

Persuasion with Motivated Beliefs

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Abstract

Considerable empirical research finds that people derive utility not only from consumption, but also from their beliefs about themselves and the world. Rather than dispassionately updating their views in response to new information, such belief-based utility implies that people at times avoid information and use other strategies to protect their existing beliefs. We present a two-stage model of persuasion in the presence of belief-protecting strategies and test it in an incentive-compatible task. In the experiment, persuaders seek to shift receivers' subjective numeric estimates related to emotionally charged topics, such as abortion and racial discrimination. We manipulate whether the persuader first acknowledges her own lack of certainty and whether she first has an opportunity to build rapport with the receiver. Though these elements of communication ought to be irrelevant or even backfire under the standard account, our theory predicts they will enhance persuasiveness. We find that acknowledging doubt leads to a greater change in the receivers' beliefs, but find no effect for building rapport. Moreover, we find that persuaders end up changing their own estimates after writing a persuasive message. Those who presented a strong argument (as judged by third party raters) end up revising their own estimate in the direction of their argument, while those who provided a weak argument update in the opposite direction.

1 Introduction

The acquisition of information holds the promise to improve the quality of our decisions and, hence, our well-being. The more accurate are our views about the options that are available to us, the more likely we are to choose the ones that maximize our utility. This optimistic view dates back to George Stigler, whose seminal work introduced to economics the idea of information as a scarce resource (Stigler, 1961). In the nearly 60 years since, economists have tended to adhere to the Stiglarian assumption that information is useful and desirable to the extent (and only to the extent) that it helps us make better decisions. When information is freely available and there are no strategic considerations, a decision-maker should always obtain it and never incur any costs to avoid it.

This perspective on information has also informed prior work on persuasion, in which the emphasis has been on the senders of information. When they are more informed, for example, they may strategically choose the extent to which they disclose information to a receiver (Crawford and Sobel, 1982). Indeed, receivers who update like perfect Bayesians can even be made worse off when senders have an opportunity to persuade them than in the absence of information (Kamenica and Gentzkow, 2011).

However, there is now substantial empirical evidence from laboratory and field studies showing that decision-makers often desire to avoid information, even when it is available at no cost and doing so can lead them to make worse decisions (Golman et al., 2017; Ho et al., 2018). A parsimonious explanation for this observation is that people derive utility directly from the beliefs they hold, a view that dates back to Abelson (1986), who argues that “beliefs are like possessions” in the sense that we are reluctant to surrender them, even for other beliefs that might be more valuable. Moreover, people often enjoy immediate benefits from holding (or professing to hold) a particular belief, especially to the extent that others share it (Abelson and Prentice, 1989). Models accounting for direct benefits from holding beliefs have since also found acceptance in economics (Loewenstein, 1987; Caplin and Leahy, 2004; Kőszegi, 2010).

A key implication of belief-based utility is that there may be substantial cost to changing a belief. Someone who is part of a religious community, for example, may find that many of their relationships are contingent on maintaining their belief. Even without such external motivation, individuals who have made costly decisions based on beliefs may have incurred sunk costs that they are reluctant to write off (Thaler, 1980). Consequently, there may be an incentive to avoid information, precisely because it may be persuasive and make the existing belief no longer maintainable (Fels, 2015).

Such a behavioral view of information has wide-ranging implications for persuasion: receivers may not desire to be accurately informed, but to have their views confirmed even when they may be inaccurate. Focusing on how suppliers may respond to such preferences, Mullainathan and Shleifer (2005) show that a competitive equilibrium leads news sources to segment the market and target their coverage to confirm their audience’s pre-existing views. In this model, the providers of information are motivated solely to reach the greatest number of consumers. They are not, however, motivated to change their audience’s beliefs. In the only economic laboratory experiment on this topic we are aware of, Coffman and Niehaus (2014) ask participants to report the maximum willingness to pay for three goods (an iPad, a risky lottery, and a delayed payment). After doing so, some participants engage in free-form communication via audio chat with a “seller.” The seller receives a commission as a function of the sale price and thus has an incentive to increase the buyer’s valuation of the goods and this incentive is common knowledge. Despite the known conflict of interest, sellers were successful overall in persuading buyers to increase their willingness to pay for the goods. Did sellers persuade with their superior product knowledge? While some did (e.g. because they owned an iPad when the buyers did not and hence could provide first-hand information), the sellers who performed best used a different strategy: they built personal rapport with the buyer (e.g. by inquiring about their field of study and learning their name) and induced higher valuations by means of other-regard. Although buyers had financial incentives, their valuation of a good is unlikely to be a belief they had been invested in.

Indeed, we find that people on average expect it to be very unpleasant to engage with those who hold opposing political views. For a potential persuader, the finding that people are resistant to information that conflicts with their views poses a considerable challenge, as receivers may now engage in strategies to avoid them. In a world with partisan motivation (Bolsen et al., 2014), widespread belief in fake news (Allcott and Gentzkow, 2017), and asymmetric updating that favors favorable and dismisses unfavorable information (Eil and Rao, 2011; Möbius et al., 2014; Sunstein et al., 2016; Tappin et al., 2017), merely relying on experts to broadcast information may not lead people to hold more accurate views.

In this paper, we propose that insights on belief-based utility suggest an alternative approach to effective persuasion: Anticipating that having their beliefs undermined will be unpleasant, people may establish psychological barriers to shield themselves from information they expect to be incongruent with their existing views. This may explain why we see relatively little effective belief change in the field (DellaVigna and Gentzkow, 2010). While providing direct and unbiased information with high confidence is the surest path to persuading someone in a Bayesian world, that same strategy is most aversive to someone who does not want to see their beliefs challenged. We propose that persuasion is most successful when it takes an indirect route, promoting receptiveness to the information even at the cost of the strength of the signal. Factors that ought not to matter in a world in which information is processed dispassionately, like the sender’s likability, now become relevant. Moreover, a sender expressing uncertainty about their views may circumvent the receiver’s defenses and end up more persuasive than someone who appears highly confident, much like a small number of Greek soldiers hidden in a wooden horse succeeded where larger armies failed.

2 Theory

We propose that the value of information can broadly be deconstructed into two separable components. First, information has “instrumental” value that is determined by its objective

informativeness, credibility, and veracity. Knowing whether one is truly at risk of losing one's job, for example, has material implications on decisions: whether to start searching for a new job, cut down on expenses, or go home on time rather than staying late at the office to finish work. A standard economic agent would make their information acquisition decisions purely based on this instrumental value, potentially trading it off against the economic cost of obtaining the information. However, we argue that information also has "hedonic" value, that is the psychological cost (or benefit) of accepting the information as true. Accepting that one is likely to lose their job in the coming months can cause anxiety, fear, and other negative emotions. In addition to the potential economic cost, then, a decision-maker also has to consider the hedonic consequences of learning potentially painful information. When confronting a receiver with information, then, it is not merely sufficient to convey upon them the instrumental value of the information, but it can be effective to reduce the (expected) hedonic cost of obtaining it. Someone who first learns about the ease with which former employees have obtained new employment, for example, may be more willing to listen to and accept information that their job is at risk.

We propose that similar motivation to avoid information can be at play with hotly contested political issues. Those favorable (unfavorable) towards affirmative action, for example, may be less accepting of evidence that minority students are performing worse (better) than initially believed. That is, in a desire to protect their attitude toward a policy, people may dismiss information that might compel them to rethink their view: if minority students indeed were to perform poorly, that could challenge the appropriateness of affirmative action, for example. And those who believe abortion should be legal (illegal) under any circumstance may seek to downplay (exaggerate) regret experienced by women who went through the procedure. After all, if most women were to regret the decision, policies imposing mandatory waiting times may be reasonable and not merely punitive. Accepting what at first appears to be neutral and objective information may thus threaten to undermine (potentially costly) investments in an existing and deeply held belief.

Consequently, decision-makers seeking to protect their belief utility, have an incentive to protect themselves against incongruous information. Rather than changing their views on affirmative action, for example, individuals may seek to dismiss information that would suggest it is (or is not) an effective policy. They may do so by limiting their news consumption to sources that are ideologically aligned with their views (Mullainathan and Shleifer, 2005; Bakshy et al., 2015). When such physical avoidance fails, individuals have a number of other strategies available to them. Most relevantly, they may simply fail to update their beliefs and thus not take into account the undesirable information (Eil and Rao, 2011; Möbius et al., 2014; Rabin and Schrag, 1999; Sunstein et al., 2016; Tappin et al., 2017) or choose not to commit it to memory (Benabou and Tirole, 2011; Shu and Gino, 2012). We focus on situations in which the persuasion attempt is not (physically) avoidable, such as when approached by an opinionated colleague. Receivers merely have a choice to commit ex ante to how much weight they give to the information that they are about to be presented with.

In this setting, we propose that biased processing of information can be the result of “psychological defenses” and that the establishment of the defenses is an important first step that has so far not been accounted for in models of persuasion. When a decision-maker encounters a situation in which she may be persuaded (for example when she reads the headline of a news article), she first determines whether this information is likely to validate or threaten her existing beliefs. Based on this assessment, and other factors we discuss shortly, she makes an investment in psychological defenses that dampen the impact of the information. In the second stage, she receives the information and updates her beliefs in a biased fashion, where the extent of the bias is determined by her defensive investment. Importantly, the commitment to the defenses arises before the information is presented and when the decision-maker does not know with certainty whether the information will be aligned or misaligned with her underlying views.

2.1 A Two-Stage Model of Persuasion

There are many settings in which people are not invested in a belief and are receptive to advice. Someone traveling to a new city, for example, is easily persuaded to visit a particulate site or eat at a restaurant that has been recommended. With no belief utility at risk, openness to information comes only with an upside of making a better decision on how to spend limited time.

In some situations, which are the ones we focus on in this paper, a decision-maker faces the choice of whether to obtain, or be receptive to, new information that presents a trade-off between its hedonic and instrumental value. In some cases, obtaining information may threaten cherished values, but offer the promise of improving decision making. Receiving critical feedback on a manuscript draft, for example, may undermine how competent an author believes herself to be, but could enhance the chance that the manuscript gets accepted. The author could protect her ego utility by failing to obtain feedback on drafts, failing to read the feedback provided, or – as a last resort – dismissing the comments as a result of the others’ lack of familiarity with the topic (one that, surely, would not be shared by potential reviewers). While all of these strategies allow her to maintain a favorable view of her research, they likely reduce the chances that the paper ultimately gets accepted.

In other, much rarer, cases, information may offer the promise of enhancing cherished values but the threat of undermining the quality of decision making. Information conveying expertise in a topic, for example, may make a student feel competent, but lead her to study less and hence perform worse on an exam. Someone in that position would similarly discount favorable information, but do so for strategic reasons to increase her consumption utility. Although a model for these situations may look very similar, the factors influencing the “defenses” would differ substantially and is beyond the scope of the present work.

When people receive unambiguously negative information, they appear to underweigh or outright dismiss the information. [Eil and Rao \(2011\)](#) show that when participants in a laboratory experiment initially obtain unfavorable information (about their attractiveness or

IQ), they are subsequently less likely to desire additional information, which may similarly be unfavorable. Moreover, those who have consistently received unfavorable feedback about how they rank on the two dimensions compared to other participants are willing to forgo earnings to avoid learning their true rank. We conceptualize this and other avoidant strategies as “psychological defenses” that people establish in order to protect their cherished beliefs.

In a purely Bayesian world, whether information threatens to challenge or promises to validate someone’s belief is an irrelevant factor. But when facing receivers who rely on belief-protecting strategies, the persuader has reason to make himself appear less threatening. Suppose we have a sender who has aligned incentives with a receiver and seeks to persuade her on a topic she is invested in. In a Bayesian framework, the sender should communicate (only) information aimed at changing the belief. Moreover, she should express the maximum degree of certainty to ensure the receiver puts more weight on the new information. Someone who can credibly show their expertise and knowledge in a domain is more likely to hold accurate beliefs and should be more trustworthy. However, in a world in which the receiver is averse to information that challenges her views, she may be motivated to dismiss even the most sound arguments. Indeed, someone who forcefully conveys their point and leaves no room for disagreement may be most aversive to someone who does not want to see their beliefs challenged. To the extent that the receiver wants to avoid such threatening information, persuasion may be more successful when the sender appears less confident and driven to persuade – that is when she can first take steps to reduce the receiver’s defensiveness. Even if the informational content of an uncertain sender is less influential, it may ultimately lead to greater belief revision.

The proposed theory separates a persuasive attempt into two distinct stages. In the first stage, prior to being subject to a persuasive attempt, the receiver assesses the threat the sender is likely to pose to her beliefs. She may do so based on prior information about the sender, for example his political affiliation or previously expressed attitudes. In the absence of previous interaction, reliance on stereotypes (e.g. gender or ethnicity) may also lead to

inferences about views on politically charged topics. Based on this assessment, she then takes into account how receptive she should be to the person’s views. Although this step is likely to occur subconsciously, we can think of it as-if it were a conscious decision, trading off the potential gains and losses to belief utility as well as to consumption utility. When she has committed to a level of defensiveness, she then receives the message and updates her beliefs in a biased fashion. That is, when defenses are high, she underweighs the informativeness of the new information and insufficiently updates compared to a perfectly Bayesian agent. We next discuss the two stages in greater detail, emphasizing particularly the novel features resulting from the introduction of the first stage.

