Based on Denberg 2020

Study 1 Methods

Study Sample

We conducted a stated preference survey of societal views on and personal support of Universal Health Care (UHC), capital punishment, anthropoegenic (human-caused) climate change, and slavery, among students enrolled in a Psychology course at a Midwestern University. Participants were recruited through an online survey platform and were offered course credit in exchange for their participation.

Survey design and development

Development of the survey instrument drew on prior literature on support for universal healthcare, perspectives on deontological and utilitarian moral orientation, as well as prior work on perception of social consensus. Our social consensus manipulation exercise was adapted from work on estimation of social consensus conducted by Kobayashi and colleagues (2018). Our final survey questionnaire directed participants to estimate perceived social consensus on support for different social issues, and then receive artificially high or low feedback on the degree of social consensus which allegedly exists among the population. We presented each participant with the same four social issues (support for UHC, capital punishment, climate change, and slavery); these scenarios were intended to provide variation in social characteristics, such as relative liberal/conservative leaning of issues and recent or past historical relevance. Participants then provided their level of support for our social issues after the social consensus manipulation. Support levels were captured as continuous variables ranging from 0 (strong disagreement) to 100 (strong agreement), with 50 representing relative neutrality. Participants also were measured for their deontological and utilitarian orientation, health literacy, numeracy, as well as demographic information related to gender identity, age, race/ethnicity, and year in school.

Intervention

Randomization of participants to either intervention condition was achieved using a randomization algorithm that guarantees each element was selected approximately equivalent amounts of times. We subjected participants in our intervention groups to a series of preference estimation tasks. Balance was sought between the social issues chosen such that there were a variety of public policy perspectives, both liberal and conservative, presented. Participants in our ‘high’ social consensus condition were given artificially high feedback on the degree to which society agreed on the four aforementioned issues; The feedback was manipulated to be 20% higher than the actual American survey values recorded in the literature. Likewise, participants in our ‘low’ social consensus were given artificially low feedback; feedback was manipulated to be 20% lower than survey values. Participants were prevented from changing their responses in prior answers in the survey.

Statistical analysis

? DO WE EVEN WANT MEASURES?

**Measures**

The primary outcome measure was a single item support for UHC measure, adapted from Shen & Labouff (2013), measured both pre and post-intervention. The scale is comprised of a single item measuring support for UHC, “Our government needs to implement Universal Health Care because basic population needs are not being met”. The capital punishment ("Capital Punishment (the Death Penalty) is necessary in America") and climate change ("Greenhouse gas emissions generated by human activity has and will continue to change Earth's climate") issues were assessed using language taken directly from surveys of American public opinion in 2017 and 2020 (Economist - YouGov poll, 2017; Pew Research Polling, 2020). The measure for the slavery item ("Slavery, forced labor and human trafficking are violations of human rights") was taken from the United Nations – Human Rights Office of the High Commissioner (2021). All four items were measured on a 7 point Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree).

Participants additionally were asked to complete a measure of their baseline deontological and utilitarian orientation. This was assessed using the Ethical Standards of Judgement Questionnaire (Love, 2018). This questionnaire is comprised of two segments, each segment assessing either utilitarian or deontological orientation respectively. Each segment consisted of six items measuring the aforementioned orientation; each item was measured on a 5 point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Final deontological or utilitarian orientation scores were taken as an average of all six items corresponding to that orientation; see Appendix B for item wording

Several additional measures of health literacy and numeracy were also collected. Health literacy was assessed using the Single Item Health Literacy Screener (Morris, 2006). This item “How confident are you filling out medical forms by yourself?” was measured using a 5 point Likert scale from 1 (Never) to 5 (Always). Our first measure of numeracy was the Subjective Numeracy Scale (Fagerlin, 2007), which consists of 8 items measuring general confidence in using numbers, and preference for numbers over words (e.g., “How good are you at figuring how much a shirt will cost if it is 25% off?”, and “How often do you find numerical information to be useful?”). All items were measured on a 6 point Likert scale. Total scoring for the scale was taken as a simple average of all items, after reverse scoring the 7th item. Our second measure of numeracy was an objective measure, consisting of the number line task developed by Thompson and colleagues (2021). This item consisted of placement of 20 fractions one at a time, at the appropriate place on a number line ranging from 0 to 1, and then placing 20 more fractions, one at a time, on a number line ranging from 0 to 5 (e.g. the relative distance between 2/3, 7/9, 12/13, 4/7, etc.). Performance on this task was measured as precision on the number line estimation as a summation of the percentage of absolute error on all fractional placements. Additionally, there was a free-response question requesting feedback on the exercise they had just completed, both on things they liked, and things they found challenging. Finally, we also measured demographic information, including gender identity, age, race/ethnicity, and year in school.

