

**BELIEVE WHAT YOU WILL:
EVERYDAY ETHICS OF BELIEF SUPPORT MOTIVATED REASONING**

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Abstract

Rationality requires unbiased reasoning to produce accurate beliefs, but people appear routinely biased towards believing what they want, even if inaccurate (i.e., motivated reasoning). What makes motivated reasoning so common if it is so irrational? Traditionally, psychologists have assumed that people are committed to empiricism and unanimously disapprove of motivated reasoning, and that therefore motivated reasoning must happen unconsciously. A newer perspective tries to dissolve the issue by arguing that we can reinterpret many apparent cases of “motivated” reasoning as rational Bayesian cognition. This perspective argues that it is perfectly reasonable to treat a new piece of information with more scrutiny if it contradicts a large body of prior evidence, and thus when we observe people being more skeptical of information they disagree with, they are not necessarily being unreasonably “motivated”. In my dissertation, I will challenge both of these views: The first four studies challenge the Bayesian alternative, showing that people are not only skeptical of high quality information that challenges their preferred beliefs, but also willing to elevate low quality information (e.g., anecdotes, a single non-expert’s opinion) to the status of evidence when they are favorable to their preferred beliefs. The next four studies challenge the view that people universally disapprove of motivated reasoning by directly asking them about their ethics of belief: these studies reveal that many people actually approve of social, emotional, and especially moral goals guiding their empirical reasoning in addition to accuracy. Moreover, people acted in line with what they reported approving of: Participants who disapproved of social and emotional bias did not show signs of a self-serving bias, while approvers of social and emotional bias did. A final pair of experiments finds that even empiricist participants selectively elevate anecdotes to the status of evidence when given a moral motive.

Lay Summary

Psychologists have long assumed that while people use motivated reasoning to support desirable conclusions, they also disapprove of it, and therefore need self-deception to use it. A newer perspective is that motivated reasoning is often overstated, because it makes sense to question information that contradicts strong prior knowledge. I challenge both of these views. First, I show that people selectively consider anecdotes to be evidence *if* they support desirable conclusions. Next, I ask people what kinds of motivated reasoning they (dis)approve of, and find that most people approve of goals besides accuracy biasing their factual beliefs. People who approved of biased reasoning were also the only ones to show bias, suggesting that motivated reasoning does not require self-deception. Finally, I find that even people who claim to value being unbiased still use motivated reasoning when morally motivated. These findings suggest that personal epistemologies support, rather than oppose, motivated reasoning.

Preface

I am the primary author of the work presented in this dissertation responsible for developing the research questions, designing experiments and other survey materials, collecting and analyzing the data, and writing the dissertation. My supervisors, Kristin Laurin and Azim Shariff, provided intellectual contributions and shaped the ideas discussed in this dissertation. UBC's Behavioral Research Ethics Board approved all studies (#H20-01524).

Tables of Contents

Abstract.....	iii
Lay Summary	iv
Preface.....	v
Tables of Contents.....	vi
List of Tables	viii
List of Figures.....	xi
Acknowledgements	xii
Chapter 1: Motivated Reasoning.....	1
1.1 Motivated Reasoning	1
1.2 Explaining (Away) Motivated Reasoning	2
1.3 Motivated Model of Reasoning	2
1.4 Coda	13
Chapter 2: What do people count as evidence?	15
1.1 Introduction.....	15
2.2 Study 1	22
2.3 Study 2	26
2.4 Study 3	34
2.5 Study 4	42
2.6 General Discussion	47
Chapter 3: Who cares about motivated reasoning?	52
3.1 Introduction.....	52
3.2 Studies 1a & 1b.....	55
3.3 Study 2	65

3.4	Study 3	72
3.5	Study 4	75
3.6	General Discussion	82
Chapter 4: Where are illusions of objectivity?		90
4.1	Introduction.....	90
4.2	Study 1	92
4.3	Study 2	100
4.4	General Discussion	108
Chapter 5: Everyday Ethics of Belief		115
5.1	Explaining the Prevalence of Motivated Reasoning.....	115
5.2	Personal Epistemologies	117
5.3	Limitations and Opportunities	127
5.4	Outlook	129
References		132
Appendix A: Supplemental Materials for Chapter 2		156
Appendix B: Supplemental Materials for Chapter 3.....		198
Appendix C: Supplemental Materials for Chapter 4		228

List of Tables

Table 2.1:	<i>Study 2: Main effects and interactive model results</i>	28
Table 2.2:	<i>Study 2: Evidence judgements by statement and order condition</i>	32
Table 2.3:	<i>Study 3: Main effects and interactive model results</i>	37
Table 2.4:	<i>Study 3: Simple effects of favorability for each statement, by intervention condition</i>	39
Table 2.5:	<i>Study 3: Intervention evidence judgements (N = 325)</i>	40
Table 2.6:	<i>Study 3: Fully Interactive Model</i>	40
Table 2.7:	<i>Study 4: Main effects and interactive model results</i>	43
Table 2.8:	<i>Study 4: Simple effects of favorability for each statement, by intervention condition</i>	44
Table 2.9:	<i>Study 4: Intervention evidence judgements (N = 302)</i>	45
Table 2.10:	<i>Study 4: Fully Interactive Model</i>	46
Table 3.1:	<i>Study 1a & 1b: Ethics of Belief Items and Factor Loadings</i>	57
Table 3.2:	<i>Study 1a & 1b: Bayesian Likelihood Ratio Tests</i>	63
Table 3.3:	<i>Study 4: Profile Demographic Differences</i>	79
Table 4.1:	<i>Vignettes</i>	94
Table 4.2:	<i>Study 2: State Ethics of Belief Questions</i>	101
Table A.1:	<i>Chapter 2: Study 1: Testing Motivated Empiricism with Inattentive Participants</i>	156
Table A.2:	<i>Chapter 2: Study 1: Simple Slopes by Information Type with Inattentive Participants</i>	156
Table A.3:	<i>Chapter 2: Study 2: Testing Motivated Empiricism with Inattentive Participants</i>	157
Table A.4:	<i>Chapter 2: Study 2: Simple Slopes by Information Type with Inattentive Participants</i>	158
Table A.5:	<i>Chapter 2: Study 3: Testing Motivated Empiricism with Inattentive Participants</i>	159
Table A.6:	<i>Chapter 2: Study 3: Intervention Effects on Motivated Empiricism</i>	160

Table A.7:	<i>Chapter 2: Study 3: Simple Slopes by Information Type with Inattentive Participants.....</i>	161
Table A.8:	<i>Chapter 2: Study 4: Testing Motivated Empiricism with Inattentive Participants.....</i>	161
Table A.9:	<i>Chapter 2: Study 4: Intervention Effects on Motivated Empiricism.....</i>	162
Table A.10:	<i>Chapter 2: Study 4: Simple Slopes by Information Type with Inattentive Participants.....</i>	164
Table A.11:	<i>Chapter 2: Study 1: Testing Motivated Empiricism with a Continuous Measure of Information Favorability.....</i>	165
Table A.12:	<i>Chapter 2: Study 2: Testing Motivated Empiricism with a Continuous Measure of Information Favorability.....</i>	165
Table A.13:	<i>Chapter 2: Study 3: Testing Motivated Empiricism with a Continuous Measure of Information Favorability.....</i>	166
Table A.14:	<i>Chapter 2: Study 4: Testing Motivated Empiricism with a Continuous Measure of Information Favorability.....</i>	167
Table A.15:	<i>Chapter 2: Study 1: Testing Motivated Empiricism with a Continuous Measure of Information Persuasiveness.....</i>	167
Table A.16:	<i>Chapter 2: Study 1: Testing Motivated Empiricism with a Continuous Measure of Information Quality.....</i>	168
Table A.17:	<i>Chapter 2: Study 2: Testing Motivated Empiricism with a Continuous Measure of Information Quality.....</i>	169
Table A.18:	<i>Chapter 2: Study 3: Testing Motivated Empiricism with a Continuous Measure of Information Quality.....</i>	169
Table A.19:	<i>Chapter 2: Study 4: Testing Motivated Empiricism with a Continuous Measure of Information Quality.....</i>	169
Table A.20:	<i>Chapter 2: Samples 1-3: Effects of Information Favorability on Continuous Information Quality Evaluations for Information Classified as Evidence and Not Evidence.....</i>	171
Table A.21:	<i>Chapter 2: Study 1: Moderation of Motivated Empiricism by Political Ideology.....</i>	173
Table A.22:	<i>Chapter 2: Study 2: Moderation of Motivated Empiricism by Political Ideology.....</i>	173
Table A.23:	<i>Chapter 2: Study 3: Moderation of Motivated Empiricism by Political Ideology.....</i>	174

Table A.24:	<i>Chapter 2: Study 4: Moderation of Motivated Empiricism by Political Ideology</i>	174
Table A.25:	<i>Chapter 2: Study 3: Effects of Information Favorability on Willingness to Share Information on Social Media</i>	176
Table A.26:	<i>Chapter 2: Study 4: Effects of Information Favorability on Willingness to Share Information on Social Media</i>	177
Table A.27:	<i>Chapter 2: Meta-Analysis of Differences Between Discounting and Elevation.....</i>	180
Table A.28:	<i>Chapter 3: Moderation of the Self-Serving Bias by Bases for Belief.....</i>	200

List of Figures

Figure 2.1:	<i>Study 1: Evidence Judgements</i>	25
Figure 2.2:	<i>Study 2: Evidence Judgements</i>	30
Figure 2.3:	<i>Study 3: Motivated Empiricism by Intervention Condition</i>	38
Figure 2.4:	<i>Study 4: Motivated Empiricism by Intervention Condition</i>	43
Figure 3.1:	<i>Studies 1a & 1b: Scree Plots of Eigenvalues</i>	60
Figure 3.2:	<i>Studies 1a & 1b: Distributions of Bases for Belief</i>	61
Figure 3.3:	<i>Studies 1a & 1b: Scree Plot of BIC Values</i>	62
Figure 3.4:	<i>Studies 1a & 1b: Three-Profile Plot</i>	63
Figure 3.5:	<i>Study 2: Three-Profile Plot</i>	69
Figure 3.6:	<i>Study 2: Effect of Feedback by Profile</i>	70
Figure 3.7:	<i>Study 3: Three-Profile Plot</i>	73
Figure 3.8:	<i>Study 3: Effect of Feedback by Profile</i>	74
Figure 3.9:	<i>Study 4: Three-Profile Plot</i>	77
Figure 3.10:	<i>Study 4: Profile Differences in Education</i>	79
Figure 3.11:	<i>Study 4: Profile Differences in Binary Gender Identity</i>	80
Figure 3.12:	<i>Study 4: Profile Differences in (Non)Religious Identities</i>	81
Figure 4.1:	<i>Study 1: Three-Profile Plot</i>	97
Figure 4.2:	<i>Study 1: Profile Differences in Motivated Elevation</i>	98
Figure 4.3:	<i>Study 2: Three Profile Plot</i>	102
Figure 4.4:	<i>Study 2: Profile Differences in Motivated Elevation</i>	104
Figure A.1:	<i>Chapter 3: Differences in Thinking Styles Between Profiles</i>	202
Figure A.2:	<i>Chapter 3: Correlation Matrix of Thinking Style Constructs</i>	204

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Chapter 1: Motivated Reasoning

1.1 Motivated Reasoning

Motivated reasoning is the tendency for desired conclusions to bias reasoning about what is true (Kunda, 1990). For example, a researcher who has invested significant time and effort into developing a particular theoretical framework may critique competing theories more harshly than their own (e.g., focusing more on minor methodological flaws or interpreting ambiguous conclusions self-servingly), while overlooking similar issues in their own research. But motives can bias reasoning in a number of ways: mechanisms of motivated reasoning include, among others, strategic flexibility in what information people expose themselves to (Golmann et al., 2017), for how long and how effortfully people process information (Edwards & Smith, 1996; Taber & Lodge, 2006), what information people remember (Sanitioso et al., 1990; Andersson & Hanslmayr, 2014; Carlson et al., 2020), how charitably people interpret new information (Ditto & Lopez, 1992), how much evidence people require to be satisfied (Gesiarz, Cahill, & Sharot, 2019), and how people communicate information to others (Ekstrom & Lai, 2021).

Although this type of cognition can be psychologically comforting (Taylor & Brown, 1988; Murray, Holmes, & Griffin, 1996) and in rare cases even adaptive (McKay & Dennett, 2009), motivated reasoning also contributes to climate change denialism (Hart & Nisbet, 2012), stereotyping (Kunda & Spencer, 2003), partisanship (Lebo & Cassino, 2007; Leeper & Slothuus, 2014), academic failure (Pyszczynski, Greenberg, & LaPrelle, 1985), self-handicapping (Elliot & Church, 2003), resistance to medical test results (Ditto et al., 2003), and a host of other problematic outcomes. Moreover, it clashes with widely taught principles of the scientific worldview that descriptive, factual beliefs should be guided by a search for the truth, based on an unbiased evaluation of available evidence (Burbules & Linn, 1991). Given that motivated reasoning is often harmful, and always at odds with rational reasoning, how is it so common?

1.2 Explaining (Away) Motivated Reasoning

People are cognitively bounded creatures that evolved in an uncertain ecology. Therefore, we have adapted to make decisions that are instrumentally rational in the long run, even if they deviate from what a perfectly rational actor without limitations would do in a particular situation (Gigerenzer & Gaissmaier, 2011). For example, it may seem irrational to estimate the likelihood of an event by how easy it is for you personally to recall similar cases when better information is available, but this strategy ends up being extremely efficient in practice (Tversky & Kahneman, 1974; Schwarz et al., 1991). Nevertheless, people often deviate from rational standards in suspiciously self-serving ways; for example, by making an argument which loads the deck in favor of a conclusion that makes them happier, even if it takes leaps of logic to justify or is harmful (e.g., denial). This suggests that deviations from rational reasoning are not only the product of ineffable evolutionary fine-tuning, but also run-of-the-mill wishful thinking. Nevertheless, it is not so easy to tell whether people are thinking wishfully, or according to an at-first counterintuitive but ultimately rational logic (Ditto et al., 2019; Tappin et al., 2020). In this dissertation, I challenge two common approaches to explaining (away) the ubiquity of motivated reasoning:

1.3 Motivated Model of Reasoning

Traditionally, theories of motivated reasoning have argued that when reasoning is motivated, people do not realize it because they use self-deception and illusions of objectivity to defend the desirable view that they and their reasoning are rational and evidence-based. These illusions of objectivity enable people to use motivated reasoning without realizing it. This perspective is premised on the idea that people are committed to empiricism: they believe that reasoning should consist of an unbiased evaluation of the available evidence, and that non-

accuracy related goals (e.g., to avoid an immoral conclusion, fit in, or feel better) should not influence empirical reasoning.

Examples of this assumption abound. Motivated reasoners require an “illusion of objectivity” where they use self-deception to shield themselves from noticing that they are engaging in motivated reasoning (Pyszczynski & Greenberg, 1987, p. 302). Motivated reasoning leads to “biased beliefs that feel objective” (Epley & Gilovich, 2016, p. 133). People are “subjectively logical” (Kruglanski & Ajzen, 1983, p. 14). People “draw the desired conclusion only if they can muster up the evidence necessary to support it” and do “not realize that the [reasoning] process is biased by their goals.” (Kunda, 1990, p. 483). The illusion of objectivity is thought to be so important that some have even argued biased reasoning would disappear without it: “if people knew that their judgments were subject to influence from other judgments made about an object or from judgments just previously made about other objects, or from the order in which the object was examined, then they would correct for such influences and these effects would not exist” (Nisbett & Wilson, 1977, p. 247).

The core proposition illustrated by these quotes is that people’s personal ethics of belief—their views about appropriate ways of believing—do not permit motivated reasoning. That is, scientists who study people have assumed that their self-image, perhaps like the scientists’ own, is that of an empiricist who forms factual beliefs only by impartially evaluating available evidence. But is *this* assumption supported by the evidence?

Evidence for the Empiricist Assumption

The common empiricist assumption is that most if not all people have an empiricist ethics of belief, but this has not been directly tested. However, some research has documented empiricist tendencies emerging from samples as a whole. This work generally finds that as the truth becomes harder to deny, motivated reasoning decreases (see Strohminger & Melnikoff,

2022). For example, when judging similarly qualified White and Black applicants, prejudiced evaluators preferred White applicants, but only when they could justify doing so by differentially weighting the two candidates' strengths (e.g., strong high school grades versus strong SAT scores; Hodson, Dovidio, & Gaertner, 2002). When both candidates were obviously strong (i.e., both had good grades *and* test scores), the bias decreased—presumably because prejudiced people could not convince themselves that the White applicant was objectively superior given the available evidence.

In another example, participants claimed to be above average in their peer group when traits were defined ambiguously (e.g., when “athleticism” could mean running *or* playing a racquet sport *or* playing a team sport *or* lifting weights *or* skiing) but less so when traits were described more specifically (e.g., when “athleticism” had to mean specifically running or lifting weights; Dunning, Meyerowitz, & Holzberg, 1989). When a trait is given a specific and narrow definition, the researchers argued, it is not as easy for all people to construct a seemingly rational basis on which to claim that they have it.

Such findings suggest that motivated reasoning is indeed constrained by the available evidence and the “wobble room” the reasoner has to interpret it. This overall pattern is consistent with the empiricist assumption. However, on a theoretical level, these average effects across participants leave open the possibility of individual differences. Perhaps some people feel compelled to reject beliefs they cannot justify with empirical accuracy, but others may not. Moreover, that people care about their beliefs being accurate does not prove this is *all* they care about. People can value accuracy, but also value additional considerations like morality, emotions, or social goals. Even if they prioritize accuracy in some circumstances, they might openly prioritize these other goals instead at other times.

Evidence Against the Empiricist Assumption

On an empirical level, I interpret at least three disparate lines of work as at least implicitly calling the standard theory of motivated reasoning into question:

First, some work outlines specific cases when people may sometimes choose beliefs even when faced with clear evidence that they are not accurate. For instance, people sometimes come to truly believe positions they have been asked to advocate for, even in the face of clear contradictory evidence (Strohminger & Melnikoff, 2022): People assigned to the role of a defense attorney versus prosecutor both had access to the same video footage that unequivocally proved the accused was guilty, but the defense attorneys nevertheless came to believe privately that the accused was instead innocent. However, it is still possible that these participants used some unmeasured form of motivated reasoning to rationalize their false beliefs.

As well, people will maintain superstitious decisions even when they consciously flag them as unfounded or incorrect with respect to the evidence (Risen, 2016; Walco & Risen, 2017). For example, in a hypothetical sports game, people will call the play that feels intuitive even when they explicitly acknowledge that a different play has a higher chance of success. However, this disavowal of empiricism took place in the very specific context of low-stakes games, whereas motivated reasoning more often takes place in higher stakes domains like the Self, morality, and politics.

A second recent line of work offers more direct evidence that, *contra* the empiricist assumption, people approve of morality in particular as an appropriate basis for holding descriptive beliefs. In one study, participants saw strong evidence that a person had possessed cocaine, and agreed that a “perfectly detached observer” should believe the person had in fact done the deed (Cusimano & Lombrozo, 2021). They nonetheless advised that the person’s friend, who was also aware of the evidence, ought to believe them innocent out of loyalty.

In another study, participants read a summary of a scientific report indicating that racial minorities offer less generous tips than White people, or a summary of a similar report that did not indicate that conclusion (Cusimano & Lombrozo, 2023). Participants who read the first report not only evaluated the study as lower quality, but also stated that they did so because they believed considering racial differences in people's tipping behavior was disrespectful. Crucially, they also explicitly reported that this influence of a moral view on a factual evaluation was appropriate.

These findings suggest many people's ethics of belief are not strictly empiricist, in that they approve of bias by moral values, which—similar to empirical facts—are perceived to be objectively true (Goodwin & Darley, 2012) and universal (Skitka, 2010). It is not clear this means they would also approve of other non-accuracy factors, like goals to be happy or socially accepted, motivating reasoning. Moreover, just like overall findings supporting the empiricist assumption, findings that support a moralist view of everyday ethics of belief averaged across participants leave unaddressed the possibility of individual differences.

These first two lines of work challenge the standard view by identifying some cases where, on average, people do *not* seem committed to seeing themselves as empiricists. A third and final line of work challenges the standard view by suggesting that there might be individual differences in this commitment. This research finds people do not universally agree that “It is important to me personally to be a rational person” (Ståhl et al., 2016) or that “People should always take into consideration evidence that goes against their opinions” (Pennycook et al., 2020; Newton et al., 2024). In other words, some people do not strongly believe that logic, evidence, and the pursuit of accuracy should guide beliefs.

However, no corresponding work has examined what these people think *should* guide beliefs instead. As well, the existing individual difference work does not specify to participants

what kind of beliefs they should have in mind when reporting their ethics of belief. This is a critical oversight when making claims about peoples' ethics of belief, because it is specifically descriptive beliefs about empirical realities that are the purview of empiricism; injunctive beliefs by definition express moral and aesthetic preferences, and as such cannot be constrained to evidence-based justifications. People who disagreed that "Beliefs should always be revised in response to new information or evidence" (Pennycook et al., 2020) might not have been thinking about descriptive beliefs (e.g., whether or not torture is effective) but rather injunctive beliefs (e.g., whether or not torture is an acceptable thing to do). Even a perfect empiricist could resist updating certain moral beliefs in the face of new empirical information.

Beyond the work on moralism I described above, only one paper I can find shows individual differences in explicit endorsements of bases for descriptive beliefs besides accuracy. This paper found that creationists (vs. those who believed in evolution) were more likely to attribute the cause for their beliefs to scripture, their upbringing, and their feelings about what is true, and rated those factors as more acceptable bases for belief (Metz, Weisberg, & Weisberg, 2018). In other words, creationist participants endorsed factors like social ties as appropriate bases for choosing beliefs. It remains to be seen whether this ethics of belief is confined to the religious and their theological belief, or runs more deeply throughout society.