2.1.1 Stage 1

Before any communication takes place, a receiver chooses to make an investment in her defenses \mathcal{D} . This defensive investment has to be made prior to obtaining information and is hence going to affect both favorable and unfavorable information. We propose that three factors drive the extent of the defensive investment:

1. the expected alignment of beliefs between the sender and the receiver ($\mathcal{A} \in [-1, 1]$),
2. the importance attributed to the belief by the receiver ($\mathcal{S} \in [0, 1]$), and
3. the sender’s expected expertise ($\mathcal{E} \in [0, 1]$).

Most straight-forward, \mathcal{D} is decreasing in \mathcal{A} . If a sender is believed to hold aligned views that can reinforce an existing belief, there is no reason to establish defenses. In fact, any new information is likely to bolster one’s views against future challenges and hence the receiver should be receptive to the message. Conversely, if a sender is known to hold a strongly opposed belief, defenses become most useful. Someone who is misaligned on many important beliefs is most likely to threaten them and unlikely to provide any additional supportive content.

Defensive investments are similarly increasing in \mathcal{I} . To the extent that defensive investments are costly (e.g. because the receiver misses out on additional consumption utility from holding an accurate belief), there is no reason to protect a belief that one does not care about. An example of such a belief may be the value of a number one has randomly been assigned to in an experiment, as in one condition in [Eil and Rao \(2011\)](#), where no biased updating of beliefs was observed. Conversely, a belief that is central to one's identity (e.g. abortion for a devout Catholic) is worth protecting even at a cost to consumption utility. Indeed, such a cherished belief may also be an important factor in signaling membership to a group that confers other advantages ([Kahan et al., 2013](#)).

The effect of the sender's expected expertise on \mathcal{D} is less straight-forward and depends on \mathcal{A} . Suppose the receiver encounters a sender who is an authority on a subject and is expected to have a wealth of objective information at their disposal. When this expert is likely to hold aligned beliefs, the receiver benefits most from dropping her defenses and integrating the available information. In addition to validating her existing belief, she will then be better prepared to defend her view against future challenges. If the expert, however, has misaligned beliefs, they become most threatening to the receiver: they are likely to present new evidence that could undermine one's views and find fault with one's existing reasons for holding their belief. In this case, the receiver is most motivated to protect herself against this new information.

So far, we have discussed psychological defenses abstractly. The model and the experimental predictions are agnostic to the means by which individuals defend themselves from conflicting views (see also [Schulz, 2011](#)). However, exploring some strategies may nonetheless be informative. First, receivers may believe the sender to be misinformed and dismiss the information as factually inaccurate. This may be most easily done when the sender does not have obvious expertise, or if the expertise can easily be attacked. Second, receivers may dismiss the sender as being biased, himself the victim of biased information processing. As [Kahan et al. \(2016\)](#) observes, those who are best able to interpret scientific evidence end up

most polarized along partisan dimensions. Thus, someone with substantial access to factual information may also be most adept at selecting which to perceive as credible and which to convey to the receiver. Finally, receivers may attribute misaligned incentives or malice to the sender. Climate scientists, for example, are frequently dismissed by skeptics on grounds that their grant funding is subject to publishing confirmatory evidence. As this example highlights, the reasoning does not have to be based on valid information, although there may well exist pressures to withhold publication of contradictory evidence (Moyer, 2018).

Once psychological defenses have been established, the receiver is committed to them. It is difficult, after all, to first dismiss a news source entirely, then come to willingly forget these concerns and incorporate the information fully after learning that it would have been aligned with one’s beliefs. Indeed, it may be easier to believe that the sender is right, but for the wrong reasons. The next stage then concerns the updating process in light of the established defenses and the incoming signal.

2.1.2 Stage 2

After establishing her defenses, the receiver obtains the sender’s message and integrates it into her beliefs. Rather than updating as a pure Bayesian, however, she ends up discounting the sender’s information, with the extent of the discounting driven by the strength of her defenses. This leads to a type of conservative Bayesian updating (Ward, 2007). However, the key distinction is that decision-makers do not end up updating consistently conservatively, but that the degree of conservatism is endogenous to the situation and driven by motivated reasoning. One way to capture this dynamic is with a biased posterior that is formed by a mixture of the unbiased Bayesian posterior and the prior, where $\mathcal{D} \in [0, 1]$ determines the relative weight on the two components:

$$P(A|B) = (1 - \mathcal{D}) \cdot \frac{P(B|A) \cdot P(A)}{P(B)} + \mathcal{D} \cdot P(B|A)$$

Note that when $\mathcal{D} = 0$, that is when there are no defenses established by the receiver, the equation reduces to Bayesian updating. This is what we would expect when the information has no impact on a belief from which the individual derives utility, when the sender is informative, and when it is known that the sender holds aligned views. When the receiver has maximally invested in her defenses, $\mathcal{D} = 1$, she holds on to her prior. That is, she dismisses the incoming information entirely and no updating takes place. Such an extreme setting might be, for example, that the receiver has learned who the source of the information is and decided not to devote any attention to the persuasive message. Without processing, much less remembering, the information, no updating of beliefs could be expected.

2.2 Predictions

The two-stage model of persuasion implies that factors that ought not to matter when information is non-threatening and processed without bias now become relevant. Under the standard account, the surest (and only) path to persuasion is to provide the recipient with (objectively) persuasive information, presented in the most compelling and credible way. However, the introduction of psychological defenses opens up a second avenue to change beliefs: senders may attempt to reduce the receiver's defenses prior to sending a persuasive message. Engaging in such threat-reduction strategies may leave the informational value of the persuasive message unchanged, for example when using a pre-communication period to establish rapport.

More interestingly, however, threat-reduction strategies may come at the expense of the objective, instrumental impact of the information. A sender may express uncertainty about his views and attitudes, making himself appear less expert and creating (favorable) uncertainty about the alignment of his beliefs. Validating conflicting views, similarly, expresses that the situation is not entirely clear to the sender, making them appear less threatening in return. At the same time, a less convinced sender is also likely to be less well informed, at least in settings where the amount of information correlates with more, not less, cer-

tainty. Under a standard account, such threat-reduction strategies could only make the sender worse off. But in a model with psychological defenses, the persuasive gains from reducing anticipated threat may outweigh the costs to the informativeness of the message.

Such threat reduction strategies may take different forms. In an experiment by [Coffman and Niehaus \(2014\)](#), for example, participants in the role of sellers (working on commission) were able to increase a buyer's evaluation of a good through free-form communication. Successful sellers used their time to establish a rapport with the buyer, engaging in cheap talk that did not convey information about the good itself, but made the sender more likable to the receiver. In contrast to this work, however, [Coffman and Niehaus \(2014\)](#) do not directly measure beliefs: an increasing willingness to pay might be due to a true change in beliefs about the valuation of a good, or they might be a costly (but the only) way for the buyer to transfer money to the seller. Building rapport and making oneself more likable may be successful strategies to undermine a receiver's defenses even as they would appear pointless in a Bayesian framework.

Another strategy to bypass a receiver's defenses may be to express doubt of one's own view and acknowledge that conflicting beliefs are valid as well, prior to communicating a persuasive message. Doing so validates the recipient's view of the world and may make the sender appear less threatening, thus prompting lower defenses by the receiver. In a Bayesian world, however, expressing doubt would lead a receiver to put less weight on the information than on that of a persuader who is thought to be confident. Thus, under our account, doubt and validation have the opposite predicted effect and can enhance rather than only diminish persuasiveness. Establishing likability and expressing doubt may circumvent the receiver's defenses and end up as effective tools of persuasion where direct information provision fails. The next section tests these two predictions experimentally in a laboratory study.

3 Experiment

Experiments on political persuasion have to date relied on self-reported attitudes on policies. This poses two challenges for experimental economists. First, responses are limited to Likert scales, with support for a policy generally being reported from “strongly disagree” to “strongly agree.” If results show that participants are persuaded by information, this may imply that they shifted from “strongly disagree” to “somewhat disagree,” which does not have an unambiguous interpretation. Moreover, the measure is unlikely to be linear, which changes from disagreement to agreement being more substantial than merely agreeing less strongly. Second, policy attitudes do not have an underlying true state, which means the responses cannot be incentivized for accuracy. Someone who strongly disagrees with legalized abortion, for example, is no more right or wrong as someone who strongly agrees with it. This may make it more likely for participants to succumb to demand effects and allows them to express potentially identity-relevant information at no economic cost.

In order to conduct incentivized experiments, we develop a series of questions that elicit numeric responses on a bounded scale. We predicted, and indeed find, that the estimates participants provide are correlated with their policy attitudes. This allows us to look at persuasion along those estimates, rather than the underlying policy attitudes.

Finally, previous work on political persuasion has predominantly looked at updating after receiving information from the researcher. This might make the information harder to dismiss for participants, even when they are motivated to do so. In an incentivized framework, this presents an additional challenge: receivers of the information may update not because they believe the information, but because they believe they respond to the researcher’s biases, which in turn could increase their earnings. We therefore rely on peer-persuasion, with all information provided by other participants recruited from the same pool as those receiving the information.

We begin by introducing and validating the estimation questions and underlying policy attitudes that will be used in the main experiment. In particular, we show that partici-

pants' responses are correlated with their policy preferences: e.g. respondents who favor a path to permanent residency for undocumented immigrants also believe that fewer deported undocumented immigrants have been convicted of a crime. The pilot shows this without economic incentives for accuracy and we replicate the finding with incentives in the main experiment. The experiment further tests two strategies that could promote receptiveness to belief-threatening information: expressing uncertainty about one's own views and establishing rapport with the receiver prior to attempting to persuade them.

3.1 Pilot: Item Development

Ideally, we would like to study how people update their policy attitudes after receiving new information. However, this poses numerous challenges: first, such attitudes cannot be right or wrong and hence it is not possible to incentivize respondents to be accurate. Second, Likert scales on which such attitudes can be elicited are difficult to transform into effect sizes: it may be much more difficult to shift someone from “somewhat disagree” to “neither agree nor disagree” than it would be to shift someone from “somewhat agree” to “strongly agree.” Third, participants may enter with vastly different background knowledge. New information may fail to persuade not because it is dismissed or disbelieved, but also because it is already known to the participant. Fourth, persuasion in such a setting would also be difficult to interpret: if we indeed found that someone who “somewhat disagreed” with legalized abortion now “somewhat agreed” after reading a short message from another participant, would it really be sensible to conclude that people can be persuaded by a few short sentences by an anonymous participant? It may be more plausible that the participant simply succumbed to demand effects.

One way to resolve these concerns is to rely on numeric estimates that people may not have thought about much, but that are likely to either inform or be informed by an attitude toward a policy. Consider the following question: “Of women who had an abortion, what fraction ended up regretting the decision?” The question tackles views on abortions that

may similarly inform views on policy: those who are favorable to bans and restrictions may also estimate a high percentage. Those who oppose restrictions across the board, however, would want that number to be low, suggesting the decision is made deliberately already. Importantly, however, unlike someone’s view on abortion, there is an objective answer available and this answer was not generated by the researcher. Because the topic is also connected to partisan politics in the United States, it is likely that responses will differ between Democrats and Republicans (or liberals and conservatives).

It may be that participants are motivated to desire a percentage to be low (or high), but it may also be that this belief informs their policy attitude. The pilot is not designed to separate those mechanisms for why the estimates may be polarized, but rather to establish that estimates *are* polarized and hence suitable for experiments on persuasion.

3.1.1 Experimental Design

We select estimates and policies related to five potentially polarizing domains: abortion, social benefits (SNAP), affirmative action, immigration, and crime. One question, for example, asks participants to estimate the fraction of food stamp recipients who are employed. Either before or after providing all numeric estimates, participants report their views on various policies. Corresponding to the question on employment among food stamp recipients, for example, participants report their view on whether government spends too much on social welfare programs. We propose that those who see beneficiaries of programs as hard working (lazy) are more (less) likely to believe that the government should spend more on related programs. For exact wording of all questions, see the experimental materials in [subsection A.1](#).

We recruit participants ($n = 202$) via Amazon Mechanical Turk. Participants provided all estimates and reported all attitudes along with demographic information in exchange for a fixed payment. The elicitation of estimates was not incentivized for accuracy and we counterbalanced whether participants first provide all estimates or reported their policy

attitudes. The policy view on abortion was elicited on a 3 point Likert scale, with other policy attitudes elicited on 5 point scales.

3.1.2 Results

First, we begin by examining whether people feel strongly about any of the policy issues. [Figure 1](#) shows how frequently each response was chosen by participants. The strongest attitudes are responses of 1 and 5, respectively, except for abortion, for which the strongest response was 3 (abortion should always be illegal). While 98 respondents thought abortion should be legal under all circumstances, 22 thought it should never be legal; and 82 respondents thought there should be some constraints. That is, 59% of respondents selected one of the two most extreme answers, more than for any other topic. At the other extreme, only 15 participants thought that Atheists were either much more or much less ethical than religious people (7%). Moreover, 89% of respondents picked the most extreme response in at least one of the attitudes. This figure drops to 80% excluding the question on abortion. This suggests that the domains cover issues on which most participants have some strong feelings.

