Chapter 3

Should individuals who are adversely affected by mitigation be compensated?

Authors: Brilé Anderson

Individuals and firms working in emission-intensive industries lobby against mitigation policy to delays its enactment. A proposed solution to this is to compensate mitigation's losers (i.e., those who are adversely affected by mitigation) with social assistance. I investigate whether Americans believe mitigation's losers qualify for social assistance using a population-based survey experiment in the United States (N=2000). The empirical focus is on coal communities in the United States and providing welfare support to an old and young coalminer. The results show that mitigation does not significantly increase welfare support for either coalminer. In fact, amongst liberal mitigation advocates, mitigation significantly reduces welfare support for the younger coalminer. In summary, Americans appear unwilling to provide social assistance to coalminers simply because their need is due to mitigation. It follows that compensating mitigation's losers could face strong public opposition in the United States.

3.1 Introduction

In order to keep global warming to 2 degrees Celsius above pre-industrial levels by 2100, OECD countries must reduce greenhouse gas emissions by 40 to 70 percent below 2010 levels by 2050 and reach near zero emissions by the end of the century (OECD, 2015). Transitioning to this low-carbon

future will change nearly every aspect of economic life from how we produce and consume goods to the way we generate energy. This transition will cause structural shifts in employment, which means employees in carbon−intensive industries and along their supply chains will risk losing their jobs (Fankhaeser et al., 2008; OECD, 2010). Even though new jobs will be created in low−carbon industries, labor is a less mobile factor of production than land or capital. This is because retraining individuals requires time, resources, and could even compel individuals to move (OECD, 2010). Therefore, individuals may not immediately find new jobs and if they do, these jobs could require drastic changes such as relocating or lower salaries.

This uncertain and bleak outlook for mitigation's losers (i.e., firms and individuals who are adversely affected by the reduction of greenhouse gas emissions) incentivizes them to lobby against mitigation policy. For example, in the United States, the five largest coal companies spent 95 million USD[1] in the last decade lobbying Congress to stall emission limits on power plants.[2] Similarly, in Poland, coal miners are such a politically powerful group that, "Accepting any compromise on the issue [of coal] is a vote-killer," for politicians.[3] In the United Kingdom, the fossil-fuel industry successfully lobbied former Primer Minister David Cameron to resist EU regulations on fracking.[4] These are characteristic examples of Olson's collective action theory (Olson, 1965). Policy enactment is not only about the aggregate benefits and costs of a policy to society, but the way those costs are distributed amongst actors (Dolšak and Prakash, 2015; Olson, 1965). It is far easier for a smaller group of mitigation's losers with concentrated costs to organize and resist climate policy than the more diffuse group of those who will benefit from mitigation in the future to coordinate (Olson, 1965). This is problematic since it delays the enactment of climate policy in these countries (e.g., the United States, Poland, the United Kingdom).

Dolšak and Prakash (2015) argue that losers' resistance to climate policy will continue until mitigation's advocates recognize its distributional consequences. The authors propose embedded environmentalism as an alternative strategy, which is to lobby for compensation of mitigation's losers in conjunction to the mitigation policy. This compensation, according to the authors, must go above and beyond job retraining to, for example, revitalizing infrastructure or additional funding to public schools. The essence of this idea is not new. The OECD (2015) also recommended integrating climate change policies with social and economic policy, "Phasing-in policies according to a clear timetable, and helping workers to retrain or move to other forms of employment, are examples of measures to help smooth the transition to a low-carbon economy," (4).

These recommendations reflect a broader discussion on whether generous welfare policy improves environmental performance. On the one hand, Gough (2013) and Dryzek (2013) claim that climate and welfare policy are mutually reinforcing, and attribute the environmental performance of Scandinavian countries to their social democratic regimes. Their claim is that social democratic regimes can already absorb any unemployment generated by mitigation policy, which, in turn, leads to less

[1] Note in the preceding decade (1996 to 2006), the coal mining lobby spent 12.56 million. https://www.opensecrets.org/industries/totals.php?cycle=2016&ind=E1210

[2] https://www.bloomberg.com/news/articles/2016-06-28/coal-companies-spent-95-million-/on-lobbying-before-bankruptcies

[3] http://www.politico.eu/article/why-poland-still-/clings-to-coal-energy-union-security-eu-commission/

[4] https://www.theguardian.com/environment/2015/sep/10/uk-backs-bid-by-fossil-fuel-/firms-to-kill-new-eu-fracking-controls-letters-reveal

resistance from mitigation's losers. On the other, Bernauer and Bhmelt (2013) empirically investigated the relationship between environmental performance and welfare policy in OECD countries and found no correlation.

Despite this mixed evidence, policy−makers and academics seem to believe that climate policy and welfare policy ought to reinforce each other. Welfare spending is ultimately driven by public opinion in democracies (Brooks and Manza, 2008; Castles et al., 2012; Wlezien and Soroka, 2012), the feasibility of embedded environmentalism or similar proposals depends on whether citizens believe mitigation's losers should qualify for welfare. This question is especially pertinent in liberal welfare states where assistance is means-tested like the United States, Canada, Switzerland, and Australia. Means-tested assistance requires individuals to demonstrate need in order to qualify for social assistance (Esping-Andersen, 1990). Thus, need resultant from mitigation must be seen by citizens as an appropriate reason to qualify. This article focuses on the United States since it is the largest emitter historically and the second largest emitter presently in terms of cumulative emissions as well as a laggard in terms of climate policy. Nevertheless, this question is relevant for other liberal welfare regimes.

I build on prior work in sociology and political economy to explain citizens' welfare support for a loser of mitigation. Prior work shows that citizens determine their welfare support for a potential recipient using the deservingness heuristic, which is a judgment about whether the recipient's need is their fault (Alesina et al., 2001; Ford, 2015; Larsen, 2008; Petersen, 2015; Petersen and Aarøe, 2013; Petersen et al., 2010; Slothuus, 2007; Van Oorschot, 1998). Recipient characteristics, such as age or health, act as cues of deservingness. These cues signal the recipient's level of control and reciprocity where control refers to one's power over their neediness (i.e., the less in control, the more deserving one seems of welfare, for example, an extremely ill person) (Fong, 2007; Larsen, 2008), and reciprocity refers to whether the recipient contributed enough to society to merit welfare (i.e., the greater effort to contribute, the more deserving of welfare, for example, an elderly person who worked their entire life) (Petersen, 2015). The deservingness heuristic is triggered unintentionally and automatically. Importantly, prior work shows that the deservingness heuristic overrides the effect of citizen-level characteristics on welfare support for a potential recipient such as political ideology, self-interest, and humanitarianism (Larsen, 2008; Petersen, 2015; Slothuus, 2007). Moreover, the deservingness heuristic can be triggered by a simple cue like "an old man who has worked his entire life" (Petersen et al., 2010).

Recent work finds that citizens anchor their welfare support for a recipient based on deservingness cues, and then adjust their welfare support in line with their self-interest (Cavaillé, 2015). If the characteristics of the welfare recipient cue deservingness, then citizens' material self-interest is irrelevant. However, if the recipient cues undeservingness, poor citizens with unpredictable income (i.e., low−mean and high variance income) show significantly higher welfare support for the recipient than those from other income groups since poor citizens with unpredictable income may need to access welfare in the future.

I adapt Cavaillés theory to the context of compensating mitigation's losers, and argue that citizens will first use cues to assess the deservingness of a potential welfare recipient (i.e., a loser

of mitigation) then adjust their welfare support in line with their self-interest if the recipient is underserving. In contrast to Cavaillé, I claim that citizens' self−interest is more than material when determining their welfare support for a loser of mitigation, and instead influenced by their political ideology (i.e., liberal, moderate, conservative) and mitigation preference (i.e., advocate of mitigation, opponent, unsure whether advocate or opponent). Citizens' ideology and mitigation preference will affect whether citizens perceive government regulation of emissions as best for their future, which will translate into more or less welfare support for the undeserving recipient. If the characteristics of the welfare recipient cue deservingness, then individuals' self-interest should be irrelevant because this will be crowded-out by the deservingness cue.

