	345.03	792.95	2.9	62.3
Income (%)	8,307	4.39	27.38	2.9	62.3
Income (SD-adjusted)	8,045	0.37	0.84	2.9	62.0
Employment (prob.)	9,540	0.65	13.38	0.6	59.9
<b>Actual gaps</b>					
Income (USD)	2,525	199.05	442.76	9.8	65.3
Income (%)	2,525	12.09	31.64	9.8	65.3
Income (SD-adjusted)	2,411	0.36	0.80	9.9	65.2
Employment (prob.)	3,614	15.24	75.09	37.6	30.1
Time spent finding a job (months)	2,525	-0.38	4.19	34.9	21.5
Relationship of job to studies (1-7)	2,525	0.31	2.17	43.4	31.0
Likes job (1-7)	2,525	0.33	1.65	41.5	37.0
Comparison with peers (1-3)	2,525	0.24	1.12	50.9	35.1

in the same direction with respect to expectations.

For brevity, throughout the paper I focus on two income gap measures: dollars and adjusted by SD. The most relevant perceived reason to pursue higher education in Chile is to improve one's income and labor opportunities (CEP 2017). Also, income gaps are intimately related to the theoretical insights linking the gap to political behavior, as discussed in Section 2. Among income gaps, the dollar gap is the simplest, and the SD adjustment facilitates better comparisons between individuals with different areas of study and from different higher education institutions. The Online Appendix shows the results for the rest of the gap measures.

Finally, most variables are poor predictors of actual gaps (Online Table B.3).<sup>16</sup> Gender, age, school type, institution type, parents' education, source of higher education funding, and political position do not consistently yield significant coefficients across different gap measures. The exceptions are the dummies for whether the individual was working full time or part time in wave 1: these are statistically significant and relatively large.<sup>17</sup> These results are fairly robust to different sets of control variables. Overall, they suggest that actual gaps are quite difficult to predict in terms of observable variables, except for working status in wave 1. They also reduce concerns about selective attrition.

<sup>16</sup>This exercise is less relevant for predicted gaps, because in the experiment variation comes from random treatment assignment.

<sup>17</sup>In general, working full time is correlated with a lower actual gap. This makes sense, since individuals who have working experience are better informed about what to expect.

## Indexes for ideology and political position

The panel includes a full module of political behavior. To reduce dimensionality and summarize the information into a few theoretically relevant measures, I construct two indexes using the procedure in Anderson (2008) and Kling, Liebman, and Katz (2007). This method consists of defining groups of dependent variables, based on theoretical constructs, and providing a standardized summary index for each group:<sup>18</sup>

- (1) Ideology: related to the respondent’s preferences on the government–market axis, individualism and redistribution. Higher values imply that the respondent attributes more responsibility to the individual and less to the government. I also refer to higher values in this index as a more right-wing ideology and vice versa.
- (2) Political position: related to identification on the left–right axis and the evaluation of Chilean political coalitions or political actors. Higher values indicate a stronger identification with the right. Ideally, identification on the left–right axis would be enough to capture this concept, especially considering that evaluations of political actors may depend on personal affinities that are often unrelated to politics. However, since a great share of respondents does not identify on the left–right axis (53% in 2016 and 36% in 2017)<sup>19</sup>, focusing only on self-identification would imply losing numerous observations in a non-random way. Many of these respondents *do* have a political position, even if they are unwilling to self-identify in terms of left and right. Incorporating information on how they assess key political actors is a way of capturing their implicit political views.

Table 3 shows the variables included in each index. Column 3 indicates whether the sign was switched, and column 4 shows the weight in the construction of the index.

Table 3: Grouping of variables in political behavior summary indexes

Question	Group	Switch signs	Weight
Equality vs. reward of individual effort (1-10)	Ideology	No	0.18
Responsibility for people’s financial support: government vs. individual (1-10)	Ideology	No	0.16

<sup>18</sup>Selected variables in each group are normalized and adjusted so that they all go in the same direction by switching signs. Next, the variables are averaged using weights that correspond to the inverse of the covariance matrix of the transformed variables in the group. This implies that the variables that add more information within the group have greater weights. To make the indexes in both waves comparable, I calculate the indexes in wave 2 normalizing the variables with the moments of the control group in wave 1, using weights from wave 1. The results are robust to normalizing and weighting with data from wave 2.

<sup>19</sup>The reduction in this share is probably related to the presidential elections in 2017, which generally increase political identification.

Question	Group	Switch signs	Weight
The government is responsible for the labor opportunities of higher education graduates (1-7)	Ideology	Yes	0.34
Agreement that any person who is willing to work has plenty of opportunities to succeed economically (1-7)	Ideology	No	0.23
Agreement that most people who are not successful economically should not blame the system but themselves (1-7)	Ideology	No	0.08
Grade given to Alianza por Chile (1-7)	Pol. position	No	0.07
Grade given to Nueva Mayoria (1-7)	Pol. position	Yes	0.14
Grade given to Student Movement (1-7)	Pol. position	Yes	0.07
Identification with left	Pol. position	Yes	0.16
Identification with center left	Pol. position	Yes	0.2
Identification with center right	Pol. position	No	0.18
Identification with right	Pol. position	No	0.19

The correlation between both indexes is 0.32 in 2016 and 0.42 in 2017, suggesting that although they are related, they reflect different dimensions of political behavior. However, there is persistence over time: correlations between both waves are 0.57 for ideology and 0.78 for political position, which suggests they are capturing durable and meaningful attitudes, despite the variation.

## 6. Experiment

The experiment in the first wave randomized information about the average labor outcomes of previous graduates from the respondent's institution who obtained the same degree, based on administrative data. In all cases, the information shock included employment rates one year after graduation and, when available, it also included information on average income four years after graduation. The difference between individual expectations and the information in the shock creates the predicted gap. The information shock was randomly assigned to half of the respondents, provided labor outcome data was available for their institution/degree.<sup>20</sup> After the information shock, respondents were asked about the extent to which they thought the information provided on labor prospects was correct, followed by an open question to let them write their comments. Both of these questions were intended to make them reflect on the information.

<sup>20</sup>The balance table is provided in Online Table C.1. There are no significant differences by treatment assignment in most variables, except for the percentage that expects to work full/part time, which is in line with confidence levels.

Theoretically, the treatment effect depends on the ability of the information shock to change the individual’s prior beliefs by changing either their expectations or their level of certainty about them. Neither of these changes is observed. However, the respondents tend to assume the information is valid: average correctness assigned by respondents was 5 on a 1–7 scale.<sup>21</sup> Notably, among respondents who believe their performance will be close to that of their peers, assigned correctness varies little with respect to the individual’s predicted gap (average correctness for the lowest and highest gap deciles is 4.7 and 5.2, respectively). This suggests some degree of updating will occur among treated individuals.

The treatment effect will depend on the extent to which labor outcomes in the information shock are better or worse than the individual’s prior beliefs. Therefore, the specification interacts the treatment with the predicted gap measure.<sup>22</sup> Consistent with loss aversion, the specification allows for asymmetric treatment effects for positive and negative gaps, in a general and flexible approach.<sup>23</sup>

$$(1) \text{ Index} = \beta_0 + \beta_1 \text{Gap}^+ + \beta_2 \text{Gap}^- + \beta_3 \text{Treat} + \beta_4 \text{Gap}^+ * \text{Treat} + \beta_5 \text{Gap}^- * \text{Treat} + \gamma X$$

Where, for each individual,  $\text{Gap}^+$  and  $\text{Gap}^-$  correspond to the measure of the gap when it is positive (underperforming) and negative (outperforming), respectively, and zero otherwise.  $\text{Treat}$  is an indicator for whether she received the information shock.  $X$  is a set of individual control variables including gender, age, age squared, dummies for whether she works, works part time, or is searching for a job, fixed effects for higher education institution and area of study, socioeconomic proxies (type of secondary school and parental education level), dummies for expected working hours, dummies for the main source of funding of studies (grant or loan), and the individual’s level of certainty<sup>24</sup> in her own expectations. It should be highlighted that using institution/area-of-study fixed effects controls for all area and institution characteristics such as the environment to which students were exposed. The results are robust to different sets of control variables. Estimations are OLS with robust standard errors.

The coefficients of interest are  $\beta_3$ ,  $\beta_4$ , and  $\beta_5$ .  $\beta_3$  is the effect of the information shock when the respondent’s expectations correspond exactly to average labor outcomes and may be interpreted as a shock that provides more certainty to individual expectations.  $\beta_4$  and  $\beta_5$  correspond to the marginal effects of the treatment for each additional unit of the measure of the underperforming (+) or outperforming (-) predicted gap, respectively.

A visual exploration of the raw data is consistent with the specified functional form. Online Panels C.1-C.2 plot loess regressions of the summary indexes and gap measures, separately for

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<sup>21</sup>The Chilean grading system is based on a 1 to 7 scale (4 is passing).

<sup>22</sup>Since this is a large-n experiment, there is sufficient common support between treatment and control in terms of the moderator variable—in this case, the gap (Hainmueller, Mummolo and Xu 2019).

<sup>23</sup>For an analogous, although symmetric, specification, that interacts the treatment with the variable corresponding to the information provided in the (natural) experiment, see Ferraz and Finan (2008). The results are robust to a linear symmetric specification (Online Table C.4).

<sup>24</sup>An alternative approach that includes certainty as a moderator instead of as a control suggests that the results are stronger for individuals who are less certain of their expectations (not shown).

control and treatment groups. Especially in the SD-adjusted case, loess results suggest there are treatment effects that depend on the gap and are asymmetric. This indicates the results do not depend on the chosen functional form.

## Results

For the case of ideology, the two first columns of Table 4 show that while the treatment has no main effect, the interaction term between the underperforming gap (+) and the treatment reveals that making respondents aware of positive gaps (i.e. of worse labor prospects than expected) causes a shift in ideology toward the government/pro-redistribution side. The effects are -0.3% of a standard deviation in ideology for every hundred dollars of unmet expectations, or -5.1% of a standard deviation for every degree-/institution-specific standard deviation of unmet expectations, which are significant at the 90% and 99% levels, respectively. Interactions between treatment and negative sign gaps do not yield statistically significant results. These findings are in line with asymmetric effects of the gap; unmet expectations have a stronger effect.

The next two columns display the results for the political position index. They are substantively similar to those for ideology. The pure treatment has no effect, but the interaction between the underperforming gap (+) and the treatment reveals that making respondents aware of greater underperforming gaps reduces identification with the political right. The effects are -0.3% of a standard deviation in political position for every hundred dollars of unmet expectations, and -2.6% of a standard deviation for every degree-/institution-specific standard deviation, significant at the 95% and 90% levels, respectively. Here, too, there is an asymmetric response to treatment, in which only underperforming gaps have an effect.

Panel 1 plots the marginal effects for the main results for both indexes, using the dollar gap.<sup>25</sup> To illustrate the magnitude, the effect of a move from a zero gap to the 90th percentile (\$1,448) is a 3.8% standard deviation move toward pro-equality/pro-government ideology, and a 2.7% standard deviation move to the left in political position. These changes are greater than the difference in average ideology and political position between those who voted for Sebastián Piñera in 2017 –the center-right candidate who became president– and those who voted for José Antonio Kast –the extreme-right candidate.

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<sup>25</sup>These plots, and all equivalent plots below, exclude 1% of extreme values of the gap measure on each side and include a density rug that represents the distribution of the corresponding measure of the gap, which is as discontinuous as the gap measure is.