Study 2

While previous research has been relatively effective at increasing moralization of an issue, it has struggled in general with reducing moral conviction. One of the obvious issues are that many contemporary topics become highly polarized once they begin gaining political attention (e.g. free/hate speech, sports gambling, etc.). In effect, any experiment manipulating the perception of topics that commonly arise in ‘regular’ life, are potentially contaminated as respondents have already had significant exposure to framing of the topic (Druckman, 2012). Thus, there is a significant open question in the research whether or not non-moral framing can reduce moral conviction in topics well known to the public.

Additionally, non-moral framing of persuasive messages has been shown to be effective for those that are not neutral, but instead already hold a strong moral identity (i.e. their stance on an issue is important to their identity, and that stance is based on the issue’s perceived ‘goodness’ or ‘badness’). For example, Tauber and colleagues found evidence of this when presenting arguments attempting to persuade Dutch citizens to support climate change (Tauber, 2013). In the moralized framework, wherein the Netherlands were seen as immoral due to their difficulties in combating climate change, Dutch citizens were less willing to strive for improvement in climate change. Conversely, in the non-moral framework, wherein the Netherlands were seen as incompetent instead of immoral, Dutch citizens were significantly more willing to strive for improvement in climate change. Vitally, competence can be seen as separable from morality, and is instead perceived as a non-moral issue. This effect was significantly more pronounced in Dutch citizens that strongly identified support for climate change as one of their moral convictions and was relatively nonexistent for Dutch citizens that were morally ambivalent regarding climate change. It is another open question whether people who have strong moral feelings in one direction could be persuaded by a strong moral argument in the other direction. For example, an argument on how immoral it is to restrict a woman’s ability to regulate their own health being presented to a highly morally convicted pro-life supporter.

**Procedure**

Our participants will begin by clicking on the virtual study link, available in the online study sign-up website. This study link will forward to an online Qualtrics survey. Participants are brought to a cover page that included a brief description of the research they would be involved in. After indicating consent, three ‘blocks’ of content are presented, in a randomized order such that all participants are exposed to each block of content. Each block of content focuses on a different ethical/moral construct that we are assessing support or opposition towards.

The first block of content focuses on assessing support for UHC. We begin this block by first assessing baseline support for UHC, next, we assess the relative moral conviction of the subject on this issue. Then further randomization occurs, and our participants receive either one of three essays in favor of supporting universal healthcare or a control statement describing what UHC is. The first essay has a highly moralized framing supporting UHC centered on the rights and obligations that citizens are due from the U.S. government. The second essay has a highly moralized framing supporting UHC centered on perceptions that the U.S. is immoral if it does not provide UHC to it’s citizens. The third essay has a non-moral framing supporting UHC centered on arguments centered on the relative benefits of UHC in other countries, emphasizing the pragmatic benefits of UHC (increased lifespan, relatively lower healthcare costs, etc.). The control statement presents some brief, factually true, but neutral information neither in favor or opposition to UHC. After being presented with this informational intervention, participants are exposed to a brief pamphlet consisting of relatively neutral, factual, information in favor of UHC. Lastly, we re-measure support for UHC and level of moral conviction on the subject again, to assess if any changes occurred after our intervention.

The second block of content is very similar and focuses on assessing support for physical exercise. We begin this block by first assessing baseline support for physical exercise, next, we assess the relative moral conviction of the subject on this issue. Then further randomization occurs, and our participants receive either one of two essays in favor of supporting exercise, or a ‘control’ statement describing what country music is. The first essay has a highly moralized framing supporting exercise centered on the perspective that exercise strengthens moral character, leads to more ethical living, and that ignoring your own health and wellbeing is immoral. The second essay has a non-moral framing supporting exercise centered on factual arguments regarding relative reduction in risk of death and prevention of several common chronic illnesses. The control statement presents some brief, factually true, but neutral information neither in favor or opposition to exercise. After being presented with this informational intervention, participants are exposed to a brief pamphlet consisting of relatively neutral, factual, information in favor of exercise. Lastly, we re-measure support for country music and level of moral conviction on the subject again, to assess if any changes occurred after our intervention.

