How morality and efficiency shape public support for minimum wages☆

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ABSTRACT

We use a survey-based experiment to examine public support for minimum wages. To start, we elicit respondents moral assessments of two labor market systems: one with a minimum wage and one without. We find that gender and political affiliation are the strongest predictors of moral assessments, where men and Republicans find the lack of a minimum wage less problematic. Next, we present four pairs of hypothetical employment outcomes and ask respondents to "vote" for their preferred system. Estimating the trade-off between moral attitudes and unemployment, we find the average respondent is willing to tolerate a large increase in unemployment, 4.7 percentage points, before voting against the minimum wage system. Our point estimates, however, mask considerable polarization: 42% always choose the minimum wage system and 27% always choose the no minimum wage system. Overall, Republicans are 14.5 percentage points less likely to choose the minimum wage system, though they exhibit little difference in willingness to tolerate additional unemployment. Notably, racial and gender equity considerations matter. The average respondent is almost 20 percentage points less likely to choose the minimum wage system when told minorities and females are disproportionately affected. Finally, the average respondent is 7 percentage points less likely to support a system featuring a minimum wage of $15 relative to $10.10 or $7.25, all else equal, suggesting that support for minimum wages may not be driven by a desire to maximize aggregate income for low-wage workers.

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1. Introduction

Public and political discussion of minimum wages is often normative, and is concerned with issues of fairness, equity, right versus wrong, exploitation, dignity, and "living" wages. For example, former President Obama remarked in a press conference in April 2014, "[i]n fact, about three in four Americans support raising the minimum wage [because] we believe

that in the wealthiest nation on Earth, nobody who works full-time should ever have to raise a family in poverty."[1] This is corroborated by surveys such as those conducted by the Pew Research Institute, who found in 2015 that support for a $10.10 federal minimum wage was as high as 73%.[2]

In contrast, economic research on minimum wages focuses on how minimum wages affect employment outcomes. For example, Card and Krueger (1994) find that minimum wages were associated with little to no negative employment effects when comparing fast-food restaurants on either side of the Pennsylvania and New Jersey border shortly after New Jersey raised its minimum wage. Card and Krueger's findings have been supported by the work of Card (1992), Addison et al. (2009), Dube et al. (2010), Allegretto et al. (2011), Cengiz et al. (2019), Harasztosi and Lindner (2019), Ashenfelter and Jurajda (2021), Cengiz et al. (2021), and more. A competing strand of research finds that minimum wages harm certain groups, including younger workers (see for example: Neumark and Wascher, 2000, Neumark and Wascher, 2004, Neumark and Wascher, 2007, Neumark et al., 2014, Neumark and Shirley, 2022). Sabia and Burkhauser (2010), Meer and West (2016), Clemens and Wither (2019), Kreiner et al. (2020), Gopalan et al. (2021), Powell (2022), and Jardim et al. (forthcoming) also find negative effects of increased minimum wages on employment.

Regardless of the findings, economic research on minimum wages largely focuses on labor market consequences, while such consequences seem to be only a minor component of the public and political discourse surrounding minimum wages. To address the apparent gap in discourse between economists and the general public, we conduct an experimental investigation into the nature of Americans' preferences on minimum wages. In particular, we design and implement a survey-based randomized experiment with 2219 Americans to study how morality, employment consequences, wage levels, and equity considerations shape respondents' attitudes toward minimum wages.[3]

Our work is inspired by, and contributes to, the literature in which surveys and experiments are used to elicit social preferences with respect to income distribution, redistribution, taxation, and kidney shortages (e.g., Kuziemko et al., 2015, Elias et al., 2019, Fisman et al., 2020, Stantcheva, 2020, and Fisman et al., 2021). Methodologically, we draw particularly strong inspiration from Elias et al. (2019) who use a similar experimental approach to estimate the willingness of the public to allow payments to kidney donors. In their experiment, participants are randomly assigned to hypothetical alternative systems varying by compensation levels ($30,000 or $100,000), sources of compensation (public or private), cash versus non-cash payment, and hypothetical transplant gains. Participants are then are asked to choose whether they prefer the hypothetical proposal over the current system (i.e., $0 payments). To examine whether attitudes toward paying donors have moral roots, the authors also ask participants to express their moral judgments about both the current system and the hypothetical payment system.

In our experiment, respondents encounter two hypothetical labor market systems: one with a minimum wage (of $7.25, $10.10, or $15, assigned randomly) and one without.[4] Respondents assess these two systems, using a 0 to 100 scale, on several moral dimensions including the degree to which they view the system as unfair, exploitative, or undignified. After respondents assess the two systems, we then present them with four pairs of hypothetical employment consequences where the disemployment effect of the minimum wage, relative to the system without a minimum wage, ranges from zero to eight percentage points.[5] Informed by pretests, we deemed this (perhaps implausibly) large range of disemployment effects necessary to generate sufficient variation in respondents' choices. Alongside the unemployment numbers for each system, some respondents are told that unemployment disproportionately affects racial minorities and women, others are told that unemployment is proportionate across groups, and the remainder are given no information about the distribution of unemployment. We then ask respondents to indicate their preferred system within each pair.

In designing and implementing the survey, we first completed two rounds of pretests to (a) ensure the survey instrument was working as intended, and (b) to determine whether the chosen parameters would generate sufficient variation and statistical power. The pretests and final survey instrument were constructed in Qualtrics and administered via Amazon's mTurk service. To combat concerns of inattention, the use of bots, and other issues leading to problematic survey responses, we built in several attention checks to help us identify and remove internally inconsistent and unreliable respondents from our estimation sample (roughly 13% of the full sample). To lend support to the external validity of our findings, we introduce consequentiality by emphasizing our intention to publicize our findings, and asking respondents to commit to carefully reading and providing honest answers to the survey questions. Moreover, during the survey, we remind respondents of our intention to publicize our findings and ask them whether they think policy-makers *should* be interested in our findings. Over 83% indicated yes, suggesting that the vast majority of respondents felt they provided thoughtful and truthful responses. We discuss our pretests, attention checks, and survey instrument in greater detail in the sections to follow.[6]

Relative to a labor market system featuring a minimum wage, we find that respondents assess a labor market system without a minimum wage as being significantly less fair to workers, more exploitative, and more undignified. When estimating associations between moral assessments and demographic characteristics, political affiliation and gender stand out.

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[1] See https://www.obamawhitehouse.archives.gov/the-press-office/2014/04/30/remarks-president-raising-minimum-wage.

[2] At the time of the survey, the federal minimum wage was $7.25. For more on the findings of the survey, see http://www.people-press.org/2014/01/23/most-see-inequality-growing-but-partisans-differ-over-solutions/.

[3] Lennon et al. (2019) provides an abbreviated and non-peer-reviewed overview of our findings.

[4] University of Louisville IRB Protocol 18.0002, approved September 5, 2018.

[5] Half of the respondents are given a range of zero to six percentage points, and the other half are given a range of two to eight.

[6] The survey experiment remains available to complete at http://www.louisville.az1.qualtrics.com/jfe/form/SV_39Keupyg3Vnqj49.

Females and those who identify as Democrats view the system without a minimum wage as more problematic, relative to males, Republicans, and independents. We also explore the relationship between respondents' relative assessments of each system and their home state's minimum wage and Economic Freedom Index value (provided by the Fraser Institute), but find little to no convincing evidence of a significant association.[7]

Turning to the trade-off between morality and employment consequences, our estimates imply that the average respondent is willing to tolerate up to 4.65 percentage points of additional unemployment before they would vote against the minimum wage system. However, focusing on the average respondent masks considerable polarization; 41.5% of respondents always vote for the minimum wage system, while 27.1% of respondents always vote for the system without a minimum wage. Notably, Elias et al. (2019) find very similar polarization as us in their setting: 46% support paying donors at all levels of transplant gains, while 21% always oppose paying donors.

Highlighting that minimum wages are a morally-charged issue, respondents' choices in our experimental setup are strongly related to their moral assessments of the two systems. Compared to all other respondents, those who always select the system without a minimum wage assess that system as 41% less morally problematic. Perhaps unsurprisingly, then, we also find that political identity plays a significant role in respondents' choices. All else equal, Republicans are 14.5 percentage points less likely than Democrats to choose the minimum wage, though they exhibit little to no difference in willingness to tolerate additional unemployment. Those who identify as neither Republican nor Democrat are 8.5 percentage points less likely than Democrats to choose the minimum wage, and also exhibit little to no difference in willingness to tolerate additional unemployment.

Interestingly, our findings suggest that support for minimum wages may not be driven by a desire to maximize aggregate income for workers. That is, we find that respondents randomly assigned to consider a system featuring a minimum wage of $15 are 7 percentage points less likely to support the minimum wage system, relative to those assigned $10.10 or $7.25, holding employment levels and all else constant. Given 68.6% of our respondents never change their system choice regardless of employment effects, and the fact that those who do switch require an implausibly large 4.65 percentage point employment gain (on average), our findings suggest that appeals to the public based on income and employment effects (or the lack thereof) may do little to sway public opinion.

On the other hand, we find that respondents are relatively sensitive to disparate effects of minimum wages, at least in terms of racial and gender equity. For example, respondents are almost 20 percentage points less likely to support the minimum wage system when told that females and racial minorities would be disproportionately affected, relative to respondents who receive no information on the identity of those affected by unemployment. In contrast, when respondents are told the effects are distributed evenly, there is no observable difference in support for minimum wages. These findings suggest that, to the extent that empirical research finds that minimum wages disproportionately harm already-disadvantaged groups, sharing information about such consequences with the public *would* likely influence public support.