Table 4: Experimental results

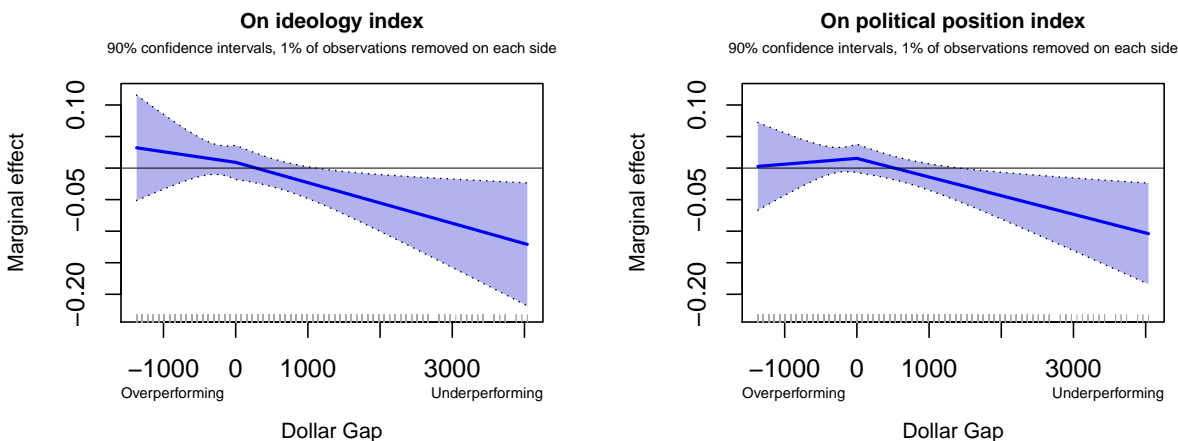
	<i>Dependent variable:</i>			
	Ideology		Political position	
	(1)	(2)	(3)	(4)
Treatment	0.009 (0.017)	0.022 (0.018)	0.015 (0.014)	0.013 (0.015)
USD gap, hundreds (+)	0.007*** (0.001)		0.005*** (0.001)	
USD gap, hundreds (-)	0.002 (0.003)		0.007** (0.003)	
SD-adj. gap (+)		0.080*** (0.013)		0.051*** (0.010)
SD-adj. gap (-)		0.015 (0.033)		0.061** (0.028)
Treat * USD gap, hundreds (+)	-0.003* (0.002)		-0.003** (0.001)	
Treat * USD gap, hundreds (-)	-0.002 (0.004)		0.001 (0.003)	
Treat * SD-adj. gap (+)		-0.051*** (0.018)		-0.026* (0.014)
Treat * SD-adj. gap (-)		0.008 (0.044)		0.002 (0.037)
Constant	0.348*** (0.056)	-0.101 (0.192)	0.261*** (0.047)	0.219** (0.090)
Controls	Yes	Yes	Yes	Yes
Observations	8,307	8,045	8,307	8,045
R <sup>2</sup>	0.122	0.124	0.162	0.163
Adjusted R <sup>2</sup>	0.114	0.116	0.155	0.156
Residual Std. Error	0.555	0.554	0.465	0.466
F Statistic	15.601***	16.552***	21.798***	22.860***

*Note:*

\*p&lt;0.1; \*\*p&lt;0.05; \*\*\*p&lt;0.01

Robust errors in parentheses

## Panel 1: Marginal effects of experiment results



Overall, the experimental results indicate that unmet expectations induce a shift toward left-wing ideology and political identification. The results for percent and employment gaps, are not as significant, but follow the same pattern (Online Appendix Table C.2). These results are robust to different specifications, including using no controls (Online Tables C.3–C.4), to different treatments of extreme values (not shown), and although less strong, are fairly robust to using survey weights (Online Table C.5).

## 7. Panel Analysis

The panel is designed to measure the correlation between the gap in expected vs. actual higher education outcomes and changes in political behavior at the individual level.<sup>26</sup> As with the experiment, positive and negative gaps are allowed to have different correlations with changes in political behavior. The estimating equation is:<sup>27</sup>

$$\Delta Index = \beta_0 + \beta_1 Gap^+ + \beta_2 Gap^- + \beta_3 Job + \beta_4 X$$

Where  $\Delta Index$  is the change in the political behavior index, and  $Gap^+$  and  $Gap^-$  correspond to the measure of the gap when it is positive (underperforming) and negative (outperforming), respectively and zero otherwise.<sup>28</sup>  $Job$  is a set of controls related to the respondent’s job, including how much she earns and how much she likes her job,<sup>29</sup> and  $X$  is a set of controls including institution

<sup>26</sup>Note that this is not the standard panel analysis, where the right-hand variable of interest corresponds to a change in time: here it corresponds to the difference between expectations and outcomes.

<sup>27</sup>Specifications including quadratic terms for the gaps, of the form  $\Delta Index = \beta_0 + \beta_1 Gap^+ + \beta_2 (Gap^+)^2 + \beta_3 Gap^- + \beta_4 (Gap^-)^2 + \beta_5 Job + \beta_6 X$  are also tested. Results are fundamentally similar and do not support relevant non-linearities (visual presentation in online Panel D.1).

<sup>28</sup>The actual gap in USD is included in hundreds.

<sup>29</sup>The correlations between these variables and the gap measures are not as high. For example, the correlation of the actual gap in USD with income is -0.37, and with liking one’s job is -0.12.

and area-of-study fixed effects, gender, and age, plus dummy variables indicating whether the individual was working full or part time during the first wave. All control variables in  $X$  are measured in wave 1. The results do not depend on the choice of control variables. Errors are heteroskedasticity consistent.

Since actual gaps are not necessarily distributed randomly, the coefficients from the estimating equation are not necessarily causal. However, the regressions for the actual gap measures (Online Table B.3) suggest they are hard to predict based on observable variables, which increases the chances that actual gaps are (as if) random. Additionally, institution and area-of-study fixed effects account for part of the variation due to unobservable variables. Although there may still be biases, at least there are no obvious sources of omitted variables. These results are complemented by the experiment results, which are causal.

## Results

The two first columns of Table 5 report the ideology results. Both income gap measures have a statistically significant negative correlation with the index change for the negative side of the gap. The asymmetry again suggests loss aversion, in the sense that a loss in expectations has a greater effect than the corresponding gain. Additional gap measures, although not always significant, generally show a similar picture (Online Appendix Table D.1).

These results indicate that having a lower income than expected or being worse than expected in other employment outcomes is correlated with moving toward more pro-government attitudes. Regarding the order of magnitude, making USD \$100 less than expected is associated with a 1% of standard deviation move to the pro-equality/pro-government pole, whereas unmet expectations by one area-/institution-specific standard deviation are associated with a 6% of standard deviation move in the same direction. Again, this last change is greater than the difference in average ideology between voters of center-right Piñera and extreme-right Kast.

These results are not driven by any particular question in the ideology index, as they consistently appear in all of its components, although they are not always significant. The results for ideology are consistent with different sets of control variables,<sup>30</sup> including the use of no controls, and with different specifications (Online Appendix Tables D.3-D.4). They are generally robust to different treatments of extreme values of income measures (not shown) and to the use of survey weights that account for the differences in observable variables between the two waves (Online Table D.5).

The ideology results are strikingly consistent with the experimental findings. They are substantively equivalent, with a negative coefficient for the positive gap, and no results for the negative gap. In the case of the SD-adjusted gap, they are even of the same magnitude (-0.05 vs. -0.06). The similarity is visually clear. Figure 1 shows the estimated relationship between the gap and the ideology change for the dollar gap, which follows a similar pattern as the marginal effect of the

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<sup>30</sup>The results are also robust to controlling for the number of working hours and for the gap between the expected and actual working hours (not shown).

Table 5: Panel analysis results

	Ideology		Political position	
	(1)	(2)	(3)	(4)
Dollar gap (x100) +	-0.01** (0.005)		0.005*** (0.002)	
Dollar gap (x100) -	-0.001 (0.004)		-0.0000 (0.003)	
SD-adj. gap +		-0.06** (0.02)		0.03** (0.01)
SD-adj. gap -		-0.0003 (0.03)		0.01 (0.02)
Constant	0.59** (0.29)	0.42*** (0.08)	-0.56*** (0.08)	-0.41*** (0.05)
Controls	Yes	Yes	Yes	Yes
Observations	2,525	2,411	2,525	2,411
R <sup>2</sup>	0.02	0.03	0.04	0.04
Adjusted R <sup>2</sup>	-0.005	0.003	0.01	0.01
Residual Std. Error	0.55	0.55	0.36	0.36
F Statistic	0.84	1.13	1.53***	1.60***

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01  
Robust errors in parentheses

treatment along the predicted gap (Panel 1, left figure).

Next, I report the ideology results for the experiment participants, separating the sample between those in the treatment vs. control groups.<sup>31</sup> Since the treatment affected political behavior in wave 1, the indexes have a different baseline for treated individuals. Also, since predicted gaps are correlated with actual gaps (cor=0.32 for the dollar case), treated individuals in wave 1 may have anticipated part of the effect of the gap in political behavior in wave 2.<sup>32</sup>

Panel 2 shows the estimated relationship between the dollar gap and ideology by treatment assignment (Online Appendix Table D.6).<sup>33</sup> Individuals in the control group have a larger ideology

<sup>31</sup>Alternatively, I include the interaction between the predicted gap that was informed by the experiment and the treatment (separately for the positive and negative sides of the gap). This specification mirrors the estimation in the experiment. The results generated using this approach are substantively consistent with those estimating the main equation separately by treatment assignment.

<sup>32</sup>For completeness, I also checked whether the expectation shock had a direct effect on a set of outcomes in wave 2. I tested three specifications (only treatment, interaction of treatment and gap, and interaction with positive/negative gaps) on the number of calls, CVs, and emails sent as part of the respondent's job search effort, and for work income, with no results. I do find some results in the asymmetric specification for *ex post* expectations (expectations recalled in wave 2) and for time spent finding a job. The result for *ex post* expectations may be caused by treatment, for example if individuals who were informed that their expectations were too high with respect to past graduates' outcomes adjusted their expectations, and therefore remember having lower expectations. The estimated effect of the time spent finding a job is likely to arise out of luck, especially since there are no effects on the effort put into the job search or on the labor income. Nor are there any effects regarding the political behavior indexes in wave 2.