To test this, I designed a survey experiment, which was fielded by IPSOS in the United States amongst a representative sample of adult Americans (N = 2000) to investigate their preferences for providing welfare to coalminers. The production and consumption of coal in the United States is declining causing multiple coal companies to file for bankruptcy.[5] In the wake of these closures, coal communities face rising unemployment, increasing poverty, greater opioid usage, higher obesity, higher rates of birth defects due to poor prenatal nutrition, and less funding for public schools.[6] Even though, the decline in production and consumption of coal is largely due to the lower cost of natural gas, popular rhetoric in coal communities blames former President Obama and the Environmental Protection Agency's (EPA) Clean Power Plan. The avarice and contempt of coal communities is so salient that Hillary Clinton was jeered out of a West Virginian town on her Presidential campaign tour,[7] and coal miners symbolically stood by President Trump as he signed an Executive Order to abolish climate policies implemented under President Obama.[8]

Results disconfirm the theoretical framework. Instead, when the reason for the recipient's need is known (i.e., the treatments), citizen−level characteristics directly affect welfare support and are no longer crowded out by deservingness cues. Welfare support for the underserving recipient is significantly lower after all treatments (EPA, Market, and Information) compared to the Control group for the sample as whole. Further analysis reveals that liberal mitigation advocates' welfare support for the young coalminer (undeserving recipient) significantly decreases after the EPA and Information treatments compared to the Control group. This finding poses a major obstacle to embedded environmentalism or similar proposals, which rely on mitigation advocates to lobby for compensation of mitigation losers in conjunction with the mitigation policy. I discuss potential implications for coal communities and mitigation's losers, in general, in the discussion.

The next section outlines the theoretical framework in more detail followed by a description of the experimental design. After, I present the results from the experiment and conclude with a discussion on their implications.

[5] https://www.bloomberg.com/news/articles/2016-06-28/coal-companies-spent-95-million-on-/lobbying-before-bankruptcies

[6] https://www.theguardian.com/us-news/2015/nov/12/beattyville-kentucky-and-americas-poorest-towns

[7] https://www.nytimes.com/politics/first-draft/2016/05/02/hillary-clinton-hears-/wrath-of-coal-supporters-in-west-virginia/

[8] https://www.nytimes.com/2017/03/28/climate/trump-executive-order-climate-change.html

3.2 Theoretical Framework

Prior work in sociology and political economy shows that citizens use the deservingness heuristic to determine their welfare support for a potential recipient (Ford, 2015; Larsen, 2008; Petersen and Aarøe, 2013; Petersen et al., 2010; Slothuus, 2007; Van Oorschot, 1998). Recipient's characteristics (i.e., age, disability, race, marital status, etc.) cue this heuristic and imply whether the recipient's need is their fault. If a recipient's need is seen as self-induced, for example, out of laziness, the recipient will be perceived as undeserving. The deservingness heuristic is activated automatically and unintentionally (Larsen, 2008; Petersen, 2015; Petersen and Aarøe, 2013; Petersen et al., 2010; Slothuus, 2007). Importantly, a strong activation of this heuristic effectively crowds-out other values from a citizen's welfare support for a recipient overriding citizens' political ideology, self-interest, and humanitarianism (Larsen, 2008; Petersen, 2015; Petersen and Aarøe, 2013; Petersen et al., 2010; Slothuus, 2007; Van Oorschot, 1998).

Several studies found that citizens' perceptions of welfare recipients' deservingness is fairly consistent across citizens, cultures, and over time (Larsen, 2008; Van Oorschot, 1998). Elderly people are seen as the most deserving closely followed by sick and disabled people, then unemployed people, and immigrants are typically seen as the least deserving of all (Van Oorschot, 1998). Moreover, very simple descriptions of the recipient such as "an aged man who has been in the labor market all his life" cue the deservingness heuristic (Petersen, 2015).

Scholars have identified five signals that cue deservingness: control, reciprocity, identity, need, and attitude (Van Oorschot, 1998). The relative weight of these is disputed, but control and reciprocity seem to matter most (Larsen, 2008; Petersen, 2015; Petersen and Aarøe, 2013; Petersen et al., 2010; Slothuus, 2007; Van Oorschot, 1998). *Control* refers to the power the recipient has over their neediness. The less in control the recipient is (e.g., old age, illness), the more deserving one seems (Fong, 2007). Petersen (2015) argues that *reciprocity* results from an evolutionary survival tactic. Our prehistoric ancestors relied on reciprocal exchanges as a solution to resource variance, and the crucial adaptive problem was not how to shun cheaters who free ride but to reintegrate them into the exchange system. Consequently, Petersen (2015) argues that our minds have adapted to look for signals regarding reciprocity (i.e., an individual's willingness to exchange and accrue resources). This is not in absolute terms, but by whether the recipient made an effort to contribute to society (Petersen, 2015). The greater one's perceived effort to contribute to society, the more deserving one seems of welfare (i.e., an elderly person who worked their entire life). *Identity* refers to the similarity in identities between the recipient and individual (Van Oorschot, 1998). The idea is the greater similarity in identities between the individual and recipient (e.g., single moms living in New York City), the more deserving the recipient seems. *Need* refers to the recipient's deprivation. Lastly, *attitude* is whether the recipient "wants" to work and makes an effort to find a job (Van Oorschot, 1998).

Recent work shows that citizens will anchor their welfare support based on deservingness (cued by recipient characteristics) and then adjust their preferences to better align with their material self-interest (Cavaillé, 2015). Cavaillé (2015) shows that if the characteristics of the welfare recipient

cue deservingness, then citizen's material self-interest is irrelevant for their welfare support to the recipient. But if the recipient's characteristics cue undeservingness, which usually triggers low welfare support for the recipient, poor citizens with unpredictable income (i.e., low mean and high variance income) show higher welfare support than other income groups. This is because poor citizens with unpredictable income may need to access welfare in the future, and as a result, it is in their interest to be generous and support welfare even if the recipient is undeserving.

I modify Cavaillé's theoretical framework to explain citizens' welfare support for mitigation's losers. Citizens will anchor their support based on deservingness cues (i.e., recipient characteristics) and then adjust their support in line with their self-interest (see the top branch in Figure 1). However, I argue that citizen's self-interest is more than a material need when compensating mitigation's losers. Citizen's self-interest will be driven by their mitigation preference and their political ideology. These attributes (i.e., mitigation preference and political ideology), in particular, will be triggered by the context of mititation (i.e., EPA treatment: description of decline of coal communities due to governmental regulation of emissions). Depending on whether a citizen is a mitigation advocate or opponent as well as liberal or conservative will affect whether supporting or opposing welfare for the undeserving mitigation loser is in their interest. This combined ideological viewpoint will determine whether citizens perceive supporting or opposing welfare to the undeserving recipient as in their interest.

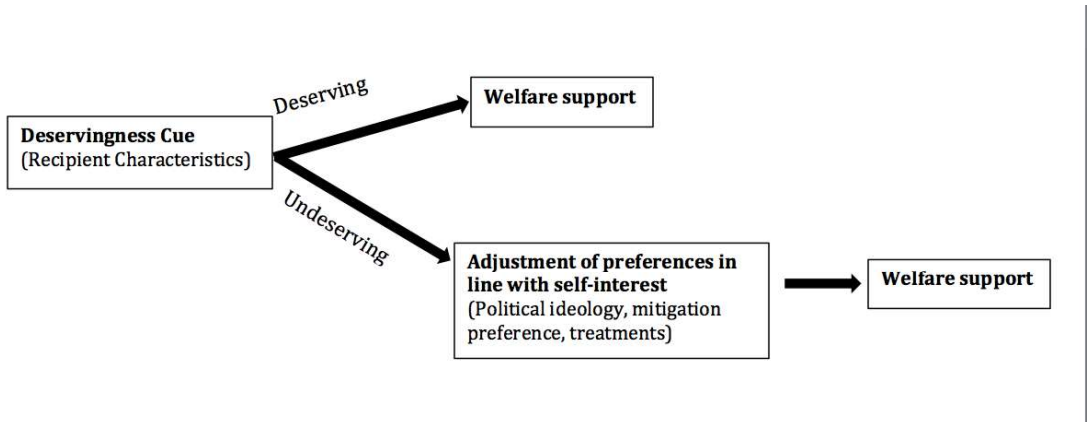

Figure 3.1: Theoretical Framework

Similar to Cavaillé (2015), I expect that *if a coalminer cues deservingness, then the treatments, political ideology, and mitigation preference should not significantly affect welfare support.* A strong activation of the deservingness heuristic should crowd-out these citizen-level characteristics from opinion formation (i.e., welfare support for the deserving coalminer).