Overall, the lack of focus on employment consequences in the public discourse may reflect gaps in economic education. This possibility is consistent with Mishagina and Montmarquette (2021), who examine how beliefs impact support for a minimum wage increase in Quebec. While the authors find that respondents' preferences toward a proposed minimum wage increase are consistent with their own self-interest, social preferences, and beliefs about the policy's consequences, the authors also find that beliefs about outcomes depend on respondents' knowledge of the minimum wage and economic literacy. On the other hand, it is also possible that public support for minimum wage legislation among many individuals is deontological in nature: for these individuals there is something morally impermissible about low wages. If so, consequentialist arguments focused on the effects of minimum wages will be ineffective. Social scientists have acknowledged these kinds of deontological preferences when discussing the economics of repugnance. Examples include sexual encounters (Fiske and Tetlock, 1997), price-gouging (Roth, 2008; Holz et al., 2020), and human organs (Elias et al., 2019). In addition to contributing to this literature on morally-charged transactions, our work contributes to the literature in economics that examines how fairness, religious beliefs, political ideology, repugnance, identity, and dignity influence decisions. See, for example, Akerlof and Kranton (2000), Bénabou and Tirole (2009), Bénabou and Tirole (2011), Bénabou et al. (2018), Benjamin et al. (2012), Benjamin et al. (2016), and Bursztyn et al. (2016).

In Section 2 we describe our choice experiment, attention checks, and other features relevant to experimental validity. In Section 3, we describe the data we collect in greater detail, including an analysis of how demographic characteristics relate to individuals' moral views. Section 4 describes our main findings. In Section 5, we report the results of sensitivity and heterogeneity analyses. In Section 6, we conclude.

2. The choice experiment

We implement our choice experiment in Qualtrics while recruiting experiment participants using Amazon's mTurk platform. On this platform, "requesters" can pay people to perform relatively short human intelligence tasks (HITs). These tasks include data entry, audio transcription, and so on. The platform is regularly used for economics and marketing surveys and experiments. We restrict participation to U.S. residents aged 18 or older.

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[7] See https://www.fraserinstitute.org/economic-freedom/dataset for more on the Economic Freedom Index.

Table 1

Description of Alternative Systems.

System	Description to Participants
System A	This system features a minimum wage of $X per hour worked. This minimum applies in all 50 U.S. states and employers must pay their employees at least $X per hour. Any employer who pays any worker a wage below $X would be guilty of a federal crime under the Fair Labor Standards Act.
System B	The federal government abolishes all minimum wages. For the purposes of this survey, please assume that this law would apply equally in all 50 U.S. states and would override existing laws in all states. That is, there would be no minimum wage law anywhere in the United States. Workers and employers would negotiate hourly wages on a case-by-case and person-by-person basis. All wage agreements that workers and employers agree to are completely legal.

In this table, we report the labor market systems described to participants. We set $X to be $7.25, $10.10, or $15 with probabilities of 20%, 40%, and 40% respectively. See Table 2 for more info on assignment to treatment conditions.

As mentioned earlier, our experimental design is inspired by Elias et al. (2019), who examine the extent to which individuals would be willing to trade off their moral objections in order to tolerate payments to kidney donors. They present private or public (and cash versus non-cash) payments as alternative options for organizing the market for kidneys, and then elicit whether each system is viewed as fair, exploitative, or coercive to kidney donors and recipients. Then, they present participants with hypothetical outcomes describing how many kidneys would be procured and ask survey participants to "vote" for their preferred option (the current "no payment" system is also an option).

The approach developed by Elias et al. (2019) appears to be well-suited to analyze the public's views on a wide range of controversial market exchanges. Thus, we apply a modified version of their design to examine the extent to which paying workers less than a specified minimum wage is viewed as morally problematic, as well as the extent to which individuals trade off moral concerns with employment consequences. While Elias et al. relax the existing price ceiling to allow the kidney market to move toward an efficient outcome (i.e., more kidney transplants), in our setting we relax the price floor (minimum wage) to potentially increase efficiency (reduce unemployment). The simplest way to explain this to participants is to say the federal minimum wage is eliminated. Therefore, our experiment compares two systems: one with a minimum wage (denoted System A) and one without (denoted System B). The next subsection provides the details of the experimental procedure.

2.1. Experimental procedure

We fielded our experiment by posting a "Human Intelligence Task" (HIT) on the mTurk system.[8] The HIT required mTurk workers to click on a link to a Qualtrics survey containing the choice experiment.[9] The first screen they see explains their rights as a research subject and allows them to provide informed consent. Then, the experiment proceeds in four stages.

In stage one, we present the options for organizing the labor market to participants. As part of this, but prior to observing the alternative systems, we present participants with some background information on what a minimum wage is, what it does, and who it typically applies to. We also explain how it varies across the United States. In addition, to help encourage truthful responses, we advise participants that we intend to publish our findings. The descriptions of System A (minimum wage) and System B (no minimum wage) are summarized in Table 1. The complete text of the experiment is available in Appendix B.

Notice that the value for the minimum wage that respondents observed is denoted as $X in Table 1. This is because we assign each respondent to one of three minimum wage levels: $7.25, $10.10, or $15 with probabilities of 20%, 40%, and 40%. In addition, we set System A (minimum wage of $X) unemployment to be 8 percent or 10 percent. In Section 2.5 below, we explain our choice of parameters and how they were informed by pre-testing.

We then ask participants to assess each system on five dimensions: exploitation, unfairness to workers, unfairness to employers, human dignity, and subjective values.[10] As an example, when asked about exploitation, the statement respondents observe is "[t]his system exploits workers." They express their agreement or disagreement using a sliding scale that ranges from zero (strongly disagree) to 100 (strongly agree).

In stage two of the experiment, we ask respondents to choose their preferred system from each of four pairs of hypothetical employment consequences for each system. To ease interpretation, we ask respondents to focus on outcomes in a representative U.S. city with a labor force of 100,000 adults. We present unemployment for each system as "the number of people who are unable to find work." For a given respondent, the number of people unable to find work under System A (minimum wage) is either 8 percent (8000 people) or 10 percent (10,000 people) in all four scenarios. For System B (no minimum wage), the number "unable to find work" across the four scenarios, in order, is 8, 6, 4, and 2 percent.[11]

Note that, to study whether the distribution of disemployment effects by race and gender matters, we further assign each respondent to one of three potential information treatments effects. In particular, we tell one-sixth of our respondents

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[8] We deployed the survey experiment on September 7, 2018.

[9] They return at the end of the survey to input a unique code to receive their payment of $1.

[10] We randomly varied the order of presentation of each system.

[11] Our pretests, discussed in Section 2.5, indicated that we would need relatively large employment differences to generate sufficient variation.

Table 2
Summary of Assignment to Treatment Conditions.

Minimum Wage Observed	$7.25	$10.10	$15.00	All
Unreliable Responses	40	86	100	226
Duplicate IP Addresses	24	40	38	102
Valid Responses	446	880	893	2219
Unemployment Treatments				
System A Unemployment = 8000	225	418	401	1044
System A Unemployment = 10,000	197	428	454	1079
No Efficiency/Employment Info Group	24	34	38	96
Race and Gender Information Treatments				
Did not Observe Race/Gender Info	240	442	419	1101
Observed Race/Gender Info	206	438	474	1118
Observed Unequal Race/Gender Outcomes	135	296	322	753

Note: Each respondent is assigned one of three minimum wage levels, one of two levels for unemployment in System A (minimum wage), and to one of three potential information treatments regarding the distribution of unemployment by race and gender (no information, equal effects, unequal effects). The table reports on the distribution of respondents to the eighteen potential treatment conditions within the experiment. The table also highlights how many responses are deemed reliable (these respondents passed our built-in attention checks) and how many had to be removed from the sample.

that females and minorities comprise 45% and 40% of the labor force in the experiment's fictional city, and that females and minorities comprise 45% and 40% of those unable to find work under both System A and System B ("equal effects"). We tell one-third of respondents that females and minorities comprise 75% and 70% of those unable to find work under System A, but only 45% and 40% under System B ("unequal effects"). The remainder observe no information on the distribution of employment effects by race and gender. In sum, these parameterizations ensure that each participant experiences only one of 18 potential treatment conditions. Table 2 breaks down the frequency of assignment to each condition.

Finally, toward the end of the survey, respondents are asked to provide demographic information and to consider a moral dilemma in a medical setting. Specifically, we ask respondents if a fictional doctor should inject two substances, one of which is a vaccine and the other deadly poison, into two fictional patients. Both patients have contracted a deadly virus and will die regardless of the doctor's actions. However, by injecting the substances, the doctor will learn which substance is the vaccine (the patient who gets the poison will die immediately). The doctor will then be able to replicate the vaccine and save many from contracting the deadly virus in the first place. Those who agree that the vaccine should be injected are supposedly utilitarian, which can help us identify those who have consequentialist views on ethical issues more broadly.

In the following subsections, we discuss additional features and details of our experiment, including those designed to elicit thoughtful and truthful responses and filter out the inconsistent or unreliable responses.

2.2. Attention checks

We built several attention checks into the survey. We consider two of these to be relatively strong and the rest to be somewhat weaker. The stronger checks ask respondents (1) to recall if they ever chose each system and (2) if they would never choose either of the systems. They fail the first check if they cannot accurately recall if they chose System A or System B across the various choice scenarios. They fail the second check if they claim they would never choose one of the systems but actually did choose one of those systems in at least one choice scenario. In the estimates in the paper, we eliminate all those who fails both of these checks as well as duplicates based on respondents' IP address, leaving us with 2219 responses (see Table 2).

Appendix Table A.1 reports the "pass" and "fail" rate for each attention check for the remaining 2219 responses. The stronger checks on attention are presented first. Among those who did not fail both of those reliability checks, there remains a small minority who failed one of them. However we keep these responses in our data because many of those who fail one of the strong checks do not fail any of the other weaker three tests. In any case, our findings are very similar if we exclude those who fail just one of those strong checks. Moreover, including those who fail both of our stronger checks does little to alter the estimates.