<sup>33</sup>This exercise reduces the sample size, because there are 676 individuals in wave 2 for whom we can calculate actual gaps who were not part of the experiment due to missing information from previous graduates from their programs. Degree programs for which information is lacking are generally smaller or newer, and therefore have students who are probably different from those for whom we have data. Thus, the panel results reported above are

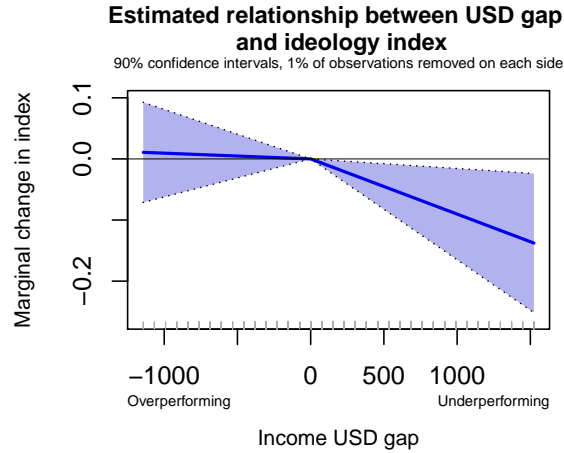


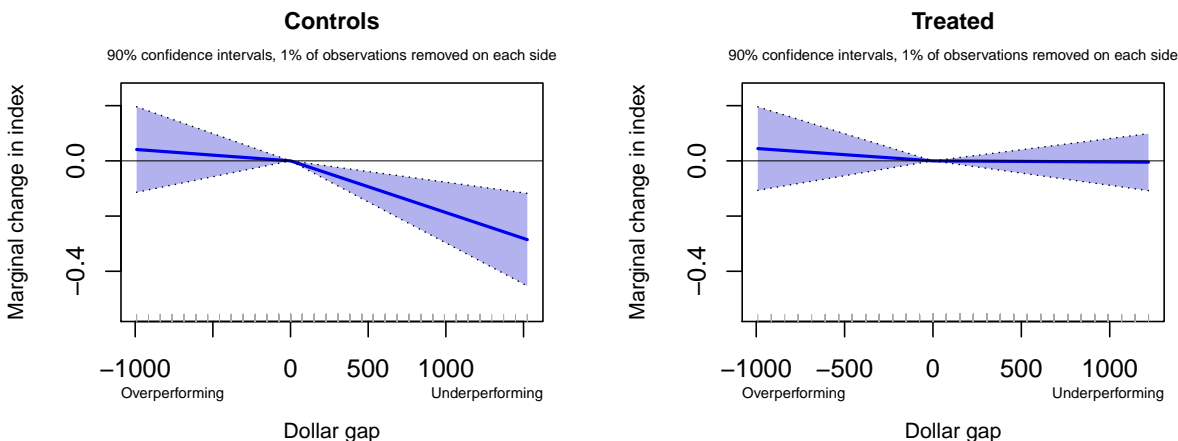
Figure 1: Marginal changes of panel results

change when faced with actual unmet expectations: the coefficients of the positive gaps are roughly twice the magnitude. This suggests that *experiencing* unmet expectations has a greater effect than being informed of the possibility. Conversely, treated individuals, who received information on their possible labor outcomes the previous year, do not show significant results. The differences for the coefficient of the positive dollar gap between treated and control individuals are significant at the 90% level. Thus, to some extent, individuals who were informed of their possible labor outcomes adjusted their ideology accordingly, and therefore did not change their ideology when their labor outcomes materialized a year later. The information shock appears to be an effective form of anticipating some of the effects on ideology caused by a full year of labor market experience.

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not simply a weighted average of results for individuals in the treatment and control groups. In any case, the panel results for ideology barely change when excluding individuals who received treatment (not shown).

**Panel 2: Estimated relationship between dollar gap and ideology by treatment assignment**



A final question regarding the ideology results is whether there are relevant heterogeneous effects for some key variables. There are no statistically significant differences in the effects by high school type (a proxy for socioeconomic status), gender, type of higher education institution, or area of study. With respect to higher education funding, there are no differences depending on whether the individual had a loan, but some specifications show statistically stronger effects for those who received grants.

The results for the political position index appear in the last two columns of Table 5. The positive sides of both income gap measures yield positive significant coefficients, although the magnitudes are half those found for ideology. These results are less robust to different specifications. None of the additional gaps yields significant results for unmet expectations (Online Appendix Table D.2). The SD-adjusted coefficient is no longer significant when no controls are included or when regressions use weights that account for attrition (Online Tables D.3 and D.5). Neither measure is robust to excluding individuals who were treated in wave 1 (not shown). Overall, the results for political position are less consistent and less robust, and in any case, smaller.

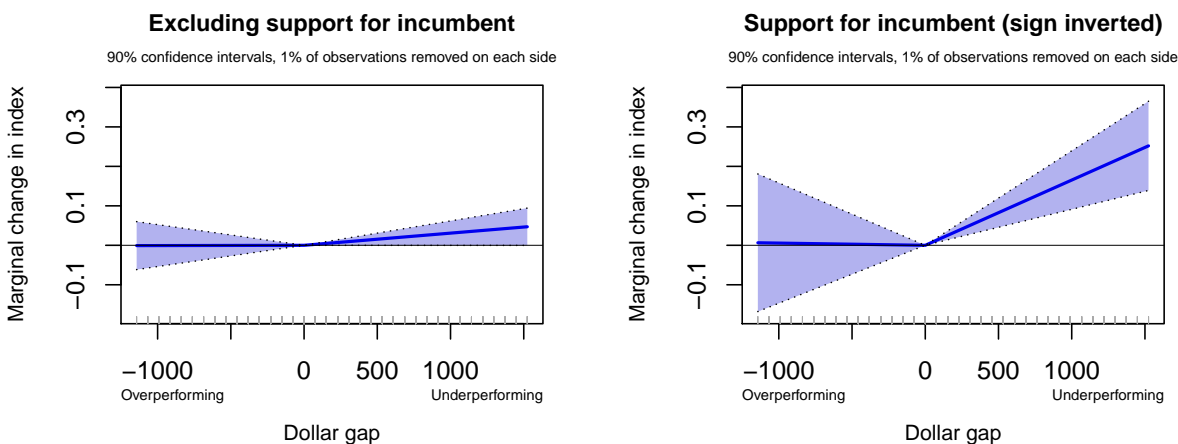
These unclear results, which suggest an association between unmet expectations and a shift to the right, contrast with the findings from the experiment, where being warned of the possibility of unmet expectations triggered a shift to the left. They also contrast with the ideology results, which in theory should move in tandem with political position.

Differences between experimental settings and what happens in the field are not rare, as subjects often react differently to hypothetical situations (e.g. Boas, Hidalgo and Melo 2018). Still, it is important to better understand this inconsistency. It turns out to have theoretical significance. To start, the political position index is built based on questions about self-identification on the left–right axis, as well as evaluations of key Chilean political actors including Nueva Mayoría, the coalition in government throughout the study period. Therefore, the index also captures incumbent

support.

Disentangling these two aspects of the political position index clarifies the issue. Panel 3 shows, for the dollar gap, the main results for the index excluding support for the incumbent coalition from its construction (left figure), and for support for the incumbent alone (right figure; since this variable enters the index after switching signs, it is presented with its sign inverted, so that both figures go in the same direction). While the results for political position excluding support for the incumbent are not significant, those for incumbent support are more than double those in Table 5 in magnitude (Online Table D.7). Clearly, the positive results observed for political position in Table 5 are mostly driven by a change in support for the government coalition.<sup>34</sup> These results are consistent with retrospective voting theory: when faced with unmet expectations, graduates punish the incumbent government. This was not the case in the experiment, which generated no effects on support for Nueva Mayoría (not shown).

### Panel 3: Estimated relationship between the dollar gap and components of the political position index



In sum, in the experiment, subjects who were faced with the possibility of unmet expectations changed their political position in accordance with their change in ideology (i.e., toward more pro-government/pro-equality ideology and to the left), without changing their assessment of the government coalition. In the real world, subjects still change their ideology along the same lines, but they do not alter their overall political position, although they punish the incumbent government for unmet expectations.<sup>35</sup>

<sup>34</sup>There are no relevant heterogeneous effects for punishment to the incumbent. Regressions with interactions and subsetting by the values on key variables reveal no statistically significant differences in the effects by high school type, gender, area of study, or type of higher education funding. An analysis by type of higher education institution suggests stronger effects for individuals from public universities.

<sup>35</sup>The results for political position by treatment assignment are harder to interpret than in the case of ideology, probably due in part to the general instability of the results for this index (not shown).

## 8. Discussion

The main finding of this study is that there is a relationship between the gap in expected vs. actual outcomes of higher education and political ideology: unmet expectations push graduates toward more pro-equality/pro-government ideology. This result is robust and consistent for both the experiment (which estimated the causal effect of hypothetical unmet expectations) and the panel (which estimated the effect of actual unmet expectations). Certainly, actual gaps are not distributed randomly, which raises concerns of endogeneity bias. However, the actual gaps are hard to predict based on most observable variables, and the estimations include institution and area-of-study fixed effects, making this a quite strong observational study. In any case, the striking consistency with the experiment suggests the estimation is a proper causal effect and not just a correlation.

I interpret the effect of unmet expectations on ideology as arising from changed perceptions of social mobility. Both the experiment and the panel reveal that unmet expectations have a strong effect on perceptions of social mobility, measured as the degree of agreement with the statement “Any person who is willing to work has plenty of opportunities to succeed” (one of the questions in the ideology index; see Tables C.6 and D.8 in the Online Appendix). In line with several past studies, perceptions of social mobility are negatively related to support for redistribution and preferences for a stronger role for government (Piketty 1995; Bénabou and Ok 2001; Alesina and Giuliano 2011). In a society in which it is not possible to improve one’s livelihood by working hard, inequality is less justifiable, and the government becomes essential to improving one’s situation.

A lack of social mobility also appears to be a relevant factor in explaining unfulfilled expectations in answers given to an open-ended question. At the end of the second wave, after asking about their current labor conditions, the survey showed respondents their expectations for 2017 from 2016, and then provided a blank space to comment. Many provided long explanations of why their expectations were not met, and these were often related to a lack of social mobility.<sup>36</sup> One example is illustrative: “I used to believe that if I strove, I would make it, but there’s inequality in opportunities. I dream of meritocracy, but there are only connections.”

The second main finding is that actual unmet expectations are associated with a strong reduction in support for the incumbent coalition. There is no change in other components of the political position index (political self-identification or the assessment of other political actors). This means that respondents with unmet expectations, despite moving more towards the left in ideology, punish the left-wing government. Prior studies have established that evaluations of political actors are often distinct from abstract ideology (Achen and Bartels 2016; Kinder and Kalmoe 2017). However, this disparity between the panel ideology results and assessments of the incumbent contrasts with the experiment’s results, in which, when faced with unmet expectations, respondents’ political position moved in accordance with ideology without changing their evaluation of the government coalition.

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<sup>36</sup>A manual tabulation of topics in these texts shows that 54 individuals mention connections, meritocracy, or related words. Other explanations are related to limited work opportunities (109 mentions), bad economic situation/bad policies (89), and loans/high cost of higher education (28).



What could explain these differences in behavior? In the experiment, a randomized information shock shows average outcomes of past graduates from the respondent's program. Thus, while the panel focuses on *actual* unmet expectations, the experiment reveals the *hypothetical* possibility of unmet expectations in the future. While the chance of unmet expectations is just a possibility and it is unclear whose responsibility it would be, actual unmet expectations are a fact, leading people to search for explanations. In practice, graduates may blame the incumbent government, which is often considered responsible for labor market conditions. Notably, income information in the experiment was given for four years after graduation, with elections in between, so it was not even clear who would be in government by then.

Thus, subjects whose career outcomes do not meet their expectations in the real world may attribute this discrepancy to the government and punish it accordingly, even if this is inconsistent with their shift in ideology. This is only observed in the panel, where unmet expectations have already materialized. In the experiment it is easier to be theoretically consistent: since the unmet expectations were hypothetical, respondents did not punish the incumbent coalition.

## 9. Conclusion

The evidence in this study consistently shows that unmet labor market expectations after higher education induce a change in ideology toward more pro-government/pro-equality positions. As well, while in the experiment political position moved in accordance with the change in ideology, respondents with actual unmet expectations punished the left-wing incumbent government for their misfortune. It is not a new finding that material conditions may affect political behavior, but the role that expectations play in this relationship has been generally overlooked. The role of unmet expectations identified in this study, however, is consistent with a strong body of literature that argues that expectations play a fundamental role in individual satisfaction (Inglehart 1990; Stutzer 2004).