Our third block follows the same structure, and focuses on assessing support for capital punishment (a.k.a. the death penalty). We begin this block by first assessing baseline support for the death penalty, next, we assess the relative moral conviction of the subject on this issue. Then further randomization occurs, and our participants receive either one of two essays in favor of supporting capital punishment, or a control statement describing what capital punishment is. The first essay has a highly moralized framing opposing capital punishment centered on the moral unacceptability of both accidental executions of the innocent and significant racial bias in sentencing. The second essay has a non-moral framing opposing capital punishment centered on the economic unacceptability of significantly increased cost to taxpayers, emphasizing the pragmatic downsides of capital punishment (greater burden on the courts, longer time to final sentencing, roughly $1,000,000 per person greater cost relative to life sentencing, etc.). The control statement presents some brief, factually true, but neutral information neither in favor or opposition to capital punishment. After being presented with this informational intervention, participants are exposed to a brief pamphlet consisting of relatively neutral, factual, information in opposition to capital punishment. Lastly, we re-measure support for capital punishment and level of moral conviction on the subject again, to assess if any changes occurred after our intervention.

For all three blocks, the first argument is intended to portray a heavily moralized argument, wherein the argumentation in favor of the subject relies heavily on activation of moral conviction. Conversely, the second argument is intended to portray a neutral ‘facts based’ argument in favor of the subject, which is intended to be as non-moral as possible. The control statement is meant to provide a completely neutral, but accurate, informational assessment on the concept. The intention is to provide no argumentation in favor of the issue in the control statement, one way or another. We will be assessing whether or not moral conviction increases with a manipulation, directly measuring moral conviction on the issue before and after the manipulation; see appendix B for Study 2 experimental materials. Study 2 will use a between-groups design, wherein different participants will receive each condition of our independent variable.

**Measures**

The primary outcome measure will be the same support for UHC scale as used in Study 1 (“Our government needs to implement Universal Health Care because basic population needs are not being met”), adapted from Shen & Labouff (2013). Our outcome measurement for capital punishment is likewise the same as used in Study 1 ("Capital Punishment (the Death Penalty) is necessary in America"), taken from Pew Research Polling (2021) on the American public. Our measure for support of exercise (“What is your level of desire or motivation to exercise?”) was adapted from Katula and colleagues (2006). This measure would be on a 7 point Likert scale, with measurement ranging from 1 (No Desire Whatsoever) to 7 (Strong Desire).

We will also be measuring as a manipulation check the degree of moral conviction that our participants have towards the issues we assess. We will evaluate moral conviction with Skitka and colleagues single item measure of moral conviction. This consists of the question “My feelings about X are a reflection of my core moral beliefs and convictions”, measured on a 7-point Likert scale from 1 (Strongly disagree) to 7 (Strongly agree). We will also collect a measure of subjective numeracy and health literacy, using the Subjective Numeracy Scale and the Single Item Health Literacy Scale as in Study 1. Participants will additionally complete a free-response question, asking the subjects what they thought was good about the exercise they completed, and what they thought was challenging in the exercise they completed. Finally, we also measure demographic information, including political affiliation, gender identity, age, race/ethnicity, and year in school.

Study 3

**Participants**

We are planning to recruit participants that are students enrolled in Psychology 1000 at a Midwestern University. Participants will receive course credit for participation in this study.

**Procedure**

Our participants will begin by clicking on the virtual study link, available in the online study sign-up website. This study link will forward to an online Qualtrics survey. Participants are brought to a cover page that included a brief description of the research they would be involved in. After indicating consent, we measure deontological and utilitarian ethical predisposition using the Ethical Standards of Judgement Questionnaire, as in Study 1. Then, we take an initial assessment of support for UHC and support for capital punishment, as well as the amount of moral convicition that our participants have regarding their stance on these two issues.