Liberal and Conservatives fundamentally differ in their attitudes towards social assistance and their approach to mitigation. Liberalism is a political ideology that, at its core, denounces economic and social inequality. Liberals usually advocate public policies to reduce or eliminate these inequalities, and perceive government as the means to make this possible (Heywood, 2012). In contrast,

conservatives generally prefer the existing order in a society, and want to ensure civil liberty by keeping government small (Heywood, 2012). This opposition to bigger government (i.e., greater regulation, more government spending) is increasingly pronounced in the last decade (Parker and Barreto, 2014). Importantly, liberals and conservatives' ideological temperament translate into very different approaches to mitigation. Liberal mitigation advocates tend to favor regulation (e.g., as seen under the Obama Administration and the Clean Power Plan) while Conservatives mitigation advocates tend to advance a limited government solution to climate change that involves pricing carbon, for example, a carbon tax or emissions trading system.[9] Thus, depending on one's political ideology and mitigation preference, providing welfare to an underserving mitigation loser may or may not be in one's interest. I argue that *liberal mitigation advocates will be more supportive of providing welfare to an underserving recipient if their need is due to mitigation (i.e. EPA treatment)*, because government regulation of emissions and providing help to the needy aligns with their ideological interest. In contrast, *conservatives will be less supportive of providing welfare to the underserving coalminer if their need is due to mitigation (i.e. EPA treatment)*, because they perceive government regulation of emissions and providing help to the needy as against their interests. Likewise, I suspect that *conservative and liberal mitigation opponents will be less supportive of providing welfare to the underserving coalminer if their need is due to mitigation (i.e., EPA treatment)*, because they do not perceive mitigation as in their interest.

It is challenging to predict the effect of the EPA treatment (i.e., need due to government regulation of emissions) compared to the control on welfare support for the underserving coalminer for moderates across mitigation preferences. Moderates represent themselves as a mix of liberal and conservative ideologies (Heywood, 2012). Therefore, it is difficult to formulate expectations on what exactly moderates view as in their interest. Likewise, those who are unsure about mitigation lack any clear preference. Thus, I suspect that *there will be no significant difference between the welfare support for the undeserving recipient between the EPA and Control group for those who unsure about mitigation across political ideologies.* The theoretical expectations for the EPA treatment are summarized in Table 3.1.

	Advocate of Mitigation	Unsure whether advocate or oppose	Opponent of Mitigation
Liberals	Higher	No difference	Lower
Moderates	$--$	No difference	$--$
Conservatives	Lower	No difference	Lower

Table 3.1: **Theoretical Expectations for the EPA treatment**: Difference in welfare support if underserving recipient's need is due to mitigation (EPA treatment) compared to an undeserving recipient where their need is unexplained (Control group).

Need resulting from the cheaper price of natural gas (i.e., Market treatment) is not in conflict with citizens' mitigation preference, and therefore, *I do not expect to find any adjustment of the welfare support for the undeserving recipient by political ideology and mitigation preference after the Market treatment.* Likewise, I include the Information treatment (i.e., the description of the decline in

[9] http://news.nationalgeographic.com/2017/02/conservatives-unveil-plan-to-fight-climate-change/

coal communities with no reason specified) to disentangle the effect of mentioning coal from the reasons for coalminers' need (i.e., Market or EPA treatments). Therefore, *I do not expect to find any moderated treatment effects by political ideology or mitigation preference on welfare support for the young coalminer (undeserving recipient) after the Information treatment.*

3.3 Study Design

I use an experimental design, which randomly assigns participants to the Control Group (no information) or one of three treatments: description of the decline of coal communities with no reason specified (Information treatment), description of declining coal communities as a result of climate policy (EPA treatment), and description of declining coal communities as a result of market forces (Market treatment). All treatments were adaptations of an article from the *Washington Examiner* on the decline of coal communities.[10] Participants then respond to two items measuring the dependent variable, welfare support for two types of coalminers: one coalminer cueing deservingness (i.e., an old man who was worked his entire life) and the other cueing undeservingness (i.e., a young man). By comparing participants' preferences under treatments to the control condition, I can identify the causal effect of the three explanations of recipient's need (i.e., EPA treatment, Market treatment, Information treatment) on welfare support.

The survey experiment was fielded by IPSOS[11] to its online panel in the United States from the 22^{nd} February to 3^{rd} March 2017. IPSOS used stratified sampling to approximate a representative sample of the United States by sex, age, income, census region (i.e., Northeast, Midwest, South, West) and occupation (i.e., employed full-time, employed part-time, not working).

3.3.1 Treatments

I employed an issue framing experiment, which means I randomly assign survey participants to a passage of text emphasizing a specific aspect of the decline of coal communities. By showing each participant one frame only, I enhance the saliency of that particular feature, which allows for causal identification of that feature's effect (Borah, 2011; Chong and Druckman, 2007a). All treatments were adapted from an article in the *Washington Examiner* on the decline of coal communities, which permitted a parallel structure design between treatments. That is, the structure of the treatments was the same. The article cited two reasons for the decline: the cheaper price of natural gas and environmental regulations. From this, I created the three treatments by removing certain passages: description of decline of coal communities with no reason (Information), description of decline of coal communities as a result of cheaper price of natural gas (Market), and lastly, a description of the decline of coal communities as a result of environmental regulation (EPA). I also removed any geographic references from the article as well as any references to the *Washington Examiner* to minimize bias.

[10] http://www.washingtonexaminer.com/article/2556187
[11] https://www.ipsos.com/en-us/

I included the Information treatment in addition to the Control in order to distinguish the effect of describing the decline of coal communities from the reason for the coal communities decline (EPA or Market).

Participants in the Control group received no information, and directly entered the survey after reading the following introduction: *On the following pages, we would like to know your opinion on providing social assistance to coal communities.*

The treatment texts are shown below. Participants assigned to the Information treatment did not see the sections labeled Market and EPA. Likewise, participants in the EPA treatment did not see the section labeled Market and vice versa.

In a dimly lit steakhouse that two years ago overflowed with customers, the only patrons on a recent Tuesday evening are the four local coal industry employees gathered around a Formica tabletop teaching an out-of-towner about coal and the way things used to be.

The owner of a trucking business says his workforce has dwindled from 37 to four. A mine safety officer says he's lucky he wasn't one of the more than 100 people who got laid off at his company but, even so, he accepts that he's going to have to leave town too or end up unemployed. Coal towns such as this one are in free fall. Coal is important to everyone in this valley town of 1,779, which has lost 28 percent of its population since 2000. Nearly 31 percent of its inhabitants live below the poverty line. Restaurants are empty. Services industries, such as the one that once made tires for massive mining trucks, are no longer needed. The population of this county, founded in 1824, dropped from a high of 77,391 in 1950 to 36,743 in 2010.

[**Market**]

Everyone here has an opinion about why it got so bad. Most start with the cheaper price of natural gas.
Decline accelerated when the shale gas boom began in the late 2000s. Plentiful supplies of natural gas pushed prices to record lows, making it competitive with coal. Power companies built cheaper generators to run on gas. Buyers for coal went away meaning the decline of coal is due largely to market forces. By 2030, the government says coal will generate 30 percent of the nation's electricity, down from 42 percent today.

[**EPA**]

Everyone here has an opinion about why it got so bad. Most start with the government and its environmental regulations.

Now the town faces carbon emissions limits for power plants. Coal power plants are a major source of carbon emissions in the United States. Therefore, the government is explicitly targeting the coal industry with environmental regulation in its efforts to fight climate change. These regulations, America's most aggressive effort yet to slow climate change, aim to slash emissions to 30 percent below 2005 levels by 2030. By then, the government says coal will generate 30 percent of the nation's electricity, down from 42 percent today.

People here, much like the state government, don't know how their community can survive without coal.

3.3.2 Dependent Variables

I included two items to measure the dependent variable, citizens' welfare support, for two types of coalminers: one coalminer cueing deservingness (i.e., old man who has worked his entire life) and the other cueing undeservingness (i.e. young man). These items have been used in other survey experiments from the sociology and political economy literature (Petersen, 2015; Petersen and Aarøe, 2013; Petersen et al., 2010). Part of the justification for specifying the recipient (i.e., cueing whether the recipient is undeserving or deserving) is to control for participants' imagination. Petersen and

Aarøe (2013) show that when cues are absent (i.e., no triggers of deservingness), people rely heavily on their imagination. In short, in sparse information contexts, people imagine what they cannot see (the welfare recipient) and then inform their welfare support based on these internally generated representations. Therefore, when the recipient is not clearly specified, people tend to conjure up an image of a welfare recipient that fits their biases and stereotypical image of who a welfare recipient is. Therefore, I control for participant's imaginations by triggering the deservingness heuristic to ensure that effects are due to the treatments.