Updating the Standard Theory

In Chapter 3, I question whether everyone holds the same empiricist ethics dictating that descriptive beliefs should be guided exclusively by facts and evidence. I also ask whether this individual variation can offer a different explanation for motivated reasoning that does not rely on ubiquitous self-deception and illusions of objectivity. That is, I ask whether peoples' motivated reasoning aligns or clashes with their self-proclaimed ethics of belief.

Rational (Bayesian) Model of Reasoning

There have been various versions of a “rationality debate” in psychology’s history (e.g., Bem, 1967; Brown, 2012; Pyszczynski & Greenberg, 1987; Redlawsk, 2003; Stanovich & West, 2000) with one side typically favoring the view that people are mostly rational (albeit fallible and cognitively bounded) reasoners, and another side favoring the view that people are better thought of as fundamentally passionate, motivated reasoners. Most recently, though not for the first time (e.g., Edwards & Smith, 1996; Koehler, 1993; Gerber & Green, 1999), this debate has centered on the “motivated” nature of suspiciously self-serving information evaluations (Druckman & McGrath, 2019; Kim et al., 2020; Pennycook et al., 2023; Tappin, et al., 2020; Tappin & Gadsby, 2019).

Broadly, when people engage in motivated information evaluation (e.g., “motivated skepticism”, Ditto & Lopez, 1992; “biased assimilation”, Lord et al., 1979), they judge information more harshly when it supports a conclusion misaligned with their motives. For example, participants in Ditto & Lopez (1992) tried harder to disprove an ostensibly real medical test with unfavorable results than participants randomly assigned to take an identical test but with favorable results. However, the impact of motives on information is not limited to the amount of effort that people put into disproving unfavorable information (Ditto et al., 2003; Ditto & Lopez, 1992; Munro & Ditto, 1997), and people generally tend to find novel information with unfavorable conclusions to be more flawed and less persuasive than otherwise identical information reaching the opposite conclusion (Campbell & Kay, 2014; Corner et al., 2012; Lord et al., 1979; McHoskey, 1995; Miller et al., 1993; Munro et al., 2002; Washburn & Skitka, 2018; Taber et al., 2009; Taber & Lodge, 2006). In a recent meta-analysis of 51 motivated information evaluation studies in the political domain, Ditto et al. (2019) found robust evidence of a partisan bias in information evaluation, such that people judged otherwise identical political information more harshly when it came to an ideologically unfavorable (vs. favorable) conclusion (e.g.,

supporting a liberal vs. conservative agenda). The studies in their meta-analysis broadly operationalized information evaluation with various perceptions of information quality (e.g., perceived quality of a study's methods) and persuasiveness of the information.

However, recent rationalist critiques have argued that seemingly motivated information evaluation could actually be explained by rational Bayesian reasoning (Druckman & McGrath, 2019; Kim et al., 2020; Pennycook et al., 2023; Tappin, et al., 2020a; Tappin & Gadsby, 2019). If successful, these Bayesian debunking arguments would undermine a core body of evidence suggesting that people are fundamentally motivated reasoners. What exactly is the Bayesian debunking argument of motivated information evaluation?

Explaining Away the Prevalence of Motivated Reasoning

A key issue Bayesians raise with motivated interpretations of seemingly self-serving information evaluations is that they do not rule out a plausible Bayesian alternative explanation where people are only accuracy-motivated (e.g., Druckman & McGrath, 2019; Gerber & Green, 1999; Koehler, 1993; cf. Ditto et al., 2019; see Tappin et al., 2020 for a brief review). This causes researchers to overestimate the prevalence of motives in information evaluation, and in turn the role of motives in reasoning. The issue stems from the fact that many studies where researchers observed ostensibly motivated reasoning use minor variations on a core paradigm which leaves ostensibly "motivated" reasoning observationally equivalent to accuracy-oriented Bayesian reasoning (Tappin et al., 2020a). Specifically, many prior experiments (e.g., many of those in Ditto et al., 2019's meta-analysis) have asked participants to evaluate information matched on all characteristics except one feature meant to manipulate a non-accuracy motivation to (dis)believe the information; for example, by asking participants to read one of two studies which use identical methods but reach opposite conclusions. From a motivated perspective, people use reasoning to resist information that conflicts with their non-accuracy motives; for

example, by rating otherwise identical studies as less persuasive when they support an unfavorable (vs. favorable) conclusion (e.g., Ditto & Lopez, 1992; Lord et al., 1979).

But many researchers have raised issue with the validity of inferring exclusively motivated reasoning from this paradigm because switching the conclusion a piece of information supports (e.g., that gun bans do or do not reduce violent crime) confounds (i) the desire to disbelieve the information with (ii) the degree to which the information is empirically plausible given prior evidence (Baron & Jost, 2019; Druckman & McGrath, 2019; Gerber & Green, 1999; Koehler, 1993; Tappin et al., 2020). This is because, presumably, people tend to have some evidence supporting positions they want to believe, or at least indirect evidence based on relevant knowledge (e.g., expectations about the health consequences of vaping given knowledge about the health consequences of cigarettes). Moreover, in the political context, partisans tend to consume very different sources of information (Pew Research Center, 2014), which supplies them with different arguments, anecdotes, and (misleading) factoids to support their beliefs (Williams, 2023). Put simply, information that people do not *want* to believe is often information that also conflicts with what they (believe they) already know.

This confound raises the possibility that when people reject information they disagree with in typical information evaluation paradigms, they are not being motivated reasoners. Rather, it raises the possibility that they are acting as accuracy-oriented Bayesian reasoners sincerely trying to rectify new information with their (inconsistent) prior body of evidence. Indeed, Bayes' theorem suggests that the stronger our priors are, the less we should update our beliefs based on new information: you should not be convinced that smoking cigarettes is healthy if tomorrow you see a single scientific study attempting to overturn decades of prior research to the contrary. Similarly, if a strongly partisan participant evaluates as unpersuasive a single policy study supporting an opposing party's narrative, they may not be rejecting the information for a

partisan motive: the study could genuinely be at odds with other information they have learned over time, leading them to be unconvinced by it. A rational Bayesian from a different information environment and with strong priors conflicting new information might even consider whether the information is even reliable in the first place: if a new study is at odds with so much other evidence, then perhaps the researchers made mistakes or are untrustworthy. A rational Bayesian skepticism could even explain the extra reasoning that people do to try and disprove unfavorable information (Ditto et al., 2003; Ditto & Lopez, 1992; Munro & Ditto, 1997): people may appear to put more effort into dispelling information because they do not want to agree with it when they are actually seeking further verification of information that is inconsistent with strong priors.

Thus, from a Bayesian perspective, we should not immediately turn to “motivated” explanations for bias in how people evaluate new information: their reasoning, as measured by common paradigms, is often consistent with rational Bayesian reasoning.

Countering Bayesian Counter-explanations

Although this critique does not apply to all types of motivated reasoning (e.g., motivated effects on memory; Anderson & Hanslmayr, 2014; Carlson et al., 2020; Sanitioso et al., 1990), the role of motives in information evaluation is a cornerstone of the motivated reasoning literature (Ditto & Lopez, 1992; Ditto et al., 2019; Taber & Lodge, 2006; Tappin et al., 2020). This is because prototypically rational reasoning requires us to evaluate information in a way that is not biased by the desire to reach any particular conclusion aside from the most accurate one. Thus, if this key component of reasoning were to be biased by motives, then reasoning would be inextricably motivated.

There has only been one set of recent experiments directly attempting to rule out recent Bayesian counter-explanation of motivated information evaluation: Celniker & Ditto (2024) used

a variation on the standard information evaluation paradigm by asking participants to evaluate the methodological quality of politically contentious scientific studies while knowing (vs. not knowing) their results. Their participants consistently judged the same scientific studies as more methodologically rigorous when they made that judgment without knowing the results, suggesting that motives introduced by knowing the outcome biased how people evaluated the quality of the methods. It is more difficult to develop a Bayesian rationalization for this, lending some support for the role of motives in information evaluation, and thus reasoning more broadly. However, it could still be that surprising results violate participants' prior expectations enough to drive suspicion about other aspects of the study (e.g., an unreported mistake in the researchers work), which could explain the effect Celniker & Ditto (2024) observed without the need for non-accuracy motives. Moreover, this work is restricted to how people judge the methodological rigor of science; and specifically how they discount its quality when motivated.

In Chapter 2, I expand on this work by testing whether motives impact a critical component of Bayesian reasoning: what types of information people consider to be capable of providing truth-bearing evidence in the first place. For example, people are generally taught that anecdotes are not evidence (of broad empirical claims), but will they break with this adage when that anecdote supports a desired conclusion? Whether or not a given piece of information is evidence is critical to Bayesian debunking of motivated information evaluation, as Bayesian counter-explanations are predicated on the role prior bodies of evidence play in rationally justifying greater skepticism of unfavorable information. But if non-accuracy motives influence which information people count as truth-bearing evidence that ought to update their factual beliefs, then even purely accuracy-oriented Bayesian reasoning would be built on a motivated body of evidence. This directly challenges the view that, because it is roughly Bayesian, information evaluation is best thought of as rational.

I also expand on this prior work by asking participants to evaluate both high quality information (e.g., science) that their motives may cause them to discount, but also low quality information like anecdotes and non-expert opinions that their motives may cause them to elevate to the status of evidence when convenient. This expands the ecological validity of motivated information evaluation which has focused on how people evaluate reasonably high quality information (e.g., science, formal arguments, investigative journalism) despite people frequently engaging with lower quality content such as anecdotes and non-expert intuitions being used to justify broad empirical claims (e.g., about the roundness of the earth, safety of vaccines, existence of climate change, efficacy of gun bans, etc.). More importantly, this minor change has significant implications for Bayesian counter-explanation of my findings because there is no rational Bayesian justification for considering anecdotes and non-expert opinions about broad empirical issues (e.g., national policy efficacy) to be evidence just because they are consistent with prior bodies of evidence: even if a single event or non-expert's opinion aligns with our priors, that should not influence whether I consider that type of information to be truth-bearing evidence or not.

1.4 Coda

How is motivated reasoning so common if it is so often harmful, and at odds with an injunctive norm of unbiased empiricism? From a traditional motivated perspective, people are able to use motivated reasoning so often because they do it under illusions of objectivity where they believe themselves rational. From a new Bayesian rationalist perspective, the question is somewhat misguided because reasoning is not so fundamentally motivated in the first-place: people are mostly rational, accuracy-oriented Bayesians who merely appear motivated when they try to reconcile new information with inconsistent priors.

In Chapter 2 of this dissertation, I challenge the Bayesian critique of motivated information evaluation by asking whether motives impact which types of information people consider to be evidence, a key component of rational Bayesian reasoning, causing them to discount science as not evidence but also elevate anecdotes and non-expert opinions to the undeserved status of evidence. In Chapter 3, I challenge the traditional motivated perspective that everyone is a committed empiricist who prioritizes accuracy in their personal ethics of belief, and further test whether their actual motivated reasoning aligns with these ethics. In Chapter 4, I test the limits of peoples' commitment to their ethics of belief by tempting participants to engage in morally motivated information evaluations of anecdotes and non-expert opinions. Finally, in Chapter 5 I consider the broader implications of my findings for explaining the prevalence of motivated reasoning despite it violating norms of rationality.

Chapter 2: What do people count as evidence?

1.1 Introduction

People often believe what they want rather than what the evidence tells them they should. This inclination towards motivated reasoning can lead people to dismiss evidence that contradicts their preferred views; for example, by treating science more skeptically when it supports an undesirable conclusion (e.g., Ditto & Lopez, 1992; Skitka & Washburn, 2018). But can they also do the reverse—that is, in the absence of evidence that supports their preferred views, can they manufacture it?

In 2015, Senator James Inhofe brought a snowball to a congressional meeting ([Barrett, 2015](#)), with the implication that the day's snowy weather in Washington D.C.—a meteorological anecdote—was evidence against climate change—a broad phenomenon emerging over extended time and space. Of course, the snowball itself was not, in reality, evidence: a single snowy day is not evidence that the climate is stable. Likewise, this Senatorial anecdote is not evidence that people in general can manufacture support for their preferred views: a single incident in the US Senate would not be evidence of a broad psychological phenomenon.

To provide this evidence, this chapter presents four studies (two pre-registered) testing whether people manufacture support for their preferred beliefs, deeming that mere anecdotes and even non-expert opinions can count as evidence for, but not against, what they want to believe. Previous work finds that people can discount science and other forms of information that *are* evidence; I hypothesize that, conversely, they can also elevate anecdotes and opinions to the status of evidence.

What is evidence?

Evidence about a claim is the information that ought to change the likelihood we think the claim is true (Kim, 1988¹; Thomas, 2021). My focus here is on broad claims, such as the

existence of climate change or the efficacy of national policies. Evidence supporting broad statements about what is generally true must be correspondingly broad. For example, a study analyzing climate data across multiple indicators and several decades would yield valid evidence about climate change. And the results of a randomized control trial across several geographic locations measuring gun violence with and without a particular gun control policy ought to change our views about the policy's effect on efficacy. An empiricist (Bayesian) worldview dictates that, when deciding whether to believe empirical claims, people should consult their available evidence both for and against.

What is *not* evidence?

Anecdotes

This same worldview dictates that people should *not* rely on anecdotal experiences, which in and of themselves are too narrow to speak meaningfully to what is broadly true: One particular snowball's existence on one particular snowy day in one particular place does not make it more or less likely that global temperatures are rising over time. Likewise, a single citizen's experience witnessing gun violence around the time a gun ban took effect does not speak to that policy's effectiveness across the entire region in which it was implemented.

Anecdotal experiences like a snowball in the Senate can in some very specific circumstances qualify as evidence that should influence whether a reasoner believes a claim. Consider for example absolutist claims—e.g., that it never snows in Washington D.C.—or claims that are very narrow —e.g., that Senator Inhofe prefers that people not believe in climate change. Or, consider a case where the reasoner has no expectations, and knows only one fact, which is that a person was shot the day after a gun ban came into effect: An empiricist worldview might allow for that single anecdote to shift the reasoner's belief in the direction of gun bans being ineffective. Finally, it could be rational to categorize a single anecdote as evidence (rather than

non-evidence) if people’s representation of the “evidence” category includes even information that offered only a minuscule amount of evidence.

All this being said, anecdotes are at best low-quality information, which most often should not count as evidence that should sway a completely logical truth-seeker’s judgment about a broad empirical claim. I do not use the term low-quality to imply that anecdotes have no value whatsoever—even with respect to determining broader empirical truth, we often rely on the comprehensive aggregation of individual anecdotes (i.e., data). But, I take it as uncontroversial that people recognize that a single anecdote, in isolation, is generally not evidence and should not sway beliefs about broader claims.

Opinions

Similarly, opinions (especially non-expert ones) do not shed light on the truth of a broad claim: A single layperson’s opinion that temperatures are or are not rising does not change the likelihood that they are. Even in the aggregate, the results of a large opinion poll about gun bans are not evidence that a certain gun control measure would be effective or not. Of course, opinion surveys are evidence for a broad claim about what a population believes. But if the broad claim is about anything other than opinions, then opinions are not good evidence for or against it. In other words, non-expert opinions too are low-quality information that, most of the time, should not sway a logical truth-seeker’s judgment about an empirical claim.

False beliefs and motivations

People care about evidence and want to feel their beliefs are justified (Epley & Gilovich, 2016; Kruglanski & Ajzen, 1983; Kunda, 1990; Pyszczynski & Greenberg, 1987; Williams, 2022). At the same time, they often prefer certain beliefs over others, independent of whether they are justified (Ditto et al., 2019; Kunda, 1990; Taylor & Brown, 1988). Existing work has thus sought to identify the strategies people use to create the illusion that their preferred beliefs

are justified, with a large amount of research focused on motivated information evaluation in particular (Ditto et al., 2019).

I review this work in the next section and note that, in my analysis, it has overemphasized the question of what people do with respect to favorable versus unfavorable evidence (e.g., Ditto & Lopez, 1992; Edwards & Smith, 1996; Gesiarz et al., 2019; Golman et al, 2017; Kraft et al., 2015; Lord et al., 1979; Stroud, 2010; Taber & Lodge, 2006). I propose that a more complete picture of *motivated empiricism* would also consider what people do with respect to information that is *not* evidence. That is, the existing literature has a lot to say about how people cope with an abundance of evidence contradicting their preferred beliefs. But what do they do when confronted with the conspicuous absence of favorable evidence? I have not been able to locate any papers testing whether people are willing to credulously elevate unambiguously low-quality information to the status of evidence when it suits them. However, the ability to selectively see low-quality information as valid evidence could serve a function that is similar and complementary to the ability to selectively deny high-quality information. It would also undermine the amotivational nature of Bayesian reasoning: if Bayesian reasoning is based on prior bodies of evidence, and motives determine what gets included in prior bodies of evidence, then Bayesian reasoning is infected by our motives.

Dismissing valid but unfavorable evidence

A reasonably large literature is consistent with the first arm of motivated empiricism, whereby people can discount high-quality information and deny that it is evidence. On the whole, this work finds people resist high-quality information when it is unfavorable. They can simply refuse to use it to update their beliefs (Tappin et al., 2020), as in one paper where partisans were less likely to agree with and find persuasive the conclusions of research (e.g., about carbon emissions) that supported an out-party (vs. in-party) agenda (Washburn & Skitka,

2018; see also Campbell & Kay, 2014; Lord et al., 1979). As well, when evaluating science that contradicts their preferred positions, people try harder to identify its methodological problems (Ditto et al., 2003; Ditto & Lopez, 1992; Munro & Ditto, 1997). Likewise, people report more skepticism toward reasonably evidence-based arguments (i.e., mixes of evidence, logic, moral appeals, and other rhetorical strategies) that undermine rather than support their preferred conclusion (Corner et al., 2012; McHoskey, 1995; Miller et al., 1993; Munro et al., 2002; Taber et al., 2009; Taber & Lodge, 2006).

These findings fall short of demonstrating what I propose here: That people explicitly categorize high-quality but unfavorable information as non-evidence. Thus, one of my goals is to test this motivated discounting effect. I note, however, that such an effect, along with the body of work summarized above, could be interpreted in a way that has nothing to do with motivation or what people want to believe: It can be rational for a Bayesian to doubt the value of new information, even science, that conflicts with prior knowledge (e.g., Tappin et al., 2020; Tappin & Gadbsy, 2019). As an extreme example, if a new study reported the average adult human was four feet tall, a rational person might assume it was fatally flawed, and thus disagree with it, call it unpersuasive, and search for its specific methodological shortcoming, and conclude that it should not count as evidence. As long as people believe they have a solid evidentiary basis for their preferred belief, it is rational for them to discount any single piece of evidence to the contrary.

Manufacturing favorable evidence from low-quality information

Far fewer studies have tested ideas related to the elevation of low quality information. In fact, I can find no studies that ask people to directly evaluate the evidentiary value of anecdotes or non-expert opinions. A small body of work does suggest that people sometimes *treat* low-quality information as if it were evidence. For example, in one paper, religious participants used

scripture, their upbringing, and their feelings—none of which count as evidence by rational standards—to explain their empirical beliefs like creationism (Metz et al., 2018). In another, people acted as if the temperature of the current day—an anecdotal experience—was evidence about climate change, reporting more skepticism of it on cooler days (Zaval et al., 2014). However, these findings fall short of demonstrating that people would insist, if directly asked, that this low-quality information *should, objectively* count as empirical evidence. Religious people might recognize that their upbringing is not evidence against evolution, but nonetheless acknowledge that it shaped their beliefs. People might likewise know that any day’s temperature does not (dis)prove climate change (Schwartz & Clore, 1983), but merely act that way when quickly completing a survey.

In short, we do not yet know whether people will explicitly categorize low-quality favorable information as being evidence about a broad claim. Moreover, it would be difficult to come up with a rational Bayesian interpretation of such an effect: A single encounter with a four-foot-tall human can only serve as evidence about absolutist (“all humans are over four feet tall”) or narrow (“a human exists who is four feet tall”) claims, to a reasoner who has extremely weak priors, or to one who includes even nearly weightless data points in their definition of evidence. But there is not even a Bayesian reason why these considerations would differ solely as a function of whether information is favorable or not to people’s preferred beliefs. Thus, evidence for motivated elevation would offer stronger evidence than prior studies of the role of motivation in information evaluations and reasoning more broadly.

Motivated Empiricism: An Overview

I propose that explicit judgments of what counts as evidence do not reliably track with whether information ought to actually influence the perceived likelihood of a claim being true, but are guided by motivations. If so, this would give people a unique tool allowing them to

acquire and maintain their preferred beliefs, while maintaining the conviction that these beliefs are evidence-based (Epley & Gilovich, 2016; Kruglanski & Ajzen, 1983; Kunda, 1990; Pyszczynski & Greenberg, 1987; Williams, 2022).

The first goal of the present chapter is to test whether people use motivated empiricism, not only discounting real evidence when it is unfavorable, but also elevating low-quality information to count as supportive evidence. Like epistemic judgments about evidence quality studied in previous research, binary evidence categorizations are likely a common and influential element of reasoning. These categorizations may often be verbalized when people justify their beliefs to others, or try to disprove another's beliefs. These categorizations may also be relevant when people engage in metacognition about their own (Jost & Kruglanski, 2013) or others' (Vesga et al., 2024) reasoning, and when they intentionally set out to "make up their mind" on an issue by weighing their evidence and evaluating conflicting sources of information.