Next, we test whether policy attitudes correlate with the reported beliefs. [Table 1](#) shows the result of OLS regression on the (verifiable) estimate with the Likert response as a continuous predictor variable. Indeed, for 7 of the 14 questions, the correlation is significant and in the predicted direction. That is, respondents who thought abortion should always be illegal estimated that regret among women who had an abortion was 37 percentage points higher than did those who thought abortion should always be legal. Participants who strongly favored a path to permanent residency for undocumented immigrants guessed a 25 percentage point lower rate of criminal convictions among those deported than did those who strongly opposed the path. Believing that the government spends far too much on welfare programs reduced the estimate of beneficiaries who are employed by 18.5 percentage points, while those who were favorable toward Stop & Frisk policies expected more Caucasians to be arrested after a search. Finally, support for affirmative action policies in university admis-

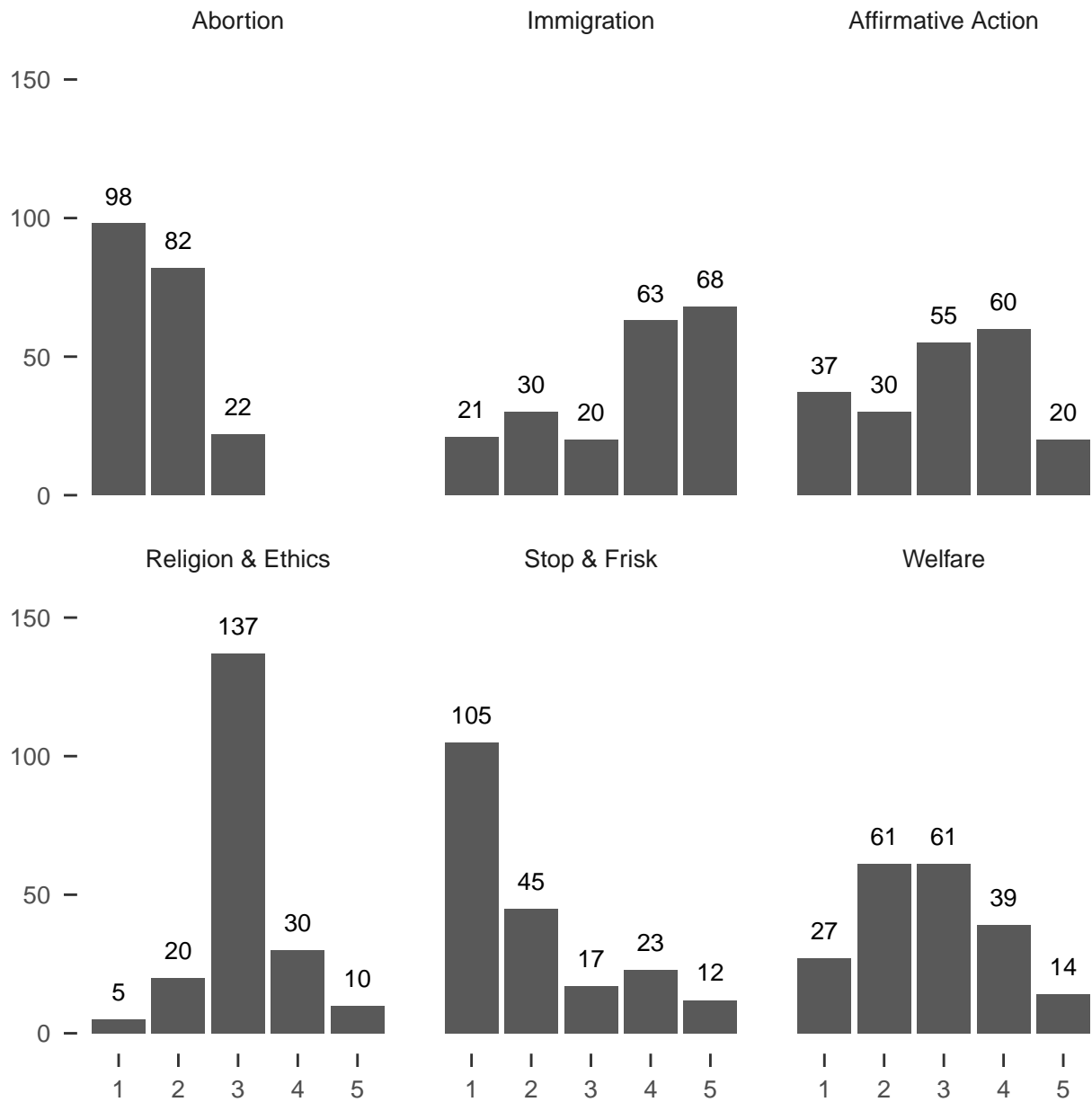


Figure 1: Frequency distribution for policy attitudes (1-3 for abortion, 1-5 rest). On most policies (except for abortion and Stop & Frisk), most participants do not have views at the extreme ends of the scale. Number of participants responding shown on top of each bar (out of 202).

Table 1: OLS regression on the numeric estimate as a function of the related policy view. Coefficient scaled to show the predicted change when going from one end of the Likert scale to the other. Someone reporting that abortion should always be illegal, for example, is predicted to believe an additional 37.4% of women regret having had an abortion. Someone very favorable toward a path to residency for undocumented immigrants reports 25.3% fewer convicted criminals among the deported. Of the 14 questions, 7 estimates are significant at the 95% confidence level, including at least one in each of the five policy domains.

Question	OLS	p value
Regret Abortion	37.44	< 0.001
Criminals Deported	-25.32	< 0.001
SNAP Employed	-18.47	< 0.001
Stop & Frisk: Whites	15.47	< 0.001
Black GPA < 2.5	-12.78	0.008
Atheist Inmates	12.69	0.0766
Black GPA > 3.5	10.10	0.0432
Non US Inmates	-8.55	0.0272
Stop & Frisk: Hispanics	7.92	0.1029
Christian Inmates	-7.03	0.4215
White GPA > 3.5	3.75	0.4339
Abortion Easy Decision	-2.79	0.5807
White GPA < 2.5	2.40	0.5543
Stop & Frisk: Blacks	2.01	0.722

sions was associated with a 13 point decrease in the estimate of Black students graduating with low GPAs and a 10 percentage point increase in graduation rates with high GPAs. Whether attitudes or estimates were elicited first did not affect the correlation between the two measures.

3.1.3 Discussion

This pilot study developed a series of questions that allow for bounded, continuous responses, that have a ground truth state that can be incentivized, and that correlate with underlying political attitudes. The main study will use only 5 of the 14 items, relying on those with the greatest effect sizes. One potential concern is that attitudes were not all elicited on the same scale, which might make comparison across domains more difficult. Moreover, although

the estimates can be incentivized, they were not in this initial pilot. The main study will address both of these concerns. First, we use modified questions to elicit attitudes to put them on a common scale (from “strongly disagree” to “strongly agree”) and all estimates will be incentivized.

3.2 Experiment: Uncertainty and Rapport

When people engage in belief-protecting strategies, we have proposed that they establish psychological defenses to guard their cherished beliefs against conflicting information. In this study, we explore two strategies a persuader may engage in an effort to try and reduce these defenses. The model from [section 2](#) posited that a sender with misaligned views who has high expertise (\mathcal{E}) would engender greater defenses than a less expert source. A sender could reduce their perceived expertise and hence their threat by expressing uncertainty about their views. Second, a more likable sender may be perceived as more aligned with the receiver (\mathcal{A}) and hence reduce defenses via that channel. Consider the surprise you experience when learning that a close friend holds a strongly opposing view on a topic that is important to you. Thus, a sender may engage in communication in an effort to establish rapport and create alignment.

The experiment recruits participants for three sequential stages. In the first stage, “senders” will write persuasive messages that will serve as the stimuli for recipients. Although many experiments on persuasion rely on information provided by the experimenter, this may be problematic when estimates are incentivized: even if they dismiss the information, they may strategically update in the expectation that the experimenter wouldn’t lead them astray. A second advantage of using peer-persuasion is that we can examine self-persuasion in a political context. Having attempted to persuade another participant, do the senders now also revise their own estimate? In the second stage, “judges” rate each message on a number of dimensions, including how persuasive they think the message is. The ratings are used as the basis for descriptively analyzing the persuasive messages and to narrow down

the messages that will ultimately be sent to receivers. This ensures that each message is likely to contain coherent information, rather than introducing noise from senders who may not have adhered to the instructions or written text that is difficult to parse. In the third stage, “receivers” will receive one of the messages, attempting to persuade them to either increase or decrease a guess they have made previously. Receivers will be randomly assigned to learning that the sender was uncertain about their advice, receiving a message from the sender intended to enhance likability, or receiving no communication prior to the persuasive message. We predict that both expressing uncertainty and establishing likability will increase persuasiveness compared to no prior communication. We use a subset of estimation and attitude pairs from the previously reported pilot study and estimates will be incentivized for both senders and receivers.

3.2.1 Experimental Design

Participants ($n = 1,327$) are recruited in three sequential stages from Amazon Mechanical Turk for the roles of sender ($n = 402$), judge ($n = 319$), and receiver ($n = 606$). In the first stage, Senders provide estimates related to five controversial topics and report their attitudes on related policies. They are then matched to one of the questions and asked to write a message persuading another participant to either increase or decrease their estimate. Senders are then asked to write a brief message that is designed to enhance likability with a receiver, and are asked to select from a set of pre-written statements the one that most closely matches how certain they were about the basis for their advice. Notably, participants were nudged to choose an option expressing uncertainty and validating opposing views.

In the second stage, Judges evaluate all the persuasive messages on a number of dimensions, including how persuasive they believe the argument to be. Each message is evaluated by multiple judges and ratings across judges are averaged. Based on the ratings, we select a subset of ten messages: two messages for each estimation item, with one arguing that a participant should increase their estimate and one arguing they should decrease it. Importantly,

this ensures that messages will be fixed across the experimental conditions.

Finally, in the third stage, Receivers provide their own estimates and are then matched to one of the estimation items on which they will be persuaded. They are then randomly assigned to one of three conditions (baseline, uncertainty, and rapport). In the baseline condition, receivers see the sender’s message immediately after providing their own estimates, then have an opportunity to revise their original guess. In the uncertainty and rapport conditions, participants receive an additional message immediately prior to the persuasive argument, expressing either uncertainty about the sender’s view or conveying a recent experience of the sender’s. They, too, then have an opportunity to revise their guess. The main outcome of interest is the extent to which participants in the three conditions revise their beliefs following the argument. Next, we discuss each of the three stages in more detail.

3.2.2 Stage 1: Senders

Participants from Amazon Mechanical Turk ($n = 402$) were recruited in exchange for a fixed payment and additional bonus payments described later. They first reported their beliefs on five quantitative estimates and corresponding policy attitudes, shown in [Table 2](#). Estimates all ranged from 0 to 100 and the policy views were expressed on a Likert scale from “strongly disagree” to “strongly agree.” The order in which questions were asked was randomized: participants answered either all estimates first or report their views on all policies first.

We then matched participants to one of the estimation tasks and asked them to write a persuasive message to a future participant who will have made a lower (higher) estimate, encouraging them to increase (decrease) their guess. Whenever possible, participants were matched to an item for which they reported strong feelings on the associated attitude (“strongly disagree” or “strongly agree”). If their initial guess was higher (lower) than the median guess from the pilot reported in [subsection 3.1](#), they were told they would be matched with someone who provided a lower (higher) estimate and were tasked with persuading them to increase (decrease) their guess. The aim of this matching was to increase the likelihood

Policy Statement	Quantitative Belief	Liberal Response
Abortion should be legal under any and all circumstances.	Of women who had an abortion, what percentage do you believe report regretting the decision afterward?	Agree & Lower
The government spends too much money on social welfare programs and should reduce benefits.	What percentage of food stamps (SNAP) recipients do you believe are employed full time or part time?	Disagree & Higher
Universities should use affirmative action in admissions decisions to increase enrollment of racial minorities.	Of African Americans who graduated with a Bachelor's degree at an accredited 4 year college/university in the U.S., what percentage do you believe obtained a GPA of 3.5 or higher?	Agree & Higher
Undocumented immigrants in the U.S. who meet certain requirements should have a way to remain the country legally.	What percentage of undocumented immigrants deported in 2015 do you believe were convicted criminals?	Agree & Lower
The police should rely on Stop and Frisk policies, in which the police stop and search people without specific cause.	What percentage of Caucasians who are searched under Stop & Frisk policy in New York City do you believe get arrested?	Disagree & Higher

Table 2: Participants express their view related to a politically contentious policy and provide a related estimate. Liberals and conservative respondents are expected to disagree on their policy views as well as on the estimates they provide.

that senders were invested in writing a persuasive message and that we can subsequently match them with a receiver who truthfully provided a lower (higher) estimate in the third stage.

After writing the persuasive message, we then ask them to repeat all quantitative estimates one more time. Although they did not receive any new information, the act of persuading someone to increase (decrease) their estimate may also affect the sender, as suggested by research on self-persuasion (Janis and King, 1954; Briñol et al., 2012).

Finally, we elicited two messages intended to express doubt and build rapport as follows. First, participants were presented with three pre-written messages and asked to select the message that most closely resembles how they felt about the advice they just gave. The messages, shown in Table 3, were written such that one expresses extreme confidence and no doubt whatsoever, one expresses no confidence whatsoever, and an intermediary option offers a balanced and reasoned expression of doubt and validates other beliefs. The two extreme messages were intended to be decoys, and we expected the majority of participants to choose the intermediary option. Establishing rapport is challenging when people participate sequentially. Absent real-time interaction, we asked them to write a brief account of the last time someone did something nice for them. We expected that this allowed senders to share a pleasant personal experience without being perceived as bragging, which may undermine (rather than establish) liking and rapport (Sezer et al., 2017).