Participants read the following instructions directly after having received the information treatment as explained above: *Please tell us how much you agree or disagree with the following statements:*

- An old man in his early sixties who has worked his entire life in the coalmines should qualify for social assistance *(strongly disagree, disagree, somewhat disagree, neither agree nor disagree, somewhat agree, agree, strongly agree).* [Deserving Recipient]
- A young man in his early thirties who has worked his entire life in the coalmines should qualify for social assistance *(strongly disagree, disagree, somewhat disagree, neither agree nor disagree, somewhat agree, agree, strongly agree).* [Undeserving Recipient]

I randomized the direction of the answer categories and the order of the dependent variables between participants.

I did not use the term "welfare" because it frequently invokes negative stereotypes in the United States (Harell et al., 2008). The term causes a racialization of the recipient; in particular, it invokes the image of a single, black mother (Harell et al., 2008). Individuals tend to combine these negative stereotypes with the perception that poverty is the result of an individual's lack of motivation or ambition (Harell et al., 2008). For these reasons, I use the term, social assistance, instead of welfare.

Figures 3.2 and 3.3 plot the distribution of responses by treatment for the coalminer cueing deservingness and undeservingness. The distributions are significantly different.[12] Answers related to the typically deserving recipient are right-skewed, meaning more participants agreed than disagreed, while answers related to the typically undeserving recipient are far less skewed to the right. From this, I can conclude that the deservingness cues (i.e., old coalminer vs. young coalminer) worked accordingly.

[12] I used a two-sample Kolmogorov-Smirnov test to determine whether the difference between the treatments is significant (D=0.31, $p < 0.001$).

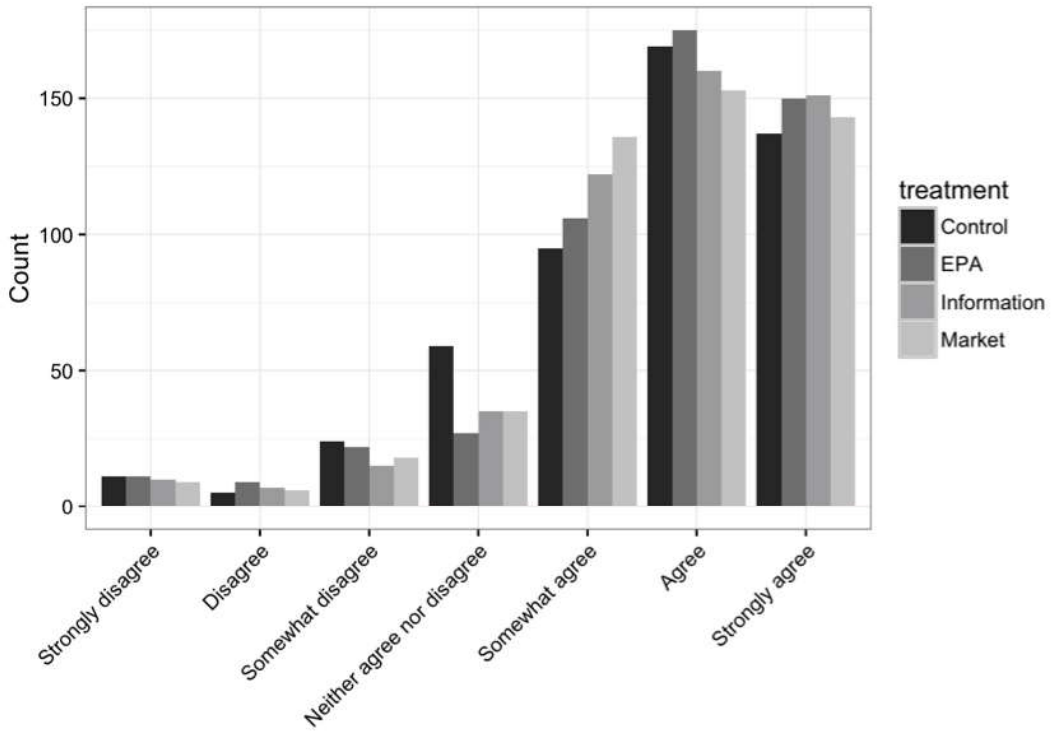

Figure 3.2: **Distribution of responses for the dependent variable measuring welfare support for the *deserving* recipient (old coalminer) by treatment.**

3.3.3 Survey Design

The survey started with questions on participants' political ideology, belief in climate change, and mitigation preferences. These questions preceded the treatments in order to avoid post-treatment bias in the analysis.

- [**Political Ideology**] Thinking about politics these days, how would you describe your own political viewpoint? *(Very liberal, Liberal, Somewhat liberal, Moderate, Somewhat conservative, Conservative, Very conservative)*
- [**Climate Skepticism**] Which of these three statements about the Earth's temperature comes closest to your view? *(The Earth is getting warmer mostly because of human activity such as burning coal, oil or natural gas., The Earth is getting warmer mostly because of natural patterns in the Earth's environment., There is no solid evidence that the Earth is getting warmer., Not sure)*
- [**Mitigation preference**] Carbon dioxide emissions are released into the atmosphere when we burn coal, oil or natural gas, which for example, occurs in energy production and transportation. What is your opinion about the United States government reducing carbon dioxide emissions? *(I support the Unites States government reducing the carbon dioxide emissions, I oppose the Unites States government reducing the carbon dioxide emissions, Not sure)*

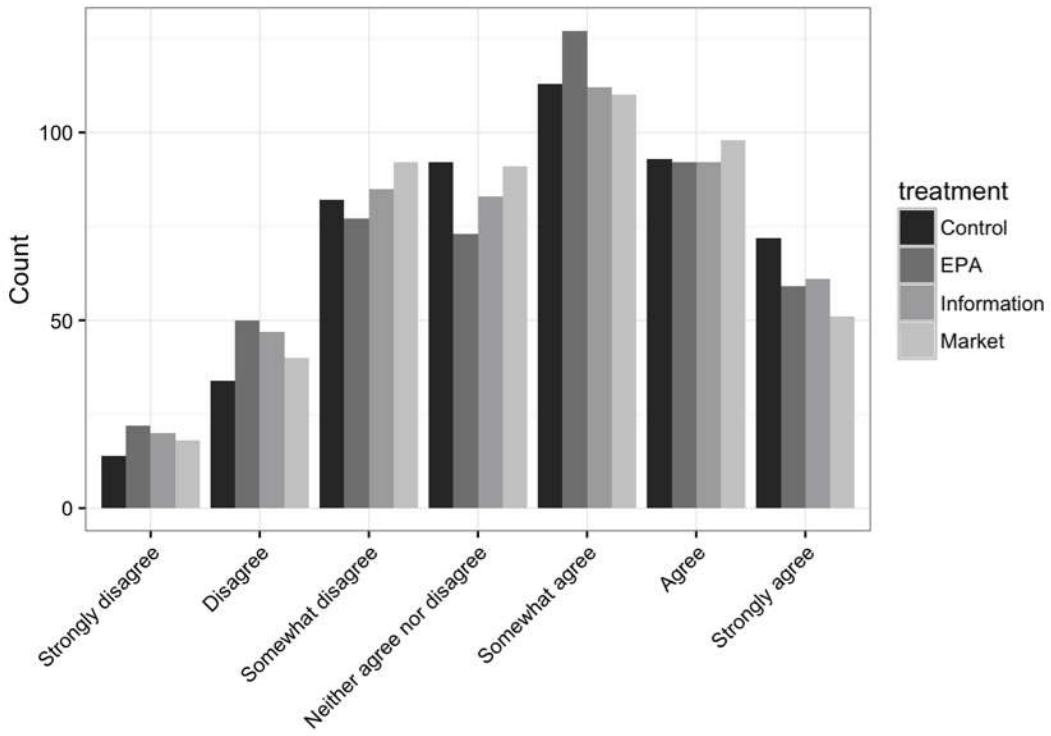

Figure 3.3: **Distribution of responses for the dependent variable measuring welfare support for the *undeserving* recipient (young coalminer) by treatment.**

I randomized the order of these three questions as well as the direction of the answer categories between participants. Table 3.2 is the cross tabulation and percent of participants by political ideology and mitigation preference. For example, 87.74 percent of participants who self-identified as liberals are also advocates of mitigation (544 participants). As can been seen, there are very few liberal mitigation opponents as well as liberal and moderate participants who are unsure about whether the federal government should or should not mitigate. There are likely only a handful of these individuals in any given treatment. Small sample sizes will cause large standard errors, and thus, only allows for the detection of very large effects.