The second goal is to compare motivated discounting (of high-quality, generalizable information like science) and motivated elevation (of low-quality non-generalizable information like anecdotes or non-expert opinions). Motivated discounting is a false negative: a failure to recognize that high-quality, generalizable information is evidence. Moreover, like most motivated evaluation work, it concerns the problem of unfavorable evidence, and could be interpreted as rational Bayesian cognition. In contrast, motivated elevation is a false positive: an incorrect labeling of low-quality information as "evidence". It is also distinct from other motivated errors in that it concerns the absence of supportive evidence, and generally cannot be interpreted as rational.

In four studies, participants read either high- or low-quality information that was either favorable or unfavorable to their preferred empirical belief about a claim. To avoid the specific circumstances under which it could be rational to treat anecdotes or opinions as evidence, the

claims I examined were broad, non-absolutist claims about topics most participants had strong priors about. Participants categorized the information they read, labeling it evidence that a perfectly logical truth seeker would use to discern the truth about the claim, or not. I tested whether people categorized information as a function of not only its quality but its favorability; I also compared the frequency of motivated discounting and motivated elevation. In the third and fourth studies, which I pre-registered, I also tested the robustness of motivated empiricism to a brief intervention.

Readers may access the data, R analysis code, research materials, and any pre-registrations at my [OSF repository](#), which provides a separate component for each study. I include the wording of all primary variables and vignettes in the appendix.

2.2 Study 1

Participants read either a scientific study or a personal anecdote that was either favorable or unfavorable to the idea that gun bans prevent crime. I measured their attitudes toward guns, predicting they would discount high-quality information unfavorable to those attitudes, and elevate low-quality information favorable to them.

Method

Participants

I recruited 593 US-based Prolific Academic workers and excluded 136 for failing any attention check. For all studies in this chapter, the appendix reports virtually identical results including participants who failed any attention check, for each study (appendix Tables A.1-A.10). I also excluded a further 12 participants whose gun attitudes fell at the scale midpoint, because the analysis strategy I used in all studies (pre-registered for Studies 3 and 4) precluded us from labeling the information they saw favorable versus unfavorable. For all studies in this chapter, the appendix reports conceptually identical results from an alternative analysis strategy

including midpoint participants (appendix Tables A.11-A.14). The final sample was 445 (196 women, 243 men, five non-binary, and one did not answer; $M_{\text{age}} = 36.03$).

Procedure

Participants reported their gun attitudes on seven items from the Gun Attitudes Scale (Tenhunfeld et al., 2020; e.g., *I am concerned about losing my second amendment right to own a gun*), using a 7-point scale (*Strongly Disagree* to *Strongly Agree*)². Then, they read about a town hall meeting where state officials heard testimony from citizens about whether to enact a new gun ban (specifically on concealed handguns; see Appendix A for the full text participants read in all conditions).

In the low-quality information conditions, the committee heard from Dr. Kunda, a local physician, who had witnessed a shooting in a convenience store. For half of these participants, the story supported the narrative that the ban would make communities safer: The physician saw an assailant with a license to carry a concealed handgun shoot the store clerk. For the other half, the story supported the reverse narrative: It was the clerk who had a license to carry, and shot the armed assailant.

In the high-quality information conditions, the committee also heard from a Dr. Kunda, this time described as a local economist who had completed a large study comparing change in crime rates between several hundred cities that either had or had not enacted a ban on concealed guns. Paralleling the low-quality conditions, for half participants the study indicated cities became safer after enacting the ban; for the other half it indicated the opposite. Participants then answered the following binary question:

Regardless of your personal position on the issue of gun bans, do you think that the story that Dr. Kunda shared counts as evidence that could be used to prove whether communities are safer or less safe when they ban concealed handguns?

Note that we are not asking you if you want Dr. Kunda's story to be used as evidence by the Officials, simply whether it counts as evidence that a logical truth seeker would consider.

I used the gun attitudes scale midpoint to categorize participants as having read favorable or unfavorable information. For example, if a participant reported attitudes on the pro-gun side of the scale but read information suggesting that banning concealed guns increased safety, I categorized them as having read unfavorable information. As noted above, the appendix (Appendix A, Analysis 1) reports conceptually identical results for all studies using a continuous alternative to this binary categorization of information favorability: either directly participants' scores on the continuous (pro-)gun attitudes measure if they were exposed to anti-gun ban information, or the same scores but reversed if they were exposed to pro-gun ban information (e.g., a participant scoring 5.5 on the 1-7 gun attitudes measure would receive a favorability score of 5.5 if they read information against, and 2.5 if they read information favoring, gun bans). My favorability indicator was not perfect, because the attitudes I measured were toward guns, whereas the policy in question was specific to *concealed handguns*. At least some pro-gun participants likely favored banning concealed handguns. Nonetheless, I felt safe assuming that, on average, the anti-gun ban information would feel more favorable to pro-gun participants than would the pro-gun ban information, and that the reverse would be true for anti-gun participants.

In this and all studies, I also asked additional exploratory questions; for instance, about the strength of Dr. Kunda's evidence on a Likert scale. These are available in the Appendix A (Analysis 2), alongside the conceptually similar results they produced.

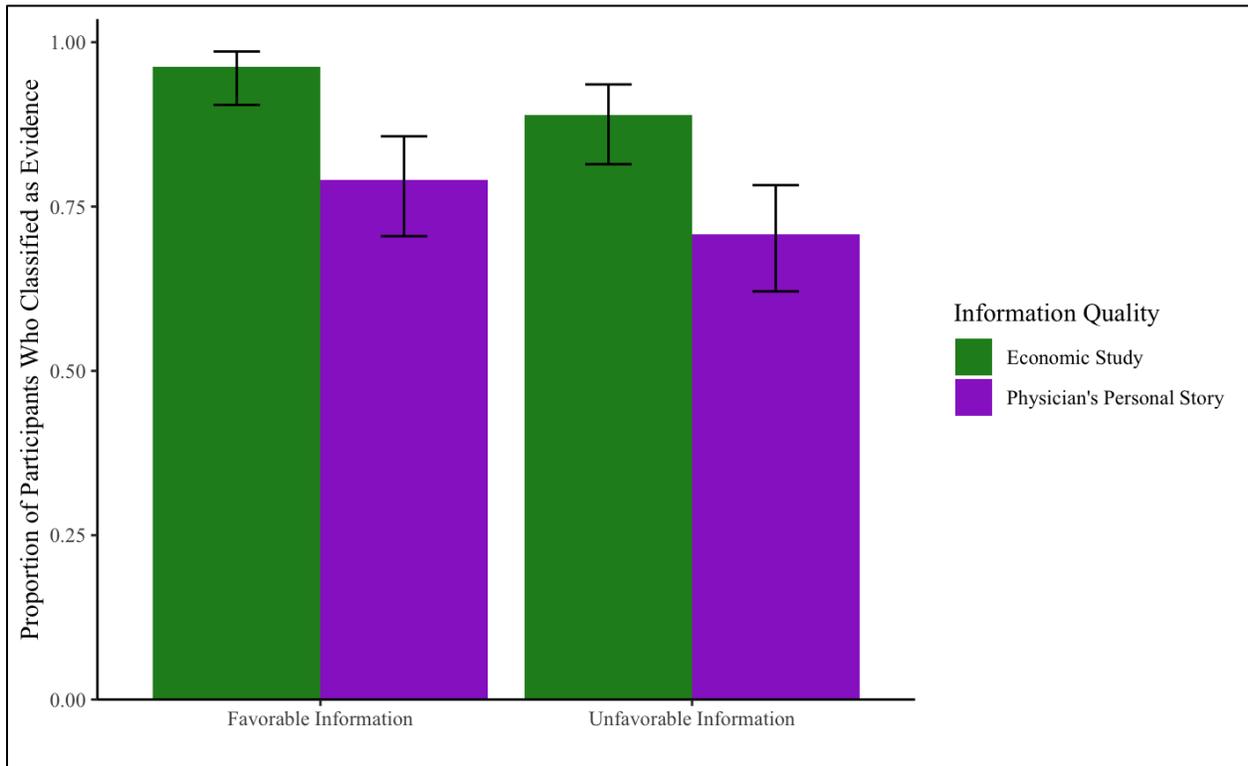
Results

A logistic regression tested whether information's favorability (unfavorable = -1, favorable = 1), quality (low-quality = -1, high-quality = 1), and their interaction influenced how

participants categorized it (does not count as evidence = 0, counts as evidence = 1); see Figure 2.1.

Figure 2.1

Study 1: Evidence Judgements



The main effect of favorability ($OR = 3.29$; 95% CI [1.65, 6.99]; $p = .001$) was consistent with motivated empiricism: Participants were more likely to categorize information as evidence when it was favorable to their personal attitudes (93.56%) than when it was unfavorable (74.78%).

The non-significant interaction ($OR = 2.07$; 95% CI [.59, 8.55], $p = .278$) suggested that motivated discounting (of high-quality information) and motivated elevation of low-quality information did not reliably differ. Nonetheless I noted that the tendency to categorize a favorable anecdote as evidence ($OR = 1.82$; 95% CI [1.27, 2.60]; $p = .001$) was directionally

smaller than the tendency to categorize an unfavorable study as not-evidence ($OR = 2.61$; 95% CI [1.51, 4.52]; $p = .001$). I return to this non-significant trend after testing it in subsequent studies.

I was surprised to find no main effect of information quality ($OR = 1.56$; 95% CI [.85, 2.88]; $p = .151$): Participants were not significantly more likely to categorize the scientific study (87.56%) as evidence than the personal story (79.39%). This made me hesitant to rely conclusively on Study 1's other results; Studies 2 and 3 explored in more depth why so many participants counted the physician's story (even the unfavorable one) as evidence.

Discussion

Participants more often said a perfectly logical truth seeker would *not* use a large scientific study as evidence when it did not support their presumed preference. They also more often said this truth seeker *would* use a single person's experience as evidence, as long as that experience suited their preference. Before drawing conclusions from these findings, though, I considered why participants in Study 1 did not categorize a systematic study differently than a single anecdote. Do people generally disagree with common scientific standards for evidence? Do more of them than I expected recognize that an anecdote is actually a tiny amount of evidence? Or are their standards for evidence vulnerable not only to motivated influences, but also to non-motivated, cognitive ones (Biernat & Manis, 1994), such that those who read low (high) quality information used a lower (higher) threshold for counting information as evidence? Studies 2 and 3 tweaked Study 1's paradigm to investigate this third possibility.

2.3 Study 2

Study 2 used a within-subjects manipulation of information quality: Participants categorized: a scientific study and three different pieces of low-quality pieces of information. As in Study 1, I randomly assigned participants to see pro- or anti-gun ban information. I also

randomized whether participants judged the scientific study first or last. If participants' first judgment sets their threshold for evidence, those who see the study first (vs. last) should use higher thresholds in their subsequent judgments, and use the "evidence" label more conservatively.

Method

Participants

I recruited 358 American Prolific Academic workers and excluded 20 for failing any of several attention check questions. Similar to Study 1, the analysis strategy excluded a further two participants whose gun attitudes fell exactly at the scale midpoint. This left a sample of 336 (169 women; 164 men, three identified as non-binary; $M_{age} = 41.67$). Because all participants judged four pieces of information, this yielded 1,344 evidence judgements for analyses.

Procedure

Participants reported their gun attitudes in the same way as in Study 1. Then, they read four pieces of information: (i) a summary of a large economic study examining the impact of gun bans on crime; (ii) an everyday non-expert citizen's anecdotal experience around gun bans; (iii) the results of a public opinion poll on whether the government ought to enforce gun bans; (iv) a story about a pastor providing their personal opinion on the issue to members of their congregation and (see Appendix A for full text of each). After reading each piece of information, participants answered Study 1's binary question, edited slightly for clarity:

Regardless of your personal position on the issue of gun bans or other information you know about the effectiveness of gun bans, do you think that [this information] counts as evidence that could prove whether bans on concealed handguns actually make communities safer or less safe? Put differently, would a completely logical truth seeker use [this information] as evidence to decide if gun bans actually work or not?

Participants either read the scientific study first and then the three low-quality pieces of information in a random order, or the three low-quality pieces of information in a random order

and then scientific study last. As in Study 1, for half of participants all the information they read fit the narrative that gun bans made communities safer; for the other half, less safe. Also as in Study 1, I used this manipulation in combination with participants' gun attitudes to place them into favorable and unfavorable conditions. Unlike Study 1, I did not provide the context of a town hall meeting and an upcoming policy decision; I simply asked participants to judge the information. I eliminated this context in case it caused participants to misunderstand the evidence question as asking them whether the democratically elected state officials should take the information into account, in which case it might be reasonable for them to answer in the affirmative about constituents' experiences and opinions.

Results

Multilevel logistic regression models predicted participants' evidence judgements (not evidence = 0; evidence = 1) from the favorability of the information (unfavorable = -1; favorable = 1), an information type variable (with each of the three low-quality conditions dummy coded against the economic study as the reference group), the order with which the information was presented (high-quality information first = -1; high-quality information last = 1), and random intercepts for each participant. An initial main effects model used only these variables with no interactions; a second interactive model added all possible interactions between predictors (see Table 2.1)

Table 2.1

Study 2: Main effects and interactive model results

	Main	
	Effects	Interactive
	Model	Model

Parameter	Main Effects Model			Interactive Model		
	<i>Odds Ratio</i>	95% <i>CI</i>	<i>p-value</i>	<i>Odds Ratio</i>	95% <i>CI</i>	<i>p-value</i>
Intercept (i.e., Economic Study)	3.78	[2.31, 6.21]	< .001	2.24	[1.21, 4.14]	.010
Citizen's Anecdote	0.02	[.01, .03]	< .001	0.04	[.01, .09]	<.001
Opinion Poll	0.04	[.02, .06]	< .001	0.09	[.04, .20]	<.001
Pastor's Opinion	0.003	[.00, .01]	< .001	0.01	[.00, .03]	<.001
Favorability	4.09	[2.46, 6.82]	< .001	11.07	[3.36, 36.44]	<.001
Order	2.32	[1.41, 3.79]	< .001	5.15	[1.87, 14.23]	.002
Favorability × Anecdote				0.30	[.07, 1.26]	.100
Favorability × Poll				0.26	[.07, 1.02]	.054
Favorability × Pastor				0.25	[.04, 1.51]	.131
Order × Anecdote				0.33	[.09, 1.23]	.098
Order × Poll				0.34	[.10, 1.14]	.081
Order × Pastor				0.33	[.06, 1.81]	.201
Favorability × Order				0.60	[.09, 4.00]	.596
Favorability × Order × Anecdote				2.61	[.29, 23.53]	.394
Favorability × Order × Poll				1.43	[.17, 14.23]	.738

		11.89]	
Favorability × Order × Pastor	2.57	[.19, 34.20]	.475

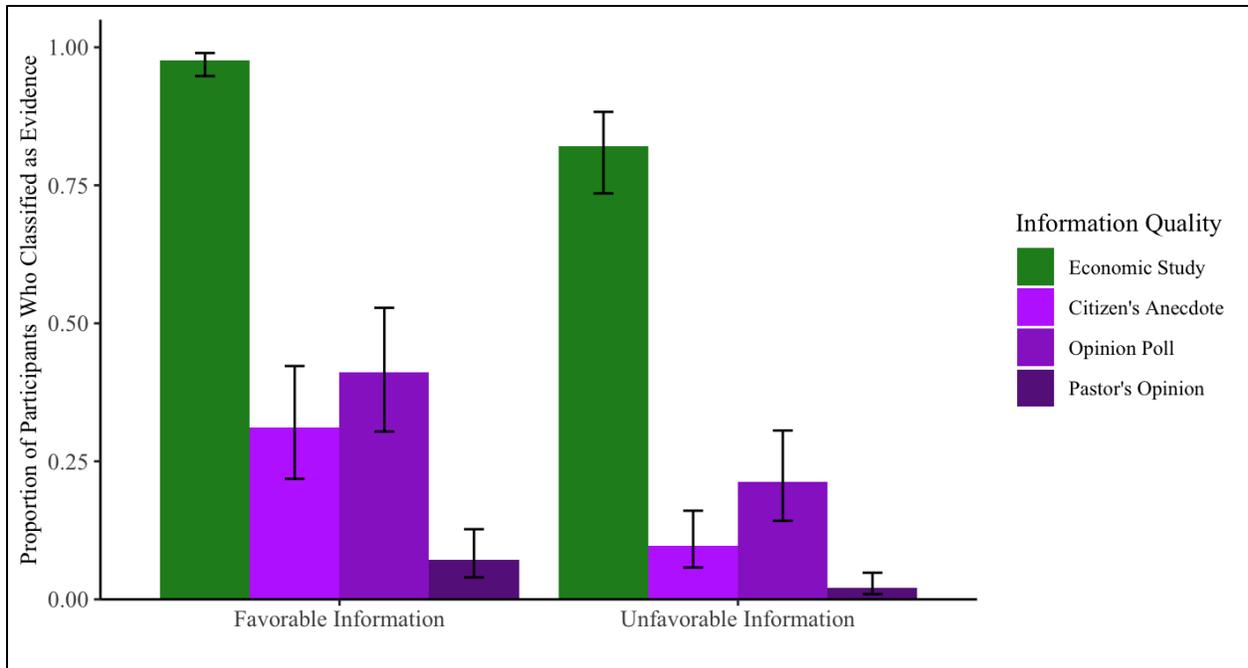
Motivated empiricism

The main effects model revealed an effect of favorability consistent with motivated empiricism. Participants were more likely to categorize information as evidence when it was favorable (49.46%) than when it was unfavorable (17.84%) to their preferred conclusion.

The interactive model suggested this was again not moderated by information quality, with the Favorability × Information Type interactions’ *p*-values ranging from .054 to .131 (Figure 2.2). The trend, however, was similar to Study 1: Participants were directionally more likely to discount as non-evidence an unfavorable (vs. favorable) scientific study (*OR* = 3.01, 95% CI [1.90, 4.77], *p* < .001) than they were to elevate to the status of evidence a favorable (vs. unfavorable) citizen’s anecdote (*OR* = 2.04, 95% CI [1.42, 2.94], *p* < .001), opinion poll (*OR* = 1.61, 95% CI [1.15, 2.25], *p* = .006), or pastor’s opinion (*OR* = 1.88, 95% CI [1.16, 3.03], *p* = .010). I continue monitoring this trend over the final two studies.

Figure 2.2

Study 2: Evidence Judgements



Effects of Order and Adhesion to the Scientific Standard

The main effects model (Table 1) revealed a main effect of order: When participants saw low quality information first, they applied the “evidence” label more liberally, indicating that they had lowered their threshold for what counts as evidence. This is consistent with a non-motivated, cognitive effect whereby people’s threshold for evidence is influenced by the quality of information they have recently seen.

Nonetheless, the main effects model also revealed strong effects of information type, clearly visible in Figure 2: Participants considered the economic study to be evidence at a much higher rate than they did the citizen’s anecdote, the public opinion poll, or the pastor’s opinion. This was true in both order conditions (see Table 2.2). In other words, across the board in Study 2, participants’ judgments were better aligned with the scientific standard than in Study 1. This could reflect Study 2’s within-subjects design, where participants saw multiple pieces of information and could explicitly compare between them, or the removal of the democratic context which may have caused confusion about what the question meant. In any case, it

suggests that on the whole people do agree with the scientific standard, though they may not always feel beholden to follow it.

Table 2.2

Study 2: Evidence judgements by statement and order condition

Statement	High-Quality Information First		Low-Quality Information First	
	<i>% who classified as evidence</i>	<i>95% CI</i>	<i>% who classified as evidence</i>	<i>95% CI</i>
Economic Study	84.21	[75.70, 90.13]	96.52	[93.20, 98.38]
Citizen's Anecdote	11.69	[6.95, 18.99]	25.50	[17.30, 35.97]
Opinion Poll	23.51	[15.59, 33.82]	36.20	[26.10, 47.74]
Pastor's Opinion	2.33	[1.02, 5.20]	5.66	[3.10, 10.36]

Discussion

People were more conservative in labeling information “evidence” when they began by judging a scientific study, presumably because they set a higher threshold for what should count. Regardless of what they saw first, though, participants more often categorized a high-quality scientific study as non-evidence when it was unfavorable (compared to favorable). They also more often categorized a single religious leader’s opinion, an individual citizen’s personal anecdote, and the popularity of certain preferences in the general public as evidence when doing so aligned with their attitudes.

The first of these two findings may reflect motivated discounting—strategically altering one’s standards for evidence to exclude unfavorable information—but it is vulnerable to an alternative Bayesian interpretation: A participant who (believed) their views on gun bans were already justified by ample evidence might assume a contradictory study must have been conducted poorly, or by untrustworthy researchers, and thus not provide credible evidence.

The second finding more clearly reflects motivated elevation—strategically altering standards to *include* favorable information. This same participant could not reasonably think that an isolated incident or non-expert opinion counts as generalizable evidence of the broader truth they already believe (though they might conclude reasonably the broad truth *explains* the incident).

To strengthen the conclusion that this motivated elevation finding is clearly distinct from any kind of Bayesian reasoning, I considered the cases where an anecdote (or an opinion) could reasonably count as evidence:

First, there is the case where the claim in question is narrowly limited to the context of the anecdote, or so absolutist that a single observation could disprove it. But the claims in my studies—those reported thus far and those to come below—do not meet these criteria: Whether or not a gun ban is, on the whole, effective is neither narrow nor absolutist.

Second, there is the case where the reasoner in question has extremely weak priors, such that even a single anecdote or lay person’s opinion could meaningfully update them. Study 2 could rule this out, because it assessed both participants’ pre-existing beliefs about gun ban efficacy as well as their confidence in these prior beliefs. Confidence in prior beliefs was very high, and if anything descriptively stronger among those who categorized the low-quality information they read as evidence ($M = 8.08$; $SD = 1.97$ on a 0-10 scale) compared to as not evidence ($M = 7.89$; $SD = 2.09$).