The third reliability check in the table examines if participants chose the system they assessed to be most "desirable." Given the loaded and subjective meaning of that term, we do not consider "failing" this check to be a major concern. A person could consider System A as "most desirable" but choose System B due to its employment consequences.

Reliability check number four examines respondents' answers to our "switching" question. In the survey, towards the end, our "switching" question asks respondents to choose (on a sliding scale) the level of unemployment that would be required to get them to choose System B. A respondent fails this check if their answer implies that they should have chose System B in at least one choice scenario but did not; 96.2% of respondents passed this "test."

The fifth reliability check examines inconsistent preferences. There are four binary choices for each participant, leading to 16 combinations of choices. Eight of these 16 potential routes through the experiment reflect consistent preferences in the sense that the participant always answers the same choice in each scenario or switches from System A or B to the other,

only once. A respondent therefore fails this check if their responses do not respect monotonicity. For instance, a respondent who chooses A, then B, then A again is potentially unreliable. The data shows that 96.4% of respondents' choice patterns respect monotonicity.

2.3. Consequentiality

Toward the end of the survey, to examine the degree to which participants believe their responses matter, we remind participants of our intention to publicize our findings and ask respondents if policy makers *will* be interested in our findings and if they *should* be interested in these findings. Appendix Fig. A.1 provides the breakdown of respondents answers to those questions. It is clear that most respondents do not believe their voice will be heard. However, over 83% of respondents feel that their voice *should* be heard. These findings inspire further confidence in the reliability and truthfulness of our survey responses.

2.4. Time to complete survey

The average respondent took just over 12 min to complete the survey. The median respondent took 10 and a half minutes. The average time is inflated significantly by outliers in the right tail of the "time taken" distribution. For example, one respondent took over 2 h and 40 min to complete the survey. It is likely that this person did not spend that time focused on the survey. Indeed, given 25% of reliable survey respondents took less than 8 min to do the survey, we suspect that the time taken to do the survey is artificially inflated for reasons that are unrelated to the survey's length (such as interruptions or working on other short mTurk tasks). Finally, excluding those above the 95th percentile of the time distribution (a survey completion time of about 26 min) brings the median time to completion to 10 min and 7 s and the mean to 10 min and 55 s.

2.5. Pre-testing

Before finalizing and implementing our experiment, we completed a round of pretesting in August of 2018. To be precise, we did two pretests, one involved gathering and paying for 50 responses to check our survey instrument was working as intended. Then, we gathered 250 responses to estimate the effect size of interest and to understand if the parameters would generate enough variation in the data. None of the data gathered in the pretest phase is presented in the main body of the paper. The pretest version of the survey allowed the unemployment rate to vary randomly in System A between 4%, 6%, 8% and 10%. For System B, the rate varied between 4% and 6% (presented to participants as X out of 100,000 who want to work are unable to find a job). We presented participants with three choice scenarios where employment effects were drawn randomly. From this, we found that in order to overcome the mean repugnance between System A and System B, respondents needed about a difference in employment of roughly 5000 workers (i.e., a 5 percentage point difference).

With this setup, about 15% of respondents in the pretest faced three choice scenarios where all three were basically redundant. That is, due to the randomization they never observed a scenario where System A was "worse" than System B.[12] In addition, many experimental participants observed three situations where System B was significantly more efficient than System A. To avoid these extremes, we altered the survey design to the parameters discussed earlier in this section. These changes ensured that every respondent observes a scenario where the employment difference between System A and System B is small and one where it is not.

3. Data

We collected 2534 responses to our survey. However, we had concerns about reliability for about 8% of respondents due to attention check failure (226 responses) and duplicate IP addresses (102 responses).[13] We exclude these respondents from our main estimates, leaving us with 2219 acceptable responses. Note that $2534 - 226 - 102 \neq 2219$; there is some overlap between those who provide unreliable responses and duplicate IP addresses.[14]

In addition, we separate 107 respondents from the estimation sample because we randomly assign them to experience one choice scenario with no information on employment. When this occurs it is always as the first scenario the respondent observes. We do this to give us a baseline distribution of support for the two systems, and also as an additional sanity check to see whether support for each system is different when respondents do not observe employment outcomes. Of these 107 responses, we deem 96 to be acceptable, leaving us with 2123 respondents in the main estimation sample. Of the 96 who do not observe employment consequences at all, 88.5% choose the system with a minimum wage (System A). In contrast, respondents chose a system with a minimum wage in 55.5% of situations where hypothetical employment consequences are presented.

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[12] There are eight possible pairings, unemployment in System B was the same or worse than System A in three of these eight pairings.

[13] We exclude those whose internet protocol address appears more than once in our data (102 responses) because it suggests that one person is using several mTurk accounts to complete our survey multiple times.

[14] See Section 2.2 and Appendix Table A.1 for more on the reliability of responses.

Table 3
Selected Demographic Characteristics of Experiment Participants, by Political Identity.

		Democrat	Republican	Neither	All
Count		1095	614	510	2219
Demographics	Age	36.2	39.3	35.8	36.9
	Std. Dev.	11.4	12.8	11.1	11.8
	% Male	45.2%	52.1%	51.1%	48.5%
	White	71.8%	87.0%	68.6%	75.3%
	Black	12.9%	3.1%	10.8%	9.7%
	Other	15.3%	9.9%	20.6%	15.1%
Politics	Liberal-Conservative Scale	1.9	4.0	2.8	2.7
		Note: 1= Strongly Liberal and 5 = Strong Conservative			
Self-Reported Income	<$20,000	11.3%	10.4%	17.0%	12.3%
	$20,000 to $60,000	50.5%	45.5%	49.2%	48.8%
	$60,000 to $100,000	25.3%	27.0%	24.4%	25.6%
	$100,000 or more	12.9%	17.0%	9.4%	13.3%
Education	Less than High School	0.5%	0.2%	0.8%	0.5%
	High School or Some College	41.6%	44.0%	52.55%	44.8%
	Bachelor's Degree	41.6%	38.6%	34.3%	39.1%
	Graduate Degree	16.4%	17.3%	12.4%	15.7%
Religion	Christian	39.3%	75.4%	36.3%	48.6%
	Other	8.9%	3.4%	9.2%	7.8%
	Atheist/Agnostic/No Affiliation	51.9%	21.2%	54.5%	43.7%
Morality Questions	Some Values are Sacred	4.4	4.3	4.4	4.4
	Suffering for an Ethical Principle is Wrong	3.9	3.5	3.7	3.7
	Freedom from Interference	3.5	3.4	3.6	3.5
	Vaccine Injection	3.5	3.5	3.4	3.5
		Note: 1= Strongly Disagree and 5 = Strongly Agree			
Min Wage Experience	Currently Works for Min Wage	7.5%	5.9%	14.0%	8.9%
	Ever Worked for Min Wage	70.8%	69.8%	65.6%	69.1%
	Never Worked for Min Wage	21.7%	24.3%	20.4%	22.0%
Location	Number of States (incl PR and DC)	51	48	49	52
	Most Common	CA (13.3%)	CA (11.6%)	CA (14.9%)	CA (13.2%)
Repugnance	Average for System A	26.8	32.2	31.3	29.3
	Average for System B	80.3	59.5	69.6	72.1

Note: Data refers to 2219 valid responses. See Table 2, Section 2.2, and Appendix Table A.1 for more on what is considered a valid response.

3.1. Sample characteristics

Table 3 reports on the demographic characteristics we gathered for the 2219 participants with valid responses. As we have a convenience participant group, they are not representative of the U.S. population. In particular, the table illustrates that the sample is predominantly Democratic-leaning. In addition, while there are respondents from every state, there is a mild west coast bias in the sample. Part of this is due to population: California appears most frequently but we should expect this given California is the U.S.'s most populous state. However, it is over-represented in our data (by about a 1.1 to 1 ratio). States such as Oregon (1.77 to 1) and Nevada (1.47 to 1) are also over-represented relative to their population. We suspect that this pattern arises because we began gathering our data late in the evening on September 7th, 2018. We expected the data gathering process to take 24 to 48 h and, therefore, the starting time to matter little to the composition of our sample. To our surprise, the data gathering process took just under 12 h. For Californians, and others on the west coast, this time period was roughly 5pm to 5am. For east coast mTurkers, it was 8pm to 8am. Without knowing in advance how long it will take to gather a given amount of data, it is unclear when the "ideal" time to begin data collection would be to have a more geographically balanced representation. For a complete breakdown of the geographic representation of respondents relative to the U.S. as a whole, see Appendix Fig. A.2. In our results discussion to follow, we present sensitivity analyses that control for state fixed effects and political affiliation to address these kinds of sample imbalances.

3.2. Moral assessments

Fig. 1 illustrates the assessment of each system on the five dimensions of morality described earlier. As a reminder, each respondent assessed each aspect of each system on a scale from zero to 100. The order in which respondents viewed the two alternative systems is randomized.[15] We can see that respondents consider both systems to be relatively fair to employers. On the other four measures, they assess System A to be fairer to workers, less exploitative, more dignified,

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[15] Unfortunately, we did not set the Qualtrics system to record the order of presentation for this randomization.