	Mitigation Advocates	Unsure	Mitigation Opponents
Liberals	87.74 (544)	5.16 (40)	7.10 (32)
Moderates	76.84 (488)	16.77 (44)	6.39 (105)
Conservatives	54.64 (512)	22.15 (175)	23.21 (167)

Table 3.2: **Percent of sample by political ideology and mitigation preference.** The number of the preferences is the number of participants.

Participants were then randomly assigned to one of the three treatments (Information, EPA, or Market treatments) or Control group (N= 500 for each of the four groups). Participants receiving

a treatment first read an introduction to the treatments: *We are now going to show you an excerpt from a recent news article, please read the excerpt carefully to be able to answer the upcoming questions. You will be allowed to proceed with the upcoming questions after 50 seconds. Thank you.* After which, participants were directed to the treatment text, and were forced to wait 50 seconds before proceeding to the next page in the survey. This was to encourage participants to read the treatments carefully. After reading the treatment text, participants were asked two comprehension questions on the treatment. The first question read: *This article discusses the decline of: (coal, oil, natural gas, none of the above)*, and the second: *In the article, the main reason for the decline is: (Environmental regulations, natural gas prices, depletion of natural resource, the article didn't specify a reason).* The answer categories were randomized between participants. If either answer was incorrect, participants were sent back to the same treatment to read it a second time. After their second attempt, participants proceeded regardless of whether their responses were correct in order to avoid frustrating participants.

74 percent of the EPA treatment answered the two comprehension questions correctly by their second attempt, 64 percent of the Market treatment, and 52 percent of the Information treatment. Participants in the Control group did not answer any comprehension questions because they received no information. A Pearson's chi-squared test shows that participants' comprehension is not independent from the treatments ($X2 = 52.4$, p-value < 0.001), which means that participants were significantly more likely to answer the comprehension questions incorrectly after the Information and Market treatments than the EPA treatment. One possible explanation could be that the EPA explanation is the popularized explanation by politicians and the media, and the treatments could not override this prior knowledge.[13] In addition, there are significant differences in the types of individuals that understood the treatments and those who did not in terms of age, sex, employment status (Full-time, part-time, not-working), income, and education, but no significant differences by geographic region (Midwest, Northeast, South, West). Therefore, I control for these covariates in the analysis of the robustness checks.

Even though, I did not explicitly provide a reason for the decline of coal communities in the Information treatment (i.e., description of decline of coal communities) and Control group (i.e., no information), participants likely assumed a reason. Therefore, I asked participants in the Information and Control treatments, *What do you think is the* **main** *cause of the economic decline in coal communities? (Environmental regulation, Cheaper price of natural gas, Foreign competition, Customer's preferences changed, There is no decline, Other, Not sure)*, before the dependent variable questions. Figure 3.4 shows the distribution of responses. The red labels indicate the percentage of participants in the specific treatment who selected that particular reason. For example, 21.4 percent of participants in the Control group believed that the decline of coal communities is due to the cheaper price of natural gas. The reasons selected by participants are fairly diverse in the Control. However, nearly half of participants who received the Information treatment believed that the decline of coal communities is due to environmental regulation. As mentioned, the plight of coal communities was a Presidential campaign issue and remained in the media, which could explain this

[13] I did not run the analysis on the reduced sample of participants that understood the comprehension questions because any analysis would be systematically biased since individuals in the Control group did not receive any comprehension questions.

result. Further investigation reveals that 188 conservatives received the Information treatment, and 61 percent of these conservatives (115 participants) assumed the reason for coal communities decline is because of environmental regulations. Table 3.3 is a cross tabulation and percent opting for a particular explanation by political ideology for the Information treatment.

	Environmental Regulation	Cheaper price of natural gas	Foreign competition	Customers' preferences changed	There is no decline	Other	Not sure
Conservatives (188)	61.17 (115)	14.36 (27)	4.26 (8)	6.91 (13)	1.60 (3)	2.66 (5)	9.04 (17)
Moderates (162)	37.04 (60)	23.46 (38)	6.17 (10)	16.67 (27)	0.62 (1)	5.56 (9)	10.49 (17)
Liberals (150)	33.33 (50)	25.33 (38)	8.00 (12)	16.67 (25)	0 (0)	7.33 (11)	9.33 (14)

Table 3.3: **Percent of participants selecting each reason for decline of coal communities by political ideology**: The number in parenthesis is the count of participants. For example, 61.17 percent of Conservatives believed the decline of coal communities is due to environmental regulations, which is 115 participants out of the total number of Conservatives receiving the Information treatment of 188.

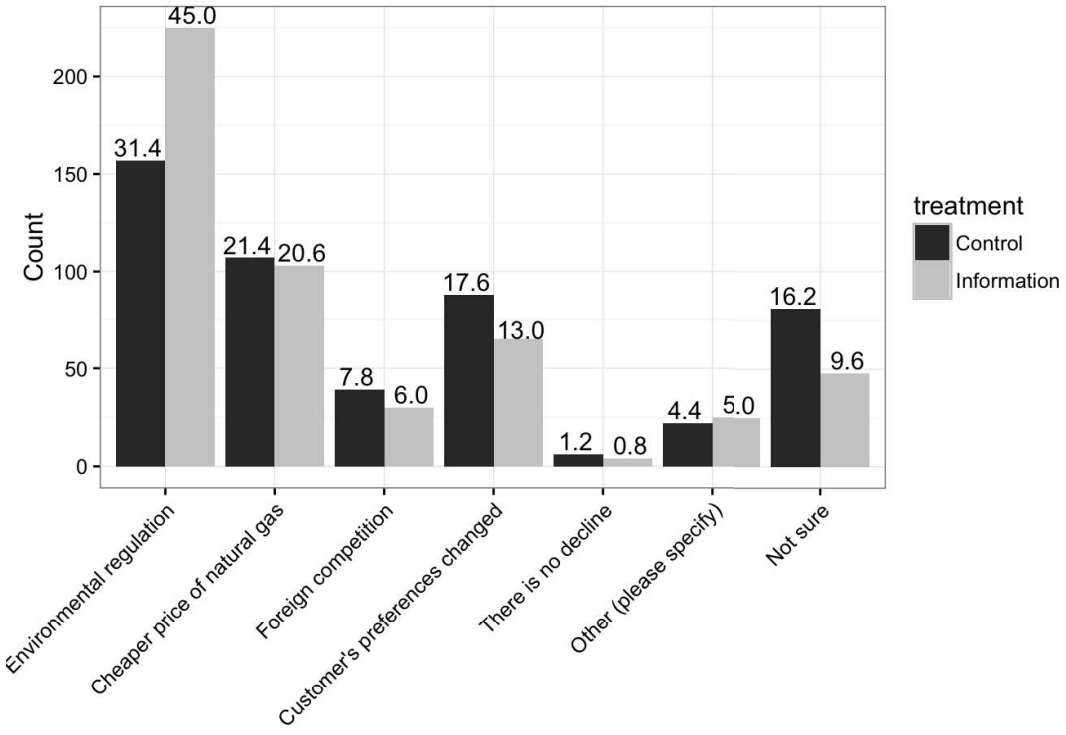

Figure 3.4: **Participants' perceptions of the cause of coal's decline (Control group and Information treatment)**: *What do you think is the* **main** *cause of the economic decline in coal communities?* (Environmental regulation, Cheaper price of natural gas, Foreign competition, Customer's preferences changed, There is no decline, Other, Not sure). The black label is the percent of participants' selecting that reason from the treatment.

After the treatments, participants answered the two items measuring the dependent variable, welfare support, for two types of coalminers followed by two blocks of questions assessing the reciprocity and control perceptions of each of the coalminers. As mentioned before, reciprocity and control have been identified as the most important triggers of the deservingness heuristic. I measured these concepts using adapted questions from Petersen et al. (2010). Participants were asked: *Please tell us how much you agree or disagree with the following statements:*

[Control]

- A young man in his early thirties who has worked his entire life in the coalmines could get a new job somewhere else if he wanted to. (Strongly disagree, disagree, somewhat disagree, neither agree nor disagree, somewhat agree, agree, strongly agree)
- An old man in his early sixties who has worked his entire life in the coalmines could get a new job somewhere else if he wanted to. (Strongly disagree, disagree, somewhat disagree, neither agree nor disagree, somewhat agree, agree, strongly agree)

[Reciprocity]

- A young man in his early thirties who has worked his entire life in the coalmines has contributed enough to society to deserve social assistance. (Strongly disagree, disagree, somewhat disagree, neither agree nor disagree, somewhat agree, agree, strongly agree)
- An old man in his early sixties who has worked his entire life in the coalmines has contributed enough to society to deserve social assistance.