Third, there is the case where a reasoner could recognize the technicality that anecdotes (and opinions) are in fact miniscule amounts of evidence. Fortunately, all my studies included an exploratory measure whereby participants rated the quality of each piece of information on a continuous scale, allowing us to test whether, when people categorized anecdotes and opinions as evidence, they nonetheless recognized its low quality (incidentally, analyzing these quality

ratings in place of participants' binary evidence judgments yielded conceptually identical results; appendix Tables A.15-A.20). Across within-subjects Studies 2-4 ($N_{\text{Participants}} = 968$; $N_{\text{Judgements}} = 3,547$), participants who said that an anecdote, non-expert opinion, or poll was evidence rated its quality as much higher, near the midpoint of the 0-4 scale ($M_{\text{Anecdote}} = 1.99$, $SD = 1.06$; $M_{\text{Pastor}} = 2.07$, $SD = 1.26$; $M_{\text{Poll}} = 2.14$, $SD = 0.99$), than participants who said that this information was not evidence ($\text{Mean}_{\text{Anecdote}} = .37$, $SD = .59$; $M_{\text{Pastor}} = .19$, $SD = .48$; $M_{\text{Poll}} = .33$, $SD = .58$). Thus, participants considering favorable anecdotes evidence were not merely playing a semantic game, but fully elevating this low-quality information to an unwarranted status, attributing it much better quality, nearly on par with that of science that they acknowledged was evidence (whose quality they rated $M = 2.39$, $SD = 1.01$).

These additional analyses thus find no support for the view that participants were calling anecdotes and opinions in a rationally defensible way. Instead, when people use the label “evidence” to describe favorable anecdotes and opinions, they are manufacturing support for their beliefs out of material that they know better than to use. In the appendix (Tables A.21-A.24), I also find that these effects are consistent across the left-right political spectrum.

2.4 Study 3

Study 3 aimed to replicate the basic pattern in a new context, setting aside gun bans and focusing instead on a (broad and non-absolutist) claim about taxes on the wealthy and their effect on the economy. Study 3 also introduced an intervention aiming to reduce motivated empiricism: Half of participants pre-categorized different *sources* as evidence or not, without knowing what attitude those sources supported. Because this intervention task involved no motivational pressure, I reasoned it would elicit information evaluations aligned with the scientific standard. I reasoned further that participants in the intervention condition who had just applied the scientific

standard might later feel compelled to continue applying it under motivational pressure to avoid hypocrisy (Lewandowky & van der Linden, 2021).

My pre-registration predicted motivated discounting and elevation effects, as well as that participants would judge the economic study as evidence more often than anecdotes or opinions. It also included plans for analyses without directional predictions comparing discounting versus elevation, and testing the effect of the intervention.

Method

Participants

I recruited 720 American Prolific Academic workers. To account for known data quality issues with Prolific Academic around the time of data collection (February, 2022) caused by a viral video on July 24th, 2021 ([Prolific](#)), I sampled even numbers of self-identified male and female participants, and only those who made their account on or before July 1st, 2021. I excluded 69 participants for failing any of several pre-registered attention check questions. I used a single-item attitude measure assessed on a 6-point scale, meaning no participant could be excluded for scoring at the midpoint. The sample thus included 651 participants (324 women, 321 men, six identified as non-binary; $M_{age} = 41.94$). As in Study 2, participants judged four different pieces of information, this time referring to the effects of taxes on the wealthy. Due to experimental oversight, in the case of the pastor's opinion, the key DV referred to gun bans rather than to the effect of taxes; for this reason I excluded responses to it, and analyzed a final sample of 1,953 evidence judgments.

Procedure

The procedure closely followed Study 2's. Participants started by reporting their attitude toward raising taxes on the wealthy using a single-item measure:

In this part of the survey, we are interested in your feelings towards raising taxes on wealthy citizens. Some Americans think that we should raise taxes on the rich, while others think we should not.

We would like to know what you think. Please use the scale provided to indicate how negative or positive you feel towards the idea of raising taxes on wealthy citizens.

The scale ranged from 1 (*Extremely Negative*) to 6 (*Extremely Positive*).

Participants then read four statements presenting different kinds of information about raising taxes on the wealthy. As in Study 2, these were a summary of an economic study, a non-expert's personal experience, a public opinion poll, and a pastor's opinion, but in Study 3 all participants read the economic study summary first. After reading each piece of information, participants answered the same binary question as in Study 2, modified to refer to progressive taxes helping the economy. As noted above, my pre-registered materials show that I accidentally did not apply this modification to the question about the pastor's opinion, so I excluded responses to it.

As in my prior studies, I manipulated the content of the information between subjects: Half read information that fit the narrative that such taxes help the economy; half that they harm it. The exact wording of all statements is in Appendix A, and as in previous studies I used participants' attitudes (above or below the midpoint) to determine whether the information they read was subjectively favorable or unfavorable.

Prior to seeing and judging any of the four statements, half of participants performed an intervention task. They categorized seven general information sources as evidence or not, with no indication of whether any source supported or contradicted their preference. Four sources were similar to those they would later judge (a different citizen's anecdote, an economic study, a public opinion poll, a pastor's opinion), and three were different (a political leader's reasoning, a persuasive social media post by a non-expert, and a documentary including commentary from

experts). For example, I asked participants to decide whether they thought “An individual’s personal experience with trying to find work” (with no mention of whether the person succeeded or failed) after taxes were raised on the wealthy could be used as evidence or not about the true impact that such taxes could have on the economy. I reasoned that, without the motivational distraction of knowing which narrative the source’s information fit, most participants would be able to recognize that this personal experience should not count as evidence. Having made this judgment, they might feel at least somewhat compelled to carry it through to judgments of personal experiences that favored their preference.

Results

Motivated empiricism

As pre-registered, I first analyzed only the judgments (n=975) of participants (n=325) in the baseline condition: those who did not complete the intervention task. I tested for motivated empiricism using multi-level logistic regressions predicting participants’ evidence judgements (not evidence = 0; evidence = 1) from the favorability of the information (unfavorable = -1; favorable = 1), a dummy coded information quality variable (with each of the three low-quality conditions dummy coded against the economic study as the reference), and random intercepts for each participant (see Table 2.3). As in Study 2 an initial main effects model included no interaction terms, and a second interactive model included them (our pre-registration did not include the main effects model, but I later realized it was necessary in order to obtain the overall motivated empiricism effect across information types).

Table 2.3

Study 3: Main effects and interactive model results

Main effects model

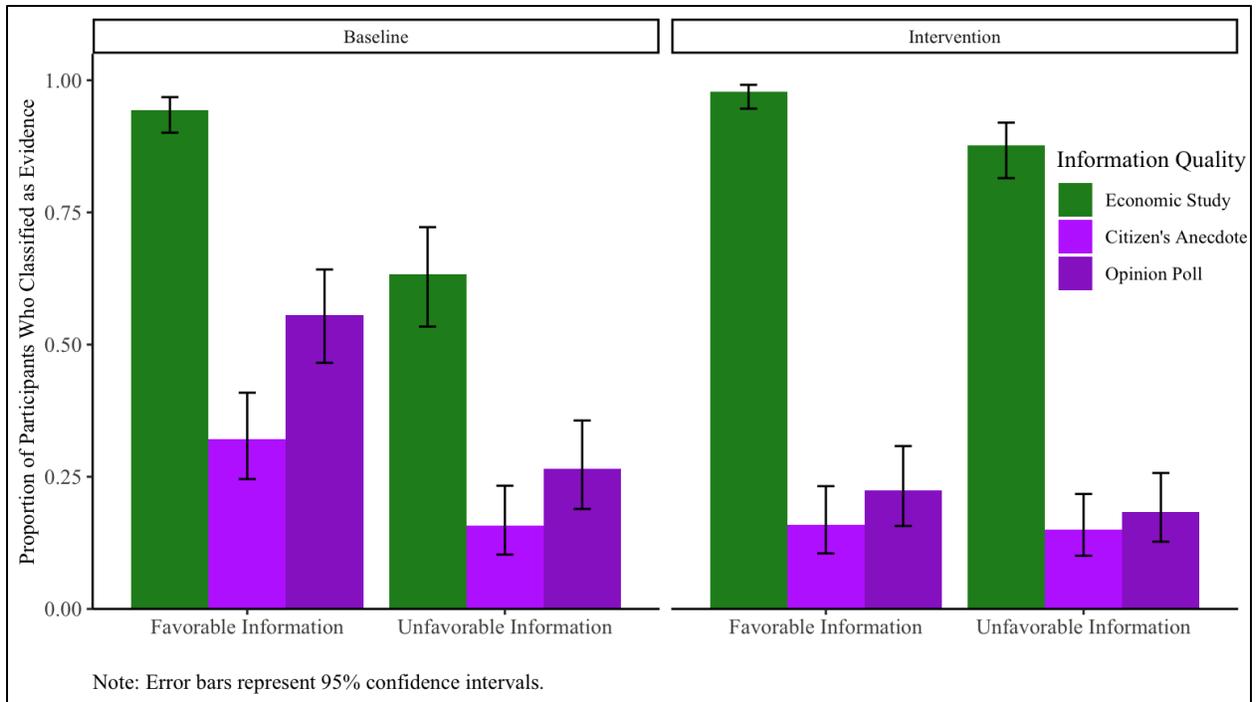
Interactive model

Parameter	<i>Odds</i>	<i>95%</i>	<i>p-value</i>	<i>Odds</i>	<i>95%</i>	<i>p-value</i>
	<i>Ratio</i>	<i>CI</i>		<i>Ratio</i>	<i>CI</i>	
	Main effects model			Interactive model		
Intercept (i.e., Economic Study)	2.45	[1.65, 3.63]	< .001	1.79	[1.16, 2.77]	.009
Favorability	4.43	[2.84, 6.92]	< .001	10.76	[5.02, 23.07]	< .001
Citizen's Anecdote	0.05	[0.03, 0.08]	< .001	0.09	[0.05, 0.18]	< .001
Opinion Poll	0.12	[0.08, 0.20]	< .001	0.19	[0.10, 0.34]	< .001
Favorability × Citizen's Anecdote				0.25	[0.10, 0.61]	.003
Favorability × Opinion Poll				0.35	[0.15, 0.83]	.017

The main effects model revealed an effect of favorability consistent with motivated empiricism: Participants were more likely to categorize information as evidence when it was favorable (33.54%) than when it was unfavorable (16.51%) to their preferred conclusion. In other words, people's motivations again biased their decisions about what new information does and does not count as evidence (Figure 2.3; left-hand panel).

Figure 2.3

Study 3: Motivated Empiricism by Intervention Condition



This was moderated by information quality (see simple slopes in Table 2.4, Baseline columns): Participants discounted the economic study at a higher rate than they elevated the citizen’s anecdote or the opinion poll. This significant effect is in the same direction as the non-significant trends in Studies 1 and 2; Study 4 offers one final opportunity to test whether people are more likely to discount science than they are to elevate anecdotes to the status of evidence.

Table 2.4

Study 3: Simple effects of favorability for each statement, by intervention condition

Statement	Baseline			Intervention		
	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>
Economic Study	3.28	[2.24, 4.80]	< .001	2.51	[1.50, 4.19]	< .001
Citizen's Anecdote	1.63	[1.19, 2.25]	.003	1.03	[0.75, 1.42]	.836
Opinion Poll	1.94	[1.43, 2.63]	< .001	1.13	[0.84, 1.52]	.413

Testing Intervention Effects

First, exploratory analyses checked whether people adhered to the scientific standard during the intervention. Table 2.5 plainly shows that the majority of participants categorized a study and an experts’ documentary as evidence, while only a minority put an anecdote, pastor’s opinion, opinion poll, political leader’s reasoning, and non-expert’s social media post in that category. There were also meaningful differences within these two sets.

Table 2.5

Study 3: Intervention evidence judgements (N = 325)

Statement	% who judged as evidence	95% CI
Non-expert’s persuasive social media post	2.15%	[1.03, 4.44]
Religious leader’s opinion	2.15%	[1.03, 4.44]
Political leader’s opinion	13.47%	[10.16, 17.65]
Public opinion poll	26.70%	[22.10, 31.65]
Individual’s experience finding work post-tax change	38.94%	[33.85, 44.28]
Netflix documentary with expert interviews	56.46%	[51.00, 61.78]
Large economic study	99.70%	[97.85, 99.96]

Next, my pre-registered analysis plan tested whether completing this intervention task moderated the effect of favorability—that is, whether it reduced the degree to which participants were swayed by their motivations. Following this plan, I added the intervention variable (-1 = baseline; 1 = intervention) and all its interaction terms to the interactive model described above; however, I later realized that an additional model that excluded interactions with information type would be required to obtain the overall favorability by intervention interaction, across information types. This model returned a significant interaction ($OR = .49$, 95% CI [0.34, 0.70], $p < .001$) indicating that overall, the intervention did indeed reduce motivated empiricism. The pre-registered fully interactive model more fully unpacked this effect (Table 2.6; Figure 2.3).

Table 2.6

Study 3: Fully Interactive Model

Parameter	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>
Intercept (i.e., Economic Study)	1.73	[1.15, 2.60]	.009
Favorability	9.61	[4.70, 19.66]	< .001
Intervention	4.12	[2.22, 7.64]	< .001
Citizen's Anecdote	0.11	[0.06, 0.20]	< .001
Opinion Poll	0.21	[0.12, 0.36]	< .001
Favorability × Anecdote	0.26	[0.11, 0.64]	.003
Favorability × Poll	0.36	[0.16, 0.84]	.018
Favorability × Intervention	0.66	[0.19, 2.28]	.506
Intervention × Anecdote	0.23	[0.10, 0.53]	< .001
Intervention × Poll	0.15	[0.07, 0.34]	< .001
Favorability × Intervention × Anecdote	0.64	[0.15, 2.76]	.550
Favorability × Intervention × Poll	0.56	[0.14, 2.33]	.427

There were no three-way interactions, suggesting that the intervention decreased motivated empiricism to a similar degree for all three information types. Nonetheless, the same size of decrease can dampen an initially-large effect, but totally eliminate an initially-small one. Indeed, Table 4 above illustrates just this. Both motivated elevation effects, which were smaller at baseline, disappeared after the intervention: Participants who pre-judged that in general low-quality information should not count as evidence were no longer able to elevate specific anecdotes or opinions to the status of evidence when they were favorable. The motivated discounting effect, which was larger at baseline, still persisted in the intervention condition: Participants who pre-judged that high-quality information was evidence still discounted unfavorable scientific studies as non-evidence more often than favorable ones.

Discussion

Study 3 replicated motivated empiricism, this time in a pre-registered design, and found firmer evidence for the trends I noted earlier comparing discounting to elevation: People found it easier to say an unfavorable economic study should not count as evidence than that a favorable anecdote or opinion poll should. Moreover, having participants essentially pre-register which information sources held evidentiary value reduced motivated empiricism, completely

eliminating the smaller motivated elevation effect, while its same-sized impact left the motivated discounting effect still significant, but smaller. Study 4 aimed to replicate Study 3 while correcting the error in the materials for the pastor's opinion.

2.5 Study 4

I predicted in Study 4's pre-registration that both motivated empiricism effects (discounting and elevation), that participants would be more likely to judge the economic study as evidence than the anecdotes or opinions, and that the intervention would reduce motivated empiricism. It also includes analyses, without directional predictions, comparing discounting versus elevation.

Method

Participants

I recruited 690 American Prolific Academic workers. I excluded 81 participants for failing any of several pre-registered attention check questions. This left a sample of 609 (325 women, 278 men, 2 identified as non-binary, 1 as gender fluid, and 3 who preferred not to answer; Mean_{age} = 44.14). As in Study 3, participants judged four different pieces of information, referring to the effects of taxes on the wealthy. Analyses thus used a final sample of 2,436 evidence judgements.

Procedure

The procedure was identical to Study 3's. The only change was that I corrected the question asking participants to judge the pastor's opinion to refer to raising taxes on wealthy citizens, and not the efficacy of gun bans.

Results

Motivated empiricism

As pre-registered, I first analyzed only the judgments (n=1,228) of participants (n=307) in the baseline condition, using the main effects and interactive models described for Study 3 (see Table 2.7).

Table 2.7

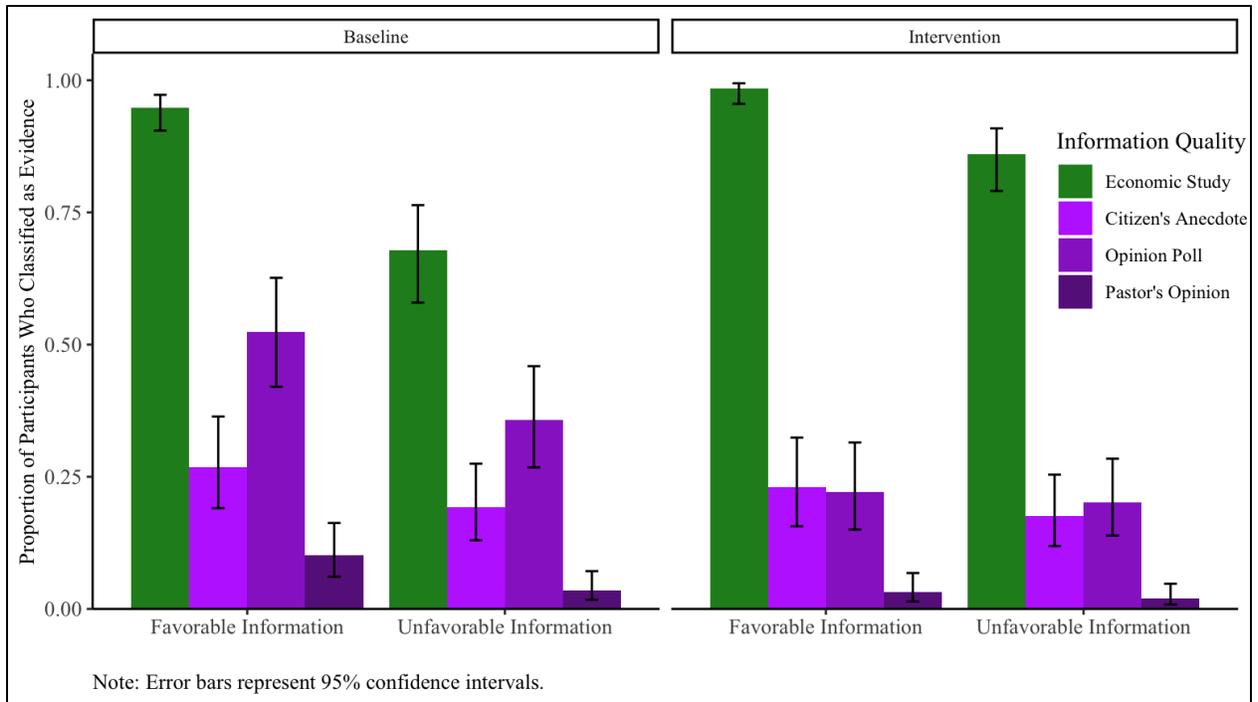
Study 4: Main effects and interactive model results

Parameter	Main effects model			Interactive model		
	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>
Intercept (i.e., Economic Study)	3.14	[2.12, 4.66]	< .001	2.13	[1.38, 3.28]	< .001
Favorability	2.76	[1.81, 4.22]	< .001	8.80	[4.03, 19.21]	< .001
Citizen's Anecdote	0.05	[0.03, 0.09]	< .001	0.11	[0.06, 0.20]	< .001
Opinion Poll	0.15	[0.10, 0.23]	< .001	0.26	[0.15, 0.45]	< .001
Pastor's Opinion	0.01	[0.01, 0.02]	< .001	0.02	[0.01, 0.04]	< .001
Favorability × Anecdote				0.18	[0.07, 0.45]	< .001
Favorability × Poll				0.23	[0.09, 0.55]	.001
Favorability × Pastor				0.35	[0.11, 1.07]	.066

Results replicated my previous findings. The main effects model revealed an effect of favorability consistent with motivated empiricism: Participants were more likely to categorize information as evidence when it was favorable (45.99%) than when it was unfavorable (31.53%) to their preferred conclusion. Once again, people's motivations biased their decisions about what new information does and does not count as evidence (Figure 2.4; left-hand panel).

Figure 2.4

Study 4: Motivated Empiricism by Intervention Condition



As in Study 3, this was qualified by information quality (marginally in the case of the pastor's opinion; see simple slopes in Table 2.8, Baseline columns): Participants discounted the economic study at a higher rate than they elevated low quality information; in fact, in Study 4 the elevation effect for the citizen's anecdote was not significant. Synthesizing this with the trends in Studies 1 and 2 and the significant effects observed in Study 3, the findings suggest that people may be more willing to discount science than they are to elevate anecdotes to the status of evidence.

Table 2.8

Study 4: Simple effects of favorability for each statement, by intervention condition

Statement	Baseline			Intervention		
	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>
Economic Study	2.95	[2.00, 4.33]	< .001	3.15	[1.79, 5.56]	< .001

Citizen's Anecdote	1.24	[0.91, 1.70]	.179	1.18	[0.85, 1.63]	.319
Opinion Poll	1.41	[1.05, 1.90]	.025	1.06	[0.77, 1.47]	.716
Pastor's Opinion	1.75	[1.12, 2.72]	.014	1.26	[0.70, 2.26]	.445

Testing Intervention Effects

Similar to Study 3, exploratory analyses found that during the intervention task, the majority of participants categorized a study and an experts' documentary as evidence whereas a minority applied this label to an anecdote, pastor's opinion, opinion poll, political leader's reasoning, or non-expert's social media post (see Table 2.9).