System Ratings on Several Dimensions
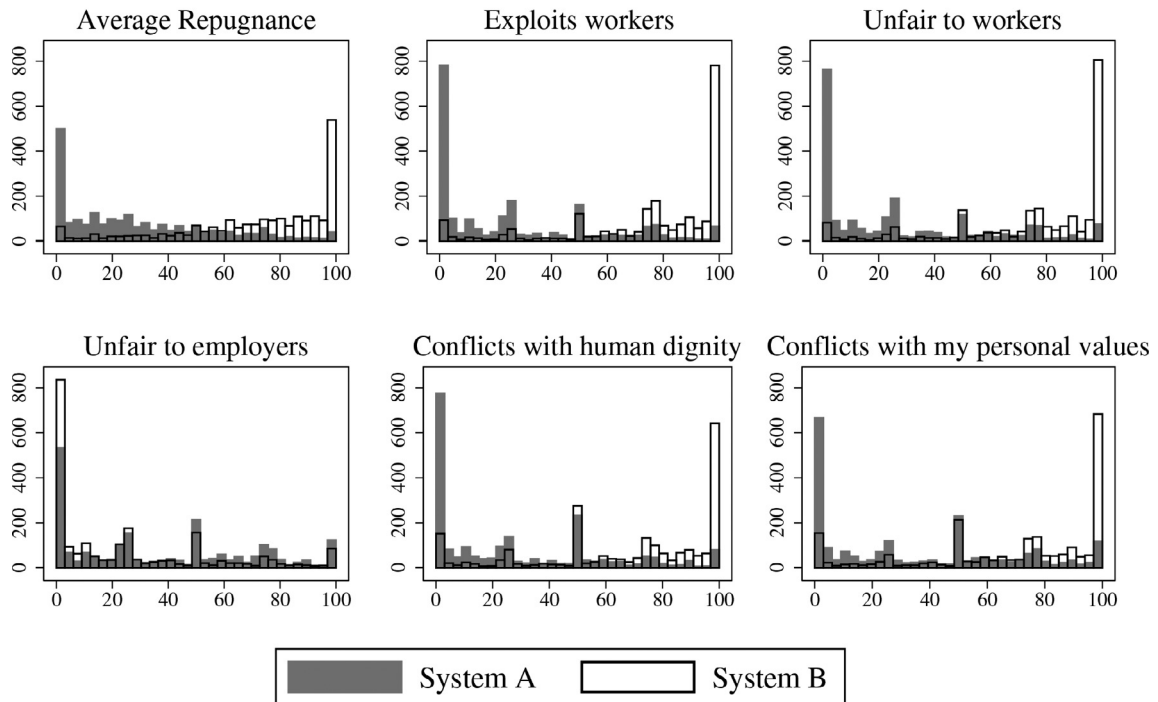## 100=Strongly Agree

Fig. 1. Ratings of System A (minimum wage of $X) and System B (no minimum wage) on Moral Dimensions.

and more concordant with their personal values. For example, almost 800 of the 2219 respondents viewed System A as completely fair to workers and not exploitative (they stated "strongly disagree" with the statements "[t]his system is unfair to workers" and "[t]his system exploits workers"). In contrast, about the same number of respondents viewed System B as maximally unfair and exploitative. Because respondents' assessments are similar for the fairness to workers, exploitation, dignity, and personal values questions, we use their average (29.2 out of 100 for System A, and 72.1 out of 100 for System B) as an overall "repugnance" rating (borrowing the term from Roth, 2008 and Elias et al., 2019) for each system and present that average as a the upper leftmost subfigure in Fig. 1.[16] Given the similarity of the ratings on each dimension, it should be clear that our findings are little different if we use any one of these four measures in place of a four-component average.

In Appendix Table A.2, we present a complete breakdown of how each system is viewed, particularly as a function of the minimum wage observed ($7.25, $10.10, or $15) and self-reported political party affiliation. There, we see the assessment of each system is responsive to the minimum wage observed with the system with a $15 minimum being markedly less problematic in four of the five moral dimensions. The exception to the pattern is in how higher minimum wages are unfair to employers. The primary comparison of interest here is that of System A (minimum wage) to System B (no minimum wage); even a system with a $7.25 minimum wage is viewed very differently to one with no minimum wage. Turning to the second panel of the table, it appears that respondents who see themselves as closer to the Democratic Party drive much of the difference in assessments between the two systems. That said, Republicans also tend to assess System B (relative to System A) as more exploitative, unfair to workers, disrespectful to human dignity, and in conflict with their personal values. The responses for those who claim to be affiliated with neither party tend to lie in the middle of Democrats and Republicans. These patterns provide additional confidence in the reliability of respondents' answers to the survey's demographic and choice questions.

3.3. Explaining differences in repugnance ratings

In Table 4, to explore why respondents assess the two systems differently, we examine how the difference in respondents' assessment of each system relates to demographic characteristics including race, gender, age, income, education, and political preferences. As part of this exercise we also relate respondents' assessments to their state's actual minimum wage at the

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[16] Because "unfair to employer" seems to be an outlier when considering respondents' ratings, we do not include it in the average repugnance rating.

Table 4
Repugnance Ratings and Respondent Characteristics.

	(1) Δ Repugnance	(2) Δ Repugnance	(3) Δ Repugnance	(4) Δ Repugnance	(5) Δ Repugnance	(6) Δ Repugnance
Age	0.0627	0.0655	0.0678	0.0673	0.0653	0.0592
	(0.0817)	(0.0819)	(0.0817)	(0.0817)	(0.0819)	(0.0818)
Male	-7.084***	-7.233***	-7.458***	-7.446***	-7.418***	-7.256***
	(1.732)	(1.732)	(1.737)	(1.736)	(1.734)	(1.731)
Asian	9.022	9.464	8.931	8.922	9.518	9.939
	(7.035)	(7.001)	(7.046)	(7.050)	(6.943)	(6.949)
Black	1.535	0.836	1.984	2.092	1.510	1.185
	(7.273)	(7.261)	(7.308)	(7.301)	(7.210)	(7.214)
White	10.01	9.565	9.924	9.974	9.987	9.664
	(6.541)	(6.512)	(6.562)	(6.554)	(6.448)	(6.449)
Some College	13.46	13.62	13.25	13.21	13.54	13.56
	(11.22)	(11.37)	(11.24)	(11.28)	(11.30)	(11.75)
Bachelor's Degree	8.335	8.740	8.191	8.134	8.671	8.795
	(11.25)	(11.40)	(11.28)	(11.31)	(11.33)	(11.79)
Graduate Degree	5.820	6.105	5.803	5.775	6.205	6.428
	(11.35)	(11.49)	(11.37)	(11.40)	(11.42)	(11.87)
Income $20,000 to $60,000	0.893	0.607	0.709	0.730	0.760	0.780
	(2.956)	(2.968)	(2.964)	(2.966)	(2.977)	(2.974)
Income $60,000 to $100,000	2.754	2.566	2.744	2.768	2.708	2.867
	(3.188)	(3.198)	(3.199)	(3.199)	(3.211)	(3.208)
Income $100,000+	-0.549	-0.746	-0.685	-0.656	-0.681	-0.477
	(3.729)	(3.737)	(3.737)	(3.739)	(3.746)	(3.744)
No Political Affiliation	-16.11***	-16.43***	-16.57***	-16.56***	-16.64***	-16.69***
	(2.238)	(2.247)	(2.245)	(2.245)	(2.248)	(2.248)
Republican	-27.21***	-27.52***	-27.26***	-27.20***	-27.54***	-27.53***
	(2.027)	(2.038)	(2.039)	(2.036)	(2.039)	(2.037)
2018 State Minimum Wage		-0.811			-1.415**	-2.318***
		(0.525)			(0.715)	(0.840)
Overall Econ. Freedom Index Score			-0.0793		-1.507	
			(0.810)		(1.095)	
Labor Market Econ. Freedom Index Score				-0.357		-3.290**
				(0.862)		(1.372)
Observations	2072	2068	2063	2063	2063	2063

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 1% level. The dependent variable in each specification in the table is the difference in the average rating between the two labor market systems (we describe how we construct that average in Section 3.3). A positive coefficient implies that the characteristic is associated with the system without a minimum wage being relatively morally more offensive. We obtain state minimum wages for 2018 based on information from https://www.laborlawcenter.com/state-minimum-wage-rates/. We obtain Economic Freedom scores from the Fraser Institute. Note, the omitted category for race is Hispanic; for income, it is the group of respondents who earn less than $20,000; for education, it is those with a high school diploma or less; for political affiliation, it is those who identify as a Democrat.

time of the choice experiment and their state's Economic Freedom Index score (provided by the Fraser Institute), both overall and then specifically to the labor market.[17]

The dependent variable in each specification in Table 4 is the difference in the average rating between the two labor market systems (we describe how we construct that average earlier in this section). Specifically, ΔRepugnance is the difference between the average repugnance rating of the system without a minimum wage relative to the system with a minimum wage. Within such a set up, a positive coefficient implies that the system with no minimum wage is more morally offensive (i.e., the difference between the ratings of the two systems is "larger").

In the first column of the table, we see that differences in political affiliation and gender are associated with differences in respondents' assessments of each system. For example, men assess the systems more similarly than females, with the difference between their ratings being 7.1 points smaller than the difference for females, all else equal. We interpret this as meaning that men assess the system with no minimum wage as less morally problematic. When looking at political affiliation, we see that those who report no political affiliation and Republicans rate the two systems more similarly relative to those who identify as Democrats. In contrast, there is no statistically significant association between age, race, income, or education and respondents' assessments.