The order of the blocks, the questions within the blocks, and the direction of the answer categories were randomized between participants.

After these questions, I assessed participants' general welfare perceptions. First, I asked participants to place themselves on a scale between 0 and 10 in terms of agreement with the following statements where 0 means, *The state should take more responsibility to ensure that everyone is provided for*, and 10 means, *Everyone should take more responsibility to provide for themselves.* Then, I measured participants' implicit welfare preferences. Participants read the following instructions:

> More generally, we would like to know the first thing that comes to your mind when you hear the words: social assistance. We will show you six pairs of words. Each pair will be on a separate page. Click on whichever word in the pair describes your feelings best when you think about social assistance. Please answer instinctively. We want to know your ?gut? reactions.

Participants were then shown the following pairs of words on separate pages in randomized order: *Good (1)/Bad (0), Fair (1)/Unfair (0), Helpful (1)/Harmful (0), Necessary (1)/Unnecessary (0), Hardworking (1)/Lazy (0), and Honesty (1)/Fraud (0).* I created a crude measure of implicit welfare attitudes by summing the responses. The scale ranged from 0 to 6 with higher numbers representing a more positive association with social assistance. I used this simple measure instead of an Implicit Association Test (IAT) because I am only interested in underlying attitudes towards one concept: social assistance. IAT requires users to quickly categorize two concepts (i.e., male/female) with an

attribute (e.g., bossy, smart), and faster pairings are then interpreted as more strongly associated. For this reason, a simplified version seemed more appropriate.

Finally, participants answered two blocks of questions in randomized order measuring their social affinity to coal communities and climate concern. I used the PEW's Index of Climate Concern:

- In your view, is global climate change a very serious problem, somewhat serious, not too serious or not a problem? (4-very serious problem, 3-somewhat serious, 2-not too, 1-serious or not a problem).
- Do you think global climate change is harming people around the world now, will harm people in the next few years, will not harm people for many years or will never harm people? *(4-Harming people around the world now, 3-Will harm people in the next few years, 2-Will not harm people for many years, 1-Will never harm people).*
- How concerned are you, if at all, that global climate change will harm you personally at some point in your lifetime? Are you very concerned, somewhat concerned, not too concerned or not at all concerned? *(4-very concerned, 3-somewhat concerned, 2-not too concerned, 1- not at all concerned).*

Responses are then summed ranging from 3 to 12. Low numbers signal lower climate concern, and high numbers greater concern. In addition, I asked questions on social affinity to coal communities:

- Have you ever lived nearby or in a coal community? *(Yes/No)*
- Have you or any of your close friends or family worked in a coalmine or coal-related job? *(Almost all of my close friends or family, Many of my close friends or family, A few of my close friends or family, None of my close friends or family)*

The order of the questions in each block and the direction of the answer categories were randomized between participants. The survey ended by asking a series of demographic questions that were not asked in the screening on job industry, political party, and education.

3.3.4 Statistical Approach

I fitted an OLS as well as an ordinal logistic regression on the two items measuring the dependent variable on welfare support for two types of recipients: undeserving (young coalminer) and deserving (old coalminer). I regressed the treatment, political ideology, and the mitigation preference as well as the interaction terms between those three variables on the two dependent variables. The results remained unchanged in terms of the significance of terms between OLS (see Tables 8.1 and 8.2) and ordinal logistic regression (see Tables 8.3 and 8.4). Therefore, to ease interpretation, I report the results and figures from the OLS. An OLS is appropriate since the dependent variables can assume seven different values, the underlying concept is continuous, and the intervals between the ranked values are approximately equal.

3.4 Results

To begin, I will discuss average treatment effects followed by the conditional treatment effects by political ideology and mitigation preference.

Figures 3.5 and 3.6 show the predicted welfare support for the undeserving and deserving recipient, respectively, for all participants after receiving the three treatments or no treatment (i.e., Control group). Predicted welfare support is on the y-axis (labeled Fit) and ranges from 1 to 7 where 1 is *strongly disagree that [the young/ old coalminer] should qualify for social assistance* and 7 is *strongly agree that [the young/ old coalminer] should qualify for social assistance.* Results for the regression can be found in Table 8.1 in Appendix 8.1.1. Regression results with controls did not affect results; therefore, I report the predicted results without controls. Regressions results with controls can be found in Appendix 8.1.2 Table 8.2.

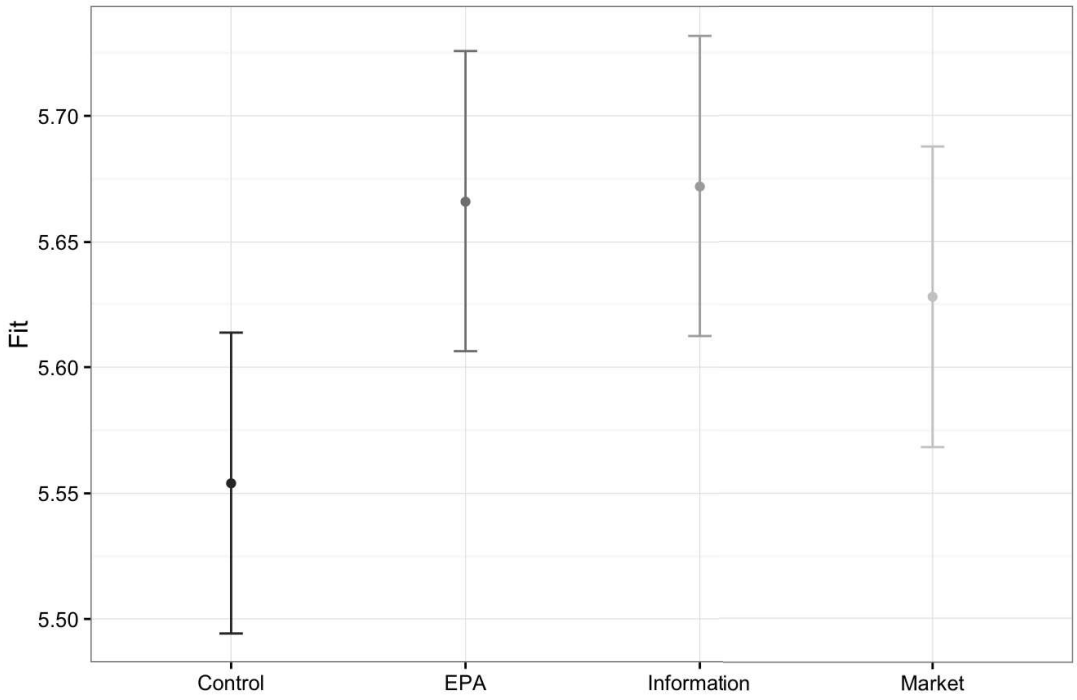

Figure 3.5: **Average treatment effects for the deserving recipient (i.e., old coalminer)**: Predicted welfare support is on the y-axis (labeled Fit) and ranges from 1 to 7 where 1 is *strongly disagree that old coalminer should qualify for social assistance* and 7 is *strongly agree that old coalminer should qualify for social assistance.*