Table 2.9

Study 4: Intervention evidence judgements (N = 302)

Statement	% who judged as evidence	95% CI
Non-expert's persuasive social media post	3.36%	[1.82, 6.12]
Religious leader's opinion	2.34%	[1.12, 4.83]
Political leader's opinion	16.11%	[12.35, 20.59]
Public opinion poll	28.09%	[23.33, 33.40]
Individual's experience finding work post-tax change	39.41%	[34.07, 45.02]
Netflix documentary with expert interviews	64.79%	[59.39, 70.06]
Large economic study	98.99%	[96.92, 99.68]

I pre-registered and ran the same models described above for Study 3; these largely replicated the findings from that study. The initial model's overall favorability by intervention interaction ($OR = .74$, 95% CI [0.53, 1.02], $p = .068$) provided marginal evidence that the intervention reduced motivated empiricism (Figure 2.4). The full model (Table 2.10), like Study 3's, returned no three-way interactions, suggesting that this reduction was not different across information type. Also as in Study 3, participants in the intervention condition showed no motivated elevation effects (which were smaller at baseline); only the motivated discounting effect remained (see Table 2.8 above).

Table 2.10

Study 4: Fully Interactive Model

Parameter	Odds Ratio	95% CI	p-value
Intercept (Economic Study)	2.11	[1.38, 3.23]	< .001
Favorability	8.67	[4.01, 18.72]	< .001
Intervention	2.91	[1.54, 5.50]	.001
Citizen's Anecdote	0.11	[0.06, 0.20]	< .001
Opinion Poll	0.26	[0.15, 0.45]	< .001
Pastor's Opinion	0.02	[0.01, 0.04]	< .001
Favorability × Citizen's Anecdote	0.18	[0.07, 0.45]	< .001
Favorability × Opinion Poll	0.23	[0.09, 0.55]	.001
Favorability × Pastor's Opinion	0.35	[0.12, 1.07]	.066
Favorability × Intervention	1.15	[0.29, 4.50]	.845
Citizen's Anecdote × Intervention	0.31	[0.14, 0.71]	.005
Opinion Poll × Intervention	0.16	[0.07, 0.35]	< .001
Pastor's Opinion × Intervention	0.19	[0.06, 0.66]	.009
Favorability × Citizen's Anecdote × Intervention	0.79	[0.17, 3.73]	.763
Favorability × Opinion Poll × Intervention	0.50	[0.11, 2.30]	.372
Favorability × Pastor's Opinion × Intervention	0.45	[0.06, 3.17]	.424

Discussion

Study 4 largely replicated the effects of Study 3. I again found evidence for motivated empiricism, and again people discounted unfavorable science more than they elevated favorable anecdotes and opinions. The effect of the intervention, though marginal, was otherwise similar to Study 3's: It reduced motivated empiricism, completely eliminating the (smaller) elevation effect but leaving a robust discounting effect.

Additional Analyses

Participants in Studies 3 and 4 reported their willingness to share the information they judged on social media. If the intervention forced people to acknowledge that low-quality information was not evidence, I wondered if this would further compel them to resist sharing it with others. The intervention did in fact make people less willing to share low-quality (compared

to high-quality) information, however it did not eliminate the effect of favorability (appendix Tables A.25 & A.26). That is, everyone was more likely to share favorable than unfavorable anecdotes and opinions, but participants who completed the intervention shared both valences of information at a lower rate than did baseline participants. This suggests that the intervention did have some effect on people's information-sharing, just not one that eliminated their motivated elevation.

2.6 General Discussion

Although people are motivated reasoners, their beliefs are also constrained by reality: They want their beliefs to align with the evidence. These studies suggest people may get around reality constraints by flexibly determining what counts as evidence. When confronted with an unfavorable scientific study, many people discounted it as not truth-bearing evidence. When asked whether a non-expert's opinion is evidence of a broader empirical reality, or if a group's preference about what they *want* sheds light on what actually *is*, many people said "yes", if those opinions suited their attitudes. This motivated empiricism could skew the realities people feel constrained by: Instead of reluctantly adjusting beliefs to challenging evidence, motivated empiricists could simply dismiss it as irrelevant, and rather than searching for high-quality supportive information (and risking not finding it), motivated empiricists could point to congenial information, however anecdotal, as belief-justifying evidence.

Theoretical Implications

Motivated vs. Bayesian Explanations for Bias

Motivated empiricism speaks to longstanding debates on the rational nature of belief (e.g., Bem, 1967; Pyszczynski & Greenberg, 1987; Stanovich & West, 2000), most recently surrounding Bayesian counter-explanations for seemingly motivated phenomena (Celniker & Ditto, 2024; Tappin & Gadsby, 2019; Tappin et al., 2020). Some (e.g., Tappin et al., 2020) have

argued that the majority of studies claiming to demonstrate motivated reasoning (Ditto et al., 2019 for a meta-analysis) fail to do so convincingly, because skepticism towards high-quality information can be rational, for instance when science purports to prove an exceedingly unlikely claim (e.g., Bem, 2011). This Bayesian perspective could explain the motivated discounting I observed here.

However, the motivated elevation I observed offers clearer evidence for motivated reasoning. Although there are situations where a rational Bayesian might label an anecdote or a non-expert's opinion as evidence, they do not seem to explain my studies. There are cases where it is rational to call an anecdote or non-expert opinion evidence, but additional analyses reported after Study 2 ruled out every such case I could think of. All in all, I find no evidence for any Bayesian rationalization I could think of for the motivated elevation effect.

Of course, this finding by no means refutes that Bayesian explanations could account for some part of what is commonly interpreted as motivated information evaluation. For instance, I consistently found lower rates of motivated elevation than of motivated discounting; this was a trend in Studies 1 and 2, but a significant difference in Studies 3 and 4. Furthermore, a within-chapter meta-analysis (see appendix Table A.27; R script in [OSF repository](#)) using data from the three within-subjects studies (N = 3,547 judgements), found that motivated elevation of each low-quality piece of information was significantly less frequent than motivated discounting. These differing rates could have many interpretations, but one is that discounting is a larger effect because it combines a motivated skepticism (selectively adjusting one's standards for evidence to justify one's preferred belief) alongside a rational Bayesian skepticism (of an apparently outlying datapoint). Moreover, just as the intervention completely eliminated the more clearly *motivated* elevation, it might have also eliminated the motivated component of discounting, leaving the Bayesian component untouched: Pre-judging that science in general is

evidence should not prevent people from rationally concluding that one piece of purported science that contradicts dozens of others must be flawed and should not count as evidence.

Evidentiary standards

These studies also shed light on people's overall standards for what counts as evidence. In all studies, a sizable minority considered low-quality, non-generalizable types of information to be evidence that should inform beliefs about broader empirical claims. Even without the lure of a preferred conclusion, over a third of participants completing the intervention task said a single person's job search following a new tax policy would be evidence of how that policy affected the overall economy. Over a quarter said the same of an opinion poll, and over 10% a politician's personal view. Although these participants may have considered these sources weak evidence, this echoes people's difficulty in distinguishing between news media that are "facts" versus "opinions" (Mitchell, 2018).

But most people in the West spend time in school learning what sources of information count as evidence in a way that more or less aligns with the traditional scientific, empiricist standard (Burbules & Linn, 1991). Would participants who did so more recently align more with science? Or do people actively disagree with what they learn? Do they decide to discard the scientific standard only after some experience applying it and feeling obligated to consider adopting unfavorable beliefs? Future research is warranted on when and why peoples' everyday epistemology deviates from scientific standard.

Practical Implications

Low-quality information is available without limit, particularly in the online ecosystem where bad actors exploit it to spread biased, misleading, and even false narratives (Williams, 2022), using content that plays on moral-emotional (Brady et al., 2017) and group-oriented (Rathje et al., 2021) motives, often at the expense of truth. Although many false beliefs are

psychologically useful (McKay & Dennett, 2009; Taylor & Browne 1988), the behaviors they inspire can be misguided, unhelpful, or even harmful. Believing there is no racial wealth gap, for example, could undermine support for policies meant to combat it. Understanding the motivated underpinnings of false beliefs can inform interventions targeted at the appropriate steps in the process.

For instance, Studies 3 and 4 had people establish evidence judgments free from motivational pressures, and found them less likely to apply biased standards thereafter (see also Wilson & Brekke, 1994; Schultz et al., 1995; Goldin & Rouse, 2000; Lewandowsky & Van Der Linden, 2021) despite minimal instructions, merely asking participants to categorize sources; I did not even provide feedback. My findings suggest people *can* accurately discern evidence from non-evidence, but may need reminders to do it. In turn this principle might improve existing interventions' ability to improve reasoning. For example, accuracy nudges (e.g., prompting users to consider whether information is true, Pennycook et al, 2020) and fact-checking (flagging information as false and linking to evidence of this assessment, Clayton et al., 2020; Koch et al., 2023) both target whether people conclude that the information is true or false. But simply ensuring that people can make this distinction is not sufficient to prevent erroneous reasoning: for example, even true information sometimes should not be used as a basis for (dis)believing a broader empirical claim. A grieving parent may be truthfully sharing that their child died shortly after receiving a vaccine, but this story nonetheless does not constitute reliable and generalizable evidence about vaccine safety. Thus, common interventions for correcting reasoning like accuracy nudges and fact-checks could be extended by attempting to limit the impact of true but epistemically low-quality information on peoples' beliefs. For example, in addition to linking users who view false information to corrective true information as in fact-checking, platforms could also link users who view misleading but true anecdotes to more reliable and generalizable

information (e.g., linking viewers of trending stories to accessible and short summaries of relevant science).

Coda

This chapter demonstrates that people's judgments about what counts as evidence are not epistemically pure but often directed by motives. While people recognize scientific studies as high-quality evidence of broad conclusions, they are willing to selectively elevate low-quality information such as anecdotes and opinions to the status of evidence for these same broad conclusions when they align with their preferred beliefs. This motivated elevation parallels, yet is a distinct epistemic wrongdoing from, the well-documented tendency to discount unfavorable science and high-quality information. These symmetrical effects suggest that motivations powerfully impact our reasoning by biasing which information we count as truth bearing evidence. The flexibility to manipulate evidentiary standards can help people justify their desired beliefs while preserving an illusion of objectivity that their beliefs align with the evidence.

Chapter 3: Who cares about motivated reasoning?

3.1 Introduction

What bases do (some) people think are appropriate for belief?

In Chapter 3 I ask how widespread empiricist commitments are, and to what extent different people endorse various non-accuracy factors as appropriate bases for belief. I expected to conceptually replicate existing findings of individual variation in endorsements of facts and evidence, and to extend such findings by more precisely considering three broad non-empirical goals that commonly bias reasoning: morality, social goals, and emotions.

I did not intend for these three goals to form an exhaustive set of the potential bases for people's personal ethics of belief. Rather, I chose them as three non-empirical goals that are thought to commonly bias beliefs. For example, when people reject the conclusions of a study claiming to demonstrate racial differences in generosity (Cusimano & Lombrozo, 2023), they are letting moral considerations bias their descriptive beliefs. When they hold exaggeratedly positive views of their ingroups (Clark et al., 2019; Greenwald & Pettigrew, 2014; Jost & Hunyaday, 2003; van Bavel & Pereira, 2018), they are letting social factors bias their descriptive beliefs. And when they universally declare themselves above average on athleticism (Dunning et al., 1989; Gilbert et al., 1998), they are letting their desire to experience positive emotions and well-being bias their descriptive beliefs.

I also chose these three non-empirical goals because they were ones I thought at least some people might not only use but approve of as bases for beliefs. Moral values guide people's beliefs and important behaviors in ways that are long-lasting and hard to change (Luttrell, Petty, Briñol, & Wagner 2016; Luttrell & Togans, 2020; Skitka, Bauman, & Sargis, 2005), and in some ways people see moral values as similar to facts (Goodwin & Darley, 2012; Skitka, 2010). Recent evidence even shows that people are willing to explicitly endorse morally motivated

factual reasoning (Cusimano & Lombrozo, 2023). Social affiliations can command loyalty (Cusimano & Lombrozo, 2021), and people might endorse accepting the prevalent views of their social group as a way to achieve the much desired sense of belonging and shared reality (Hardin & Higgins, 1996; Echterhoff et al., 2009; Rossignac-Milon et al., 2020). Likewise, people might endorse choosing beliefs that help them regulate their emotions, as when they use cognitive reappraisal to frame a situation more positively (McRae et al., 2012; Boden et al., 2016).

Do people use motivated cognition only in accordance with their personal ethics of belief?

I also ask whether individual variation in ethics of belief offers an alternative way of reconciling widespread commitments to empiricism with the prevalence of motivated reasoning. That is, do people's professed ethics of belief correspond to their actual reasoning tendencies, such that self-professed empiricists resist the pull of motivated reasoning?

One possibility is that the standard theory is wrong about empiricism being universal, but right that people can endorse an empiricist ethics of belief and still use motivated reasoning. Indeed, some people might express strictly empiricist ethics of belief, and yet still engage in motivated reasoning. Indeed, people do not always act in line with expressed preferences (e.g., Claudy et al., 2013; Kokolakis, 2017). The standard theory could even be correct in positing that empiricists use illusions of objectivity to remain unaware of their biased reasoning. Or, self-proclaimed empiricists may be misreporting an aspirational rather than genuine ethics of belief (Higgins et al., 1987), or even lying about a commitment to reason to signal trustworthiness (Schaffner & Luks, 2018; cf. Berinsky, 2018).

A different possibility is that the standard theory could be wrong both about the universality of empiricist commitments, *and* about it co-occurring with motivated reasoning. That is, perhaps people who endorse a strictly empiricist ethics of belief follow that ethics and do not, in fact, let non-empirical goals bias their reasoning. This would be consistent with work

suggesting that individual differences in goals (Carver & Scheier, 1982; Gollwitzer & Moskowitz, 1996; Oettingen, 2000) and values (Schwartz, 1996; Schwartz & Butenko, 2014; Lee et al., 2022) powerfully explain judgements and behaviors even if people do not always act in line with them. Also, people are able to accurately report the influence of various subjective preferences (e.g., frugality, aesthetic values) on their decision-making (Morris et al., 2023), and might likewise be able to report the influence of subjective goals on reasoning. If empiricists do not engage in motivated reasoning—if people only use motivated reasoning that their ethics of belief allow—then there is no paradoxical co-occurrence to explain. Moreover, this would illuminate an important boundary condition on motivated reasoning.

Overview of Studies

Using a novel measurement approach, Studies 1a & 1b investigated how appropriate people think it is for factual beliefs to be based on the pursuit of accuracy, moral, social, and emotional goals. I included those four goals on the basis of existing theory and findings, but made no assumptions about what particular combinations of them participants would commonly endorse. Instead, I used a bottom-up, person-centered cluster analysis to uncover three naturally occurring ethics of belief. Next, Study 2 placed participants in a motivated reasoning paradigm, and tested whether their self-professed ethics of belief mapped onto their actual reasoning. Study 3 (pre-registered) directly replicated Study 2. Finally, Study 4 (pre-registered) recruited a sample nationally representative in terms of gender, political ideology and education, to identify demographic differences between the profiles.

Readers may access the data, R analysis code, research materials, and any pre-registrations at my [OSF repository](#), which provides a separate component for each study. I include the wording of all primary variables and vignettes in the appendix.

3.2 Studies 1a & 1b

Study 1a developed a measure of people's self-professed ethics of belief, the ethics of belief scale, that asked participants how much factual, descriptive beliefs should be based on the pursuit of accuracy, moral, social, and emotional goals. The measure builds on previous attempts to assess epistemic views (e.g., Pennycook et al., 2020; Ståhl et al., 2016) by ensuring that participants are responding with respect to descriptive beliefs, and by capturing alternative potential goals for choosing beliefs besides accuracy. Based on prior findings, I expected to find variation in the endorsement of accuracy goals (Pennycook et al., 2020; Ståhl et al., 2016), that a substantial number of participants would also value moral goals (Cusimano & Lombrozo, 2023), and that at least some people would value social and emotional goals influencing their reasoning (Metz et al., 2018). Study 1b replicated the findings from Study 1a, while improving and shortening the measure.

Method

Participants

Study 1a. I collected data from 1,004 U.S.-based MTurk workers. Because of issues with low quality MTurk data in my lab around the time of data collection, and because it was critical that participants were attending carefully to my questions about their ethics of belief, I took four steps to ensure data quality. First, to even qualify for the study, participants had to successfully complete three English comprehension check questions; those who failed were redirected. Second, I included two standard attention checks (see Appendix B), which eliminated 146 participants. Third, I included a reading check question for the ethics of belief scale instructions, and excluded 57 participants who answered incorrectly. Fourth, after defining descriptive beliefs, the ethics of belief scale asked participants to provide two examples of them; I excluded 112 who gave low-quality written responses (e.g., nonsense, single-word answers, chunks of text pasted

from a website, copying the example). This left 689 participants who passed all data quality checks.

As noted above, I specifically wanted to elicit participants' ethics of belief for *descriptive* beliefs: Empiricism does not forbid, for example, people's desires to fit in from influencing their beliefs about how they should dress. I therefore coded participants' examples of descriptive beliefs, and eliminated participants ($n = 233$, or 34% of the quality-controlled sample) whose examples included injunctive beliefs (see details below). I was surprised at this high number, and aimed to reduce it in Study 1b by providing participants a clearer definition of descriptive beliefs. In the meantime, for Study 1a this resulted in a final sample of 456 participants (43.42% Male; 54.61% Female; .01% Non-binary; Mean Age = 40.89).

Study 1b. I collected data from 350 U.S.-based MTurk workers. As in Study 1a, these workers all passed three English language comprehension questions, and I included the same two standard attention checks which eliminated 46 participants, as well as a reading check for the ethics of belief scale instructions that excluded a further 56 participants. Also as in Study 1a, I excluded the 18 participants who provided low-quality written responses when asked to list examples of descriptive beliefs). This left 230 participants who passed all quality checks. Also as in Study 1a, I coded these participants' examples and excluded those who listed any that were not clearly descriptive beliefs. Using the same standards as in Study 1a, this final step excluded only 23 (10% of the quality-controlled sample) participants, leaving a final sample of 207 (99 Male, 107 Female, and 1 who chose not to answer; Mean Age = 43.71). I concluded that 1b's definition of descriptive beliefs was clearer and more effective, and retained it for future studies.

Procedure

Study 1a. Participants read the following instructions, advising them to think about descriptive, factual beliefs rather than injunctive, moral beliefs using language based on previous research about people’s lay understanding of this distinction (Heiphetz et al., 2013):

“We are going to ask you some questions about how you decide what to think about various claims and positions you hear. In other words, when you decide what to believe about the many statements, positions, and claims you are confronted with, how do you choose what to believe?”

While you are answering the questions, you should be thinking about your beliefs about statements where only one person can be correct: For example, your belief about whether torture does or does not cause people to give up accurate information, or whether there is or is not a gender pay gap. You should not have in mind beliefs about statements where more than one person can be correct: For example, your belief about whether torture is right or wrong, or whether a gender pay gap is good or bad.”

A reading check question asked participants to indicate whether the scale asked them to think of beliefs that *can* be proven correct or incorrect (correct answer), or beliefs that *cannot* be proven correct or incorrect.

Participants then listed two beliefs that they thought fit the instructions. I coded their responses, identified only by a number, into three categories: descriptive beliefs (e.g., “Abortion is a large public health cost.”), injunctive beliefs (e.g., “Abortion is wrong.”), and low-quality responses (e.g., nonsense, single-word answers, chunks of text pasted from a website). This coding did not account for whether the descriptive beliefs were true or false.

Participants then rated how much beliefs should be influenced by each of four goals—accuracy, moral, social, and emotional goals. They did so using a 5-point scale (0 = Does not describe me; 4 = Describes me extremely well) to rate 32 items (eight per goal, see Table 3.1) presented in random order. Finally, participants responded to demographic questions. The full list of materials, including the ethics of belief scale items and quality check questions, can be found in the supplemental materials.

Table 3.1

Studies 1a & 1b: Ethics of Belief Items and Factor Loadings

	Accuracy		Emotional		Social		Moral	
	Study 1a	1b	1a	1b	1a	1b	1a	1b
*In my opinion, using logic is the primary way people should decide what to believe.	.815	.729						
*I think that beliefs should be based on facts and evidence.	.807	.766						
In my view, peoples' beliefs should come from what they know to be true and logical.	.773	N/A						
*I think that people should remain rational and logical when deciding what to believe.	.769	.710						
In my opinion, you shouldn't believe irrational things.	.668	N/A	-.106		.130			
*I think that beliefs should be revised in the face of new evidence.	.645	.498			-			.107
In my view, people should not continue to have a belief when they learn new evidence against it.	.540	N/A						
I don't like people who can't justify their beliefs with evidence and logical arguments.	.519	N/A	-.137		.232			
*I think it's important for people to believe things that make them feel good.				.889	.878			
*I think there is a lot of value in believing things that make you happy.				.856	.886			
*When deciding which of two opposing positions to believe on an issue, I believe people should go with the one that makes them feel happier.				.794	.650		.192	
*It's my opinion that people should believe things that make them feel secure.				.756	.764	.116	.148	
I think it's pointless to continue believing something if all it does is upset you.				.564	N/A	.158		.104
If believing something just makes you feel bad all the time, I think you should just stop believing it.				.551	N/A	.115		.157
I don't see the point in trying to convince people not to believe things that make them happy.				.544	N/A			- .105
I think beliefs can be useful tools for making people feel a sense of control.				.404	N/A			
*When deciding what to believe, I think people should just stick with the beliefs of the people in their social group.						.834	.753	
*In my view, people should adopt the beliefs of their friends and family when confronted with a new topic.					.137	.814	.694	
*When forming new beliefs, I think it's important that people try to stay loyal to the beliefs of the groups they are a part of.					.287	.768	.538	.108 .147
*In my opinion, when people realize that they disagree with the people they are close to, they should change their mind to align themselves with those people.					-.109	.700	.768	
I believe that group members should uphold what the others in the group believe.					.127	.616	N/A	
I believe there is value in simply agreeing with people like you.					.163	.616	N/A	
I like people who don't "rock the boat" when it comes to what a team believes.					.159	.527	N/A	

I think it's annoying when someone disagrees with the others in a team.					.520	N/A
*I don't understand why you would believe something if it supports an immoral point of view.						.832 .784
*It's my opinion that people should avoid believing things that are morally corrupt.						.819 .855
*When trying to decide whether or not to believe something, I think people should ask themselves if it is morally right or wrong to believe it.				.116		.816 .795
I think that whether or not you should believe something is largely determined by how morally good that belief is.				.138		.757 N/A
*When people realize that one of their beliefs is morally wrong, I think they should try to stop believing it.	.106	.111		-.106		.737 .795
I believe that whether or not a position is immoral should determine if people will believe in it.						.705 N/A
I think that peoples' beliefs about the world should conform to their moral values.				.170		.634 N/A
I think people should try to believe things that support their moral convictions.				.324		.610 N/A

Note: Bolded items with a * were selected for the shortened, 16-item version of the scale.