In the second column, we add the 2018 minimum wage for each respondents' state as a covariate, but we find that it is not strongly associated with respondents' assessments of the two systems. In the third and fourth columns, we add the 2018 Economic Freedom Index (EFI) scores for each respondent's state and then just a labor market specific freedom index

[17] The Fraser Institute assesses state's level of economic freedom using scores out of 10 in three categories: government spending, taxation, and labor market freedom. See https://www.fraserinstitute.org/economic-freedom/dataset for the scores for each state and more information about their methodology. We obtain information on state-level minimum wages for 2018 (the year of our experiment) from https://www.laborlawcenter.com/state-minimum-wage-rates/.
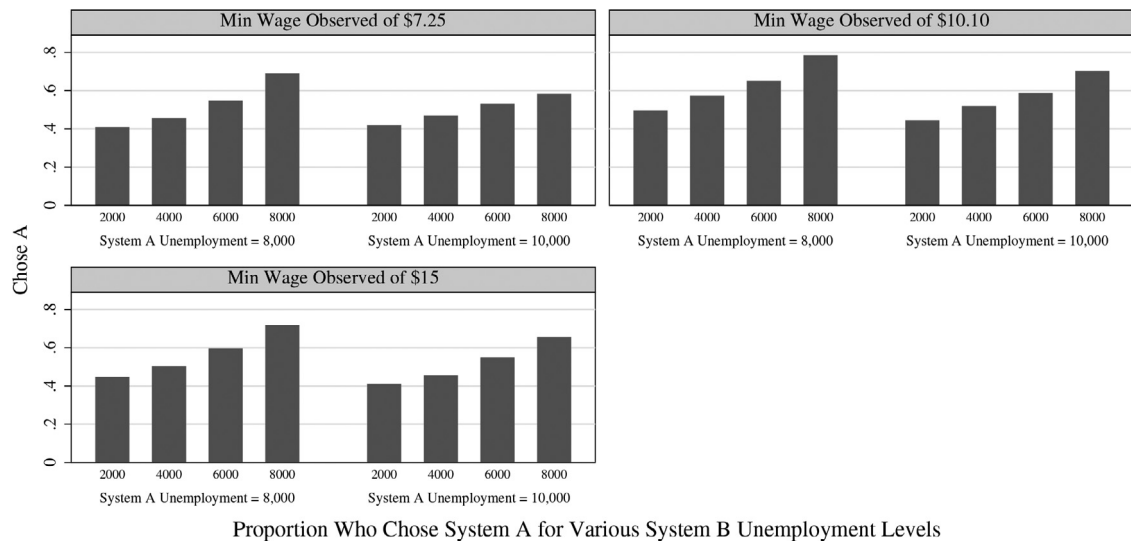
Proportion Who Chose System A for Various System B Unemployment Levels

Fig. 2. Choices in All Combinations of System A and B Unemployment Levels.

value. In each case, there is no strong association. For completeness, in the fifth and sixth columns, we include both the 2018 minimum wage and the overall EFI score and then the labor market specific freedom index scores. When we do so, we find that higher state-level minimum wages are now associated with respondents assessment of the two systems, with the effect statistically significant at the 5% level. To interpret the coefficient in column (5), the -1.415 coefficient means that the repugnance gap between the two systems closes by about 1.4 points for each $1 increase in a respondent's state minimum wage. Given that the state minimum wage is only statistically significantly associated with respondents' assessments of the two systems when we also include EFI scores, and given that the effect on respondents ratings is small even for relatively large minimum wage increases, we can conclude that one's actual state minimum wage does little to affect our experimental findings. Similarly, the association between labor market specific scores is only statistically significantly different from zero in a specification where we also include the state's 2018 minimum wage. Given these two variables are negatively correlated (largely because higher minimum wages contribute to lower EFI scores), we again conclude that the economic conditions in the state (as captured by EFI scores or the state's minimum wage) provide limited explanatory power for our respondents' assessments of the two systems.

3.4. Choice frequencies

Fig. 2 reports the pattern of choices across the different minimum wage treatments. In the figure, we see a clear pattern, System A (minimum wage) is chosen frequently (55.5% of the time, on average), but is generally less likely to be chosen when System A's unemployment is 10% (10,000 out of 100,000) and decreases as the difference in unemployment between the two systems increases. As a reminder, System B unemployment is 8000 in the first scenario and then 6000, 4000, and 2000 for the next three scenarios. The corresponding choice frequencies for System A in each scenario are 70.0%, 58.1%, 49.9% and 43.9%. These patterns suggest that at least some participants are responsive to the information presented to them.[18]

Interestingly, the level of the minimum wage appears to affect the frequency of choosing System A in a non-monotonic way. Specifically, the frequency of choosing System A is 64.0%, 53.8%, 46.2%, and 41.5% across the four scenarios for a minimum wage of $7.25 and 68.6%, 56.8%, 47.5%, and 42.3% for a minimum wage of $15. However, for any given combination of unemployment under Systems A and B, System A is more likely to be chosen when the minimum wage is $10.10 relative to when it is $7.25 or $15. Specifically, System A is chosen 74.4%, 61.5%, 54.3%, and 46.6% across the four scenarios. These patterns suggest that support for minimum wages cannot be explained only by a desire to maximize aggregate income for workers. If that were the case, we would simply expect a higher wage to be more attractive, all else equal.

3.5. Characteristics of switchers and non-Switchers

Interestingly, we find substantial polarization among respondents. For example, 41.5% of respondents always choose the minimum wage system (System A) and 27.1% always choose the system without the minimum wage (System B). In a similar fashion to Table 3, we present the demographic characteristics of switchers and non-switchers in Appendix Table A.3. One

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[18] Note that Appendix Table A.1 shows 96.4% of respondents made choices that respect monotonicity (that is, they did not switch back and forth between System A and B on multiple occasions).

Table 5
Main Estimates using Linear Probability Model.

	(1) P(Chose A)	(2) P(Chose A)	(3) P(Chose A)	(4) P(Chose A)	(5) P(Chose A)
Δ Unemployment Rate	-4.059***	-4.646***	-3.379***	-4.724***	-4.556***
	(0.195)	(0.252)	(0.438)	(0.266)	(0.493)
Δ Repugnance	-0.440***	-0.439***	-0.438***	-0.464***	-0.469***
	(0.0191)	(0.0267)	(0.0441)	(0.0254)	(0.0194)
System A = 10,000		0.617			0.486
		(1.937)			(1.887)
Δ Unemployment Rate × System A = 10,000		0.637*			0.795**
		(0.341)			(0.345)
Min Wage Observed = $10.10			0.448		0.413
			(2.940)		(2.807)
Min Wage Observed = $15			-7.848***		-7.124**
			(2.981)		(2.849)
Δ Unemployment Rate × $10.10			-0.843		-0.968*
			(0.538)		(0.532)
Δ Unemployment Rate × $15			-0.795		-0.961*
			(0.532)		(0.526)
Equal Race and Gender Effects				1.115	1.588
				(2.600)	(2.592)
Unequal Race and Gender Effects				-19.74***	-19.37***
				(2.355)	(2.347)
Δ Unemployment Rate × Equal RG				-0.0483	-0.0819
				(0.551)	(0.547)
Δ Unemployment Rate × Unequal RG				1.936***	1.941***
				(0.431)	(0.431)
No. of Choices	8492	8492	8492	8492	8492
No. of Respondents	2123	2123	2123	2123	2123

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 1% level. Standard errors are clustered at the respondent level.

thing that stands out is that dividing respondents by switcher and non-switcher status yields smaller differences in demographic and identity characteristics, relative to dividing respondents by political identity as we do in Table 3. For example, the average respondent who always chooses System A is more moderate on the self-rated liberal-conservative scale − 2.4, relative to 1.9 among those identifying as Democrats. For reference, this scale runs from 1 to 5, where 1 is strongly liberal and 5 is strongly conservative. Those who always choose System B are also more moderate on this scale − 3.2, relative to 4.0 among those identifying as Republicans. A similar pattern is observed with age, percentage of males, and race. A notable exception is in labor market experience, where the differences between those who always choose Systems A or B are larger (relative to Democrats versus Republicans) with respect to income levels and experience with minimum wage jobs.

4. Main findings

In this section, we examine the choices of our experimental participants in four scenarios where they observe varying employment effects and must choose between a system with a minimum wage and one without. In our regression estimates, we include the difference in repugnance scores between the two systems, which are gathered before they observe employment effects and make their choices, as an explanatory variable.

We present our findings as the coefficient estimates from a linear probability model (LPM).[19] The basic estimating equation takes the following form:

$$P(Chose\ A)_{ic} = \beta_0 + \beta_1 \Delta Repugnance_i + \beta_2 \Delta Unemployment\ Rate_{ic} + \Pi X_{it} + \epsilon_{ic}$$

In the estimating equation, $P(Chose\ A)_{ic}$ refers to respondent i's probability of choosing System A (minimum wage) in choice situation c and takes on the value of 100 when person i chooses System A in choice scenario c and a value of zero otherwise. The $\Delta Repugnance_i$ term reflects the difference between respondent i's moral assessment of System A and System B ($\Delta Repugnance_i = Assessment\ of\ System\ A_i - Assessment\ of\ System\ B_i$).[20] The $\Delta Unemployment_{ic}$ term reflects the percentage point difference in the unemployment rate between the systems in each choice scenario ($\Delta Unemployment_{ic} = Unemp.\ System\ A_{ic} - Unemp.\ System\ B_{ic}$). We also include controls, X_{it}, and an idiosyncratic error term ϵ_{ic}. With this setup, β_1 and β_2 represent percentage point changes in the probability of supporting System A (minimum wage) for each one unit difference in $\Delta Repugnance$ and $\Delta Unemployment$.

In the first column of Table 5, we present estimates from a specification without controls. We find that respondents' choices are strongly associated with their moral assessment of the two systems; the coefficient on the repugnance term

[19] The estimating equation is better-described as a modified linear probability model because our outcome variable takes on values of zero or one hundred, ensuring that our coefficients are percentage point changes.

[20] Note that this difference calculation is reversed from Section 3.3.

suggests that a one unit increase in $\Delta Repugnance_i$ is associated with a 0.44 percentage point reduction in the probability of choosing System A. The mean of $\Delta Repugnance_i$ is -42.92, suggesting that, all else equal, the average respondent is 18.88 percentage points (-42.92×-0.44) more likely to support a minimum wage. The coefficient associated with the unemployment term suggests that a one percentage point larger unemployment gap is associated with a 4.06 percentage point reduction in the probability of choosing System A. Thus, in thinking about the trade off between repugnance and efficiency (i.e., employment), our estimates imply that the average respondent requires a 4.65 percentage point (=18.88/4.06) reduction in unemployment to support a system without a minimum wage.