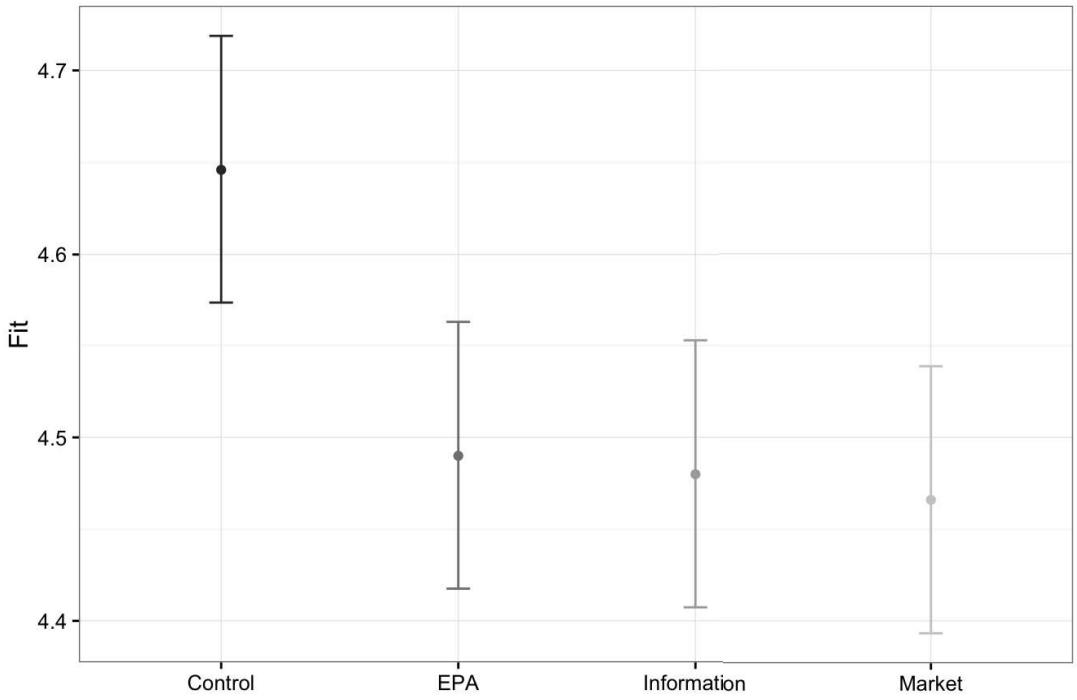

Figure 3.6: **Average treatment effects for the deserving recipient (i.e., old coalminer)**: Predicted welfare support is on the y-axis (labeled Fit) and ranges from 1 to 7 where 1 is *strongly disagree that the young coalminer should qualify for social assistance* and 7 is *strongly agree that the young coalminer should qualify for social assistance.*

As expected, there are no significant differences between treatment groups and Control group for the deserving recipient as seen in Figure 3.5. Counter to expectations, the EPA, Information, and Market treatments significantly decrease welfare support compared to the Control for the undeserving recipient as seen in Figure 3.6. There are three possible explanations: (1) participants also adjust welfare support for the undeserving recipient by self-interest after the Market and Information, (2) the theoretical framework is inaccurate (i.e., citizens do not adjust their welfare support for the underserving recipient by self-interest) and citizen-level characteristics interact with treatments and directly affect welfare support, or (3) the treatments (i.e., Market, EPA, and Information) cue undeservingness, which in turn, affects welfare support.

I can exclude the last explanation (3) that the treatments cue undeservingness. If the treatments cued undeservingness, I would expect similar treatment effects for the deserving recipient, that is, lower support for the deserving recipient after the treatments compared to Control. Given that, this is not the case, this unlikely to be the explanation. If Explanation (2) is the case, that is, the theoretical framework is inaccurate and citizen-level characteristics interact with the treatments to directly affect welfare support for the coalminers, I would expect to observe this effect with the deserving coalminer as well. This would imply that deservingness cues are no longer crowded out with the explanation for the recipient's need is known.

I plotted the predicted support for the deserving recipient by political ideology and mitigation preference. Similar to above, predicted welfare support is on the y-axis and ranges from 1 to 7 where 1 is *strongly disagree that the old coalminer should qualify for social assistance* and 7 is *strongly agree that the old coalminer should qualify for social assistance*. Figure 3.7 shows that treatments are insignificant across political ideologies for mitigation advocates and participants who are unsure about mitigation. However, counter to expectations, the treatments significantly affect welfare support for conservative and moderate mitigation opponents. The EPA treatment significantly decreases support for welfare to the deserving coalminer compared to the Control group amongst moderate mitigation opponents, while the Information treatment significantly increases support compared to the Control amongst Conservative opponents. This latter result is particularly surprising given that the majority of Conservatives in the Information treatment believed the decline of coal communities was due to environmental regulation (see Table 3.3). Moreover, the EPA treatment is not significantly different from the Control group. Given this result, I can confirm the theoretical framework is inaccurate. That is, the treatments with mitigation preference and political ideology directly affect welfare support for the two types of recipients. The rest of the section discusses moderated treatment effects for the underserving recipient in greater detail.

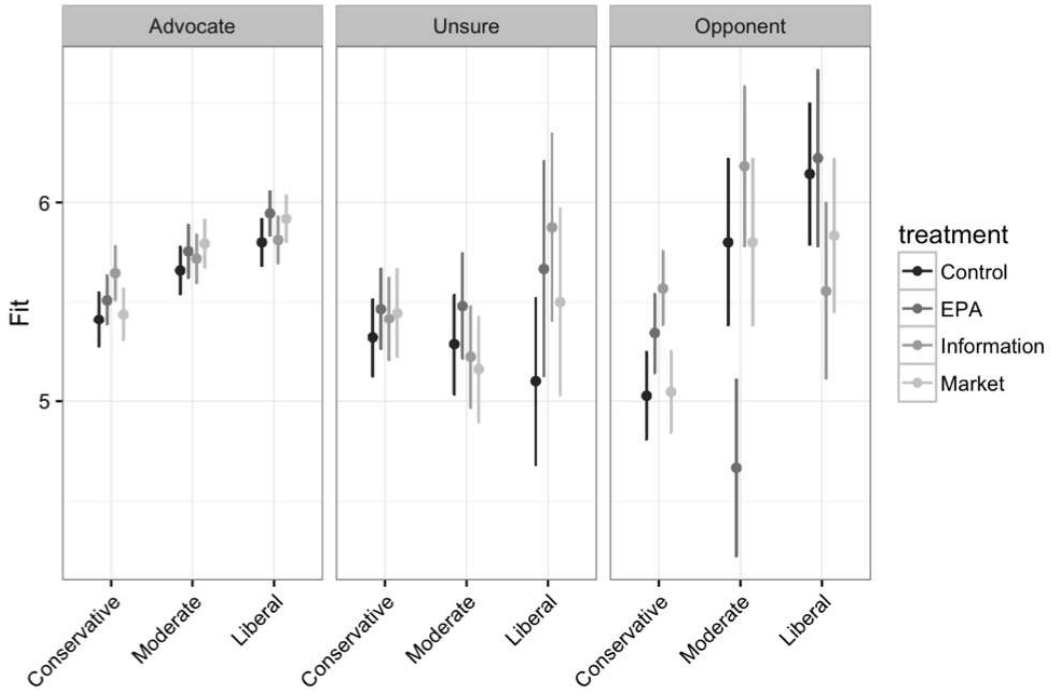

Figure 3.7: **Predicted welfare support for the deserving recipient by mitigation preference (oppose, unsure advocate)**: The standard errors are quite large for the liberal and moderate mitigation opponents as well as for liberals, who are unsure about mitigation as expected, which is due to small sample sizes (see Table 3.2).

Figure 3.8 is the predicted welfare support for the undeserving recipient (i.e. young coalminer) amongst mitigation's advocates. Predicted welfare support is on the y-axis and ranges from 1 to 7 where 1 is *strongly disagree that the old coalminer should qualify for social assistance* and 7 is *strongly agree that the old coalminer should qualify for social assistance.* Counter to expectations, there is no significant difference in welfare support amongst conservative mitigation advocates receiving the EPA treatment and the Control. Moreover, the EPA and Information treatments significantly decrease welfare support amongst liberal mitigation advocates compared to the Control. I expected that if the undeserving recipient's need was due to mitigation (EPA treatment), this would increase welfare support compared to the Control group given that liberal mitigation advocates support government regulation of emissions and are proponents of welfare. The effect of the Information treatment is likely due to the fact that the majority of liberals receiving the Information treatment believed the decline of coal communities to be due to environmental regulations.

There could be two possible explanations for the result amongst liberal mitigation advocates. First, liberal mitigation advocates could feel vindictive towards coalminers; the rationale could be that coalminers work in an emission-intensive industry harming the planet, and therefore, do not merit assistance. This feeling, in turn, could decrease their welfare support. Another possible explanation could be that liberal mitigation advocates believe that mitigation's losers do not deserve it. One could argue that scientific consensus on climate change existed since 1990 meaning mitigation's losers had plenty of time to change professions. This could decrease their welfare support and perhaps, liberal mitigation advocates underestimate the difficulties coalminers face to change professions or move.

Another unanticipated result is that the EPA treatment increases welfare support for the undeserving recipient compared to the Control amongst conservatives who are unsure about mitigation as seen in Figure 3.9. This result is at odds with the conservative ideology, which generally admonishes welfare and state intervention. It could be that those who are unsure about mitigation are more impressionable and susceptible to treatments. However, if this is the reason, it is surprising that there are no significant treatment effects for liberals who are unsure about mitigation.