Study 1b. Due to the high rate of incorrect beliefs participants reported in Study 1a, the purpose of Study 1b was to directly replicate the findings in Study 1a using a simplified version of the measure with updated the scale instructions that more clearly conveyed the distinction between descriptive and injunctive beliefs. Whereas the instructions in Study 1a characterized this distinction by the number of people who could be correct about the belief based on prior research (Heiphetz et al., 2013, 2014, 2017), which to moralists might include moral beliefs, updated instructions instead characterized it by whether or not the belief could be proven correct or incorrect, and used colored, bolded, and underlined text to highlight key points:

While you are answering the questions, you should be thinking about your **beliefs about statements that can be proven correct or incorrect**: For example, your belief about whether torture does or does not cause people to give up accurate information, or whether there is or is not a gender pay gap. You should not have in mind beliefs about statements **that cannot be proven correct or incorrect**: For example, your belief about whether torture is right or wrong, or whether a gender pay gap is good or bad.”

The reading check question asked participants to indicate whether the scale asked them to think of beliefs that *can* or *cannot* be proven incorrect again. As well, rather than rating 32 items

as in Study 1a, participants rated a subset of 16 items (see starred items in Table 1), selected on the basis of Study 1a’s factor loadings.

Results

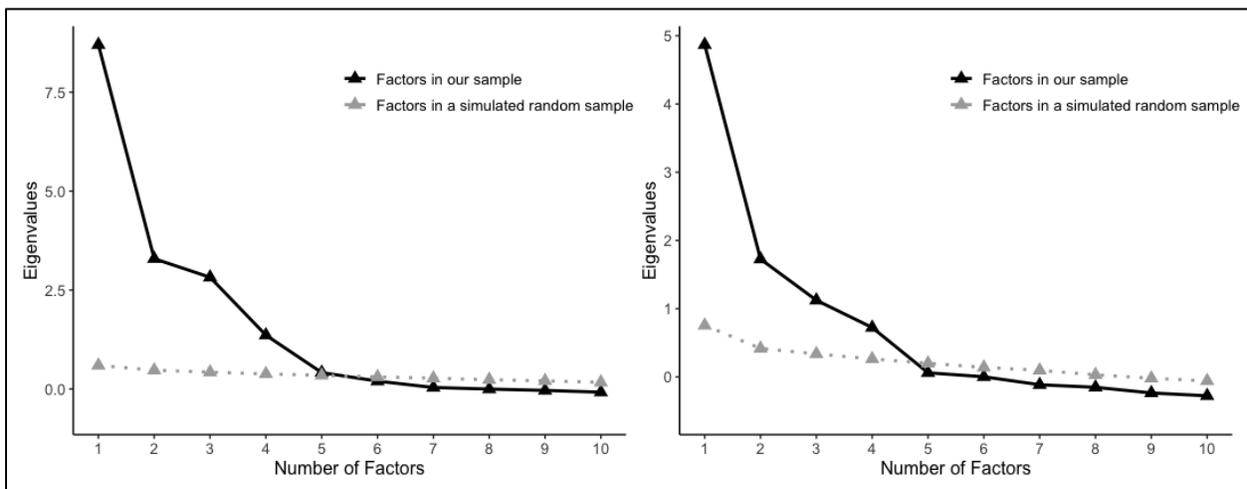
A first set of analyses asked how well I captured the four bases for belief individually, and how much participants on the whole approved of each of them. A second set considered how many distinct ethics of belief emerged in the sample using a person-centered cluster analysis. I analyzed the Study 1a and 1b datasets separately and report their results using separate figures, but within a single section for each analysis.

Analyses of individual reasoning goals

Factor structure and item reduction. I assessed the extent to which Study 1a’s 32 items and Study 1b’s 16 items reflected the four distinct bases for belief that I intended them to: accuracy, moral, social, and emotional goals. The scree plots from Exploratory Factor Analyses (EFA) using the psych package in R (Revelle, 2017) suggested a four-factor solution (Figure 3.1) that explained 52% (1a) / 58% (1b) of the variance in participants’ responses.

Figure 3.1

Studies 1a & 1b: Scree Plots of Eigenvalues



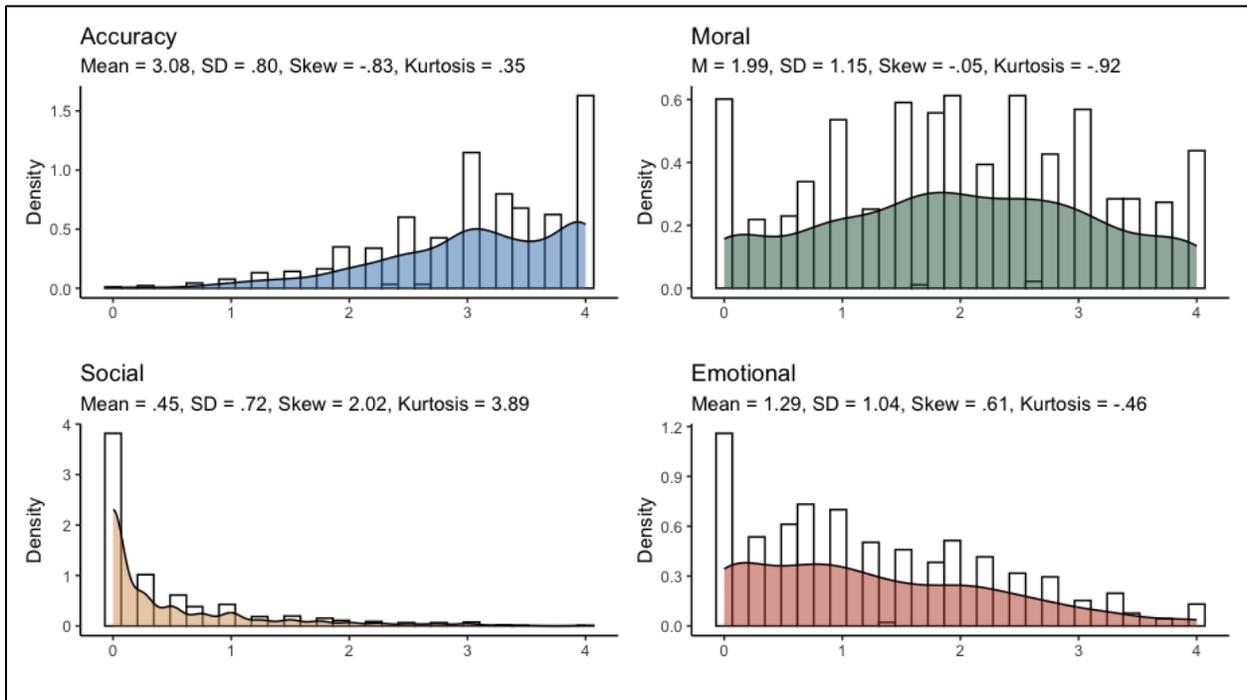
Note: I use a parallel analysis to determine the appropriate number of factors, which compares the eigenvalues in the data (solid black) to a sample of randomly simulated data (dotted gray) to determine which factors are non-random.

I extracted the four factors using maximum likelihood estimation and oblimin rotation; factor loadings clearly mapped onto the four goals I intended to capture for both Study 1a and 1b (see Table 3.1). I used Study 1a's factor loadings to reduce the number of items for Study 1b: I began by identifying the four highest-loading items for each of the four goals, then in two cases I replaced the fourth-highest loading item with the more simply worded fifth-highest loading item.

Distributions, means, and variabilities in bases for belief. I then averaged the items per basis for belief to create composite scores. This allowed me to examine their distribution (see Figure 3.2).

Figure 3.2

Studies 1a & 1b: Distributions of Bases for Belief



Note: I use data from the 16-item version of the measure from both Studies 1a and 1b combined (n = 663).

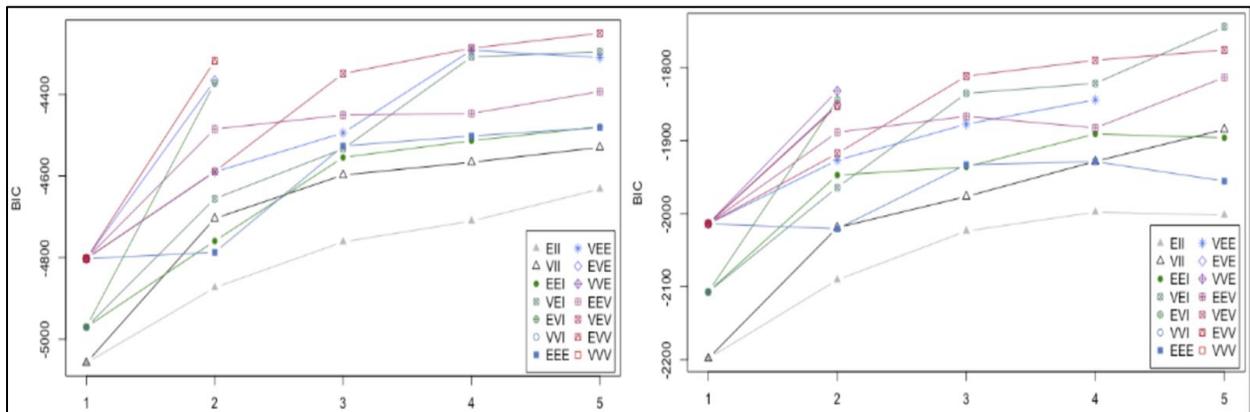
Common Ethics of Belief

To identify the distinct ethics of belief that emerged from the data, I clustered participants with their bases for belief, using Latent Profile Analysis (LPA; Oberski, 2016) with the mclust package in R (Scrucca et al., 2016). Similar to how EFA identifies factors bringing together scale items that covary across participants, LPA is a person-centered clustering analysis that identifies profiles bringing together participants whose responses covary across factors. This allowed us to identify common ethics of belief; that is, commonly occurring patterns—or profiles—of endorsements of different goals influencing reasoning.

I compared models that had anywhere between one profile (i.e., no subgroups; a monoprofile) and maximum five profiles. I set that maximum for three reasons: (i) to avoid overfitting, (ii) because I saw value in a parsimonious rather than overly complicated model, and (iii) because I wanted to identify clusters that were large enough for well-powered comparisons. I compared these models' Bayesian Information Criteria (BIC; which accounts for model complexity), and noted that profiles beyond the third provided limited improvements (see Figure 3.3) in both the Study 1a (top) and 1b (bottom) datasets.

Figure 3.3

Studies 1a & 1b: Scree Plot of BIC Values



I followed up on this visual observation with bootstrapped Likelihood Ratio Tests

(bLRTs; Nylund et al., 2007) to ensure that adding a third profile significantly improved the model. Table 3.2 demonstrates how adding the second and third profiles improves fit far more than adding the fourth and fifth profiles. I therefore concluded that the three-profile model best balanced explanatory power and parsimony.

Table 3.2

Studies 1a & 1b: Bayesian Likelihood Ratio Tests

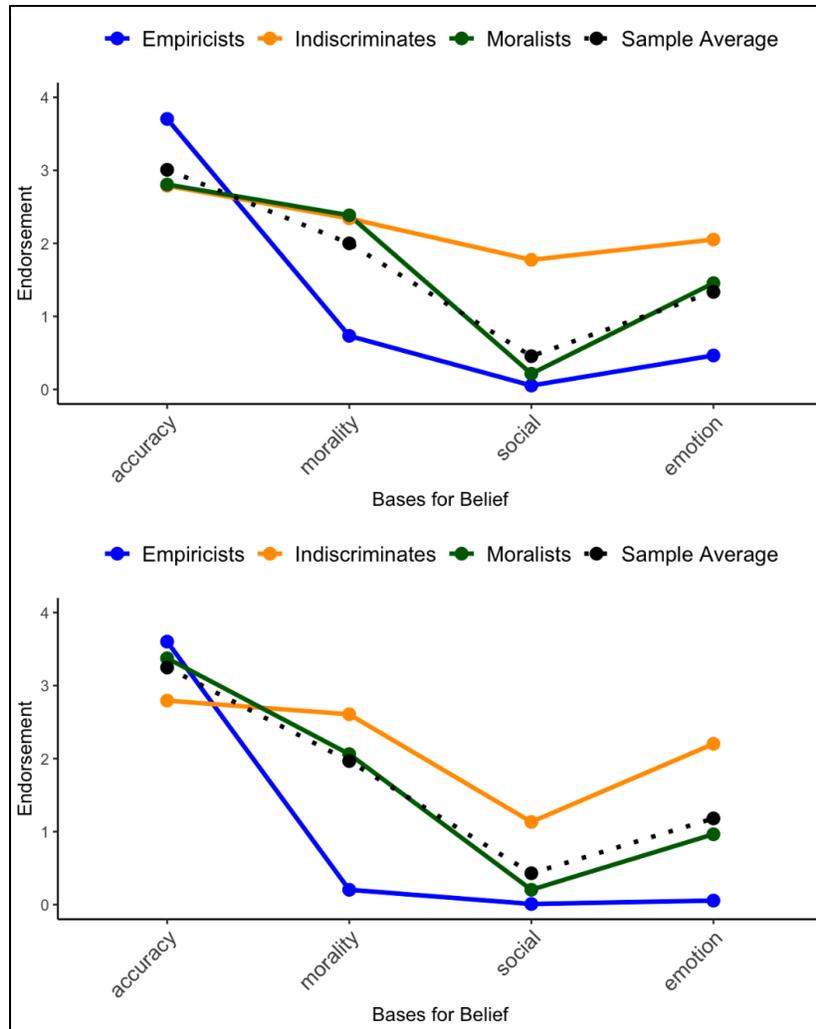
<i>Model Comparison</i>	<i>Study 1a</i>		<i>Study 1b</i>	
	<i>Likelihood</i>		<i>Likelihood</i>	
	<i>Ratio</i>	<i>p-value</i>	<i>Ratio</i>	<i>p-value</i>
1 vs 2-profiles	287.05	< .001	160.35	< .001
2 vs 3-profiles	313.54	< .001	169.93	< .001
3 vs 4-profiles	135.65	< .001	85.82	< .001
4 vs 5-profiles	110.24	< .001	92.90	< .001

Note: I conducted the bLRTs using the VEV set of model parameters in mclust.

Next I explored the contents of these three profiles. Figure 3.4 (Study 1a top; Study 1b bottom) presents the three profiles alongside the overall sample mean in terms of their endorsement of each goal as a basis for belief. One of the three profiles (blue line) corresponded to an empiricist ethics of belief: Participants who fit this profile rated accuracy as a strongly valid goal for belief, and (mostly³) rejected moral, social, and emotional goals. This *empiricist* profile was the least common (roughly 22% of participants in Study 1a and in 13% Study 1b).

Figure 3.4

Studies 1a & 1b: Three-Profile Plot



A second profile evoked morally motivated reasoners. Like empiricists but to a somewhat lesser extreme, participants who fit this profile rejected social and emotional goals, and rated accuracy as a strongly appropriate goal for belief. Unlike empiricists, they also endorsed morality as an appropriate goal. This *moralist* profile was the most common of the three, comprising (just) over half of the sample in both studies (59% in Study 1a and 60% in Study 1b).

A final profile evoked indiscriminate motivated reasoning. Participants who fit this profile rated moral and emotional goals as similarly valid to accuracy goals. They rated social goals as comparatively less valid, but they did not reject them to the same degree as empiricists and moralists did. This *indiscriminates* profile was less common than the moralist one, but nearly

as common as the empiricist one in Study 1A, comprising 18% of the sample (vs. 22% Empiricists), and more than twice as common in Study 1b, comprising 27% of the sample (vs. 13% Empiricists).

Discussion

Contradicting the standard theory of motivated reasoning, Studies 1a and 1b found that an empiricist ethics of belief was far from the universal norm, but was in fact relatively rare within my samples. Instead, two other ethics of belief were more common: Most people were moralists, endorsing both accuracy and morality as appropriate bases for empirical belief; and a large minority of people seemed indiscriminate in the bases for belief they endorsed, which included morality, social goals, and emotional goals. Moreover, I replicate all these findings despite the improvements I made to the ethics of belief scale between studies for brevity and clarity, which I use for the remaining studies.

3.3 Study 2

Study 2 again measured ethics of belief, allowing me to replicate the profile structure from Studies 1a & 1b for a third time. More centrally, Study 2 compared how ethics of belief line up with actual motivated reasoning. I used a standard paradigm assessing a canonical example of motivated reasoning, the self-serving bias: reasoning that helps defend a positive self-image (Shepperd et al., 2008). Participants took an ostensibly valid psychological assessment of a cognitive skill (analytic or emotional intelligence), and received false feedback that they had performed poorly or well. They then reported how useful the skill in question was using a number of attributes. Motivated reasoning could prompt people who had performed unexpectedly poorly (versus well) to derogate the usefulness of the skill they apparently lacked, in order to maintain self-esteem. I interpret this pattern as self-defensive cognition acting on a mixture of an emotional goal to manage the affective implications of receiving the feedback, and

a social goal to regulate one's reputation and self-perceived social value. Put differently, I expect that participants will engage in the self-serving bias in my paradigm because receiving negative (positive) feedback feels bad (good), and this feeling is itself largely based on the social implications of the feedback (i.e., being worse or better than others; Festinger, 1954; Leary et al., 1995).

The study allowed us to test two competing possibilities: On the one hand, all participants might engage in motivated reasoning, meaning that those doing so in violation of their personal ethics of belief might require an illusion of objectivity. On the other hand, people act in line with their personal ethics of belief, such that empiricists and moralists would show no self-serving bias. This study was not pre-registered, but its method (with one minor exception) and analysis plan are identical to those in the pre-registered Study 3.

Method

Participants

I collected data from 1,407 U.S.-based crowdsource workers, excluded 49 participants for failing more than one of four attention check questions embedded in the study (two traditional attention checks, and two simple English language comprehension questions), and then another 96 participants for incorrectly answering the reading check question for the ethics of belief scale instructions, which asked participants to answer with respect to their descriptive, but not injunctive, beliefs. This resulted in a final analysis sample of 1,262 (50% Male; 46.59% Female; 2.80% Non-binary; Mean Age = 36.12). Due to a high rate of exclusions in Studies 1a and 1b, I switched from collecting data directly through Amazon Mechanical Turk to collecting data through CloudResearch and Prolific Academic. Specifically, I collected data from 352 MTurkers, and excluded 11.36% (40) for failing either (i) more than one of the attention checks (12 participants) or (ii) the reading check question for the ethics of belief scale (a further 28

participants). I then collected data from another 1,055 Prolific Academic workers, and excluded 9.95% (105) for failing either (i) more than one of the attention checks (37 participants) or the reading check question for the ethics of belief scale (a further 68 participants). Thus, participants in the final sample contain a mixture of MTurkers collected through CloudResearch ($n = 312$) and Prolific academic ($n = 950$).

Procedure

Participants enrolled in a study about “understanding how people use information from psychological skill assessments” that “are often used in clinical settings.” This established a cover story for the study and presented the tests as scientifically valid. Participants read about the skill they would be tested on, and about research documenting its utility and value. I varied the skill in question (emotional or analytic intelligence) between participants for generalizability. Participants then rated how useful, socially valued, convenient, bothersome (reverse-scored), and annoying (reverse-scored) it would be to possess the skill they had read about on 5-point scales (0 = Not at all; 4 = Extremely). Average ratings on these items ($\alpha_{IQ} = .69$; $\alpha_{EQ} = .76$) formed a pre-manipulation usefulness score. Having this pre-measure allowed us to sensitively test how each participant changed their report of the skill’s usefulness after they discovered they either had it or lacked it.

Participants then completed the ostensible assessment of emotional intelligence (the Reading the Mind in the Eyes task; Baron-Cohen et al., 2001); or analytic intelligence (a set of visuospatial puzzles). So that I could credibly manipulate their perceived performance, participants indicated what percentile they expected to score in. I normalized the false feedback to this expectation: Participants saw their actual score which was always 20 percentiles either higher (positive feedback) or lower (negative feedback) than their expectation.⁴

Participants then reported their view of the skill's usefulness a second time, which I explained by saying I wanted to understand their views now that they had experience with the test. They rated the same two questions again ($\alpha_{IQ} = .78$; $\alpha_{EQ} = .79$), providing a post-manipulation usefulness score. My key DV was the change in perceived usefulness (post- minus pre-manipulation): Positive change scores meant that participants came to believe the skill was more useful after receiving feedback. Self-serving bias would result in negative change scores in the negative feedback condition, and positive change scores in the positive feedback condition.