Bonus earnings for participants were as follows. One of their estimates from either the first or the second round of elicitation would be selected at random. Choosing one at random prevents participants from hedging, such that any change we observe in the second elicitation should be due to additional contemplation rather than due to strategic considerations. Participants were then paid according to the following quadratic scoring rule:

$$\max \left\{ 2 - \frac{(\textit{Estimate} - \textit{Truth})^2}{400}, 0 \right\}$$

Messages Expressing Doubt

I cannot understand how someone could make a higher or lower estimate than I did. Providing an estimate is easy and I think someone would be foolish not to listen to my argument.

I can see how someone could make a higher or lower estimate than I did. Providing an estimate is difficult, but I believe that I thought carefully about it. Although I am not completely convinced that my estimate is right, I think my argument will help someone make up their mind and make a good decision.

I cannot understand how someone could answer this question at all. Providing an estimate was extremely difficult and I answered pretty randomly. I do not think someone should listen to my argument, because they probably will make a worse decision if they do so.

Table 3: Senders selected one of these messages to express how confident they were about their recommendation. The first and last message were intended as decoys and most participants were expected to choose the middle option.

That is, payments ranged from \$2 for providing the exact estimate to zero for participants who were off by 28 points or more. In addition, participants who wrote one of the most persuasive messages (as later determined by other participants) received a \$5 fixed bonus. Moreover, their message would be shown to participants and they received an additional 50 cents for each percentage point that the receiver updates her estimate in the direction of the sender. For the purpose of calculating this bonus, a random receiver in the baseline condition was selected.

3.2.3 Judges

Next, we recruited judges from Amazon Mechanical Turk ($n = 319$) for a fixed payment of \$2 for a task taking 10-20 minutes. Each judge was randomly assigned to one of the estimation questions (e.g. “abortion”) and one of the directions (e.g. messages persuading someone to “increase” their estimate). Judges rated each of 10 messages on seven dimensions: persuasiveness, the author’s knowledge, reliance on facts, reliance on emotions, and the author’s competency, whether the argument relied on a story or personal experience, and whether there is a clear recommendation. The first five questions were elicited on a scale from

0 to 100 and the last two dimensions are binary. Moreover, within each pair of question and direction, all judges saw the same two questions initially: one that was coherently written and made an argument and one in which the sender did not attempt to write a persuasive message. These two ratings served as an attention check and we excluded judges who thought the latter, content-free message was more persuasive. All experimental materials are shown in [subsection A.2.2](#)

Each message was rated by at least 3 judges and each message was assigned the median estimate on each dimension. For the purpose of selecting a persuasive message for receivers, we choose for each question and direction the message that was rated as most persuasive and for which the sender selected the non-decoy expression of doubt message.

3.2.4 Receivers

Lastly, we recruited participants for the role of receiver ($n = 606$) and randomly assigned them to one of three experimental conditions. All receivers first completed the five estimation tasks and self-reported their associated policy attitudes. Receivers were incentivized for accuracy in the first stage using a quadratic scoring rule with earnings of up to \$1, as shown in the following equation.

$$\max \left\{ 1 - \frac{(\textit{Estimate} - \textit{Truth})^2}{800}, 0 \right\}$$

Because the theory under investigation applied to domains in which people are invested, we match receivers to a question on which they expressed a strongly held associated attitude (i.e. for which they selected “strongly agree” or “strongly disagree”). Participants who did not select this response to any policy were assigned to a random estimation task.

Participants in the “baseline” condition then immediately proceeded to the sender’s persuasive message and made a second guess on that question only, for which they were incentivized up to \$1 (again using the same quadratic scoring rule as above). Participants

in the “uncertainty” and “rapport” conditions saw an additional screen prior to receiving the sender’s persuasive message. In the “uncertainty” condition, receivers saw the doubt message selected by the sender and were told that this message was selected by the sender to most closely reflect how certain they were about their message. Receivers in the “rapport” condition were asked to read the sender’s message about the last time someone did something nice for them. After this additional message, participants proceeded to the persuasive message and the estimation task. All experimental materials are shown in [subsection A.2.3](#).

3.3 Results

The analysis of this experiment is grouped into three subsections. We begin by validating the questions used, showing whether the observed polarization in the pilot holds with the much larger sample size and in the presence of incentives. We then look at the effect of random assignment into treatments among the recipients, testing whether conveying uncertainty and rapport enhanced persuasiveness among those with strongly held views. Finally, we look at self-persuasion among senders and test whether attempting to persuade others leads to more extreme views.

Throughout this section, we define “persuasion” as the percentage point change in the quantitative estimate between the first and the second elicitation. If the message argued for increasing the estimate, persuasion is equal to $E_{t=2} - E_{t=1}$, and, conversely, if the message argued for decreasing the estimate, it is equal to $E_{t=2} - E_{t=1}$. Thus, persuasion is always positive if updating occurs in the direction of the message and negative if updating occurs in the opposite direction.

3.3.1 Validating Question Items

We begin by validating whether the questions from the unincentivized pilot also correspond with underlying policy views in the presence of incentives and with a larger sample size. [Table 4](#) shows an OLS regression in which the predictor variable is the Likert rating of

Table 4: OLS regression on the numeric estimate as a function of the related policy view. Coefficient scaled to show the predicted change when going from “strongly disagree” to “strongly agree” on the Likert scale. Someone who strongly disagreed that abortion should always be legal, for example, predicted an additional 20.4% of women regretting having had an abortion. All estimates are significant in the predicted direction.

Question	OLS	p value
Abortion	-20.44	< 0.001
Stop & Frisk	12.04	< 0.001
Welfare	-11.61	< 0.001
Immigration	-10.89	< 0.001
Affirmative Action	4.26	0.0362

agreement on a policy and the dependent variable is the first round estimate, prior to learning about one’s role (sender or receiver) and hence prior to writing or receiving a persuasive message. We find that for every estimate, the underlying policy view is indeed a significant predictor of the estimate provided.

In [Figure 2](#), we plot the distribution of estimates for those who either strongly agreed or strongly disagreed on the underlying policy. The p-values in the figure are those of a Wilcoxon rank order test. Limiting the analysis to only participants who held such strong beliefs renders one of the comparisons (the fraction of deported immigrants who were convicted of a crime) no longer significant at the usual level ($p = 0.078$). The remaining comparisons, however, remain significant.

3.3.2 Receivers

We first show the degree to which receivers were persuaded across all conditions. [Figure 3](#) plots the density separately for each belief as well as for all topics combined. On average, receivers adjusted their estimate 15 points into the direction of the sender. Some receivers were, however, dissuaded by the sender and update in the opposite direction of the argument ($n = 44$, or 7% of receivers).

In [Figure 4](#), we collapse responses across all topics and show persuasion across exper-

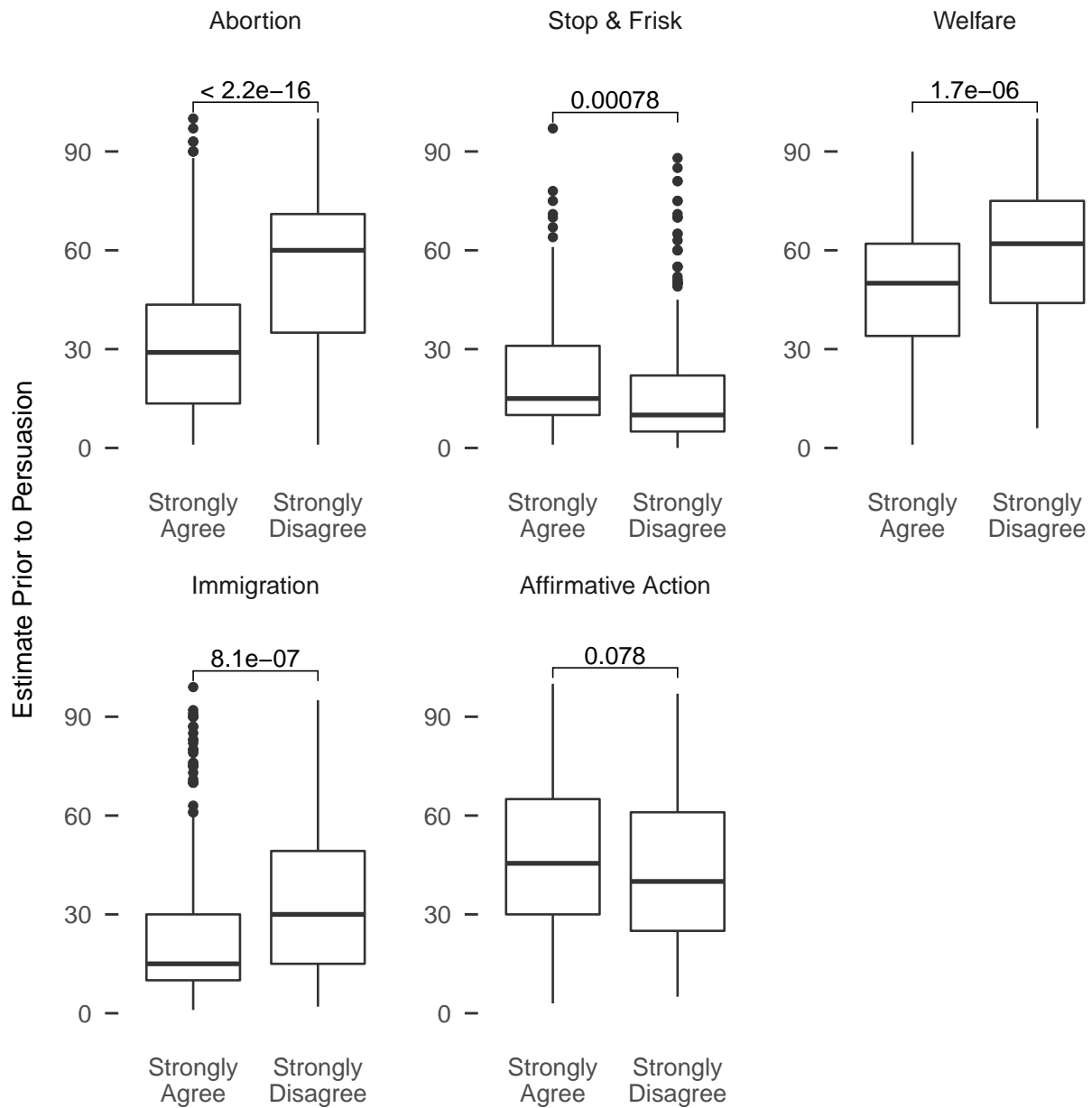


Figure 2: Plots comparing estimates of those who strongly agreed or strongly disagreed on the underlying policy. Significance test for Wilcox tests. When comparing only the two most extreme beliefs, rather than all responses, the difference in estimates for the fraction of African American students who graduate with a GPA above 3.5 is no longer significant at the usual level.

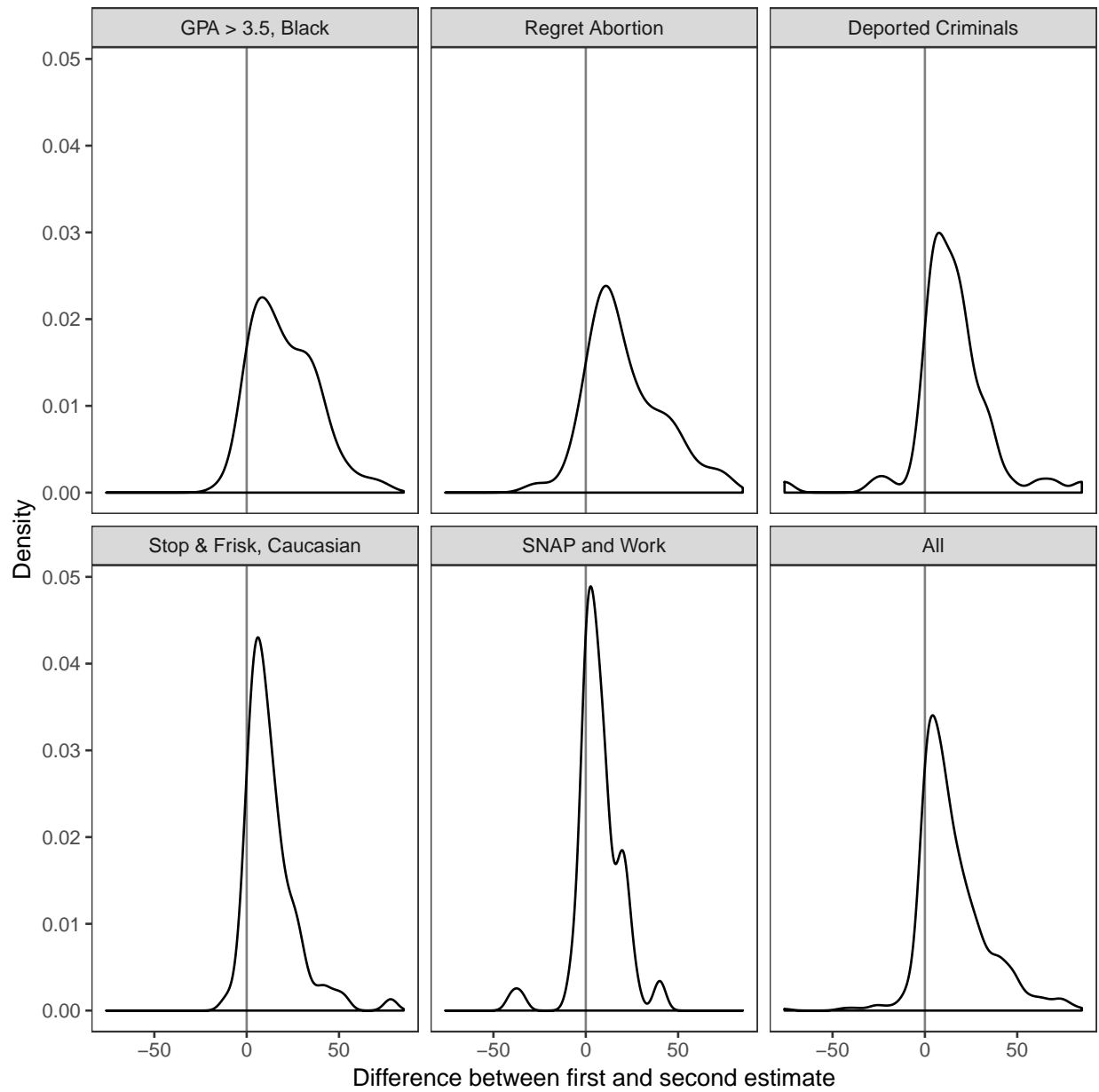


Figure 3: Change in second reported estimate in the direction of the persuasive message.

imental conditions. We separate receivers according to whether they had a strong attitude on the matched policy view, i.e. either agreed strongly or disagreed strongly. Note that we assigned receivers whenever possible to a belief on which they had a strong opinion, so this is not the result of random assignment. Recall, however, that we chose this matching because our predictions concerned those with strongly held beliefs.