Subsequent columns in Table 5 interact the main effect of repugnance and unemployment with the experimental parameters to examine if and how these affect support for each system. Specifically, in the second column, we include an indicator for System A unemployment of 10,000. We also interact the indicator with $\Delta Repugnance_i$ (coefficient estimates not reported in the table) and $\Delta Unemployment_{ic}$. Notice that the main effect of $\Delta Repugnance_i$ is little different to the first column of estimates. While the coefficient on the indicator term is positive, the overall effect is a reduction in the probability of choosing System A of about 7.4 percentage points. The total effect consists of the sum of the coefficient on the indicator term plus the effect of the two additional percentage points of unemployment relative to System A unemployment of 8000 (that is, 0.617 - [2 × 4.646]+[2 × 0.637] = 7.4). The estimated coefficient on the *System A = 10, 000 × $\Delta Repugnance$* interaction term is small and statistically no different from zero. We therefore omit it from the table to economize on space (the same is true in subsequent specifications).

In the third column, we interact $\Delta Repugnance_i$ (again, coefficient estimates not reported in the table) and $\Delta Unemployment_{ic}$ with the level of minimum wage observed ($10.10 or $15). The associated estimates should be interpreted as relative to the omitted category, $7.25. Notice that System A appears to be 7.8 percentage points less likely to be chosen when the minimum wage is $15. This seems to conflict with the aggregate data presented in Fig. 2, where System A seems to be chosen slightly more often when the minimum wage is $15 versus when it is $7.25. The discrepancy can be explained by the fact that repugnance ratings are higher for the $7.25 minimum wage than the $15 minimum wage, but are held equal in the regression framework. When jointly accounting for the effect associated with the difference in repugnance between the two minimum wage levels (i.e., the lower repugnance rating of $15 increases the probability that System A is chosen), we obtain a similar pattern as seen in Fig. 2. See Section 3.2 and Appendix Table A.2 for more details on respondents' moral assessments of each system.

In the fourth column of Table 5, we examine the effect of providing information on the distribution of unemployment effects by race and gender relative to the composition of the labor force in the experiment's fictional "city." The estimates should be viewed as relative to "no information." The data suggests that choices are similar to the baseline (no information) if females and minorities are affected equally. On the other hand, informing our participants that minorities and females are disproportionately affected is associated with a 19.74 percentage point reduction in the probability of choosing System A. This is equivalent to the effect of a 4.2 percentage point difference in unemployment.[21] Note that the coefficient on the interaction of the unemployment variable and unequal race and gender indicator is positive but the effect is somewhat mechanical. That is, given many fewer people choose System A when they observe that there is a disproportionate impact on females and minorities, there are fewer people left to "react" to further reductions in unemployment in later choice scenarios. For completeness, the fifth column presents the coefficient estimates from a specification that includes all of the indicators and interactions. The coefficient estimates remain similar to the estimates from the specifications in columns two, three, and four.

In Table 6, we examine how our estimates vary when we include controls for self-reported demographic information. Panel A of the table presents estimates that use the same specification as in the first column of Table 5. Panel B presents estimates where we include each possible difference in the unemployment rate observed by a respondent as an indicator variable. The coefficients associated with the $\Delta Unemployment$ terms should be interpreted as relative to $\Delta Unemployment =$ 0%. In Panel A, we can see that including demographic characteristics leads to negligible changes. In Panel B, the estimates reveal that the effect of additional unemployment has a diminishing effect on the probability of supporting a system with a minimum wage. Importantly, the point estimates on the $\Delta Unemployment$ and $\Delta Repugnance$ terms in each specification are statistically no different to one another, regardless of included controls. The stability of the estimates across the specifications is remarkable given the final specification in the table includes controls for age, race, gender, political affiliation, labor force status, state of residence, income level, and education level.

5. Robustness and sensitivity

5.1. Sensitivity analysis

In Table 7, we examine the robustness of our estimates to the omission of certain groups of respondents. These estimates also follow the more flexible specification used in Table 6. In the first column, we remove the 68.6% of respondents (i.e., the 1556 out of 2219) who never switch choices. Given we are focusing on those who we have identified as sensitive to employment effects it is unsurprising that the estimates without the "never switchers" are more sensitive to disemployment.

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[21] 4.2 = 19.74 ÷ 4.72, where 4.72 is the corresponding coefficient on $\Delta Unemployment$ in column 4 of Table 5.

Table 6
Linear Probability Model, Introducing Demographic Controls.

	(1) P(Chose A)	(2) P(Chose A)	(3) P(Chose A)	(4) P(Chose A)
Panel A				
Δ Unemployment Rate	-4.059***	-4.052***	-4.052***	-4.055***
	(0.195)	(0.195)	(0.193)	(0.195)
Δ Repugnance	-0.440***	-0.450***	-0.412***	-0.412***
	(0.0191)	(0.0191)	(0.0204)	(0.0208)
Panel B				
Δ Unemployment = 2%	-10.65***	-10.60***	-10.53***	-10.59***
	(1.185)	(1.187)	(1.193)	(1.210)
Δ Unemployment = 4%	-20.11***	-20.07***	-20.00***	-20.10***
	(1.307)	(1.307)	(1.311)	(1.326)
Δ Unemployment = 6%	-27.27***	-27.23***	-27.16***	-27.24***
	(1.367)	(1.368)	(1.370)	(1.389)
Δ Unemployment = 8%	-32.16***	-32.08***	-31.93***	-32.02***
	(1.902)	(1.894)	(1.877)	(1.895)
Δ Repugnance	-0.440***	-0.450***	-0.412***	-0.412***
	(0.0191)	(0.0191)	(0.0204)	(0.0208)
No. of Choices	8492	8492	8492	8288
No. of Respondents	2123	2123	2123	2072
Age, Race, Gender		Y	Y	Y
Politics, LF Status, Location			Y	Y
Income, Education				Y

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 1% level. Standard errors are clustered at the respondent level. Panel A presents estimates using the specification from column 1 in Table 5. Panel B presents estimates using a specification where we include indicators for each level of unemployment difference, rather than treating it as a continuous variable.

Table 7
Linear Probability Model, Sensitivity Analysis.

	(1) P(Chose A)	(2) P(Chose A)	(3) P(Chose A)	(4) P(Chose A)	(5) P(Chose A)
Δ Unemployment = 2%	-20.60***	-12.94***	-10.56***	-11.14***	-12.37***
	(2.304)	(1.745)	(1.605)	(1.538)	(1.090)
Δ Unemployment = 4%	-50.91***	-22.64***	-19.79***	-20.41***	-21.84***
	(2.576)	(1.909)	(1.803)	(1.699)	(1.090)
Δ Unemployment = 6%	-73.84***	-30.24***	-28.16***	-26.85***	-29.00***
	(2.383)	(1.976)	(1.959)	(1.794)	(1.090)
Δ Unemployment = 8%	-83.89***	-35.92***	-34.18***	-30.82***	-35.56***
	(2.277)	(2.668)	(2.745)	(2.555)	(1.369)
Δ Repugnance	-0.127***	-0.448***	-0.506***	-0.464***	
	(0.0263)	(0.0265)	(0.0280)	(0.0245)	
No. of Choices	2652	4368	3728	4660	8492
No. of Respondents	663	1092	932	1165	2123
Omitted Group	Never Switchers	Extreme Politics	Religious	Non-College Educated	-
Fixed Effects	-	-	-	-	Yes

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 1% level. Estimates in the first four columns include standard errors clustered at the respondent level. The fifth column reports fixed effects estimates.

In columns two, three, and four of Table 7 we eliminate those who report themselves to be extremely conservative or liberal, those who express a religious affiliation, and those who are non-college educated. The point estimates differ little relative to the comparable estimates in Table 6. The final column of Table 7 presents estimates when controlling for individual fixed effects. These estimates are quite similar to our other specifications, thereby helping to mitigate concerns about the representativeness of our sample.

While the linear probability model is the most straightforward for presenting our estimates, for completeness we also examine the robustness of our findings to estimating a binomial logit model. We report the post-estimation marginal effects of our logit estimates in Appendix Table A.4. In each column, we re-estimate the corresponding specification from Table 5. The estimates are similar to Table 5, but note that they must be multiplied by 100 to be interpreted as percentage point changes. For example, in the first column of Table A.4, a one percentage point difference in unemployment between the two systems is associated with a 4.02 percentage point reduction in the probability of choosing System A.

5.2. Heterogeneity of preferences

In Table 8, we examine how choices are related to various characteristics of respondents. In each specification we include an indicator for the characteristic of interest and interact that indicator with the unemployment difference between Systems

Table 8
Linear Probability Model, Heterogeneity Across Groups.

	(1) P(Chose A)	(2) P(Chose A)	(3) P(Chose A)	(4) P(Chose A)	(5) P(Chose A)
Δ Unemployment	-4.113*** (0.277)	-4.306*** (0.244)	-4.419*** (0.418)	-3.591*** (0.304)	-4.335*** (0.277)
Δ Repugnance	-0.449*** (0.0190)	-0.441*** (0.0191)	-0.440*** (0.0192)	-0.441*** (0.0191)	-0.403*** (0.0203)
Male	5.663*** (2.059)				
Δ Unemployment × Male	0.0833 (0.391)				
Age >40		-2.366 (2.161)			
Δ Unemployment × Age>40		0.751* (0.405)			
White			3.563 (2.488)		
Δ Unemployment × White			0.483 (0.472)		
Inject Vaccine (Agree or Strongly Agree)				1.714 (2.090)	
Δ Unemployment × Vaccine				-0.773* (0.396)	
Neither Democrat nor Republican					-8.467*** (2.608)
Republican					-14.56*** (2.586)
Δ Unemployment × Neither					0.484 (0.498)
Δ Unemployment × Republican					0.596 (0.455)
No. of Choices	8492	8492	8492	8492	8492
No. of Respondents	2123	2123	2123	2123	2123

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 1% level. Standard errors are clustered at the respondent level.