Afterwards, two ‘blocks’ of content are presented, in a randomized order such that all participants are exposed to each block of content. Each block of content focuses on a different issue (either UHC or capital punishment), where we attempt to increase or decrease moral conviction regarding the issue. In the first block of content, participants will read one of three randomized essays intended to manipulate moral conviction towards UHC, or a neutral ‘control’ statement. The first essay has a highly moralized framing supporting UHC centered on the rights and obligations that citizens are due from the U.S. government. The second essay has a highly moralized framing supporting UHC centered on perceptions that the U.S. is immoral if it does not provide UHC to it’s citizens. The third essay has a non-moral framing supporting UHC centered on arguments centered on the relative benefits of UHC in other countries, emphasizing the pragmatic benefits of UHC (increased lifespan, relatively lower healthcare costs, etc.). The control statement presents some brief, factually true, but neutral information neither in favor or opposition to UHC.

In the second block of content, participants will read one of two randomized essays intended to manipulate moral conviction towards capital punishment, or a neutral ‘control’ statement. The first essay has a highly moralized framing opposing capital punishment centered on the moral unacceptability of both accidental executions of the innocent and significant racial bias in sentencing. The second essay has a non-moral framing opposing capital punishment centered on the economic unacceptability of significantly increased cost to taxpayers, emphasizing the pragmatic downsides of capital punishment (greater burden on the courts, longer time to final sentencing, roughly $1,000,000 per person greater cost relative to life sentencing, etc.). The control statement presents some brief, factually true, but neutral information neither in favor or opposition to capital punishment.

Participants were then randomly assigned to one of two conditions representing different exposure to social consensus. Our two conditions were a ‘High’ consensus condition and a ‘Low’ consensus condition. For both experimental conditions, subjects were asked to estimate what they believe to be the percentage of ordinary Americans in 2018 that agreed with various social and scientific issues, which in this case, was support for UHC and support for capital punishment. After providing their estimate, we provided deceptive information regarding what the ‘actual results’ of what Americans believed in 2018. This ‘deception’ was our primary method of manipulating perception of social consensus.

In the ‘high’ consensus condition participants saw survey results that were biased artificially upwards by 20% (e.g., if 60% of Americans agreed that capital punishment is needed in the US, the actual percentage shown to those in the high consensus condition will be 80%). Conversely, in the ‘low’ consensus condition, participants saw survey results that were biased artificially downwards by 20% (e.g., if 60% of Americans agreed that capital punishment is needed in the US, the actual percentage shown to those in the high consensus condition will be 40%).

Afterwards, we reassessed the measurement items we asked at the beginning of the study, the degree of support for UHC and how much moral conviction that stance has, likewise with the degree of support for capital punishment and strength of moral conviction for that stance as well. Then, we assess for individual differences in health literacy and subjective numeracy. Additionally, there are a pair of free response questions where we request participants to inform us of which things they liked about the exercise, and what things they found challenging about the exercise. Finally, we assess demographic information, consisting of political orientation, age, gender, race/ethnicity, and year in school. After all measurements are completed, participants were provided with a detailed debrief revealing the true nature of our actual study, as well as providing them with the actual survey response values for support towards UHC and capital punishment.

**Measures**

Deontological and Utilitarian ethical orientation will be measured with the Ethical Standards of Judgement Questionnaire (Love, 2018). This questionnaire is comprised of two segments, each segment assessing either utilitarian or deontological orientation respectively. Each segment consisted of six items measuring the aforementioned orientation; each item was measured on a 5 point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Final deontological or utilitarian orientation scores were taken as an average of all six items corresponding to that orientation; see Appendix B for item wording

The primary outcome measure will be the same support for UHC scale as used in Study 1 (“Our government needs to implement Universal Health Care because basic population needs are not being met”), adapted from Shen & Labouff (2013), measured both pre and post-test. Our outcome measurement for capital punishment is likewise the same as used in Study 1 ("Capital Punishment (the Death Penalty) is necessary in America"), taken from Pew Research Polling (2021) on the American public.

We will also be measuring as a manipulation check the degree of moral conviction that our participants have towards the issues we assess. We will evaluate moral conviction with Skitka and colleagues single item measure of moral conviction. This consists of the question “My feelings about X are a reflection of my core moral beliefs and convictions”, measured on a 7-point Likert scale from 1 (Strongly disagree) to 7 (Strongly agree).

Individual differences in subjective numeracy and health literacy will be measured using the Subjective Numeracy Scale and the Single Item Health Literacy Scale as in Study 1. Participants will additionally complete a free-response question, asking the subjects what they thought was good about the exercise they completed, and what they thought was challenging in the exercise they completed. Finally, we also measure demographic information, including political affiliation, gender identity, age, race/ethnicity, and year in school.