In a world where higher education enrollment is high and increasing, while not always fulfilling its anticipated benefits, it is important to understand the broad consequences of unmet expectations. Around the world, huge public and private investments have increased the number of graduates, with the promise of laudable economic and democratic effects. To the extent that these expectations are unfulfilled, this may entail a social shift toward the ideological left and against political leaders. This may be a relevant driver of recent protests in Chile and elsewhere.

Further research should examine whether these findings persist as graduates get older, and to what extent they apply in different contexts, such as places where the expansion of higher education took place longer ago, like the U.S., or where higher education has not expanded greatly, like Italy. The link between unmet expectations among large groups of graduates and prominent protests around the world also deserves further study.

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# Online Appendices

## Appendix A: Online survey

### 1. Ethics

Both online surveys started with an informed and voluntary consent of research participants and encouraged participation with prize raffles (wording of consent and detail of prizes available upon request).

The treatment showed true information on labor market outcomes, which, moreover, was public in a website that depends on the Ministry of Education (<https://www.mifuturo.cl/>). As discussed in note 31, the treatment had no effect on the number of calls, CVs, and emails sent as part of the respondent’s job search effort, nor on work income. The surveys included the possibility of sending questions or comments, and I did not receive any indicating disgust with the treatment or the survey. Overall, it seems safe to say that subjects were not exposed to risk of harm.

The study ensured the confidentiality of participant identities at all stages with standard practices. I masked ID numbers with a function that I keep in a safe place, removed ID numbers as soon as I got the information, and stored encrypted data on secure servers. I only report data in an aggregate fashion.

### 2. Representativeness: Higher education institutions

Tables A.1 to A.4 compare the distribution of institutions in the sample to all institutions in Chile. Since not all institutions were invited to be part of this project (non-accredited vocational institutions that have less than 1,000 students were not invited), tables include a third column that only considers institutions that were invited to participate (“Total reached”).

Table A.1: Distribution of institutions by type (%)

	Sample	Total	Total reached
Technical formation center	24.5	32.7	19.4
Professional institute	18.4	28.0	23.3
Public university	12.2	10.7	15.5
Private university	32.7	22.7	33.0
Private CRUCh university	12.2	6.0	8.7

Note: Professional institutes mainly offer four-year vocational programs; technical formation centers mainly offer two-year programs. *Consejo de Rectores de Universidades de Chile* (CRUCh) gathers universities created before 1981, which are typically referred to as traditional universities. All public universities belong to CRUCh, but there are private universities inside and outside CRUCh.

Table A.2: Distribution of institutions by enrolment (%)

	Sample	Total	Total reached
0 - 100	0.0	10.7	0.0
101 - 1,000	4.1	24.7	5.8
1,001 - 5,000	30.6	25.3	36.9
5,001 - 15,000	20.4	23.3	34.0
15,001 - 100,000	44.9	16.0	23.3

Table A.3: Distribution of institutions by region (%)

	Sample	Total	Total reached
Metropolitan region	65.3	62	62.1
Other region	34.7	38	37.9

Table A.4: Distribution of institutions by quality, proxied by years of accreditation (%)

	Sample	Total	Total reached
/	12.2	50.0	27.2
2	8.2	4.7	6.8
3	22.4	14.7	21.4
4	14.3	10.7	15.5
5	22.4	12.7	18.4
6	12.2	4.7	6.8
7	8.2	2.7	3.9

### 3. Representativeness: Respondents

Tables A.5 to A.11 compare the main characteristics of individuals in both waves. They also compare the wave 1 sample with the real distribution within the Chilean higher education system. It is important to note that due to the large sample sizes, even small differences in these tables are statistically significant.

There are no statistically significant differences in gender between waves 1 and 2 (samples 1 and 2). In terms of age, sample 2 is slightly younger. Regarding school type, sample 2 has a larger share of students from private high schools and a lower share of public high school students. With respect to the type of higher education institution (HEI), sample 2 has an important increase in the share of students from private (CRUCh) universities. In sample 2 there is also an increase in the share of students from larger institutions, and of better quality as measured by years of accreditation. There are several significant changes in the proportions by area of study, although none of them is greater than two percentage points.

In addition, a natural question is whether respondents with better labor outcomes are more or less likely to attrite from the study. While it is not possible to compare the actual labor outcomes of the two groups, because there is no information on individuals who attrited, as a proxy, I use the average employment and income data from the ministry on past graduates who received the same degree from the same institution as the respondent. There are no statistically significant differences in terms of past graduates' employment rate for respondents who attrited and those who did not. For the case of expected income four years after graduation according to the ministry's data, there are statistically significant differences: individuals who completed both surveys obtained degrees for which past graduates' income is 2.3% higher than individuals who attrited.

Finally, it is worth comparing differences in the gaps by attrition status, as shown in Table A.12. This can only be done for predicted gaps, because we lack information on the actual outcomes of attrited individuals. All predicted gaps have statistically significant lower means in sample 2. However, the differences in means correspond to small changes in the position in the distribution of predicted gaps in the full sample. Indeed, differences in the percentile range from 0 for the USD gap to 3.1 points for the percentage one.

Table A.5: Distribution of respondents by gender (%)

	Sample 1	Sample 2	Real	P-value 1-real	P-value 1-2
Women	54.2	53.4	52.2	0.000***	0.313
Men	45.8	46.6	47.8	0.000***	0.313

Table A.6: Distribution of respondents by age (%)

	Sample 1	Sample 2	Real	P-value 1-real	P-value 1-2
15-19	1.5	1.6	16.9	0.000***	0.605
20-24	42.2	44.5	47.3	0.000***	0.003***
25-29	37.8	39	18.8	0.000***	0.120
30-34	9.5	8.5	8	0.000***	0.032**
35-39	4.2	3.1	4.2	1.000	0.001***
40 +	4.9	3.2	4.7	0.000***	0.000***

Table A.7: Distribution of respondents by high school type (%)

	Sample 1	Sample 2	Real	P-value 1-real	P-value 1-2
Public	25.9	23	31.7	0.000***	0.000***
Voucher	46.8	48.1	55.7	0.000***	0.102
Private	27.3	28.9	12.6	0.000***	0.024**

Table A.8: Distribution of respondents by higher education institution type (%)

	Sample 1	Sample 2	Real	P-value 1-real	P-value 1-2
Tech. formation center	9.2	6.6	11.4	0.000***	0.000***
Profesional institute	14.1	12.2	30.8	0.000***	0.001***
State univ.	10.9	10.9	15.4	0.000***	1.000
Private univ.	49.2	48.1	30.1	0.000***	0.167
Private CRUCH univ.	16.6	22.3	12.3	0.000***	0.000***

Table A.9: Distribution of respondents by higher education institution size (%)

	Sample 1	Sample 2	Real	P-value 1-real	P-value 1-2
Large	84	88.6	86.4	0.000***	0.000***
Medium	15.8	11.3	12.5	0.000***	0.000***
Small	0.3	0.1	1.1	0.000***	0.022**

Table A.10: Distribution of respondents by higher education institution quality, proxied by years of accreditation (%)

	Sample 1	Sample 2	Real	P-value 1-real	P-value 1-2
/	7.2	3.7	11.1	0.000***	0.000***
2	3.4	2.7	3.8	0.000***	0.015**
3	11.2	9.3	21.9	0.000***	0.000***
4	19.1	19.8	14.2	0.000***	0.263
5	28.9	28.8	24.9	0.000***	0.890
6	11.6	11.6	8.9	0.000***	1.000
7	18.6	24.1	15.2	0.000***	0.000***

Table A.11: Distribution of respondents by area of study (%)

	Sample 1	Sample 2	Real	P-value 1-real	P-value 1-2
N/A	0.6	0.4	0	0.000***	0.104
Management and business	24.4	22.2	18.8	0.000***	0.001***
Agriculture	2.2	1.9	2.2	1.000	0.199
Arts and architecture	3.2	3.2	4.4	0.000***	1.000
Science	1.6	2	1.7	0.000***	0.045**
Social sciences	11.5	13.6	9.1	0.000***	0.000***
Law	5.4	5.7	3.6	0.000***	0.404
Education	9.5	10.3	12.3	0.000***	0.086*
Humanities	0.7	1	0.9	0.000***	0.024**
Health	15.3	15.1	19	0.000***	0.727
Technology	25.5	24.5	28	0.000***	0.149



Table A.12: Descriptive statistics for variables from T=1 in both samples

	N 1	Mean 1	Min 1	Max 1	N 2	Mean 2	Min 2	Max 2	P value 1-2
Age	14,233	26.65	17.00	66.00	3,948	26.04	17.00	66.00	0.000***
Certainty	13,147	5.28	1.00	7.00	3,614	5.23	1.00	7.00	0.020**
Male	14,233	0.46	0.00	1.00	3,948	0.47	0.00	1.00	0.294
Female	14,233	0.54	0.00	1.00	3,948	0.53	0.00	1.00	0.294
HEI: Tech. formation center	14,233	0.09	0.00	1.00	3,948	0.07	0.00	1.00	0.000***
HEI: Professional institute	14,233	0.14	0.00	1.00	3,948	0.12	0.00	1.00	0.001***
HEI: Public university	14,233	0.11	0.00	1.00	3,948	0.11	0.00	1.00	0.883
HEI: Private university	14,233	0.49	0.00	1.00	3,948	0.48	0.00	1.00	0.159
HEI: Private CRUCh university	14,233	0.17	0.00	1.00	3,948	0.22	0.00	1.00	0.000***
Works full time	14,233	0.36	0.00	1.00	3,948	0.34	0.00	1.00	0.028**
Works part time	14,233	0.21	0.00	1.00	3,948	0.23	0.00	1.00	0.003***
Searching for a job	14,233	0.41	0.00	1.00	3,948	0.41	0.00	1.00	0.766
Expects to work full time	13,147	0.74	0.00	1.00	3,614	0.72	0.00	1.00	0.012**
Expects to work more than half time	13,147	0.15	0.00	1.00	3,614	0.16	0.00	1.00	0.090*
Expects to work half time	13,147	0.09	0.00	1.00	3,614	0.10	0.00	1.00	0.814
Expects to work less than half time	13,147	0.02	0.00	1.00	3,614	0.03	0.00	1.00	0.003***
Public high school	14,233	0.26	0.00	1.00	3,948	0.23	0.00	1.00	0.000***
Private high school	14,233	0.27	0.00	1.00	3,948	0.29	0.00	1.00	0.028**
Voucher high school	14,233	0.47	0.00	1.00	3,948	0.48	0.00	1.00	0.114
Parents: completed high school	14,233	0.35	0.00	1.00	3,948	0.34	0.00	1.00	0.207
Parents: less than high school	14,233	0.14	0.00	1.00	3,948	0.11	0.00	1.00	0.000***
Parents: Technical higher ed.	14,233	0.14	0.00	1.00	3,948	0.14	0.00	1.00	0.929
Parents: University ed.	14,233	0.37	0.00	1.00	3,948	0.40	0.00	1.00	0.000***
Grant as main source of funding	14,233	0.26	0.00	1.00	3,948	0.29	0.00	1.00	0.000***
Loan as main source of funding	14,233	0.35	0.00	1.00	3,948	0.38	0.00	1.00	0.000***
Treatment	9,540	0.50	0.00	1.00	2,659	0.51	0.00	1.00	0.609
Predicted gap \$	8,307	345.03	-3,277.44	7,545.73	2,395	308.51	-2,820.12	7,545.73	0.063*
Predicted gap %	8,307	4.39	-2,400.00	90.00	2,395	1.80	-2,400.00	90.00	0.053*
Predicted gap SD adj	8,045	0.37	-3.79	8.53	2,329	0.34	-2.50	8.53	0.089*
Predicted gap emp.	9,540	0.65	-89.50	76.14	2,659	-0.07	-89.50	71.84	0.073*

#### 4. Test of the seriousness of attrition

Table A.13 shows the main results of the experiment for ideology, by attrition status. Note that this distinction reduces the sample size, which partly explains why the precision falls with respect to the full sample. The results of the interaction of the treatment and positive gap measures for the attrited and non-attrited samples remain negative and on the same order of magnitude as in the full sample and are generally significant at conventional levels. Differences by attrition status are larger in the USD gap than in the SD-adjusted case, but still the coefficients of the attrited and non-attrited samples are not statistically different at the 90% level. In the case of political position, the coefficients are more similar between the subsamples, although the significance levels fall (not shown).