A t-test comparing the means of belief change for those in the uncertainty and baseline conditions (with strong beliefs) reveals a significant difference ($t = -2.246$, $p = 0.025$), suggesting that receivers who were exposed to the doubt message prior to being persuaded updated more into the direction of the sender. The difference between the rapport and the baseline conditions, however, was not significantly different ($t = -0.578$, $p = 0.564$).

Table 5 shows the results of OLS regression on persuasion. In the baseline model, in which we aggregate across all participants irrespective of their belief strength, we see that receivers changed their estimate on average by 15 points. When we look at the effect of the experimental manipulation separately for those with and without strong beliefs, we find that an expression of uncertainty increased persuasion for those with strong beliefs, but (directionally) decreases them for those without. Moreover, those with strong beliefs updated significantly less. The third model adds message fixed effects to the regression. The coefficient on the doubt and strong belief interaction remains significant.

3.3.3 Senders

Finally, our data also allow us to explore whether senders persuaded themselves after writing a message to the receiver. For each reported belief, we calculate "self-persuasion" as the change between the second estimate and the first estimate. This change is positive if it is in the direction in which an argument was made (higher or lower) and negative if it is in the opposite direction. Self-persuasion may occur when someone made a strong argument for why the receiver should adjust her estimate in the desired direction. After generating the argument, the sender's own estimate may now seem too low. On the other hand, dissuasion

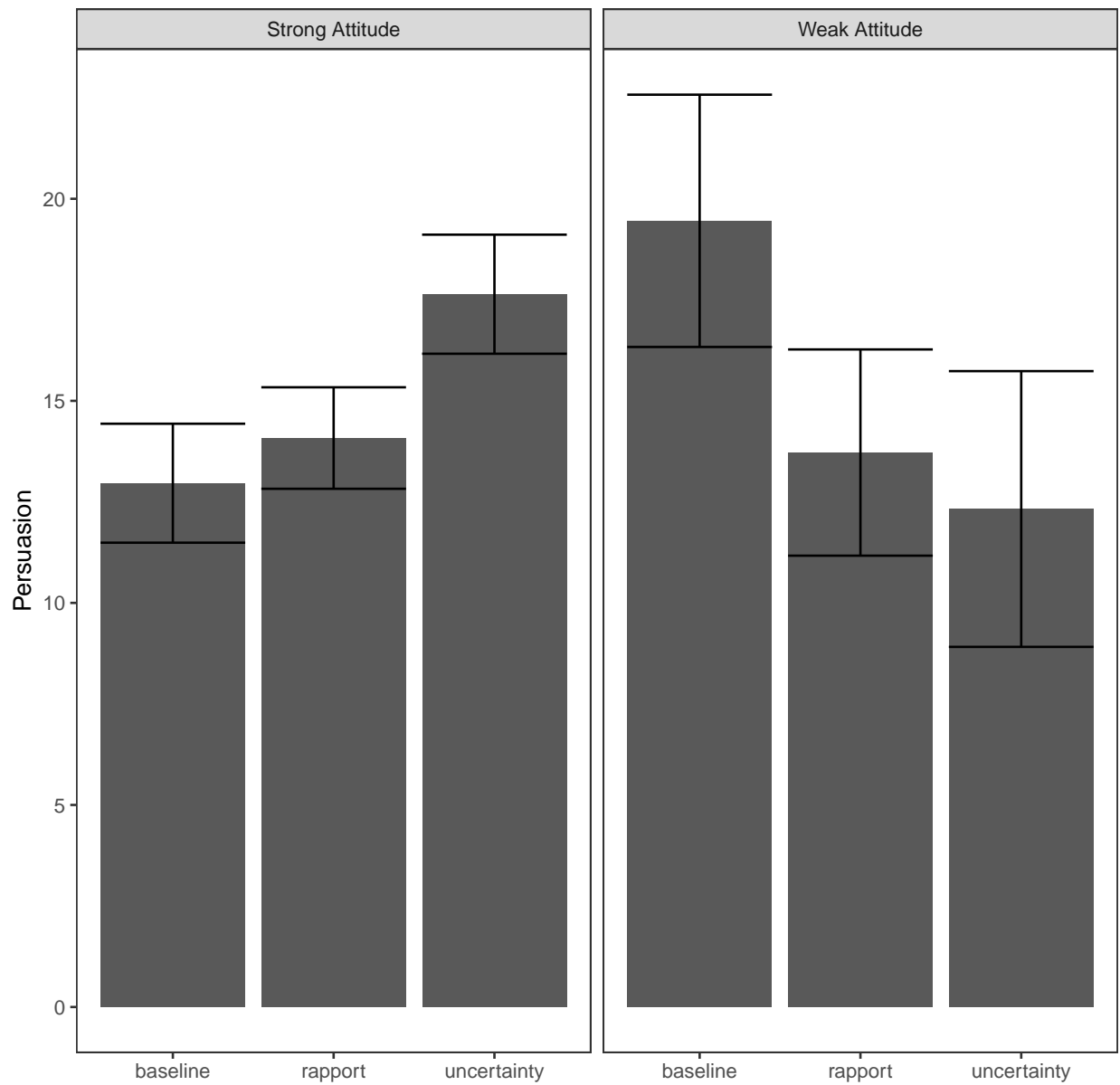


Figure 4: When Senders express uncertainty, they are more persuasive to receivers who are invested in their beliefs. Establishing rapport, however, does not enhance persuasiveness. When senders are not invested in the belief, the effect of expressing uncertainty is consistent with the prediction of the standard account, leading to less belief-revision than a more confident sender. Error bars show standard errors.

Table 5: Receivers who strongly agreed or strongly disagreed on the policy question they were matched to were persuaded more by senders who expressed uncertainty about their view. We find a directional, but no significant, effect of an attempt to establish rapport.

	Percentage Points Persuaded		
	Baseline	Interaction	Message FE
Doubt	2.411 (1.821)	-7.131* (4.162)	-5.895 (3.999)
Rapport	-0.269 (1.832)	-5.735 (4.565)	-3.686 (4.383)
Strong Belief	-0.770 (1.989)	-6.493** (3.107)	-4.739 (2.992)
Doubt x Strong Belief		11.808** (4.625)	10.951** (4.454)
Rapport x Strong Belief		6.852 (4.983)	5.677 (4.779)
Intercept	14.978*** (2.020)	19.455*** (2.748)	24.742*** (6.070)
Message FE	No	No	Yes
Observations	606	606	606
R ²	0.005	0.015	0.117

Note:

*p<0.1; **p<0.05; ***p<0.01

may occur when the sender realized that she cannot make a strong argument for the receiver to increase her estimate and ends up revising downward her own response. We calculate the change in beliefs for all estimation tasks. Estimations on which the sender did not attempt to persuade a receiver may vary as well, but any such change should be due to noise. This leads us to estimate the following model:

$$SP = \beta_0 + \beta_1 P + \beta_2 M + \beta_3 (P \cdot M),$$

where SP is self persuasion, i.e. the change in beliefs between the second and the first estimate, P is the mean persuasiveness of the message as rated by the judges, and M is whether the sender wrote a message for that belief (which is equal to 1 for one estimate and 0 for the remaining four estimates).

The results are shown in [Table 6](#). We find that across all senders, there is no evidence of self-persuasion (baseline). However, once we control for the sender’s persuasiveness, we find the expected interaction: a sender at the high-end of persuasiveness with a mean rating of 0.90 (on a scale from 0 to 1) adjusted her estimate by 2.4 points in the direction of the advice she gave. On the low-end of persuasiveness, on the other hand, a sender with a mean rating of 0.10 revised her estimate away from her argument by 2.3 points.

Table 6: Senders who wrote messages that were rated as persuasive ended up revising their own estimate in the direction of their argument. Those whose message was rated as unpersuasive, however, dissuaded themselves and updated away from the direction they were assigned to argue for.

	Self-Persuasion	
	Baseline	Interaction
	(1)	(2)
Persuasive Message	-0.539 (0.558)	-2.882*** (1.104)
Persuasiveness		-5.485 (18.315)
Persuasiveness x Persuasive Message		5.885** (2.395)
Intercept	-7.106 (4.457)	-5.763 (5.767)
Belief FE	Yes	Yes
Individual FE	Yes	Yes
Observations	2,005	2,005
R ²	0.260	0.262

Note: *p<0.1; **p<0.05; ***p<0.01

4 Discussion

When decision-makers derive utility not only from their consumption, but also from their beliefs, they may engage in efforts to protect themselves against conflicting information. Inspired by recent advances in belief-based utility, we proposed a two-stage theory of persuasion and presented results from an experiment. In the first stage, a decision-maker assesses the threat to her beliefs posed by an incoming persuader. The more threatening the persuader appears to be, the greater the investment in her mental defenses. After establishing her defenses, the receiver is exposed to the sender's message and updates her beliefs conservatively, with the extent of conservatism determined by her defenses.

We propose that supposedly irrelevant factors, like establishing rapport, and factors that under a standard account may make a sender less persuasive, like expressing doubt, can actually increase persuasiveness. In this experiment, we find evidence that an expression of doubt and acknowledgment of opposing views increases persuasiveness for those with a motivated reason to maintain their beliefs. We do not, however, find evidence that rapport or likability enhance persuasiveness. This may partly be caused by the difficulty of establishing rapport in asynchronous communication. We further found that merely writing a persuasive message can lead to either self-persuasion or self-dissuasion (updating away from one's recommendation), depending on the strength of the argument.

Persuasion occurs in a wide range of domains from advertisement to policy. Indeed, much of political discourse aims to pit two opposing sides against each other in the hope that the better argument wins out. When people have motivated reasons to believe one argument over another, however, and update with bias, then such arguments may increase polarization, rather than bring convergence. This appears particularly prominent in important, high-stakes policy decisions, like how society should respond to the threat of global climate change. A better understanding of persuasion in such emotionally charged environments may lead to more productive political discourse and help reverse a growing trend of belief polarization.