At the end of the study, participants then completed the updated ethics of belief scale, with two minor changes: I kept the key instructions to focus on descriptive beliefs identical, but condensed the prior introductory paragraph, to read simply:

We are going to ask you some questions about how you decide what to think about the way the world is and how it works. In other words, how do you choose what to believe?

Second, I did not ask participants to list example beliefs, because Study 1b had found that the revamped instructions resulted in the vast majority of participants correctly understanding the request to think of descriptive rather than injunctive beliefs. Finally, participants reported their demographics.

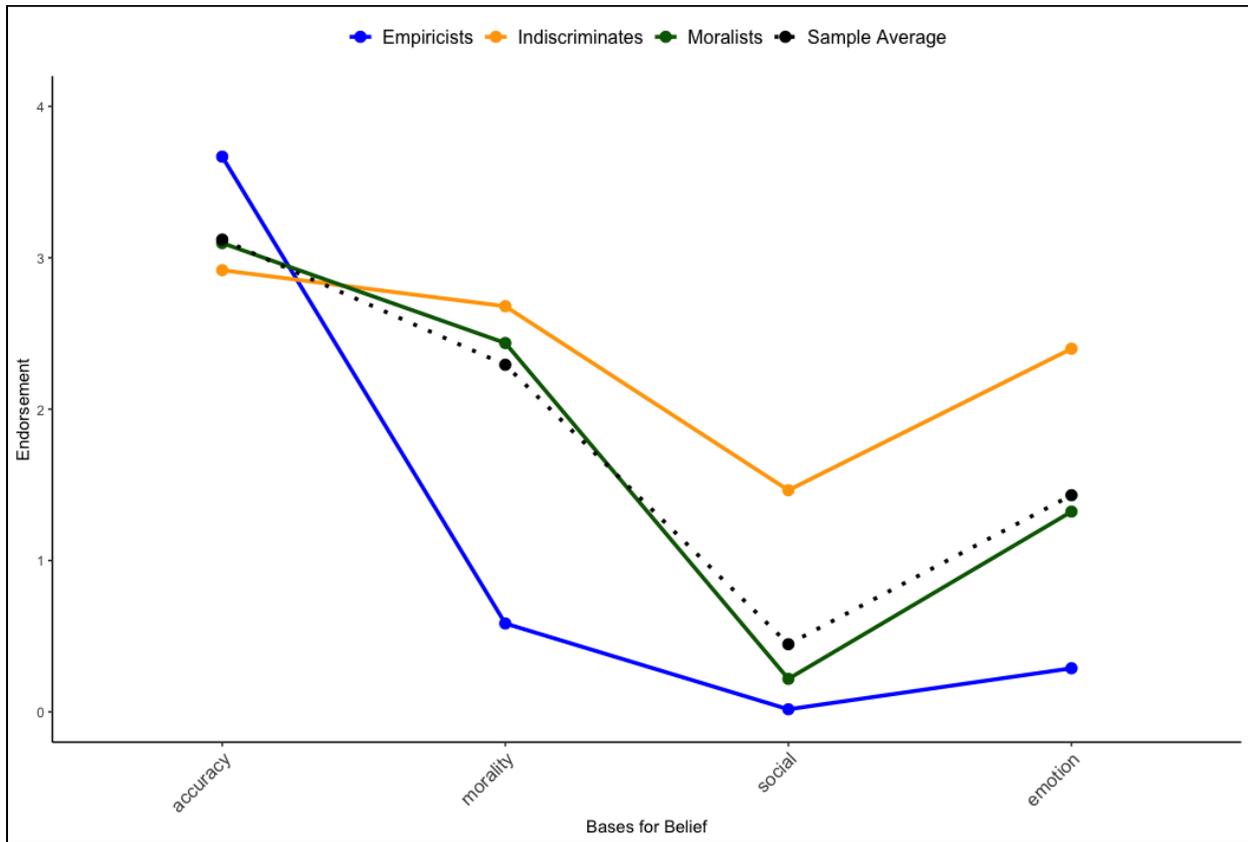
Results

Common Ethics of Belief

I used the same LPA approach to confirm the three profiles from Studies 1a-1b and to assign participants to profiles for analyses. This model (see Figure 3.5) identified the same three profiles, with comparable frequencies⁵—Empiricists were 10% of the sample, Moralists 70%, and Indiscriminates 20%—and similar shapes with some minor differences. For example, although Empiricists in Study 2 again showed a clear preference for accuracy over any other goals, they were higher off the floor for moral goals, compared to Studies 1a-1b).

Figure 3.5

Study 2: Three-Profile Plot



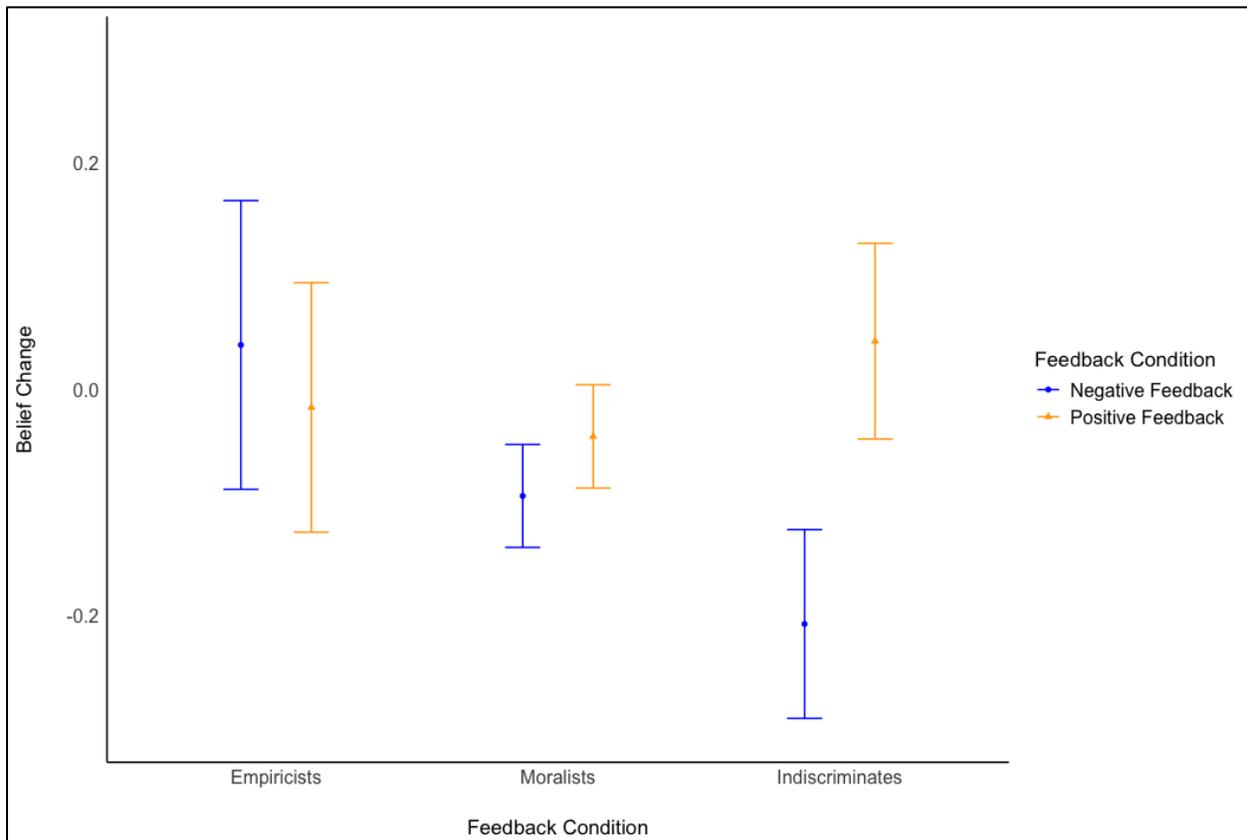
Self-Serving Bias

A linear regression predicted change in usefulness from feedback condition (Negative Feedback = -1, Positive Feedback = 1), with test type (Emotional intelligence = -1, Analytic intelligence = 1) as a covariate. This revealed an overall self-serving bias effect ($b = .08$, 95% CI = [.03, .14], $p = .002$): On average, participants declared the skill less useful than they had previously thought after receiving negative feedback (predicted change score: -.11, 95% CI [-.14, -.07], significantly below 0, $p < .001$), but not after receiving positive feedback (predicted change score: -.02, 95% CI [-.06, .02], $p = .880$).

To test whether participants' degree of motivated reasoning was linked to their ethics of belief, I ran the same model including profile (dummy coded with Empiricists as reference) and the profile \times feedback interaction terms (Figure 3.6).

Figure 3.6

Study 2: Effect of Feedback by Profile



The interaction term comparing Moralists to Empiricists was not significant ($b = .09$, 95% CI $[-.09, .27]$, $p = .314$), but the one comparing Indiscriminates to Empiricists was ($b = .30$, 95% CI $[.09, .50]$, $p = .005$). A follow-up model using Moralists as the reference group also revealed a significant interaction comparing them to the Indiscriminates as well, $b = .21$, 95% CI $[.07, .34]$, $p = .003$).

I decomposed these interactions by testing the simple slopes: Only Indiscriminate participants ($b = .13$, 95% CI [.07, .19], $p = .001$) showed significant evidence of motivated reasoning. Empiricists ($b = -.02$, 95% CI [-.10, .06], $p = .620$) and Moralists ($b = .02$, 95% CI [-.01, .06], $p = .130$) participants reported that the skill was similarly useful before and after they received feedback, regardless of whether that feedback was positive or negative.

In Appendix B I report additional analyses (Analysis 2) replacing participants' profiles as predictors with the four bases for belief from the ethics of belief scale. Results differed slightly between this study and the replication Study 3, suggesting participants' profile membership may be a more stable way of predicting whether they will show a self-serving bias.

Discussion

For a third time I identified the same three common personal ethics of belief, providing growing evidence of the meaningful heterogeneity in what people think beliefs should be based on. Some people disapprove of all forms of motivated reasoning, most approve of morally motivated reasoning, and a large minority approve of all measured forms of motivated reasoning.

I also found that what appeared to be an overall motivated reasoning effect was in fact driven by a (sizeable) minority group of participants: only Indiscriminates, who endorsed emotional and social goals for belief, displayed a self-serving bias. Empiricists, who endorsed only accuracy as an appropriate basis for belief, did not, nor did moralists, who endorsed moral goals but not emotional or social ones. Notably this means that, on the whole, no group did anything that would require an illusion of objectivity: Those who explicitly rejected emotional and social bases for belief (i.e., empiricists and moralists) showed no evidence of motivated reasoning; and while indiscriminates did show motivated reasoning, they also approved their emotions and social goals as bases for belief.

3.4 Study 3

Study 3 was a pre-registered replication of Study 2. I anticipated that I would again identify three common profiles (empiricists, indiscriminates, and moralists), that I would again observe an overall self-serving effect, and that this effect would be moderated by participants' ethics of belief.

Method

Participants

I collected data from 1,402 U.S.-based Prolific Academic workers, excluded 24 participants for failing more than one of four attention check questions embedded in the study (two traditional attention checks, and two simple English language comprehension questions), and then another 114 participants for incorrectly answering the reading check question for the ethics of belief scale instructions, which asked participants to answer with respect to their descriptive, but not injunctive, beliefs. This resulted in a final analysis sample of 1,264 (624 Male; 603 Female; 23 Non-binary; 11 who preferred not to answer; and 3 who wrote a different answer; Mean Age = 38.92).

Procedure

I followed the same procedure as in Study 2 with one exception. In Study 2, participants reported their pre-manipulation usefulness ratings prior to seeing any actual test items. This meant that changes in perceived usefulness would also reflect how seeing these items changed participants' interpretation, in addition to how the feedback they received might have biased them. In Study 3, I therefore added a practice test item that participants completed before providing their pre-manipulation ratings.

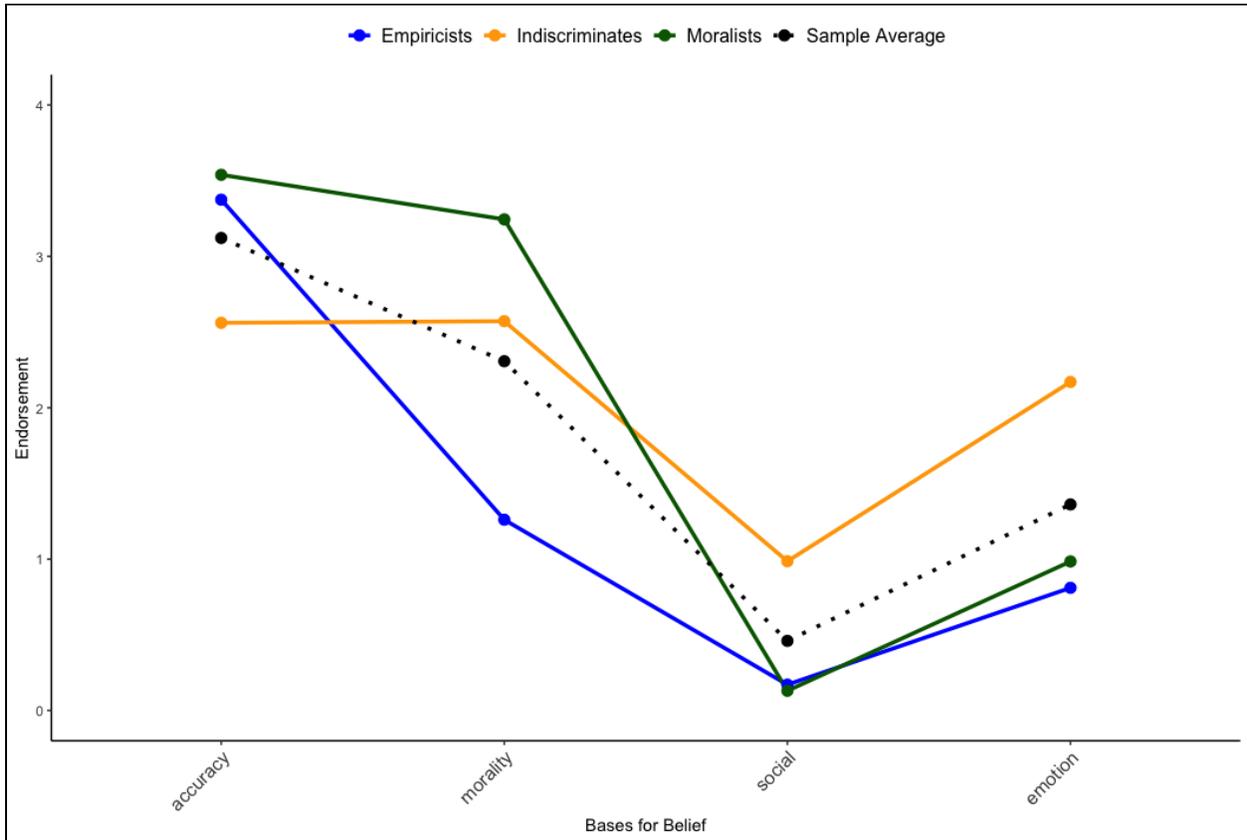
Results

Common Ethics of Belief

The three-profile model (see Figure 3.7) identified the familiar trio of profiles.

Figure 3.7

Study 3: Three-Profile Plot



These profiles had the same shape as in Study 2, including that Empiricists reported some approval of moral and emotional goals motivating reasoning, but with somewhat different frequencies: Empiricists were 35% of the sample, Moralists 28%, and Indiscriminates 37%. This variation across studies suggests we should not overinterpret the specific frequencies I report here: In this sample Empiricists and Indiscriminates were both notably more prevalent than in my previous samples. Nevertheless, the stability across studies and populations in the rough shape of the three profiles provides some evidence of their robustness. Moreover, across studies at most a third of participants expressed the ethics of belief consistent with empiricism, further

undermining the assumption of standard theories of motivated reasoning that the average person is an empiricist.

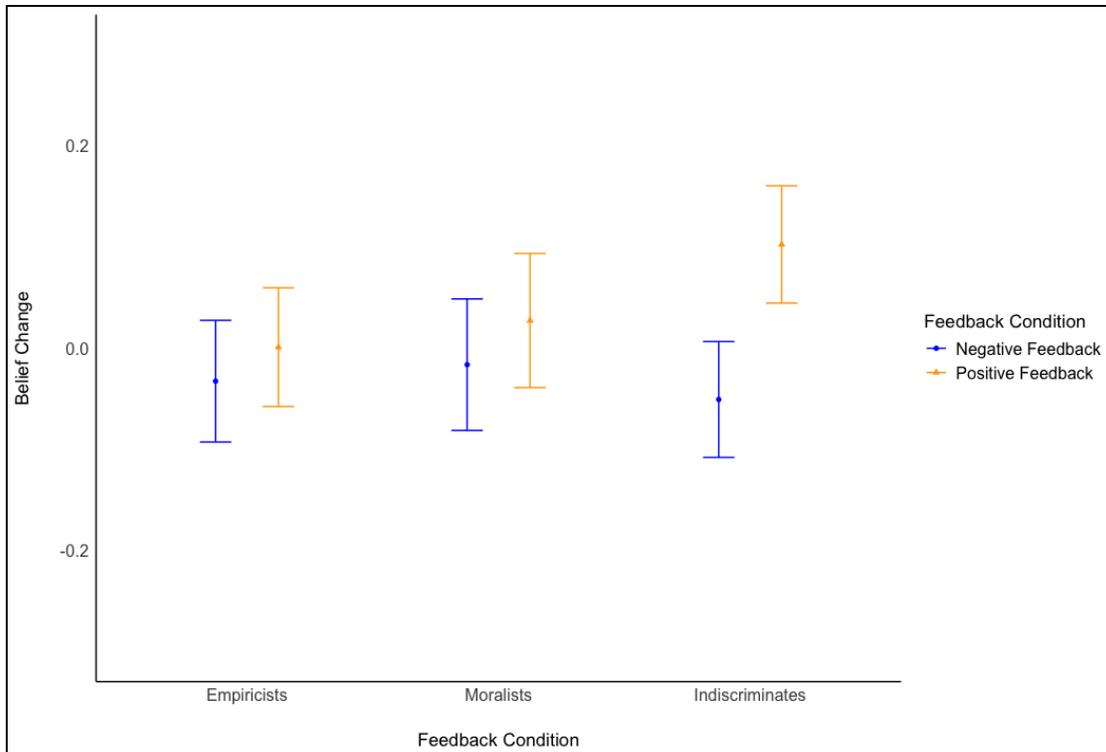
Self-Serving Bias

The same model described for Study 2 revealed an overall self-serving bias effect of a remarkably similar size ($b = .08$, 95% CI = [.03, .13], $p = .002$): On average, participants declared the skill less useful than they had previously thought after receiving negative feedback (predicted change score: $-.04$, 95% CI [-.07, .00], significantly below 0, $p = .026$), and this time as more useful after receiving positive feedback (predicted change score: $.05$, 95% CI [.01, .08], $p = .008$).

Adding profile to the model (Figure 3.8) again revealed that the effect of the feedback manipulation differed for Indiscriminates compared to Empiricists ($b = .12$, 95% CI [.003, .24], $p = .045$), and (marginally) compared to Moralists ($b = .11$, 95% CI [-0.01, 0.23], $p = .083$), but not for Empiricists compared to Moralists ($b = .01$, 95% CI [-0.12, 0.14], $p = .869$).

Figure 3.8

Study 3: Effect of Feedback by Profile



As in Study 2, only Indiscriminate participants ($b = .08$, 95% CI [.04, .12], $p < .001$), showed evidence of the self-serving bias, not Empiricist ($b = .02$, 95% CI [-.03, .06], $p = .44$) or Moralist ($b = .02$, 95% CI [-.02, .07], $p = .36$) participants.

Discussion

I identified the same three common personal ethics of belief for a fourth time, and replicated Study 2's experimental results as well.

3.5 Study 4

The purpose of Study 4 was to replicate the three profiles in a more nationally representative sample, and to uncover the demographic correlates of participants' ethics of belief. In Appendix B (Analysis 3), I also report analyses relating the profiles and four bases for belief in the ethics of belief scale with other thinking style measures.

Method

Participants

I collected data from 1,675 U.S.-based workers from Prime Panels, recruiting a sample quota matched to the population distribution in terms of sex (male, female), party identification (Republican, Democrat, Independent), and Education (9 response options, see Figure 11). As in previous studies, I excluded participants ($n = 426$) for failing a standard attention check question embedded in the ethics of belief scale. I did not, however, exclude them for incorrectly answering the ethics of belief scale instructions reading check question. Instead, those who answered incorrectly saw an error message and could not progress through the survey until they provided the correct answer. This resulted in a final analysis sample of 1,249 participants (596 Male; 647 Female; 3 Non-binary; 2 who preferred not to answer; and 1 who wrote a different answer; Mean Age = 41.19).

Procedure

Participants completed my ethics of belief scale and two other thinking style measures: the Importance (e.g., *It is important to me personally to be a rational person.*) and Moralization (e.g., *It is morally wrong to trust your intuitions without rationally examining them.*) of Rationality Scale (Ståhl et al., 2016), and the Comprehensive Thinking Styles Questionnaire (CTSQ; Newton et al., 2024) which measures four constructs distilled through factor analyses from many measures of thinking styles. Specifically, the CTSQ includes questions measuring individual differences in the degree to which people are willing to believe in spite of evidence (all measured with reverse coded items such as *Whether something feels true is more important than evidence*; “Open-Mindedness”), hold a black-and-white view of truth (e.g., *Either something is true or it is false; there is nothing in-between*; “Closed-Minded Thinking”), Preference for Intuitive Thinking (e.g., *I like to rely on my intuitive impressions*), and Preference for Effortful Thinking (e.g., all measured with reverse coded items such as *Thinking is not my idea of an enjoyable activity*).