Table A.13: Experimental results for ideology by attrition status

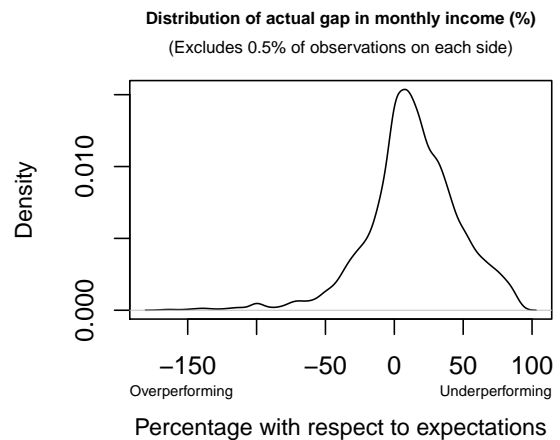
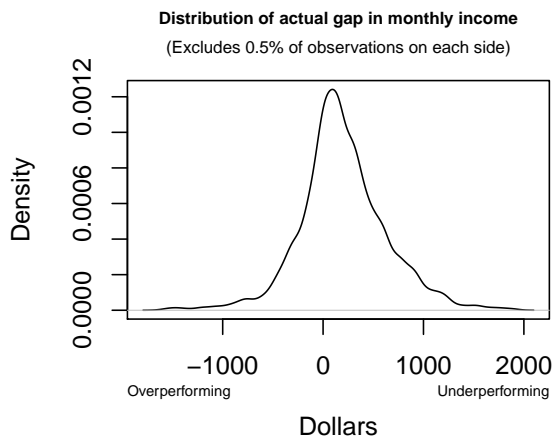
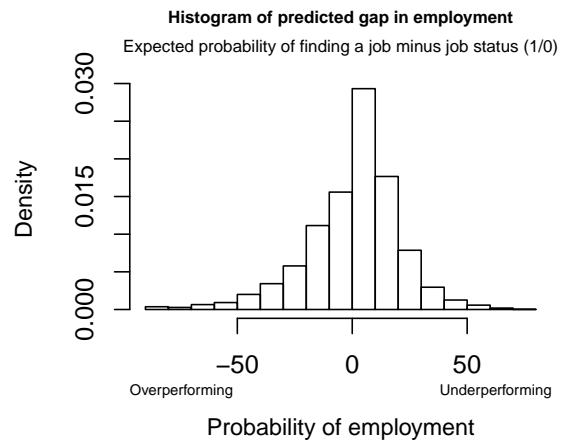
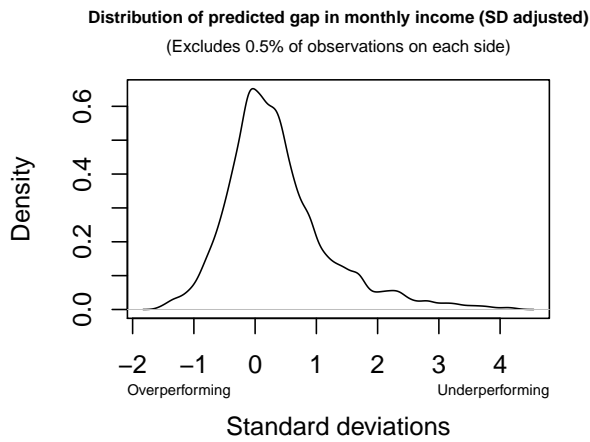
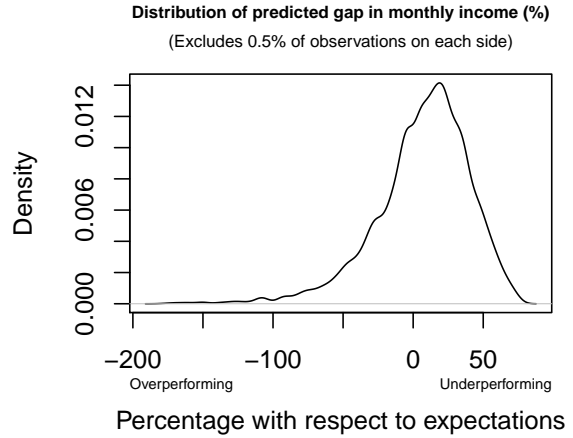
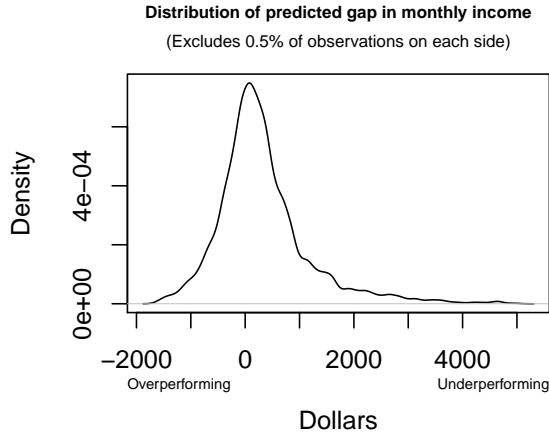
	All	Attrited	Non-attrited	All	Attrited	Non-attrited
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.009 (0.017)	-0.002 (0.019)	0.038 (0.031)	0.022 (0.018)	0.010 (0.021)	0.052 (0.033)
USD gap, hundreds (+)	0.007*** (0.001)	0.005*** (0.002)	0.010*** (0.002)			
USD gap, hundreds (-)	0.002 (0.003)	0.002 (0.004)	0.004 (0.005)			
SD adj. gap (+)				0.080*** (0.013)	0.070*** (0.016)	0.105*** (0.023)
SD adj. gap (-)				0.015 (0.033)	0.009 (0.039)	0.033 (0.061)
Treat * USD gap, hundreds (+)	-0.003* (0.002)	-0.001 (0.002)	-0.007** (0.003)			
Treat * USD gap, hundreds (-)	-0.002 (0.004)	-0.002 (0.005)	-0.002 (0.008)			
Treat * SD adj. gap (+)				-0.051*** (0.018)	-0.036* (0.021)	-0.081** (0.034)
Treat * SD adj. gap (-)				0.008 (0.044)	0.014 (0.052)	-0.008 (0.084)
Constant	0.348*** (0.056)	0.342*** (0.065)	0.244* (0.131)	-0.101 (0.192)	-0.182 (0.212)	0.327* (0.169)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,307	5,912	2,395	8,045	5,716	2,329
R <sup>2</sup>	0.122	0.120	0.141	0.124	0.123	0.142
Adjusted R <sup>2</sup>	0.114	0.109	0.115	0.116	0.113	0.116
Residual Std. Error	0.555	0.548	0.574	0.554	0.546	0.573
F Statistic	15.601***	11.061***	5.362***	16.552***	11.681***	5.482***

Note:

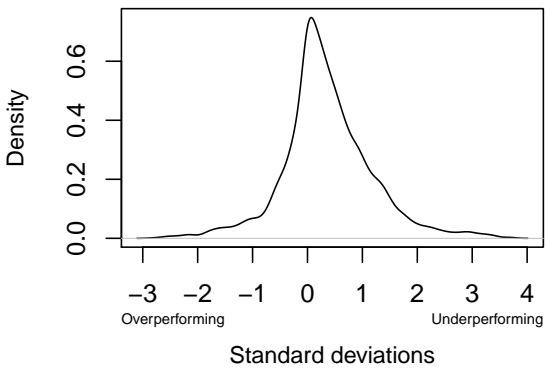
\*p<0.1; \*\*p<0.05; \*\*\*p<0.01  
Robust errors in parentheses.

# Appendix B: Measurement

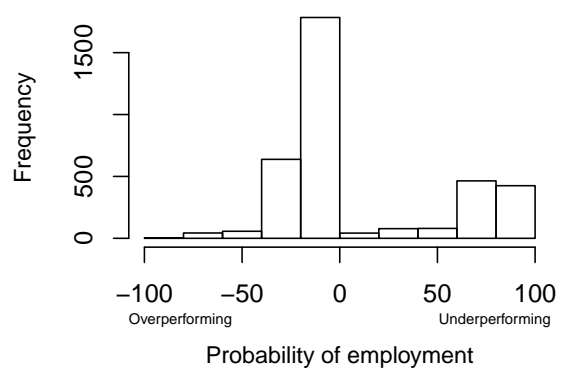
## Panel B.1: Distribution of gap measures



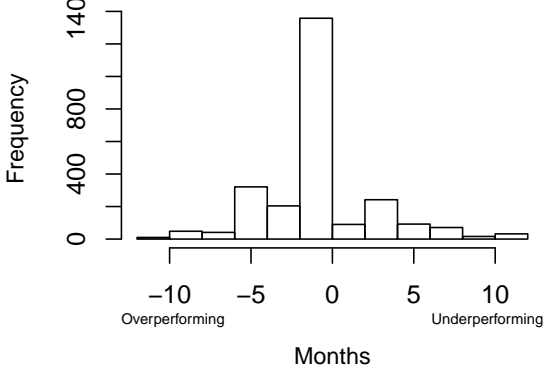
**Distribution of actual gap in monthly income (SD adjusted)**  
 (Excludes 0.5% of observations on each side)



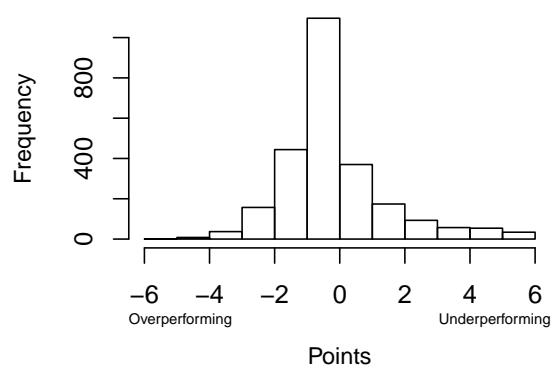
**Histogram of actual gap in employment**  
 Expected probability of finding a job minus job status (1/0)



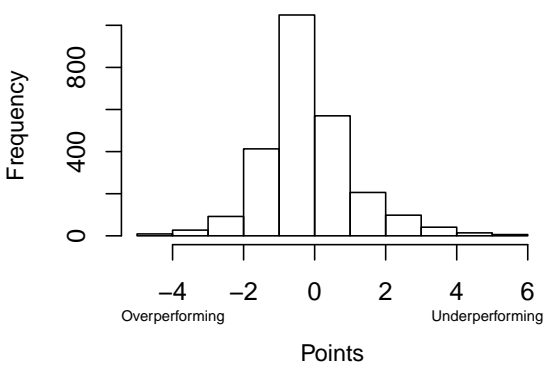
**Histogram of gap in time spent finding a job**  
 Expected time spent finding a job minus actual time