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Appendices

Appendix A Experimental Materials

A.1 Pilot: Item Development

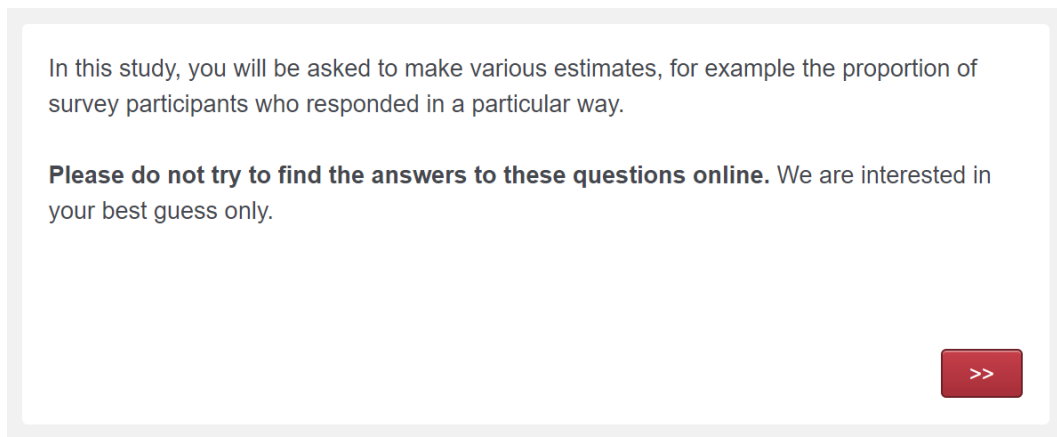


Figure A.5: Pilot (Screen 1)

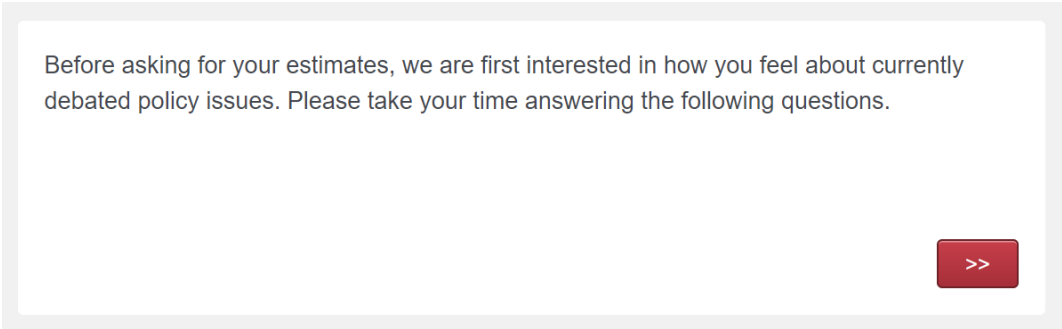


Figure A.6: Pilot (Screen 2)

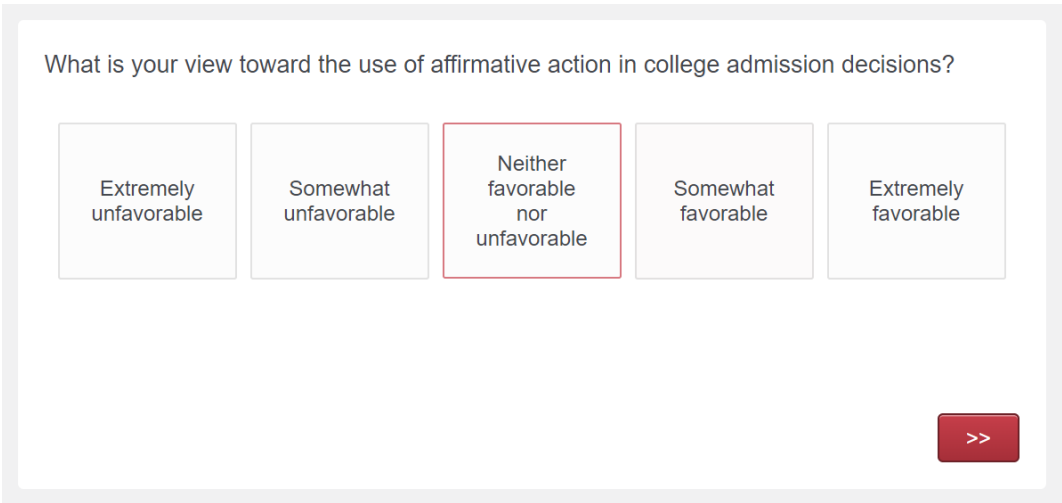


Figure A.7: Pilot (Screen 3)

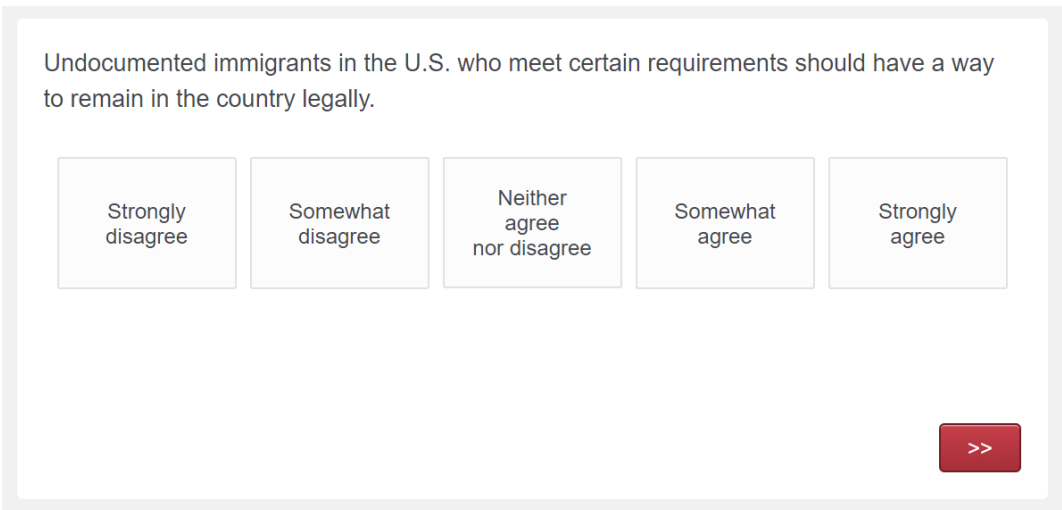


Figure A.8: Pilot (Screen 4)

Compared to atheists, do you believe that people of faith are more or less moral people?

Much less moral	Somewhat less moral	About equally moral	Somewhat more moral	Much more moral
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Figure A.9: Pilot (Screen 5)

What is your view toward "Stop and Frisk" policies, in which the police stop and search people without specific cause.

Extremely unfavorable	Somewhat unfavorable	Neither favorable nor unfavorable	Somewhat favorable	Extremely favorable
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Figure A.10: Pilot (Screen 6)

Do you think government spending on welfare programs is...

Far too little	Moderately too little	Neither too much nor too little	Moderately too much	Far too much
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Figure A.11: Pilot (Screen 7)

Do you think abortions should be...

legal under any circumstances	legal only under certain circumstances	illegal in all circumstances
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Figure A.12: Pilot (Screen 8)

Next, we are interested in your estimates on a number of questions. Please report your best guess without trying to look up the answers elsewhere.

>>

Figure A.13: Pilot (Screen 9)

What percentage of food stamps (SNAP) recipients do you believe are employed (but receive a low wage that is difficult to live on) in the month they receive them?

0 10 20 30 40 50 60 70 80 90 100

>>

Figure A.14: Pilot (Screen 10)

Of those who graduated with a Bachelor's degree, what percentage do you believe obtained a GPA of **3.5 or higher** among...

0 10 20 30 40 50 60 70 80 90 100

African American students?

Caucasian students?

>>

Figure A.15: Pilot (Screen 11)

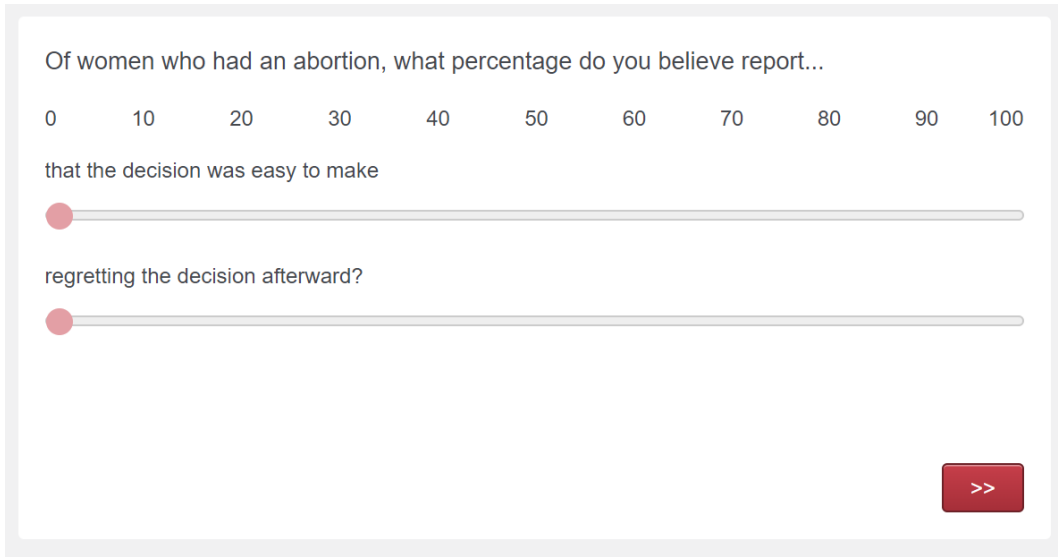


Figure A.16: Pilot (Screen 12)

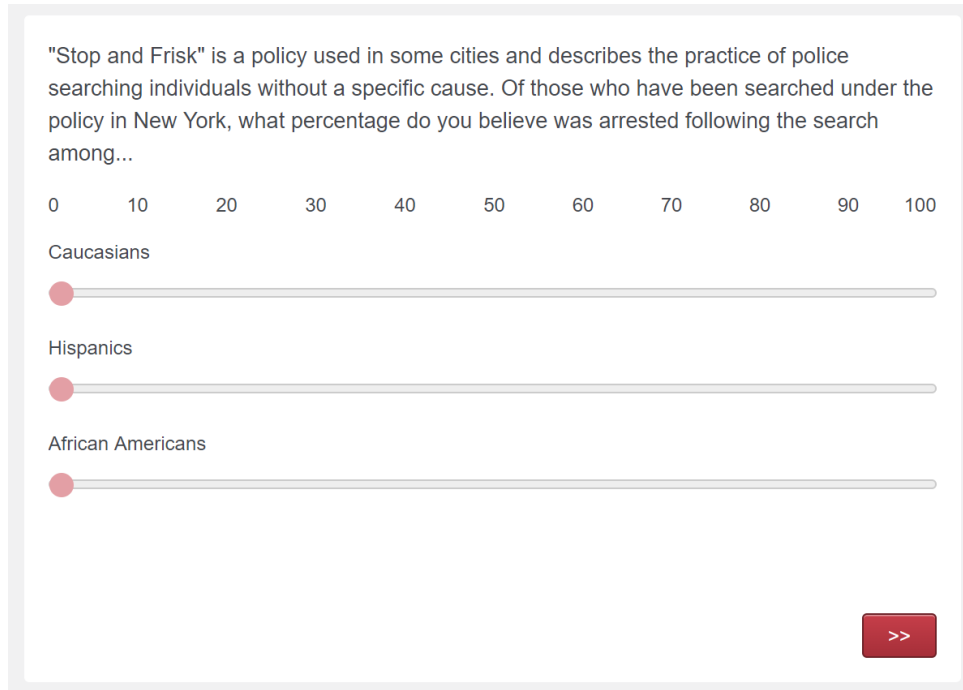


Figure A.17: Pilot (Screen 13)

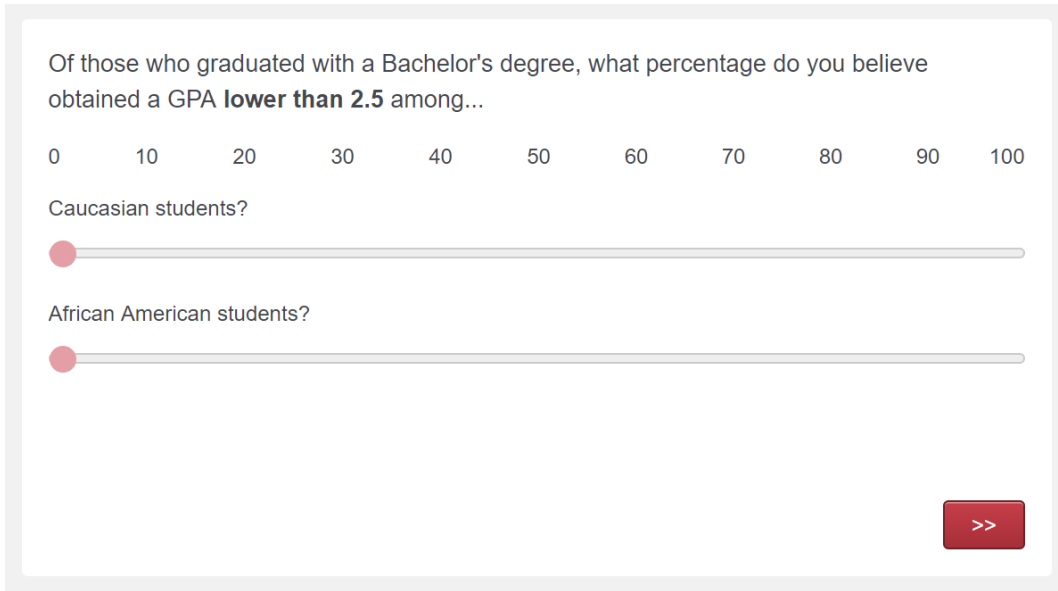


Figure A.18: Pilot (Screen 14)



Figure A.19: Pilot (Screen 15)

What percentage of inmates in federal prisons do you believe are...

0 10 20 30 40 50 60 70 80 90 100

Christians?

Not US citizens?

Atheists?

>>

Figure A.20: Pilot (Screen 16)

Finally, we would like to ask you a few demographic questions.

Gender

Male Female

Age

>>

Figure A.21: Pilot (Screen 17)

Ethnicity

White	Black or African American	American Indian or Alaska Native	Asian	Native Hawaiian or Pacific Islander	Other
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What is the highest level of education you have completed?

Less than high school	High school graduate	Some college	2 year degree	4 year degree	Professional or Masters degree	Doctoral degree
-----------------------	----------------------	--------------	---------------	---------------	--------------------------------	-----------------

How important is religion in your life?

Not at all important	Slightly important	Moderately important	Very important	Extremely important
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[>>](#)

Figure A.22: Pilot (Screen 18)

When it comes to politics, do you usually think of yourself as...