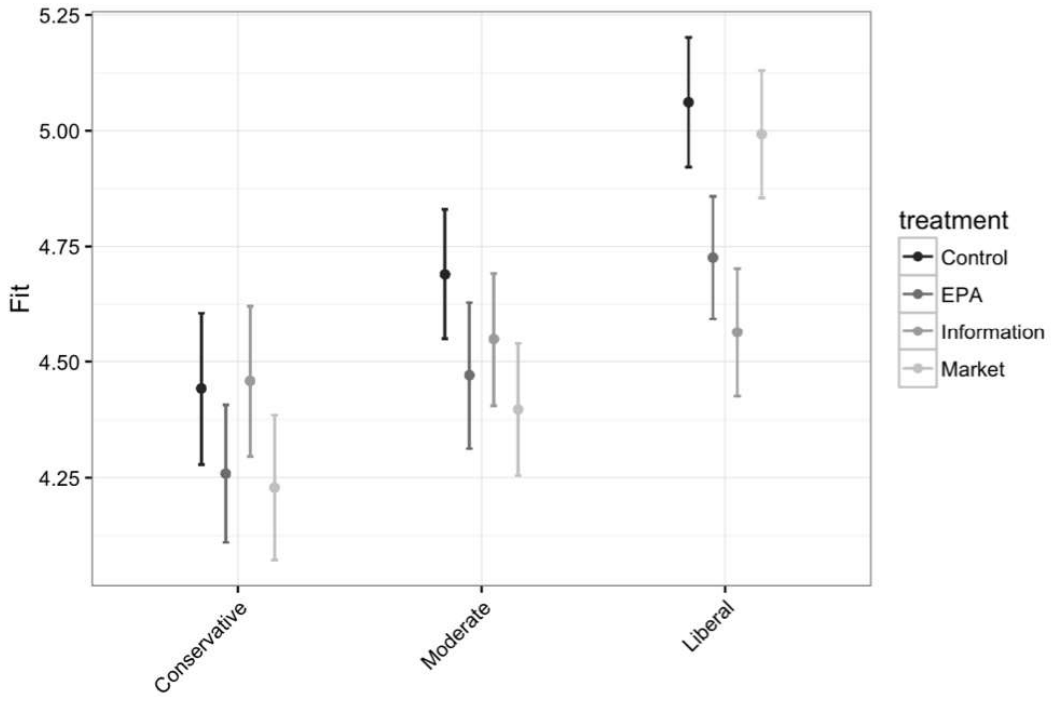

Figure 3.8: **Predicted welfare support for the underserving recipient amongst mitigation's advocates.**

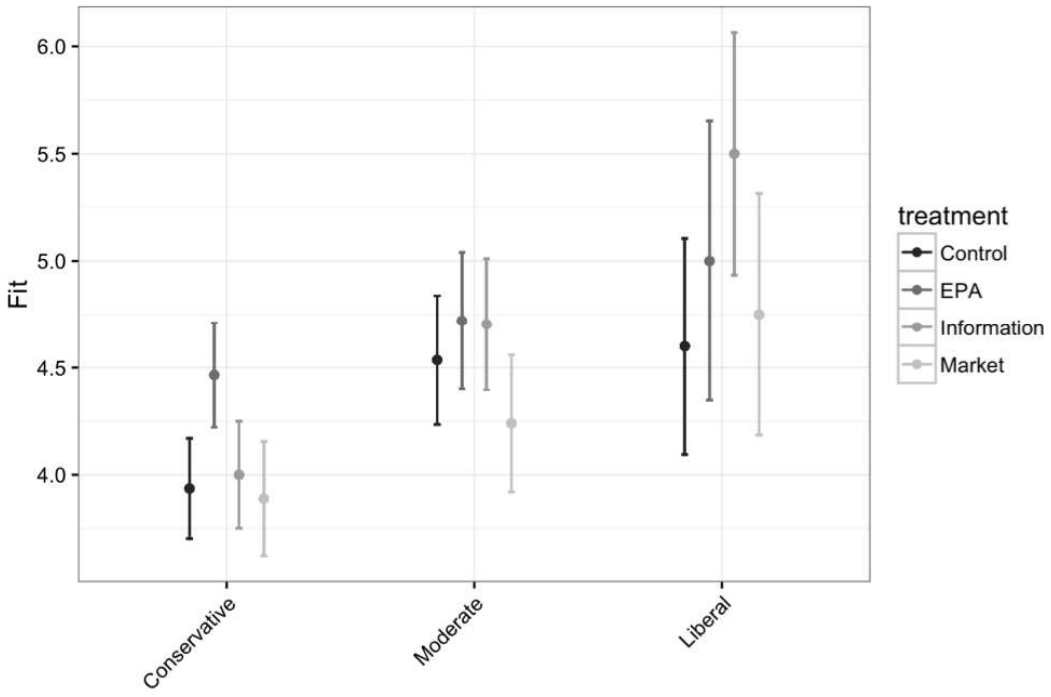

Figure 3.9: **Predicted welfare support for the underserving recipient amongst participants who are unsure whether they advocate or oppose mitigation.**

3.5 Discussion

The results do not bode well for the feasibility of embedded environmentalism in the United States. Such an approach is likely to face resistance from liberal mitigation advocates, but it is unclear why. I proposed two possible explanations. First, liberal mitigation advocates could feel vindictive towards mitigation's losers, which decreases their welfare support. The rationale could be that coalminers work in an emission-intensive industry harming the planet, and therefore, do not merit assistance. Another possible explanation is that liberal mitigation advocates believe that scientific consensus regarding climate change existed since 1990, and therefore, mitigation's losers possessed plenty of time to change professions, which decreases their welfare support. Future research should try to disentangle these competing explanations. Otherwise, embedded environmentalism or similar proposals will face major obstacles.

It is possible that these results could be due to the type of mitigation. The EPA treatment highlighted only governmental regulation instead of a carbon-pricing scheme. Citizens might have greater welfare support for mitigation's losers if the need was due to a carbon tax or an emissions trading scheme. For example, conservatives prefer mitigation, which prices carbon; therefore, conservatives may be more willing to provide welfare to mitigation's losers as a consequence of such a policy. Future research should investigate individuals' willingness to compensate as a result of other forms of mitigation. If individuals display greater welfare support for mitigation's losers as a result of one of these approaches, it might befit policymakers to pursue these types of mitigation over regulation.

Moreover, it is also conceivable that these results are particular to coalminers. As noted at several points in the analysis, coal is a highly politicized issue in the United States. As such, participants could have already formulated opinions on the cause of coal communities decline, or in the case of liberal mitigation advocates, there animosity could be directed particularly at coal. Future research should also vary the mitigation loser to see if these results hold. It is also possible that the type of social assistance matters, and some types of social assistance might be received better than others. Future work could investigate on which types of welfare programs or eligibility requirements, individuals would prefer for mitigation's losers. There could be certain combinations of policy attributes that might garner greater support, and address the reservations to those who are resistant to providing compensation to mitigation's losers. One idea would be a conjoint analysis to investigate which policy features enhance or decrease welfare support for mitigation's losers in order to design better policies. A conjoint analysis is used to determine how individuals value different attributes that comprise a policy. In a conjoint analysis, individuals chose between two pairs of policies comprised of the same attributes but with differing values, which allows for the identification of individuals preferred attribute values for a policy.

How do these results generalize outside of the United States to other liberal welfare regimes? Other liberal welfare regimes should be aware that deservingness cues might no longer crowd-out individual-level characteristics from affecting welfare support if the recipient's need is due to mitigation. One recommendation for liberal welfare regimes, in general, is try to enhance the individuals'

deservingness perceptions of mitigation losers. At present, mitigation does not cue deservingness, but if it did, this could enhance welfare support. Future research could examine which messages and framing enhance individuals' perceptions of mitigation's losers reciprocity or their lack of control.

Future research can help clarify the generalizability of results; however, the initial impression is that providing social assistance to coal communities will be challenging. The average treatment effects indicate that mentioning coal significantly decreases welfare support for the undeserving recipient. Moreover, liberal mitigation advocates appear particularly resistant. This does not bode well for the future of climate mitigation in the United States. The coal industry and coalminers will continue to lobby against climate policy, while mitigation advocates continue to lobby for it, whichever group possesses more political clout at a particular moment will dominate policy.