**Histogram of actual gap in relationship of job to studies**  
 Both measures on a 1-7 point scale



**Histogram of actual gap in liking one's job**  
 Both measures on a 1-7 point scale



**Histogram of actual gap in comparison with peers**

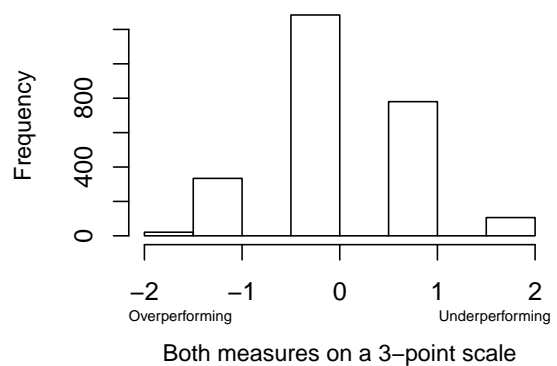


Table B.1: Quantiles of gap measures

	Predicted gaps				Actual gaps							
	USD	Percent	SD adj.	Employ.	USD	Percent	SD adj.	Employ.	Time	Relation	Liking	Peers
q. 0%	-3,277	-2,400	-4	-89	-5,030	-900	-6	-90	-12	-6	-5	-2
q. 2.5%	-1,067	-79	-1	-48	-762	-70	-1	-50	-8	-2	-2	-1
q. 5%	-838	-56	-1	-38	-457	-43	-1	-40	-4	-2	-2	-1
q. 10%	-534	-36	-1	-25	-305	-26	-1	-30	-4	-1	-1	-1
q. 20%	-229	-17	0	-14	-76	-8	0	-20	-3	-1	-1	0
q. 30%	-76	-5	0	-6	0	0	0	-10	-1	0	0	0
q. 40%	76	4	0	0	76	7	0	0	-1	0	0	0
q. 50%	229	12	0	3	152	12	0	0	0	0	0	0
q. 60%	381	19	0	6	229	20	0	0	0	0	0	0
q. 70%	534	25	1	10	381	29	1	10	0	1	1	1
q. 80%	838	35	1	16	534	40	1	70	1	1	1	1
q. 90%	1,448	46	1	23	762	56	1	90	3	2	2	1
q. 95%	2,058	55	2	30	991	70	2	100	4	4	3	1
q. 97.5%	2,820	62	3	38	1,220	80	2	100	8	5	3	2
q. 100%	7,546	90	9	76	8,155	97	8	100	12	6	6	2

Table B.2: Correlations between gap measures

	USD	Percent	SD adj.	Employ.	USD	Percent	SD adj.	Employ.	Time	Relation	Liking	Peers
<b>Predicted gaps</b>												
USD	1.00	0.45	0.93	0.19	0.32	0.14	0.25	0.01	0.01	0.02	0.07	0.01
Percent	0.45	1.00	0.45	0.21	0.14	0.23	0.14	-0.02	0.00	0.01	-0.03	-0.05
SD adj.	0.93	0.45	1.00	0.23	0.28	0.14	0.28	0.00	0.03	0.04	0.07	0.00
Employ.	0.19	0.21	0.23	1.00	-0.01	-0.02	0.02	0.11	0.07	0.00	0.10	0.06
<b>Actual gaps</b>												
USD	0.32	0.14	0.28	-0.01	1.00	0.78	0.87	-0.03	0.05	0.17	0.14	0.31
Percent	0.14	0.23	0.14	-0.02	0.78	1.00	0.76	-0.08	0.07	0.17	0.12	0.30
SD adj.	0.25	0.14	0.28	0.02	0.87	0.76	1.00	-0.07	0.05	0.19	0.15	0.33
Employ.	0.01	-0.02	0.00	0.11	-0.03	-0.08	-0.07	1.00	0.10	-0.02	0.09	0.06
Time	0.01	0.00	0.03	0.07	0.05	0.07	0.05	0.10	1.00	-0.01	0.03	0.04
Relation	0.02	0.01	0.04	0.00	0.17	0.17	0.19	-0.02	-0.01	1.00	0.41	0.12
Liking	0.07	-0.03	0.07	0.10	0.14	0.12	0.15	0.09	0.03	0.41	1.00	0.17
Peers	0.01	-0.05	0.00	0.06	0.31	0.30	0.33	0.06	0.04	0.12	0.17	1.00

<sup>a</sup> Correlations for respondents who answered both waves.

Table B.3: Regression of selected measures of actual gap

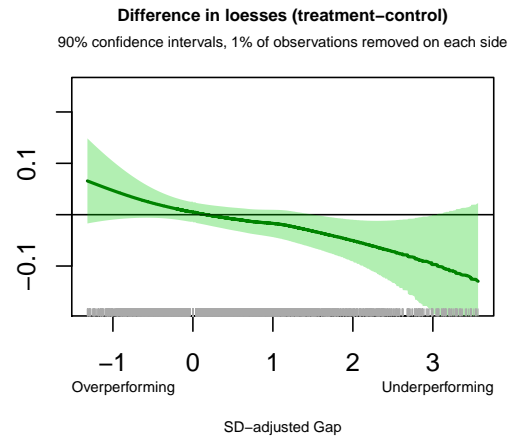
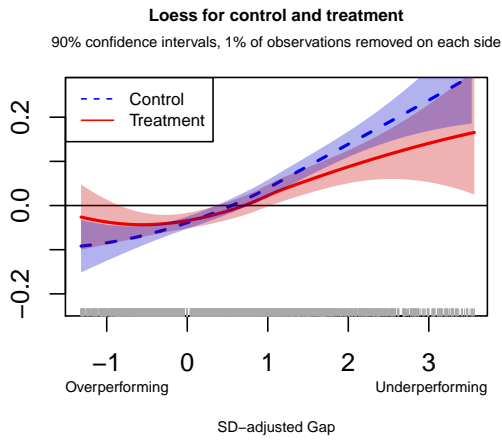
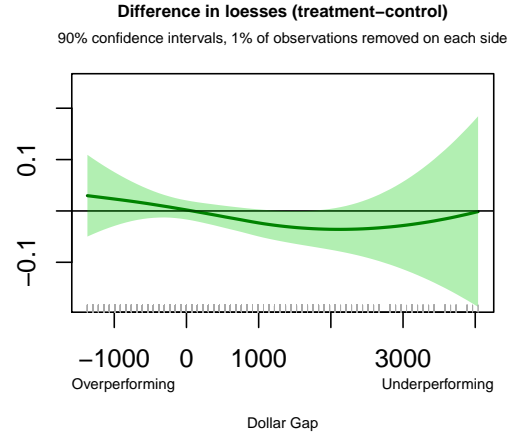
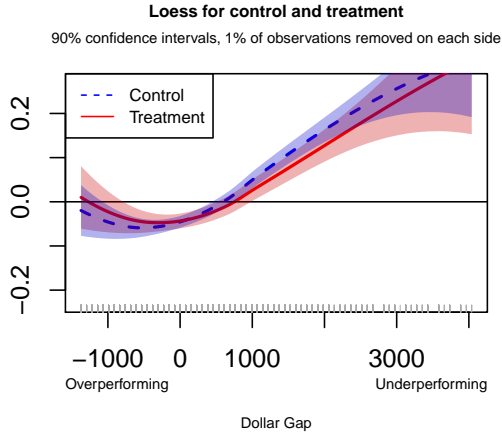
	<i>Dependent variable:</i>			
	Gap USD	Gap percent	Gap SD adj.	Employment gap
	(1)	(2)	(3)	(4)
Woman	-24.25 (23.01)	-0.57 (1.92)	-0.05 (0.04)	2.44 (1.50)
Age	5.80* (3.09)	-0.12 (0.17)	0.001 (0.01)	-0.26** (0.13)
Private high school	27.21 (38.87)	0.25 (2.87)	-0.04 (0.07)	0.89 (2.26)
Voucher high school	-1.53 (27.16)	1.01 (2.42)	-0.02 (0.05)	1.71 (1.76)
HEI: professional institute	35.08 (35.82)	1.32 (3.19)	-0.11 (0.10)	-1.03 (3.29)
HEI: public univ.	29.92 (42.80)	-4.66 (3.60)	-0.19* (0.11)	-7.02** (3.52)
HEI: private univ.	95.44** (39.34)	-0.49 (3.35)	-0.14 (0.10)	-0.75 (3.03)
HEI: private CRUCh univ.	46.75 (38.48)	-4.19 (3.41)	-0.19* (0.10)	-8.39*** (3.24)
Works full time t=1	-80.91*** (23.74)	-7.55*** (1.96)	-0.15*** (0.04)	-19.68*** (1.63)
Works part time t=1	78.46*** (27.91)	7.10*** (2.27)	0.13** (0.05)	-6.72*** (2.00)
Parents: less than high school	36.64 (36.08)	0.34 (3.81)	0.06 (0.07)	2.87 (2.39)
Parents: technical higher ed.	14.84 (34.01)	1.00 (2.45)	-0.03 (0.07)	-1.38 (2.23)
Parents: university ed.	-39.46 (30.90)	-1.69 (2.22)	-0.12** (0.05)	-0.91 (1.89)
Grant as main source of funding	-11.36 (26.44)	0.79 (1.68)	-0.04 (0.05)	1.98 (1.67)
Loan as main source of funding	19.16 (23.67)	1.04 (1.87)	0.02 (0.04)	1.12 (1.52)
Pol. pos: none	89.92 (71.61)	10.14** (5.11)	0.14 (0.10)	-0.77 (3.19)
Pol. pos: right	28.36 (72.87)	5.29 (5.27)	0.02 (0.10)	-0.74 (3.29)
Pol. pos: left	22.65 (73.47)	4.75 (5.38)	-0.02 (0.10)	-2.47 (3.35)
Constant	-206.51 (177.15)	0.03 (12.43)	0.53*** (0.20)	39.34*** (10.40)
Area of study fixed effects	Yes	Yes	Yes	Yes
Observations	2,525	2,525	2,411	3,614
R <sup>2</sup>	0.03	0.03	0.04	0.07
Adjusted R <sup>2</sup>	0.02	0.02	0.02	0.06
Residual Std. Error	532.30	42.47	0.93	41.75
F Statistic	2.75***	3.03***	3.21***	9.25***

*Note:*

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01  
Robust errors in parentheses