A and B in a given choice scenario (to reduce the number of coefficients reported, we return to the less flexible specification similar to the first column of Table 5). The first column of Table 8 focuses on differences in the choices of males and females. The estimates suggest males are 5.66 percentage points more likely than females to choose System A, holding all else equal.[22] However, males are not more responsive to the size of the unemployment difference between the systems.

The second column suggests that older respondents are slightly less likely to choose System A (2.37 percentage points), but the effect is not statistically different from zero. Older respondents are also slightly less responsive to the size of the unemployment difference between the systems − the coefficient of 0.75 implies that older respondents are 3.55 (= 4.3 - 0.75) percentage points less likely to choose System A for each additional 1 percentage point reduction in unemployment. Column four compares White respondents to all others. They are slightly more likely to choose System A, but the effect is not statistically different from zero. Column five examines differences in choices as a function of responses to our question about the moral dilemma about the deadly virus and vaccine.[23] Here, we find that respondents who give the "utilitarian" (i.e., consequentialist) response are slightly more likely to switch away from System A for a given reduction in unemployment.

The final column of Table 8 reports how the choices of Republicans and those who report no political affiliation differ from Democrats. Relative to Democrats, those who report no political affiliation are 8.47 percentage points less likely to choose System A. Those who identify as Republicans are 14.56 percentage points less less likely to choose System A. Again, the effect is a level difference rather than a slope difference with the coefficients on the interaction term being statistically no different to zero in each case.

5.3. Reweighting the sample

One may be concerned that our sample is not representative of the general U.S. population. To address this, we reweight our sample in an effort to infer what our results might be if we were to redo this survey experiment using a randomly-drawn representative sample of U.S. adults. First, we obtain information from Census regarding the composition of sex, age,

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[22] Note, however, that all else is generally not equal. Males also give System B lower repugnance ratings compared to females, as seen in Table 4.

[23] Recall from Section 2.1, this is the thought experiment concerning two patients who have contracted a deadly virus. A doctor has two syringes, and knows that one is a deadly poison and the other is the vaccine, but does not know which one is which until the doctor injects one into each patient. Once the doctor learns this information, the doctor can replicate the vaccine and save many lives.

education, race, income, and state population in the U.S. as of 2018, along with Gallup polling data on political affiliation from early September 2018.[24] Then, we implement an iterative raking procedure to compute a respondent-specific survey weight that reflects the proportion of the general U.S. population that each respondent represents (Winter, 2002).

Using our survey weights, we revisit a few parameters. First, our reweighted summary statistics imply that that 40.4% of the general U.S. adult population would always choose the minimum wage system (compared to 41.5% without weights), while 34% would always choose the system without a minimum wage (compared to 27.1% without weights). Second, we replicate our main table of estimates, Table 5, using our survey weights to obtain weighted least squares estimates for each specification. We present our results in Appendix Table A.5. The only substantive difference that appears in our weighted results is the attenuation of the estimated effect of unemployment reduction on the probability of choosing System A (i.e. the minimum wage system). However, when using weighted means and estimates, there is no difference in the implied unemployment reduction required for individuals to support System B over System A. Revisiting our earlier calculation, the weighted mean of $\Delta Repugnance_i$ is -36.88, implying that the average respondent is 15.86 percentage points (-36.88×-0.43) more likely to choose System A over System B. The corresponding coefficient on $\Delta Unemployment$ from column 1 is -3.37. These numbers imply that the average respondent requires a 4.71 percentage point ($=15.86/3.37$) reduction in unemployment to support a system without a minimum wage, compared to 4.65 when using the unweighted sample and estimates.

6. Conclusion

Economic research on minimum wages focuses heavily on employment consequences, while such consequences seem to play a minor role in the public and political discourse surrounding minimum wages. As Elias et al. (2019) write, there is a long history of calls for economists to consider the decision-making power of ethical forces (Smith, 1822, Marshall, 1890, Sen, 1999). However, with the exception of Elias et al. (2019), there is little empirical evidence on the extent to which individuals' preferences toward controversial transactions are driven by moral attitudes versus the consequences of such transactions. To help fill this gap, we use a choice experiment to assess how moral concerns, disemployment consequences, wage levels, and equity considerations shape preferences for minimum wages.

Our findings suggest that people view minimum wages as a moral issue, with significant differences in our respondents' assessment of a labor market system with and without minimum wages in terms of fairness, exploitation, human dignity, and conflict with one's beliefs. Notably, we find that males and Republicans find the lack of a minimum wage less problematic than do females, Democrats, and politically-unaffiliated respondents.

Focusing on people's choices when faced with varying employment effects, regression estimates support the idea that support for minimum wages rests upon moral foundations. In particular, we find that (1) support for minimum wages is only mildly affected by large disemployment effects and (2) respondents' choices are strongly associated with their moral assessments. In addition, given the same disemployment effect, respondents are more likely to support a $7.25 or $10.10 minimum wage than a $15 minimum wage. If preferences for minimum wages were driven by a desire to maximize aggregate income for workers, we would expect a higher wage to be more attractive, all else equal. Notably, the majority of respondents appear to be entirely unmoved by disemployment effects. In our sample, 41.5% of respondents always vote for and 27.1% always vote against a minimum wage, which also highlights substantial polarization. However, we also find that respondents are sensitive to unequal distributional effects of minimum wages. When told that racial minorities and women are disproportionately impacted by disemployment effects, respondents are almost 20 percentage points less likely to support the minimum wage system.

While evidence demonstrating disproportionate consequences for already-disadvantaged groups may sway public opinion, overall, our findings suggest that consequentialist arguments resting on the employment effects of minimum wages will not. As Roth (2008) explains, "laws against buying or selling kidneys reflect a reasonably widespread repugnance, and this repugnance may make it difficult for arguments that focus only on the gains from trade to make headway in changing these laws." Our experiment demonstrates that laws against paying workers wages that are "too low" may similarly reflect deeply-held moral values. That is, proponents *and* opponents of minimum wage legislation will find it difficult to advance their preferred policies if they focus primarily on the consequences of such policies.

Data availability

Data will be made available on request.
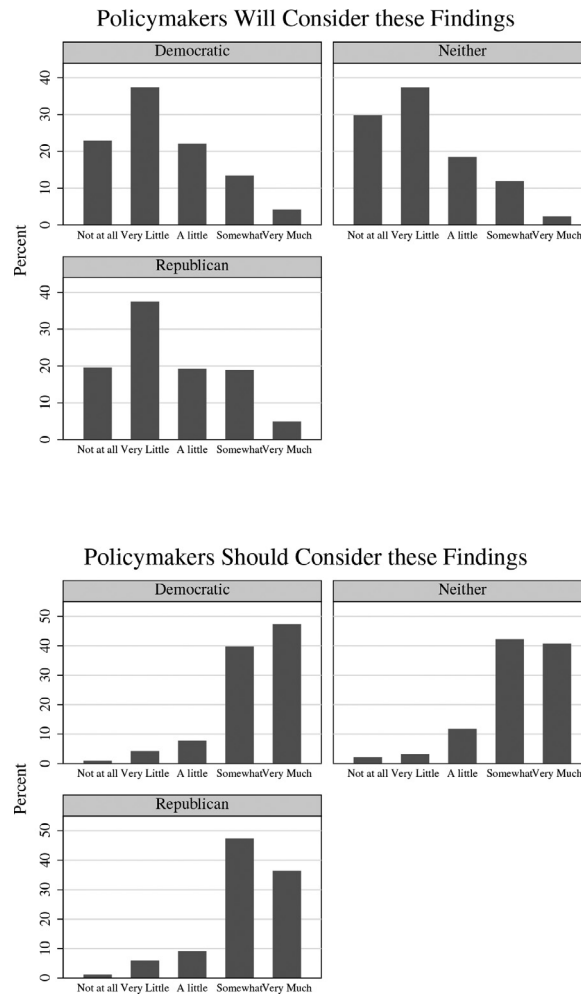
Appendix A. Additional Tables and Figures

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[24] See https://www.news.gallup.com/poll/15370/party-affiliation.aspx.

Policymakers Will Consider these Findings

Policymakers Should Consider these Findings

Fig. A.1. Beliefs on the Effect of Study on Policymakers.

Table A.1
Checks on Attention and Reliability.

Reliability Check	Description	Pass	Fail
1	Cannot recall own choices	2035	184
		91.7%	8.3%
2	Claims they would never choose a system which they did choose	2033	186
		91.6%	8.4%
3	Choices Correspond to Desirability Rating of each system	1656	563
		74.6%	25.4%
4	Suggested they would choose System B for some level of employment but did not do so in the experiment	2135	84
		96.2%	3.8%
5	Choices reflect monotonic preferences	2139	80
		96.4%	3.6%