Extremely Liberal	Liberal	Slightly Liberal	Moderate, Middle of Road	Slightly Conservative	Conservative	Extremely Conservative
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[>>](#)

Figure A.23: Pilot (Screen 19)

Whom do you intend to vote for in the 2016 presidential election?

Jill Stein	Hillary Clinton	Donald Trump	Gary Johnson	Do not intend to vote	Ineligible to vote
------------	-----------------	--------------	--------------	-----------------------	--------------------

>>

Figure A.24: Pilot (Screen 20)

Thank you for completing this study. On the next screen you will see your unique completion code.

Do you have any comments for the researchers? (optional)

>>

Figure A.25: Pilot (Screen 21)

A.2 Study 1

A.2.1 Stage 1: Senders

Instructions
In this study, you will be asked to make a number of guesses, for example about the percentage of survey participants who responded in a particular way.

You will be asked to make 5 such guesses at the beginning and again at the end of this experiment. There will be another part in the middle. We will show you the instructions for that part later.

Bonus Earnings
To encourage you to think about your estimates, we will select one of your guesses at random (either one from the beginning or one from the end of the experiment). You will then receive a bonus depending on your **accuracy**. The more accurate you are, the greater your bonus.

Calculating your bonus
Your bonus is calculated according to a **quadratic scoring rule**. The rule is illustrated in the example below. You do NOT need to know or understand the exact calculations involved to maximize your payoff, but for the sake of transparency, the formula is shown below.

$$\max \left\{ 2 - \frac{(TRUE\ VALUE - YOUR\ ESTIMATE)^2}{40}, 0 \right\}$$

Example
Suppose the true value for a question is 50. The table below shows your earnings depending on the number you reported. As you can see, your bonus is greatest if you get the value exactly right and you will earn no bonus if you are more than 30 percentage points away from the true value.

Your Estimate	Your Bonus
20	\$0
25	\$0.44
30	\$1.00
35	\$1.44
40	\$1.75
45	\$1.94
50	\$2.00
55	\$1.94
60	\$1.75
65	\$1.44
70	\$1.00
75	\$0.44
80	\$0

It pays to try and be as close to the true value as possible because even small adjustments can make a big difference to your bonus!

>>

Figure A.26: Study 1 - Senders (Screen 1)

Before asking for your estimates, we are first interested in how you feel about currently debated policy issues. Please take your time answering the following questions.

>>

Figure A.27: Study 1 - Senders (Screen 2)

The government spends too much money on social welfare programs and should reduce benefits.

Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
-------------------	-------------------	----------------------------	----------------	----------------

>>

Figure A.28: Study 1 - Senders (Screen 3)

The police should rely on "Stop and Frisk" policies, in which the police stop and search people without specific cause.

Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
-------------------	-------------------	----------------------------	----------------	----------------

>>

Figure A.29: Study 1 - Senders (Screen 4)

Universities should use affirmative action in admissions decisions to increase enrollment of racial minorities.

Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
-------------------	-------------------	----------------------------	----------------	----------------

>>

Figure A.30: Study 1 - Senders (Screen 5)

Abortion should be legal under any and all circumstances.

Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
-------------------	-------------------	----------------------------	----------------	----------------

>>

Figure A.31: Study 1 - Senders (Screen 6)

Undocumented immigrants in the U.S. who meet certain requirements should have a way to remain in the country legally.

Strongly disagree Somewhat disagree Neither agree nor disagree Somewhat agree Strongly agree

>>

Figure A.32: Study 1 - Senders (Screen 7)

Now, we would like to get your estimates of five different percentages.

Recall that your bonus earnings will be determined by how accurate you are on one of your guesses.

>>

Figure A.33: Study 1 - Senders (Screen 8)

Of women who had an abortion, what percentage do you believe report regretting the decision afterward?

0 10 20 30 40 50 60 70 80 90 100

●

>>

Figure A.34: Study 1 - Senders (Screen 9)

What percentage of food stamps (SNAP) recipients do you believe are employed full time or part time (but earned an amount that is difficult to live on) as a fraction of all SNAP recipients (i.e. those who are both employed and unemployed)?

0 10 20 30 40 50 60 70 80 90 100

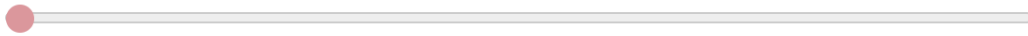


Figure A.35: Study 1 - Senders (Screen 10)

Of African Americans who graduated with a Bachelor's degree at an accredited 4 year college/university in the U.S., what percentage do you believe obtained a GPA of **3.5 or higher**?

0 10 20 30 40 50 60 70 80 90 100



Figure A.36: Study 1 - Senders (Screen 11)

What percentage of undocumented immigrants deported in 2015 do you believe were convicted criminals?

0 10 20 30 40 50 60 70 80 90 100



Figure A.37: Study 1 - Senders (Screen 12)

Stop and Frisk is a practice in some cities in which police officers stop and question a pedestrian, then frisk them for weapons and other contraband. What percent of Caucasians who are searched under the policy in New York City do you believe get arrested?

0 10 20 30 40 50 60 70 80 90 100



Figure A.38: Study 1 - Senders (Screen 13)

You have finished Part I of this study.

In Part II, your task will be to **persuade another participant**. This participant will first answer the same questions you have answered in Part I. You will be assigned one of those questions and you will be told whether the person you are matched with reported a **higher** or **lower** estimate. You will not, however, know exactly what number they reported.

Your task will then be to get them to **decrease** their estimate if they initially reported a **higher** estimate than you did, or to **increase** their estimate if they initially reported a **lower** estimate than you did.

We will use the most persuasive messages (as judged by other participants on MTurk) to send to other participants. If your message is selected, you will receive two additional bonus earnings.

Additional Bonus Earnings

1. If your message is selected by other participants on MTurk as one of the most persuasive messages, you will receive a \$5 bonus.

2. We will then present your message to another participant. For each percentage point that the person changes their estimate in the direction you argue for, you will receive another 50 cents. Thus, if someone initially reported an estimate of 50 and you persuade them to change their estimate to 80, you will receive $30 \times 50 \text{ cents} = \15 .



Figure A.39: Study 1 - Senders (Screen 14)

Your task now is to persuade another participant on the following question:

What percentage of food stamps (SNAP) recipients do you believe are employed full time or part time (but earned an amount that is difficult to live on) as a fraction of all SNAP recipients (i.e. those who are both employed and unemployed)?

Your own estimate was **86%**. The participant you may be matched with reported a **lower** estimate. Please write a message to this participant persuading them to **increase** their estimate.

You can advance to the next screen after 5 minutes.

Figure A.40: Study 1 - Senders (Screen 15)

People sometimes change their minds after having had time to think. We would now like to ask you again about your estimates for the same questions you have answered previously.

Recall that your bonus earnings will be determined by how accurate you are on one of your guesses, which includes both the guesses you made earlier and the guesses you make now.



Figure A.41: Study 1 - Senders (Screen 16)

What percentage of undocumented immigrants deported in 2015 do you believe were convicted criminals?

0 10 20 30 40 50 60 70 80 90 100



Figure A.42: Study 1 - Senders (Screen 17)

What percentage of food stamps (SNAP) recipients do you believe are employed full time or part time (but earned an amount that is difficult to live on) as a fraction of all SNAP recipients (e.g., those who are both employed and unemployed)?

0 10 20 30 40 50 60 70 80 90 100



Figure A.43: Study 1 - Senders (Screen 18)

Stop and Frisk is a practice in some cities in which police officers stop and question a pedestrian, then frisk them for weapons and other contraband. What percent of Caucasians who are searched under the policy in New York City do you believe get arrested?

0 10 20 30 40 50 60 70 80 90 100



Figure A.44: Study 1 - Senders (Screen 19)

Of African Americans who graduated with a Bachelor's degree at an accredited 4 year college/university in the U.S., what percentage do you believe obtained a GPA of **3.5 or higher**?

0 10 20 30 40 50 60 70 80 90 100



Figure A.45: Study 1 - Senders (Screen 20)

Of women who had an abortion, what percentage do you believe report regretting the decision afterward?

0 10 20 30 40 50 60 70 80 90 100



>>

Figure A.46: Study 1 - Senders (Screen 21)

In this study, you are attempting to persuade another participant. Sometimes, we may not be fully convinced of our own point of view. Below are three text snippets that express varying degrees of doubt about an opinion.

What do you think most closely reflects how much doubt you have about your own estimate on the selected question and the argument you made?

I cannot understand how someone could make a higher or lower estimate than I did. Providing an estimate is easy and I think someone would be foolish not to listen to my argument.

I can see how someone could make a higher or lower estimate than I did. Providing an estimate is difficult, but I believe that I thought carefully about it. Although I am not completely convinced that my estimate is right, I think my argument will help someone make up their mind and make a good decision.

I cannot understand how someone could answer this question at all. Providing an estimate was extremely difficult and I answered pretty randomly. I do not think someone should listen to my argument, because they probably will make a worse decision if they do so.

>>

Figure A.47: Study 1 - Senders (Screen 22)

Now that you have thought about controversial topics, we would like to conclude by asking you about something more pleasant.

Please tell us about the last time someone did something nice for you. You can continue to the next screen in two minutes. Please do not include any personally identifiable information as we may share your story with other participants, and aim to be detailed in your narrative.

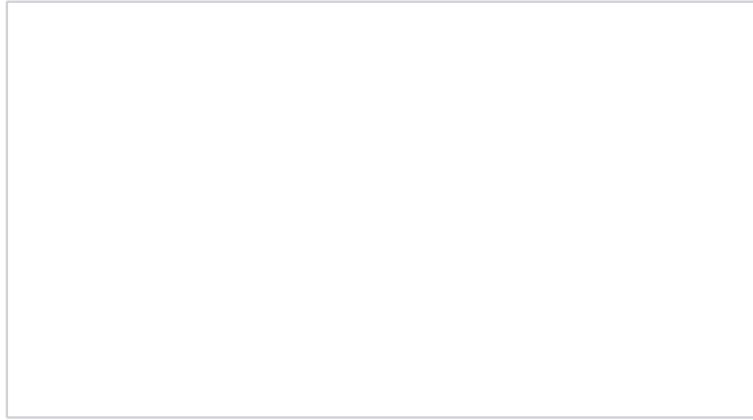


Figure A.48: Study 1 - Senders (Screen 23)

Finally, we would like to ask you a few demographic questions.

Gender

Male	Female
------	--------

Age

Ethnicity

White	Black or African American	American Indian or Alaska Native	Asian	Native Hawaiian or Pacific Islander	Other
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Figure A.49: Study 1 - Senders (Screen 24)

What is the highest level of education you have completed?

Less than high school	High school graduate	Some college	2 year degree	4 year degree	Professional or Masters degree	Doctoral degree
-----------------------	----------------------	--------------	---------------	---------------	--------------------------------	-----------------

How important is religion in your life?

Not at all important	Slightly important	Moderately important	Very important	Extremely important
----------------------	--------------------	----------------------	----------------	---------------------



Figure A.50: Study 1 - Senders (Screen 25)

When it comes to politics, do you usually think of yourself as...

Extremely Liberal	Liberal	Slightly Liberal	Moderate, Middle of Road	Slightly Conservative	Conservative	Extremely Conservative
-------------------	---------	------------------	--------------------------	-----------------------	--------------	------------------------

Whom did you vote for in the 2016 presidential election?

Jill Stein	Gary Johnson	Donald Trump	Hillary Clinton	Other	Did not vote	Ineligible to vote	Prefer not to say
------------	--------------	--------------	-----------------	-------	--------------	--------------------	-------------------



Figure A.51: Study 1 - Senders (Screen 26)

Thank you for completing this study. We will calculate your accuracy on one of the guesses **within 24 hours** and send you that part of the bonus payment.

If your message is selected as one of the most persuasive ones, you will receive a second bonus payment at the conclusion of this study, which we expect to be no later than **December 31**.

On the next screen you will see your unique completion code.

Do you have any comments for the researchers? (optional)



Figure A.52: Study 1 - Senders (Screen 27)

A.2.2 Stage 2: Judges

Please read these instructions closely, as your responses will help determine which participants from a previous study ultimately receive bonus payments.

Instructions

In this study, you take on the role of a **judge for a contest**.

We have previously recruited participants on MTurk and asked them to write **persuasive messages**. Those who write the most persuasive messages were promised a bonus payment.

Now, it is your task to help us choose the most persuasive messages.

The Contest

We first asked participants to make a guess, for example about the percentage of survey participants who responded in a particular way. They could earn a bonus based on how accurate their guess was.

We then asked them to write a message to another participant who had also made a guess that was either lower or higher than their own. If the other participant made a **lower** guess, we asked them to persuade that participant to **increase** their guess. Conversely, if the other participant made a **higher** guess, we asked them to persuade that participant to **decrease** their guess.



Figure A.53: Study 1 - Judges (Screen 1)

Judging Responses

For each message that you will see, we would like you to give a score (0-100) for each of the following criteria.

1. **Persuasiveness:** Overall, how strong an argument do you think the author makes for his or her position?
2. **Knowledgable:** How informed and knowledgable do you believe is the author?
3. **Reliance on Facts:** To what extent does the author use facts (e.g. statistics) to make their argument?
4. **Reliance on Emotions:** To what extent does the author use emotions (e.g. empathy, fear) to make their argument?
5. **Competency:** How competent do you believe the author to be?