# Appendix C: Experiment additional tests and results

Panel C.1: Loess plots for ideology index





Panel C.2: Loess plots for political position index

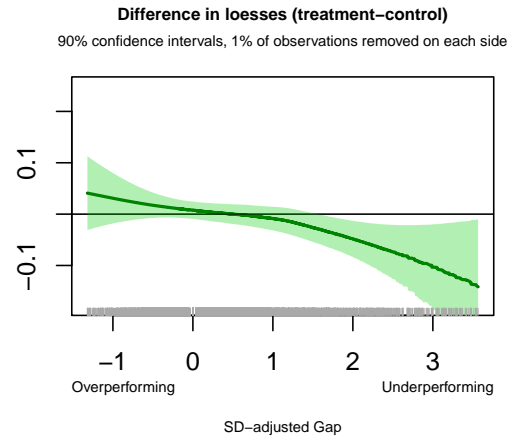
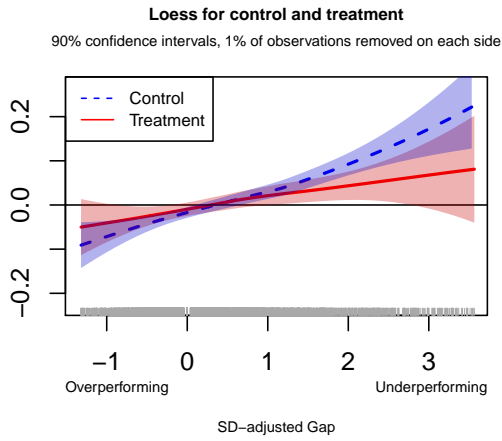
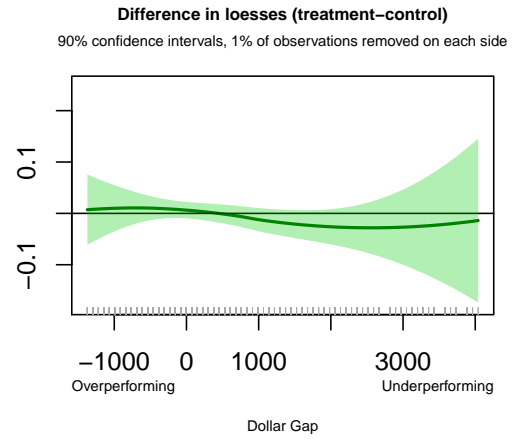
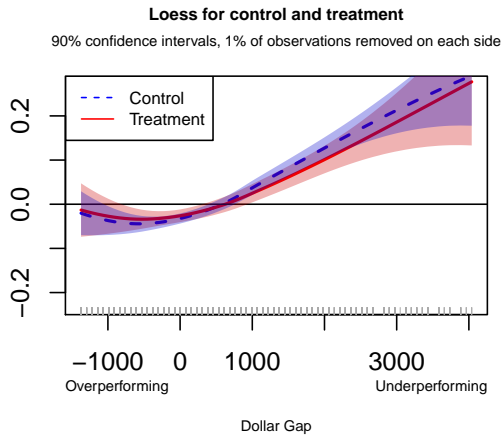


Table C.1: Balance table between control and treatment groups

	Control	Treatment	P-value
N	4,733	4,807	
Age	26.34	26.27	0.5
Certainty	5.27	5.27	0.96
Male	0.43	0.44	0.49
Female	0.57	0.56	0.49
HEI: technical formation center	0.09	0.09	0.96
HEI: professional institute	0.17	0.16	0.6
HEI: public university	0.10	0.11	0.15
HEI: private university	0.49	0.50	0.75
HEI: private CRUCh university	0.16	0.15	0.28
Works full time	0.36	0.35	0.73
Works part time	0.21	0.21	0.77
Searching for a job	0.43	0.43	0.6
Expects to work full time	0.75	0.73	0.07*
Expects to work more than half time	0.14	0.15	0.06*
Expects to work half time	0.09	0.10	0.65
Expects to work less than half time	0.02	0.02	0.97
Public high school	0.26	0.25	0.34
Private high school	0.25	0.26	0.36
Voucher high school	0.49	0.49	0.97
Parents: completed high school	0.36	0.36	0.78
Parents: less than high school	0.14	0.13	0.51
Parents: technical higher ed.	0.15	0.14	0.39
Parents: university ed.	0.36	0.37	0.42
Unknown area of study	0.00	0.00	NA
Management and business	0.26	0.25	0.39
Agriculture	0.03	0.02	0.13
Arts and architecture	0.04	0.03	0.13
Science	0.01	0.01	0.57
Social sciences	0.11	0.11	0.93
Law	0.06	0.07	0.19
Education	0.09	0.09	0.89
Humanities	0.00	0.01	0.6
Health	0.17	0.17	0.97
Technology	0.23	0.24	0.27
Grant as main source of funding	0.26	0.25	0.58
Loan as main source of funding	0.38	0.37	0.32

Table C.2: Experimental results for percent and employment gaps

	<i>Dependent variable:</i>			
	Ideology		Political position	
	(1)	(2)	(3)	(4)
Treatment	0.022 (0.017)	-0.002 (0.017)	0.015 (0.014)	0.010 (0.014)
Percent Gap (+)	0.003*** (0.0005)		0.002*** (0.0004)	
Percent Gap (-)	-0.0003*** (0.0001)		0.0001 (0.0002)	
Employment gap (+)		0.001 (0.001)		0.002** (0.001)
Employment gap (-)		0.003*** (0.001)		-0.0004 (0.001)
Treat * Percent Gap (+)	-0.001** (0.001)		-0.001 (0.001)	
Treat * Percent Gap (-)	0.00001 (0.0001)		0.00002 (0.0002)	
Treat * Employment gap (+)		-0.0004 (0.001)		-0.001 (0.001)
Treat * Employment gap (-)		-0.0005 (0.001)		0.001 (0.001)
Constant	0.335*** (0.055)	0.295*** (0.069)	0.242*** (0.047)	0.125** (0.057)
Controls	Yes	Yes	Yes	Yes
Observations	8,307	9,540	8,307	9,540
R <sup>2</sup>	0.122	0.121	0.160	0.146
Adjusted R <sup>2</sup>	0.114	0.113	0.153	0.139
Residual Std. Error	0.555	0.551	0.465	0.464
F Statistic	15.649***	16.628***	21.482***	20.670***

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01  
Robust errors in parentheses

Table C.3: Experimental results without controls

	<i>Dependent variable:</i>			
	Ideology		Political position	
	(1)	(2)	(3)	(4)
Treatment	0.004 (0.017)	0.013 (0.019)	0.013 (0.015)	0.010 (0.016)
USD gap, hundreds (+)	0.011*** (0.001)		0.008*** (0.001)	
USD gap, hundreds (-)	-0.002 (0.003)		-0.002 (0.003)	
SD adj. gap (+)		0.096*** (0.014)		0.043*** (0.011)
SD adj. gap (-)		0.009 (0.033)		0.050* (0.030)
Treat * USD gap, hundreds (+)	-0.003 (0.002)		-0.003* (0.002)	
Treat * USD gap, hundreds (-)	-0.003 (0.004)		0.0002 (0.004)	
Treat * SD adj. gap (+)		-0.040** (0.019)		-0.022 (0.015)
Treat * SD adj. gap (-)		-0.011 (0.046)		-0.002 (0.039)
Constant	-0.061*** (0.012)	-0.051*** (0.013)	-0.044*** (0.011)	-0.014 (0.012)
Controls	No	No	No	No
Observations	8,307	8,045	8,307	8,045
R <sup>2</sup>	0.017	0.011	0.013	0.004
Adjusted R <sup>2</sup>	0.017	0.011	0.012	0.004
Residual Std. Error	0.585	0.586	0.503	0.506
F Statistic	29.275***	18.110***	21.162***	7.143***

*Note:*

\*p&lt;0.1; \*\*p&lt;0.05; \*\*\*p&lt;0.01

Robust errors in parentheses

Table C.4: Experimental results, symmetric specification

	<i>Dependent variable:</i>			
	Ideology		Political position	
	(1)	(2)	(3)	(4)
Treatment	0.006 (0.013)	0.010 (0.013)	0.007 (0.011)	0.007 (0.011)
USD gap, hundreds	0.006*** (0.001)		0.005*** (0.001)	
SD adj. gap		0.069*** (0.011)		0.052*** (0.008)
Treat * USD gap, hundreds	-0.003** (0.001)		-0.002** (0.001)	
Treat * SD adj. gap		-0.040*** (0.014)		-0.021* (0.011)
Constant	0.352*** (0.056)	-0.066 (0.187)	0.257*** (0.047)	0.191** (0.085)
Controls	Yes	Yes	Yes	Yes
Observations	8,307	8,045	8,307	8,045
R <sup>2</sup>	0.121	0.123	0.162	0.163
Adjusted R <sup>2</sup>	0.114	0.116	0.154	0.156
Residual Std. Error	0.555	0.554	0.465	0.466
F Statistic	16.013***	17.010***	22.358***	23.532***

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01  
Robust errors in parentheses

Table C.5: Experimental results with weights

	<i>Dependent variable:</i>			
	Ideology		Political position	
	(1)	(2)	(3)	(4)
Treatment	0.002 (0.019)	0.015 (0.020)	0.001 (0.015)	0.001 (0.016)
USD gap, hundreds (+)	0.007*** (0.001)		0.003*** (0.001)	
USD gap, hundreds (-)	0.003 (0.004)		0.006* (0.003)	
SD adj. gap (+)		0.071*** (0.015)		0.032*** (0.012)
SD adj. gap (-)		0.023 (0.042)		0.043 (0.033)
Treat * USD gap, hundreds (+)	-0.002 (0.002)		-0.001 (0.002)	
Treat * USD gap, hundreds (-)	-0.005 (0.005)		0.0003 (0.004)	
Treat * SD adj. gap (+)		-0.033* (0.020)		-0.009 (0.017)
Treat * SD adj. gap (-)		-0.021 (0.054)		0.005 (0.041)
Constant	0.344*** (0.063)	-0.160 (0.203)	0.242*** (0.052)	0.180** (0.089)
Controls	Yes	Yes	Yes	Yes
Weights	Yes	Yes	Yes	Yes
Observations	8,307	8,045	8,307	8,045
R <sup>2</sup>	0.128	0.129	0.123	0.124
Adjusted R <sup>2</sup>	0.120	0.121	0.116	0.117
Residual Std. Error	0.520	0.516	0.425	0.424
F Statistic	16.512***	17.352***	15.866***	16.616***

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01  
Robust errors in parentheses

Note: Weights are constructed based on a propensity score, which measures the probability of being selected into the sample in terms of the student's school type and HEI type, by HEI quality (divided into three categories, based on years of accreditation). Weights correspond to the inverse of the propensity scores, and are trimmed so that they range from 0.3 to 3 (before trimming, they ranged from 0.3 to 16.9). For ideology, the results of the interaction between the positive gap and the treatment for the dollar gap are no longer significant, but are still of the same sign and magnitude. For the SD-adjusted gap measure the results are more robust: they have the same sign and order of magnitude (-0.051 in the unweighted specification vs. -0.033 in the weighted one) and are still significant, although they are now only significant at the 90% level. For the political position index, the coefficients are no longer significant, although they now have the same sign for both gap measures and the same order of magnitude for the SD-adjusted gap.