The table reports how many respondents passed or failed five checks on attention, response reliability, and consistency. Statistics are reported for 2219 respondents. This total excludes those who failed both the first and second reliability checks listed above plus those who appear to have taken the survey more than once based on their IP address.
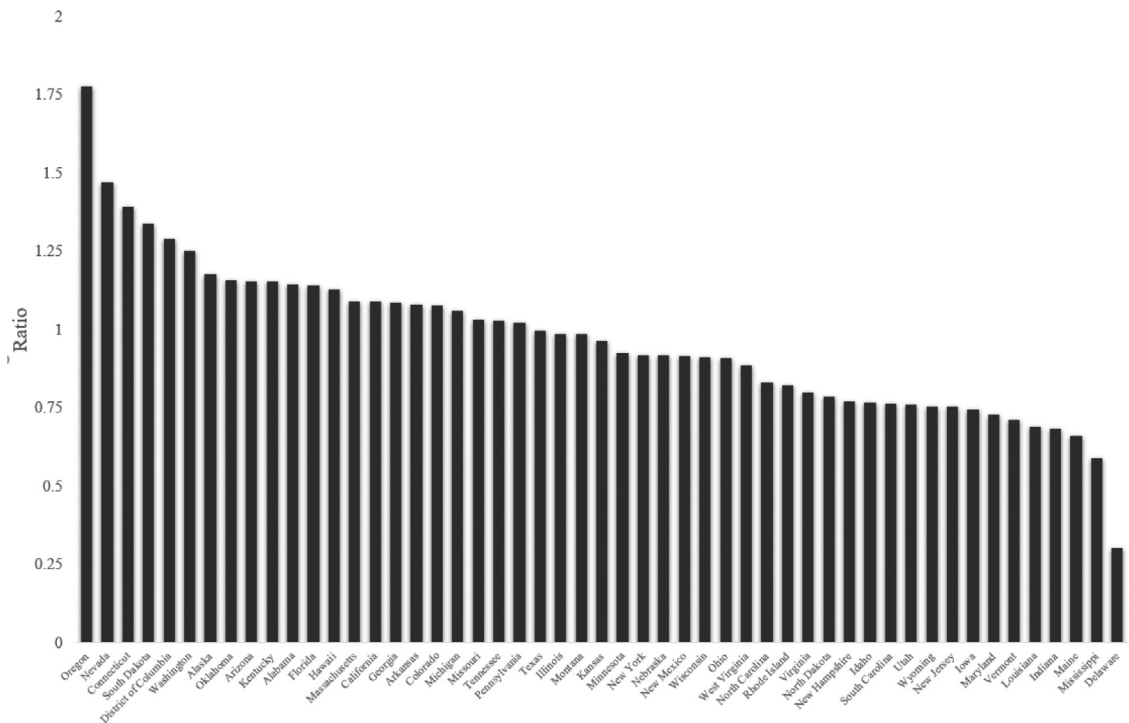
Fig. A.2. Ratio of Representation: Experiment Participants vs. U.S. Population Notes: this figure illustrates the ratio between the percent of all responses from a given state in our sample relative to that state's share of the U.S. population in 2017 as reported by the Census Bureau. Most states are reasonably represented but states such as Oregon and Delaware are over- and under-represented, respectively. Note that our main findings are robust to excluding any state which is more than 20% over- or under-represented (that is, omitting responses from any state with a 1.2 to 1 ratio of response share to population share and/or omitting those with a 0.8 to 1 ratio).

Table A.2
Detailed Repugnance Ratings.

	System A				System B			
Min Wage	$7.25	$10.10	$15	All	No Min Wage			
Count	446	880	893	2219	2219			
Exploits Workers	49.4	26.8	16.6	27.2	75.6			
Unfair to Workers	50.0	26.6	18.1	27.9	74.4			
Unfair to Employers	24.9	33.2	48.5	37.6	25.1			
Fails to Respect Human Dignity	48.3	26.5	19.3	28.0	67.8			
Conflicts with Personal Values	48.8	30.4	30.7	34.2	69.5			
	System A				System B			
Political Affiliation	Democrat	Republican	Neither	All	Democrat	Republican	Neither	All
Count	1095	614	510	2219	1095	614	510	2219
Exploits Workers	26.1	27.4	29.4	27.2	82.6	64.8	73.4	75.6
Unfair to Workers	26.6	28.1	30.5	27.9	83.0	62.4	74.9	74.4
Unfair to Employers	29.5	52.0	37.8	37.6	23.0	28.8	25.0	25.1
Fails to Respect Human Dignity	25.9	29.9	30.1	28.0	76.7	54.6	64.6	67.8
Conflicts with Personal Values	28.4	43.5	35.4	34.2	78.8	56.3	65.4	69.5

Table reports breakdown of repugnance by minimum wage observed and reported political affiliation.

Table A.3
Selected Demographic Characteristics of Experiment Participants, by Observed Choices of Systems.

		Always A	Switcher	Always B	All
Count		921	696	602	2219
Demographics	Age	37.6	35.7	37.4	36.9
	Std. Dev.	12.1	11.3	11.7	11.8
	% Male	49.6%	45.5%	50.2%	48.5%
	White	78.6%	72.4%	73.4%	75.3%
	Black	8.6%	11.8%	9.0%	9.7%
	Other	12.8%	15.8%	17.6%	15.0%
Politics	Liberal-Conservative Scale	2.4	2.8	3.2	2.7
		Note: 1= Strongly Liberal and 5 = Strong Conservative			
Self-Reported Income	<$20,000	13.5%	12.8%	10.0%	12.3%
	$20,000 to $60,000	49.8%	49.6%	46.4%	48.8%
	$60,000 to $100,000	25.9%	25.3%	25.3%	25.6%
	$100,000 or more	10.8%	12.4%	18.2%	13.3%
Education	Less than High School	0.3%	0.6%	0.5%	0.5%
	High School or Some College	43.2%	46.8%	44.7%	44.8%
	Bachelor's Degree	40.3%	37.6%	39.0%	39.1%
	Graduate Degree	16.2%	14.9%	15.7%	15.7%
Religion	Christian	43.5%	50.3%	54.3%	48.6%
	Other	6.3%	8.5%	8.1%	7.8%
	Atheist/Agnostic/No Affiliation	50.2%	41.2%	37.6%	43.7%
Morality Questions	Some Values are Sacred	4.5	4.4	4.3	4.4
	Suffering for an Ethical Principle is Wrong	3.8	3.8	3.5	3.7
	Freedom from Interference	3.6	3.4	3.5	3.5
	Vaccine Injection	3.4	3.5	3.5	3.5
		Note: 1= Strongly Disagree and 5 = Strongly Agree			
Min Wage Experience	Currently Works for Min Wage	11.29%	8.05%	6.3%	8.9%
	Ever Worked for Min Wage	69.1%	69.5%	68.8%	69.1%
	Never Worked for Min Wage	19.7%	22.4%	24.9%	22.0%
Location	Number of States (incl PR and DC)	51	52	52	52
	Most Common	CA (13.1%)	CA (13.3%)	CA (13.3%)	CA (13.2%)
Repugnance	Average for System A	27.9	25.7	35.7	29.3
	Average for System B	85.7	72.9	50.3	72.1

Note: Data refers to 2219 valid responses. See Table 2, Section 2.2, and Appendix Table A.1 for more on what is considered a valid response.

Table A.4
Logit Estimates.

	(1) P(Chose A)	(2) P(Chose A)	(3) P(Chose A)	(4) P(Chose A)	(5) P(Chose A)	(6) P(Chose A)
Δ Unemployment Rate	-0.0402***	-0.0426***	-0.0400***	-0.0403***	-0.0425***	
	(0.00188)	(0.00162)	(0.00186)	(0.00185)	(0.00160)	
Δ Repugnance	-0.00431***	-0.00431***	-0.00456***	-0.00434***	-0.00461***	-0.00431***
	(0.000180)	(0.000179)	(0.000188)	(0.000178)	(0.000186)	(0.000180)
Δ Unemployment Rate = 2%						-0.106***
						(0.0118)
Δ Unemployment Rate = 4%						-0.200***
						(0.0130)
Δ Unemployment Rate = 6%						-0.272***
						(0.0136)
Δ Unemployment Rate = 8%						-0.322***
						(0.0189)
System A = 10,000		0.0298*			0.0312*	
		(0.0171)			(0.0168)	
Min Wage Observed = $10.10			-0.0301		-0.0367	
			(0.0240)		(0.0227)	
Min Wage Observed = $15			-0.112***		-0.112***	
			(0.0241)		(0.0230)	
Equal Race and Gender Effects				0.0102	0.0141	
				(0.0224)	(0.0221)	
Unequal Race and Gender Effects				-0.118***	-0.115***	
				(0.0190)	(0.0189)	
No. of Choices	8492	8492	8492	8492	8492	8492
No. of Respondents	2123	2123	2123	2123	2123	2123

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 1% level. Standard errors are clustered at the respondent level.

Table A.5
Main Estimates, Linear Probability Model, Using Survey Weights.

	(1) P(Chose A)	(2) P(Chose A)	(3) P(Chose A)	(4) P(Chose A)	(5) P(Chose A)
Δ Unemployment Rate	-3.372***	-2.885***	-2.107*	-4.145***	-2.471**
	(0.501)	(0.598)	(1.250)	(0.608)	(1.096)
Δ Repugnance	-0.425***	-0.505***	-0.433***	-0.475***	-0.440***
	(0.0394)	(0.0514)	(0.0798)	(0.0579)	(0.0386)
System A = 10,000		0.521			0.956
		(5.240)			(4.792)
Δ Unemployment Rate × System A = 10,000		-0.704			-0.654
		(0.771)			(0.781)
Min Wage Observed = $10.10			13.22		11.20
			(10.31)		(8.128)
Min Wage Observed = $15			0.774		0.471
			(10.15)		(7.753)
Δ Unemployment Rate × $10.10			-1.690		-1.464
			(1.456)		(1.253)
Δ Unemployment Rate × $15			-1.423		-1.431
			(1.432)		(1.253)
Equal Race and Gender Effects				2.869	3.830
				(5.983)	(5.991)
Unequal Race and Gender Effects				-23.19***	-21.68***
				(6.829)	(6.509)
Δ Unemployment Rate × Equal RG				0.931	1.125
				(1.136)	(1.139)
Δ Unemployment Rate × Unequal RG				1.729	1.606
				(1.078)	(1.071)
No. of Choices	8268	8268	8268	8268	8268
No. of Respondents	2067	2067	2067	2067	2067

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 1% level. Standard errors are clustered at the respondent level. All regressions are weighted using author-generated survey weights, such that the weighted sample is representative of the general U.S. population with respect to age, sex, education, race, income, political affiliation, and state of residence.

Appendix B. Experiment/Survey Document

B1. Sample survey

A copy of our survey instrument is available in the online supplementary material. The survey remains available to complete at http://www.louisville.az1.qualtrics.com/jfe/form/SV_39Keupyg3Vnqt49.

Supplementary material

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jebo.2022.11.023.

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