On the next screen, you will see the question, the direction (higher or lower) that we asked participants to judge on, and the first message from a participant.

You will evaluate a total of 10 such messages.



Figure A.54: Study 1 - Judges (Screen 2)

Participants made a guess on this question

Of women who had an abortion, what percentage do you believe report regretting the decision afterward?

After making their guess, they were told

The participant you may be matched with reported a **lower** estimate. Please write a message to this participant persuading them to **increase** their estimate.

The author wrote the following message

Having an abortion is an extremely difficult and emotional decision. An incredible amount of information must be processed from external and internal sources. It is not only a medical decision but also a moral and sometimes religious decision. It can also be a decision that others around a pregnant woman might try to influence. It is hard to go against social influence especially if it is your husband, boyfriend or family. A pregnant woman might make a decision based upon a multitude of outside influences because it is "the right thing to do". A woman who is not doing well financially might also feel the pressure to have an abortion. All of these factors can pressure a woman to have an abortion and all of these factors have very little to do with the morality of an abortion. People often times regret past decisions. An abortion is probably one of the biggest decisions a person can make because it involves taking a life.

0 10 20 30 40 50 60 70 80 90 100

How persuasive is the argument?

How knowledgeable is the author?

To what extent does the author use facts to make their argument?

To what extent does the author use emotions to make their argument?

How competent is the author?

Does the argument rely on a story (e.g. a personal experience)?

 Yes No

Does the argument make a clear recommendation?

 Yes No

Figure A.55: Study 1 - Judges (Screen 3). This message was rated as very persuasive.

Participants made a guess on this question

Of women who had an abortion, what percentage do you believe report regretting the decision afterward?

After making their guess, they were told

The participant you may be matched with reported a **lower** estimate. Please write a message to this participant persuading them to **increase** their estimate.

The author wrote the following message

i have estimated higher then your estimate so increase your estimate in order to receive bonus.

0 10 20 30 40 50 60 70 80 90 100

How persuasive is the argument?

How knowledgeable is the author?

To what extent does the author use facts to make their argument?

To what extent does the author use emotions to make their argument?

How competent is the author?

Does the argument rely on a story (e.g. a personal experience)?

Yes

No

Does the argument make a clear recommendation?

Yes

No

>>

Figure A.56: Study 1 - Judges (Screen 4). This message was rated as not persuasive.

To what extent do you agree or disagree with the statement below?

Abortion should be legal under any and all circumstances.

Strongly disagree Somewhat disagree Neither agree nor disagree Somewhat agree Strongly agree



Figure A.57: Study 1 - Judges (Screen 5)

Finally, we would like to ask you a few demographic questions.

Gender

Male Female

Age

When it comes to politics, do you usually think of yourself as...

Extremely Liberal Liberal Slightly Liberal Moderate, Middle of Road Slightly Conservative Conservative Extremely Conservative



Figure A.58: Study 1 - Judges (Screen 6)

Thank you for completing this study.

On the next screen you will see your unique completion code.

Do you have any comments for the researchers? (optional)



Figure A.59: Study 1 - Judges (Screen 7)

A.2.3 Stage 3: Receivers

Instructions

In this study, you will be asked to make a number of guesses, for example about the percentage of survey participants who responded in a particular way.

You will be asked to make 5 such guesses at the beginning of this experiment. There will be another part after that. We will show you the instructions for that part later.

Bonus Earnings

To encourage you to think about your estimates, we will select one of your guesses at random. You will then receive a bonus depending on your **accuracy**. The more accurate you are, the greater your bonus.

Calculating your bonus

Your bonus is calculated according to a *quadratic scoring rule*. The rule is illustrated in the example below. You do NOT need to know or understand the exact calculations involved to maximize your payoff, but for the sake of transparency, the formula is shown below.

$$\max\left\{1 - \frac{(\text{TRUE_VALUE} - \text{YOUR_ESTIMATE})^2}{25}, 0\right\}$$

Example

Suppose the true value for a question is 50. The table below shows your earnings depending on the number you reported. As you can see, your bonus is greatest if you get the value exactly right and you will earn no bonus if you are more than 30 percentage points away from the true value.

Your Estimate	Your Bonus
20	\$0
25	\$0.22
30	\$0.50
35	\$0.72
40	\$0.88
45	\$0.97
50	\$1.00
55	\$0.97
60	\$0.88
65	\$0.72
70	\$0.50
75	\$0.22
80	\$0

It pays to try and be as close to the true value as possible because even small adjustments can make a big difference to your bonus!



Figure A.60: Study 1 - Receivers (Screen 1)

What percentage of food stamps (SNAP) recipients do you believe are employed full time or part time (but earned an amount that is difficult to live on) as a fraction of all SNAP recipients (i.e. those who are both employed and unemployed)?

0 10 20 30 40 50 60 70 80 90 100

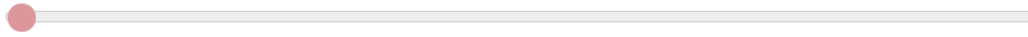


Figure A.61: Study 1 - Receivers (Screen 2)

Of women who had an abortion, what percentage do you believe report regretting the decision afterward?

0 10 20 30 40 50 60 70 80 90 100



Figure A.62: Study 1 - Receivers (Screen 3)

Of African Americans who graduated with a Bachelor's degree at an accredited 4 year college/university in the U.S., what percentage do you believe obtained a GPA of **3.5 or higher**?

0 10 20 30 40 50 60 70 80 90 100



Figure A.63: Study 1 - Receivers (Screen 4)

What percentage of undocumented immigrants deported in 2015 do you believe were convicted criminals?

0 10 20 30 40 50 60 70 80 90 100



Figure A.64: Study 1 - Receivers (Screen 5)

Stop and Frisk is a practice in some cities in which police officers stop and question a pedestrian, then frisk them for weapons and other contraband. What percent of Caucasians who are searched under the policy in New York City do you believe get arrested?

0 10 20 30 40 50 60 70 80 90 100



Figure A.65: Study 1 - Receivers (Screen 6)

Next, we are interested in how you feel about currently debated policy issues. Please take your time answering the following questions.



Figure A.66: Study 1 - Receivers (Screen 7)

The government spends too much money on social welfare programs and should reduce benefits.

Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
-------------------	-------------------	----------------------------	----------------	----------------



Figure A.67: Study 1 - Receivers (Screen 8)

Undocumented immigrants in the U.S. who meet certain requirements should have a way to remain in the country legally.

Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
-------------------	-------------------	----------------------------	----------------	----------------

>>

Figure A.68: Study 1 - Receivers (Screen 9)

The police should rely on "Stop and Frisk" policies, in which the police stop and search people without specific cause.

Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
-------------------	-------------------	----------------------------	----------------	----------------

>>

Figure A.69: Study 1 - Receivers (Screen 10)

Abortion should be legal under any and all circumstances.

Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
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>>

Figure A.70: Study 1 - Receivers (Screen 11)

Universities should use affirmative action in admissions decisions to increase enrollment of racial minorities.



Figure A.71: Study 1 - Receivers (Screen 12)

You have finished Part I of this study.

In Part II, you will have an opportunity to read a message written by another participant. This participant was previously recruited via Amazon Mechanical Turk and did the same guessing task you just completed in Part I.

For one of the guesses you have just made, this other participant made either a lower guess, in which case he or she will make an argument for why you should lower your estimate, or a higher guess, in which case he or she will argue for you to increase your estimate.

After you have read and thought about the argument, you will have a chance to make a second guess on this question. **You will receive an additional bonus** based on how accurate you are on this new guess.

We cannot tell you whether the other participant's guess was more or less accurate than yours. However, you should read the message carefully, as it may provide you with helpful information.

Calculating your additional bonus
 This additional bonus is calculated the same way as your bonus from the first part. You will earn this bonus **in addition** to any bonus you may have earned in the first part.

$$\max\left\{0, \frac{100 \times |TRUE_VALUE - YOUR_ESTIMATE|}{100}\right\}$$

Suppose the true value for a question is 50. The table below shows your earnings depending on the number you reported. As you can see, your bonus is greatest if you get the value exactly right and you will earn no bonus if you are more than 30 percentage points away from the true value.

Your Estimate	Your Bonus
20	\$0
25	\$0.22
30	\$0.50
35	\$0.72
40	\$0.88
45	\$0.97
50	\$1.00
55	\$0.97
60	\$0.88
65	\$0.72
70	\$0.50
75	\$0.22
80	\$0

It pays to try and be as close to the true value as possible because even small adjustments can make a big difference to your bonus!

Figure A.72: Study 1 - Receivers (Screen 13)

Before you will see the other participant's message, we thought you might want to learn something personal about him or her. We asked the other participant to convey a short story about the last time someone did something nice for them. Below is their response.

My boyfriend surprised me with a date night. We usually don't get to go out as much as we use to because we have 2 children. A few weeks ago, he asked his mom to babysit so we could go out to eat and to the mall. I was really happy about this and it was really thoughtful of him to put our relationship first.

>>

Figure A.73: Study 1 - Receivers (Screen 14, only shown in the “rapport condition.”)

Before you will see the other participant's message, we thought you might want to learn how confident he or she was about the guess. We asked the participant to select from three options expressing different degrees to which they were certain about their guess. Below is the statement the participant selected as most closely resembling how certain they felt.

"I can see how someone could make a higher or lower estimate than I did. Providing an estimate is difficult, but I believe that I thought carefully about it. Although I am not completely convinced that my estimate is right, I think my argument will help someone make up their mind and make a good decision."

>>

Figure A.74: Study 1 - Receivers (Screen 14, only shown in the “validation condition.”)

[You now have a chance to make a second guess on this question:](#)
What percentage of undocumented immigrants deported in 2015 do you believe were convicted criminals?

Your previous guess was: **84**
 The other participant made a **lower** guess.

[Here is the other participant's message to you:](#)
 Out of the undocumented immigrants that were deported in 2015, only 5% of them were reportedly criminals. This information came to light during the Presidential election, after Donald Trump said he would deport 2 million immigrants that were criminals. This proved that Donald Trump plans on deporting more than immigrants that have been involved in criminal activity. According to the Huffington Post, "Only 5% of undocumented immigrants were convicted criminals in 2015."

[You may now make a new guess here.](#)

You will receive a bonus based on how accurate your guess is.

What percentage of undocumented immigrants deported in 2015 do you believe were convicted criminals?

0 10 20 30 40 50 60 70 80 90 100



Figure A.75: Study 1 - Receivers (Screen 15)

The following questions address the manner in which you deal with contrary views and opinions on social and political issues that are important to you. When answering these questions think about the hotly contested issues in current social and political discourse (for example: universal healthcare, abortion, immigration reform, gay rights, gun control, environmental regulation, etc.). Consider especially the issues that you care about the most.

Please click the radio button below each statement to indicate the extent to which **you agree or disagree with that statement**.

	Strongly Disagree	Somewhat Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
I am willing to have conversations with individuals who hold strong views opposite to my own.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like reading well thought-out information and arguments supporting viewpoints opposite to mine.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find listening to opposing views informative.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I value interactions with people who hold strong views opposite to mine.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am generally curious to find out why other people have different opinions than I do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People who have opinions that are opposite to mine often have views which are too extreme to be taken seriously	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Figure A.76: Study 1 - Receivers (Screen 16)

Please click the radio button below each statement to indicate the extent to which **you agree or disagree with that statement.**

	Strongly Disagree	Somewhat Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
People who have views that oppose mine rarely present compelling arguments.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from people who have strong opinions that oppose mine is often designed to mislead less-informed listeners.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Some points of view are too offensive to be equally represented in the media.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Some issues are just not up for debate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Some ideas are simply too dangerous to be part of public discourse.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I consider my views on some issues to be sacred.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Figure A.77: Study 1 - Receivers (Screen 17)

Please click the radio button below each statement to indicate the extent to which **you agree or disagree with that statement.**

	Strongly Disagree	Somewhat Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
People who have views that oppose mine are often biased by what would be best for them and their group.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People who have views that oppose mine often base their arguments on emotion rather than logic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Listening to people with views that strongly oppose mine tends to make me angry.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel disgusted by some of the things that people with views that oppose mine say.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often feel frustrated when I listen to people with social and political views that oppose mine.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often get annoyed during discussions with people with views that are very different from mine.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Figure A.78: Study 1 - Receivers (Screen 18)

Finally, we would like to ask you a few demographic questions.

Gender

Male Female

Age

Ethnicity

White Black or African American American Indian or Alaska Native Asian Native Hawaiian or Pacific Islander Other



Figure A.79: Study 1 - Receivers (Screen 19)

What is the highest level of education you have completed?

Less than high school High school graduate Some college 2 year degree 4 year degree Professional or Masters degree Doctoral degree

When it comes to politics, do you usually think of yourself as...

Extremely Liberal Liberal Slightly Liberal Moderate, Middle of Road Slightly Conservative Conservative Extremely Conservative



Figure A.80: Study 1 - Receivers (Screen 20)

Thank you for completing this study. We will calculate your accuracy on the two parts **within 72 hours**. If you were accurate enough to receive a bonus payment, you will receive it no later than 72 hours from now.

On the next screen you will see your unique completion code.

Do you have any comments for the researchers? (optional)



Figure A.81: Study 1 - Receivers (Screen 21)