Table C.6: Experimental results for agreement with "Every person who is willing to work has plenty of opportunities to succeed" (standardized)

	(1)	(2)
Treatment	0.028 (0.028)	0.056* (0.030)
USD gap, hundreds (+)	0.007*** (0.002)	
USD gap, hundreds (-)	0.003 (0.005)	
SD adj. gap (+)		0.097*** (0.020)
SD adj. gap (-)		0.018 (0.057)
Treat * USD gap, hundreds (+)	-0.005** (0.003)	
Treat * USD gap, hundreds (-)	-0.005 (0.007)	
Treat * SD adj. gap (+)		-0.092*** (0.029)
Treat * SD adj. gap (-)		0.017 (0.076)
Constant	-0.987*** (0.093)	0.169 (0.385)
Controls	Yes	Yes
Observations	8,307	8,045
R <sup>2</sup>	0.131	0.133
Adjusted R <sup>2</sup>	0.123	0.126
Residual Std. Error	0.930	0.927
F Statistic	17.018***	18.050***
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01 Robust errors in parentheses	

# Appendix D: Additional panel tests and results

Panel D.1: Marginal effects from models that include quadratic measures of the gap

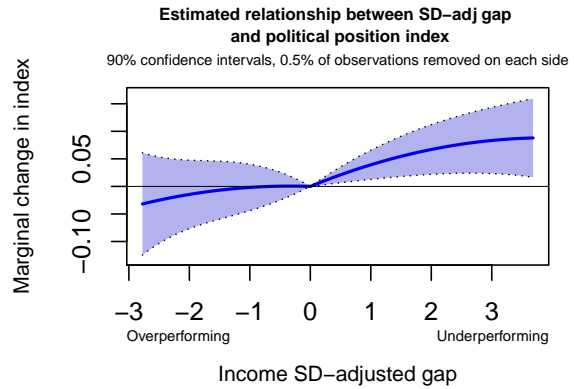
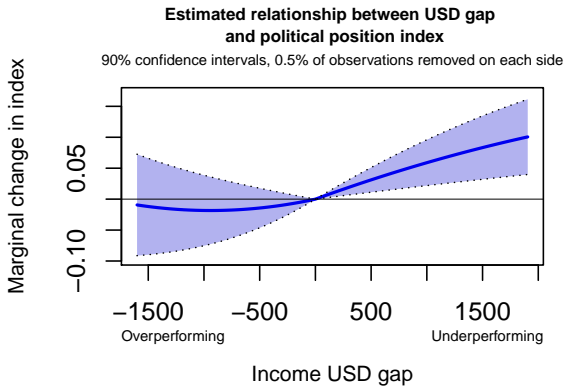
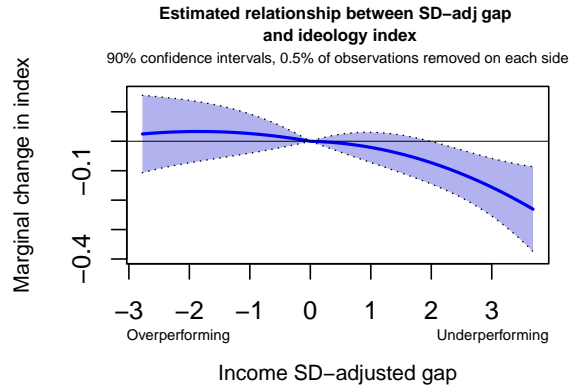
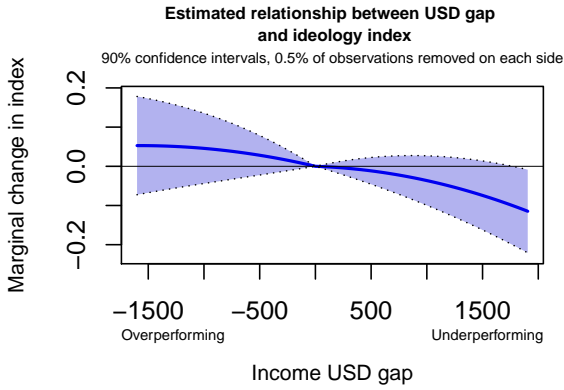




Table D.1: Panel results for ideology, additional gaps

	(1)	(2)	(3)	(4)	(5)	(6)
Percent gap +	-0.001*					
	(0.001)					
Percent gap -	-0.0000					
	(0.0003)					
Time gap +		-0.01				
		(0.01)				
Time gap -		-0.01*				
		(0.01)				
Relation gap +			0.002			
			(0.01)			
Relation gap -			-0.06***			
			(0.02)			
Liking gap +				-0.04*		
				(0.02)		
Liking gap -				-0.02		
				(0.02)		
Peers gap +					-0.02	
					(0.02)	
Peers gap -					-0.04	
					(0.03)	
Employ gap +						-0.001**
						(0.0003)
Employ gap -						-0.002**
						(0.001)
Constant	0.63**	0.60**	0.63**	0.82***	0.62**	0.64***
	(0.29)	(0.28)	(0.30)	(0.30)	(0.29)	(0.23)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,525	2,525	2,525	2,525	2,525	3,614
R <sup>2</sup>	0.02	0.02	0.03	0.02	0.02	0.02
Adjusted R <sup>2</sup>	-0.01	-0.01	-0.003	-0.01	-0.01	-0.002
Residual Std. Error	0.55	0.55	0.55	0.55	0.55	0.57
F Statistic	0.75	0.81	0.91	0.77	0.76	0.90

Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01  
Robust errors in parentheses

Table D.2: Panel results for political position, additional gaps

	(1)	(2)	(3)	(4)	(5)	(6)
Percent gap +	0.001 (0.0004)					
Percent gap -	0.0000 (0.0002)					
Time gap +		0.01 (0.004)				
Time gap -		0.002 (0.004)				
Relation gap +			0.01 (0.01)			
Relation gap -			0.01 (0.01)			
Liking gap +				0.01 (0.01)		
Liking gap -				0.02 (0.01)		
Peers gap +					-0.02 (0.01)	
Peers gap -					0.04* (0.02)	
Employ gap +						0.0002 (0.0002)
Employ gap -						-0.0001 (0.001)
Constant	-0.58*** (0.08)	-0.58*** (0.08)	-0.60*** (0.08)	-0.62*** (0.10)	-0.56*** (0.08)	-0.32** (0.15)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,525	2,525	2,525	2,525	2,525	3,614
R <sup>2</sup>	0.04	0.04	0.04	0.04	0.04	0.04
Adjusted R <sup>2</sup>	0.01	0.01	0.01	0.01	0.01	0.02
Residual Std. Error	0.37	0.37	0.37	0.37	0.37	0.37
F Statistic	1.48***	1.50***	1.49***	1.47***	1.50***	1.90***

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01  
Robust errors in parentheses

Table D.3: Panel analysis results without controls

	Ideology		Political position	
	(1)	(2)	(3)	(4)
Dollar gap (x100) +	-0.01** (0.004)		0.01*** (0.002)	
Dollar gap (x100) -	0.001 (0.004)		-0.001 (0.003)	
SD adj. gap +		-0.04** (0.02)		0.02 (0.01)
SD adj. gap -		0.0002 (0.03)		0.01 (0.02)
Constant	0.84*** (0.02)	0.84*** (0.02)	-0.40*** (0.01)	-0.39*** (0.01)
Controls	No	No	No	No
Observations	2,525	2,411	2,525	2,411
R <sup>2</sup>	0.004	0.003	0.003	0.001
Adjusted R <sup>2</sup>	0.003	0.002	0.002	0.001
Residual Std. Error	0.55	0.55	0.37	0.37
F Statistic	5.02***	3.70**	4.14**	1.77

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01  
Robust errors in parentheses

Table D.4: Panel results, symmetric specification

	Ideology		Political position	
	(1)	(2)	(3)	(4)
Dollar gap (x100)	-0.01* (0.003)		0.003** (0.001)	
SD adj. gap		-0.04** (0.02)		0.02** (0.01)
Constant	0.58** (0.29)	0.41*** (0.08)	-0.56*** (0.08)	-0.40*** (0.05)
Controls	Yes	Yes	Yes	Yes
Observations	2,525	2,411	2,525	2,411
R <sup>2</sup>	0.02	0.03	0.04	0.04
Adjusted R <sup>2</sup>	-0.005	0.003	0.01	0.01
Residual Std. Error	0.55	0.55	0.36	0.36
F Statistic	0.82	1.11	1.53***	1.62***

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01  
Robust errors in parentheses

Table D.5: Panel results with weights that account for attrition

	Ideology		Political position	
	(1)	(2)	(3)	(4)
Dollar gap (x100) +	-0.01** (0.004)		0.004** (0.002)	
Dollar gap (x100) -	-0.0002 (0.005)		0.0005 (0.004)	
SD adj. gap +		-0.06*** (0.02)		0.02 (0.01)
SD adj. gap -		0.01 (0.03)		0.02 (0.02)
Constant	0.57** (0.28)	0.44*** (0.08)	-0.54*** (0.08)	-0.40*** (0.05)
Controls	Yes	Yes	Yes	Yes
Weights	Yes	Yes	Yes	Yes
Observations	2,525	2,411	2,525	2,411
R <sup>2</sup>	0.03	0.03	0.05	0.04
Adjusted R <sup>2</sup>	-0.001	0.01	0.02	0.02
Residual Std. Error	0.56	0.55	0.36	0.36
F Statistic	0.96	1.31*	1.66***	1.70***

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01  
Robust errors in parentheses

Note: Weights are constructed based on a propensity score, which measures the probability of completing wave 2 in terms of the student's school type, HEI type, and HEI quality (divided into three categories, based on years of accreditation). Weights correspond to the inverse of the propensity scores and range from 0.28 to 2.33.

Table D.6: Panel results for ideology by treatment assignment

	Control		Treatment	
	(1)	(2)	(3)	(4)
Dollar gap (x100) +	-0.02*** (0.01)		-0.0004 (0.01)	
Dollar gap (x100) -	-0.004 (0.01)		-0.004 (0.01)	
SD adj. gap +		-0.10** (0.04)		-0.04 (0.03)
SD adj. gap -		-0.02 (0.05)		0.004 (0.05)
Constant	1.39*** (0.15)	1.70*** (0.23)	0.33*** (0.12)	0.34*** (0.12)
Controls	Yes	Yes	Yes	Yes
Observations	895	868	954	926
R <sup>2</sup>	0.07	0.06	0.08	0.09
Adjusted R <sup>2</sup>	0.002	0.0003	0.02	0.02
Residual Std. Error	0.54	0.55	0.56	0.56
F Statistic	1.03	1.01	1.26*	1.39**

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01  
Robust errors in parentheses

Table D.7: Panel results for components of the political position index

	Excluding support for incumbent		Support for incumbent	
	(1)	(2)	(3)	(4)
Dollar gap (x100) +	0.003 (0.002)		-0.02*** (0.005)	
Dollar gap (x100) -	0.0001 (0.003)		0.001 (0.01)	
SD adj. gap +		0.02 (0.01)		-0.06** (0.03)
SD adj. gap -		0.01 (0.02)		-0.07 (0.06)
Constant	-0.09 (0.10)	-0.09* (0.05)	1.49*** (0.27)	0.37*** (0.13)
Controls	Yes	Yes	Yes	Yes
Observations	2,525	2,411	2,525	2,411
R <sup>2</sup>	0.03	0.03	0.05	0.04
Adjusted R <sup>2</sup>	0.01	0.01	0.02	0.02
Residual Std. Error	0.37	0.37	1.05	1.04
F Statistic	1.19	1.25*	1.82***	1.82***

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01  
Robust errors in parentheses

Table D.8: Panel results for agreement with "Every person who is willing to work has plenty of opportunities to succeed" (standardized)

	(1)	(2)
Dollar gap (x100) +	-0.01*** (0.01)	
Dollar gap (x100) -	0.001 (0.01)	
SD adj. gap +		-0.06* (0.03)
SD adj. gap -		-0.02 (0.05)
Constant	-0.23 (0.40)	-0.31** (0.14)
Controls	Yes	Yes
Observations	2,525	2,411
R <sup>2</sup>	0.03	0.03
Adjusted R <sup>2</sup>	0.003	0.003
Residual Std. Error	0.97	0.97
F Statistic	1.11	1.13

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01  
Robust errors in parentheses