I counterbalanced whether the ethics of belief scale, including its instructions which requested participants answer with their empirical and not moral beliefs in mind, came before or after the other two thinking style scales⁶. I also randomized the order of the other two thinking style scales, and the order of all questions within all scales.

For all participants, the study concluded with a series of demographic questions and an opportunity to provide open-ended feedback about the study. Specifically, I asked participants to report their gender (*male, female, non-binary, other, prefer not to say*), age (free response), education level (9 ordered levels from *Some high school* to *Doctoral degree*), college major (if relevant; 13 options), subjective SES ladder (10-point scale), racial identity (9 options), vocation (11 options), left-right political ideology (7-point scale; *1 = Very liberal; 7 = Very conservative*), religious identity (*Religious, Spiritual but not religious, Neither spiritual nor religious*), and three items measuring orientation towards religion, spirituality, and science, respectively (6-point scale; *0 - Does not describe me; 5 - Describe me extremely well*). The full wording of each demographic question and all response options are available in Appendix B.

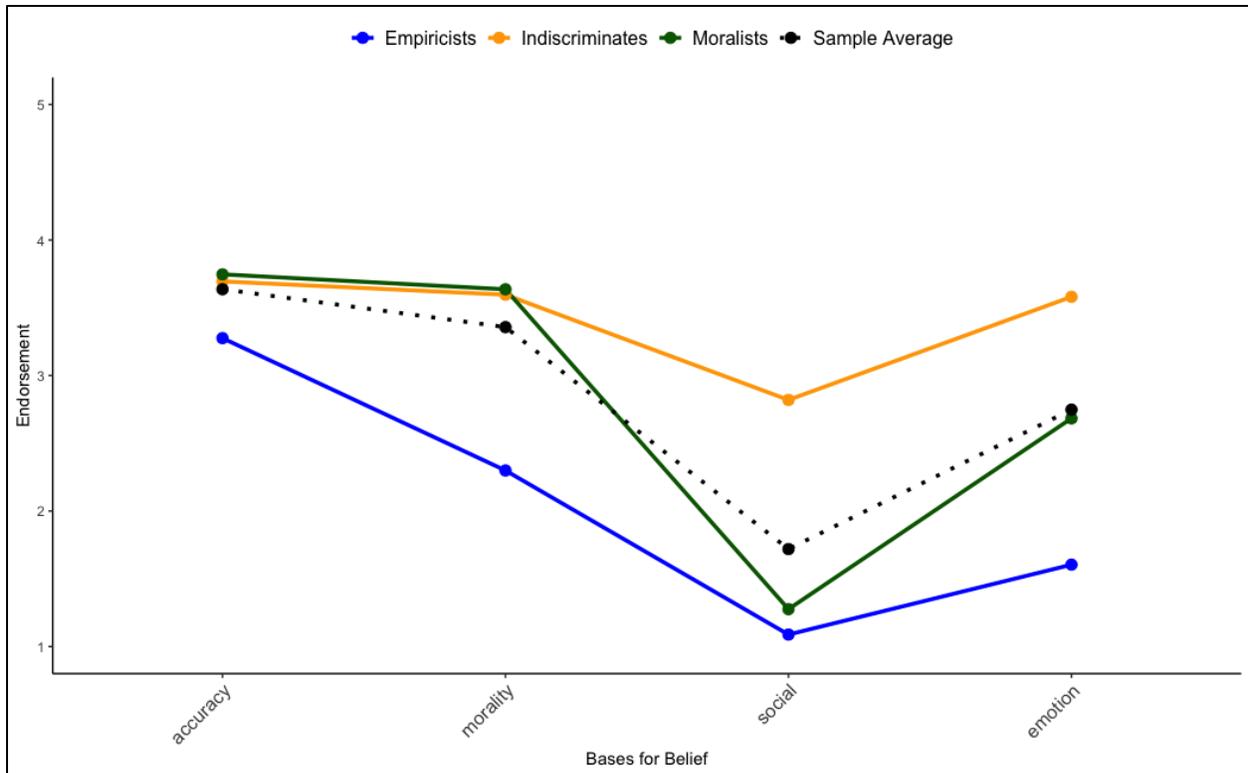
Results

Replicating the Profiles

The three-profile model (see Figure 3.9) identified the familiar trio of profiles: Empiricists (20% of the sample), Moralists (49%), and Indiscriminates (31%).

Figure 3.9

Study 4: Three-Profile Plot



The shapes of these profiles was similar to previous studies, though I was surprised to note that, although Empiricists endorsed accuracy more than they endorsed any other motive, they endorsed it *less* in absolute terms than Moralists ($\beta = .531$, 95% CI [.387, .676], $p < .001$) and Indiscriminates ($\beta = .472$, 95% CI [.317, .628], $p < .001$).

Profile Differences in Demographics

Next, I turned to examining differences between these three profiles in their demographic characteristics. I report associations with gender, political ideology, and education, because the sample was quota matched on gender, political party membership, and education⁷, and, as pre-registered, also with age, religiosity, and subjective SES (our other measure of socio-economic status). I do not examine the relationship between profile and race or vocation as there were too few participants for the number of possible response options to justify group comparisons, and I did not pre-register these comparisons.

I use separate regression models to predict each continuous demographic variable from participants' profile (dummy-coded), and I use χ^2 Difference Tests of Independence to examine the association between profile and categorical demographic variables. Table 3.3 reports statistics describing the relationship between profile and each demographic variable, using the F statistic for continuous demographic variables and the χ^2 static as well as Cramer's V (which has a scale of 0-1) for the categorical variables.

Table 3.3

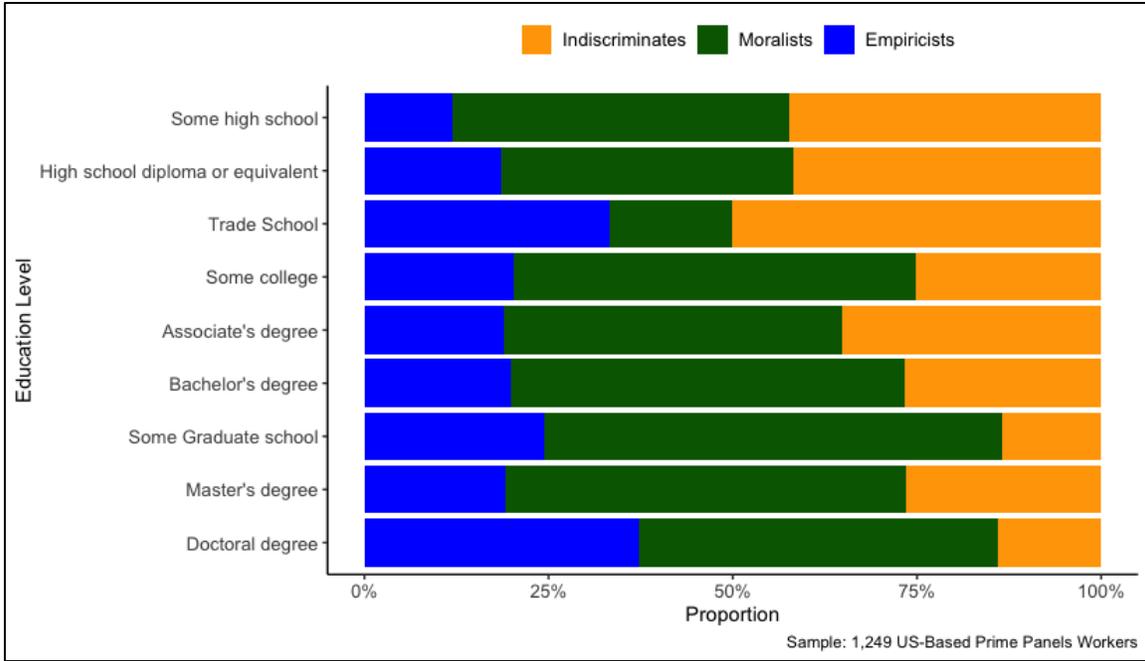
Study 4: Profile Demographic Differences

<i>Demographic Characteristic</i>	<i>Statistical Relationship</i>	<i>Empiricist</i>	<i>Moralist</i>	<i>Indiscriminate</i>
Education	$\chi^2 = 53.23, V = .12, p < .001$	-	-	-
Binary Gender (M/F)	$\chi^2 = 9.67, V = .08, p = .008$	-	-	-
Religious Identity	$\chi^2 = 18.03, V = .08, p = .001$	-	-	-
Religiously Oriented	$F(2, 1241) = 19.41, p < .001$	2.50	3.01	3.37
Spiritually Oriented	$F(2, 1245) = 14.90, p < .001$	3.17	3.74	3.88
Scientifically Oriented	$F(2, 1245) = 0.41, p = .666$	3.36	3.24	3.28
Left-Right Ideology	$F(2, 1246) = 0.05, p = .950$.30	.27	.25
Subjective SES	$F(2, 1246) = 8.24, p < .001$	5.46	5.69	6.11
Age	$F(2, 1245) = 58.37, p < .001$	45.7	44.6	33.6

Figure 3.10 depicts the the proportion of each education level belonging to each profile, Figure 3.11 does so for binary gender identity⁸, and Figure 3.12 for (non)religious identity.

Figure 3.10

Study 4: Profile Differences in Education



Note: The sample included 49 participants with some high school education, 323 with a high school education, 12 with a trades degree, 231 with some college, 111 with an associate’s degree, 282 with a bachelor’s, 37 with some graduate school, 151 with a master’s degree, and 43 with a doctoral degree.

Figure 3.11

Study 4: Profile Differences in Binary Gender Identity

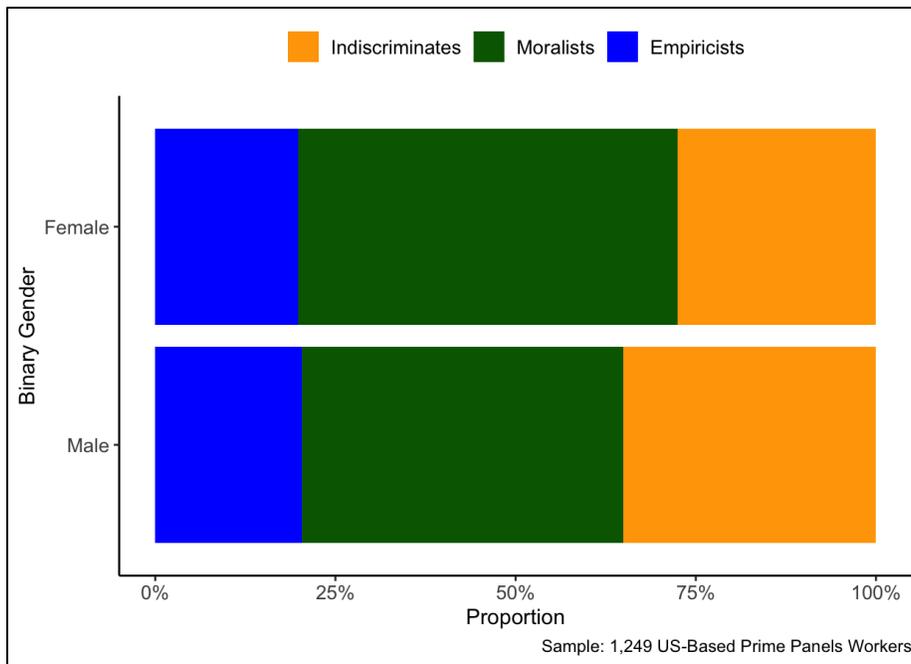
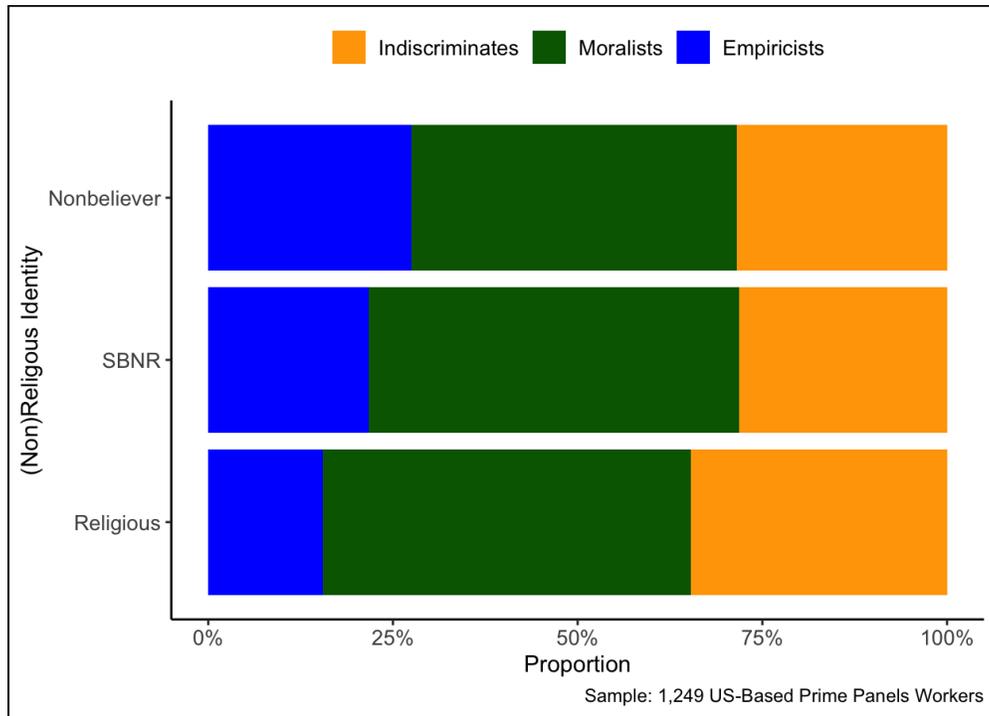


Figure 3.12

Study 4: Profile Differences in (Non)Religious Identities



Discussion

For a now fifth time, we replicated the three profiles of Empiricists, Moralists, and Indiscriminates. We also observed that the profiles were related to every demographic variable except for left-right political ideology and espousing a scientific (vs. religious or spiritual) orientation. Participant profile was dependent on education, but inspecting the profile proportions between education levels did not suggest, as might be expected, that people who are more educated (i.e., who spend more time presumably learning about the importance of empiricism in school; Burbules & Linn, 1991) are always more Empiricist. Indeed, the proportion of Empiricist participants appears to be the most stable across education levels, whereas Indiscriminates tend to be less educated and Moralists more educated. Interestingly, these trends do not align with profile differences in subjective socio-economic status: here,

Empiricists and Moralists did not differ from each other, but both reported lower subjective SES than Indiscriminates. However, this difference was very small. Similarly, the gender differences we observed were statistically significant, but not large: women were only slightly more likely to be Moralists than men, less likely to be Indiscriminates, and just as likely to be Empiricists.

The most pronounced demographic differences we observed were on age and religiosity. In particular, the average Indiscriminate was over a decade younger than the average Moralist or Empiricist, who did not differ on age. Indiscriminates were also the most religious and spiritual while Empiricists were the least, with Moralists in-between them.

Though factors such as gender, SES, age, spirituality, and religiosity all seem to have some relation to a participant's ethics of belief profile, these findings are small and suggest that anyone could be an Empiricist, Moralist, or Indiscriminate regardless of their demographic profile.

3.6 General Discussion

Theoretical Implications

Motivated reasoning is common. Scholars have traditionally treated this observation as a puzzle, contrasting it with the assumption that people disapprove of basing descriptive beliefs on anything besides facts and evidence (i.e., empiricism). To resolve that puzzle, they have invoked the idea of an illusion of objectivity, purportedly required for motivated reasoning to occur. My findings cast doubt on this perspective, indicating that only a minority of people disapprove of emotional, social, and especially moral goals determining people's descriptive, factual beliefs. Instead, a majority endorsed at least one of these goals on explicit self-report items, even when I ensured they were responding exclusively with respect to descriptive (vs. injunctive) beliefs. This confirmed my first hypothesis and suggests most people are not empiricists who think that accuracy is the only appropriate goal for descriptive belief.

Instead of replacing the assumption of universal empiricism with another universalist assumption, my findings underscore the heterogeneity in peoples' ethics of belief. I consistently found three distinct and replicable response profiles reflecting unique views on what appropriate bases for beliefs are (i.e., ethics of belief). One profile, which I call Empiricists, conformed reasonably well to the assumption of the standard theory: Participants with this response profile reported that it is only ever appropriate to allow evidence and logic to guide factual reasoning, and generally rejected the influence of moral, social, and emotional goals. However, at most a third of my participants showed this Empiricist profile, and only 20% in my most nationally representative sample. As well, in Studies 2-4, which used larger samples than the two original studies, even Empiricists did not entirely reject moral and emotional goals, rating them somewhat above the floor. My analysis also revealed two other commonly held ethics of belief that together characterized the majority of participants: First, I found a consistent group of participants with a Moralistic ethics of belief where moral goals may guide belief as much as accuracy. While Moralists still mostly reject emotional and especially social goals biasing their beliefs, their explicit endorsement of morally motivated reasoning is inconsistent with an empiricist ethics of belief. This response profile was the most common across all my datasets. I also found a consistent group of participants with a more indiscriminate ethics of belief most at odds with empiricism. These Indiscriminate participants reported accuracy, morality, emotions, and social goals as similarly valid reasons to believe, valued accuracy less than Empiricists and Moralists, and made up a larger portion of participants than Empiricists.

Though I did not predict that I would find the three profiles I did, they do resemble key perspectives from the ethics of belief literature in philosophy, a topic at the intersection of ethics and epistemology. The field began as an argument between W.K. Clifford (1877), who argued that "it is wrong always, everywhere, and for anyone to believe anything upon insufficient

evidence”, and our field’s own William James (1896), who argued instead that “our passionate nature not only lawfully may, but must, decide an option between propositions...”. In contemporary philosophy on the ethics of belief (Chignell, 2010; Feldman, 2000), “moral encroachment” views argue that descriptive beliefs ought to be constrained by the believer’s moral circumstances (Bolinger, 2020) because empirical beliefs can lead to harmful (in)action, and can directly wrong people (e.g., assuming a black person at a fancy party is a waiter). While my measure prevents us from making exact parallels between these views and my participants’, nevertheless the profiles I observed bear resemblances to dominant perspectives in relevant philosophical work. This suggests that a fruitful direction for future research on motivated reasoning may be to draw on insights from philosophical work on social epistemology and the ethics of belief, similar to the way that moral psychology draws on moral philosophy.

People also acted in line with their personal ethics of belief. Although some appeared to engage in motivated reasoning by changing their beliefs to regulate the implications of false feedback on a valuable skill, the participants who did this also said that they thought it was okay to let emotions and social goals guide reasoning (~20-35% of participants). In contrast, participants who disapproved of emotional and social biases (~65-80%) did not change their beliefs in a self-serving way. Given that Indiscriminates would presumably have no need for illusions of objectivity, this provides more convincing evidence against the idea that everyone needs illusions of objectivity for motivated reasoning. My finer-grained approach also revealed that the people who *did* engage in motivated reasoning do so to a much stronger degree than was suggested by the sample-level coefficient diluted by participants who did not. Taken together, these findings suggest that peoples’ personal ethics of belief (i.e., their views about how they should choose their beliefs) may have been an important hidden moderator in prior findings.

It is important not to generalize from what I observed here with the self-serving bias to other types of motivated reasoning. Indeed, the self-serving paradigm I used may have made motivated reasoning obvious to participants, and thereby easier to flag and harder to rationalize with illusions of objectivity, or they may have satisfied their motives with unmeasured forms of motivated reasoning. Perhaps in other situations — such as when the impact of motives on reasoning is harder to detect or easier to justify — people who disapprove of it would actually do it under illusions of objectivity. Nevertheless, the findings illuminate a boundary on illusions of objectivity in standard theories of motivated reasoning, and begs reinspection of previous sample-level effects which could plausibly have been driven by a minority of participants. I see this as an exciting and fruitful opportunity to replicate and extend previous work, ultimately sharpening theory in the process.

Methodological Implications

These insights exemplify the value of descriptive research (Rozin, 2001; Rai & Fiske, 2010; Scheel et al., 2021), such as data-driven typologies which can summarize common combinations of theoretically relevant variables within participants (Gerring, 2012). Although data-driven typologies have been used before in psychology (e.g., Gerlach et al., 2018; Espinoza et al., 2020), to my knowledge, I am the first to use replicable subgroups from cluster analysis to moderate an experimental effect. This enabled us to not only discover, based on the data, which ethics of belief best described participants, but to go beyond a purely descriptive use of cluster analysis and test theoretically important hypotheses. This speaks to the untapped value of person-centered methods (see Beck & Jackson, 2020; Brandt & Morgan, 2022; Grice et al., 2020; Fisher et al., 2018; Molenaar, 2004; Woo et al., 2018) which focus on variability within and between individuals and subgroups instead of aggregate, sample-level analyses.

In the current research, typical sample-level analyses would have led us to the misguided conclusion that everyone engages in (a variable degree of) self-serving reasoning, rather than the more nuanced conclusion that a small number of people engaged in a moderate degree of self-serving reasoning. Although interaction terms with the feedback condition using the three non-accuracy motives does reveal moderation of the effect (SOM Analysis 3), they do not illuminate the qualitatively distinct subgroups in the data, or that some of these groups (and most participants) were simply not using the bias at all. Similarly, the means and plotted distributions of belief change scores reveals that most participants did not change their beliefs (much) in response to the feedback, but this also would not have led us to uncover three qualitatively distinct groups of participants.

Our findings are thus a cautionary tale in generalizing from sample-level bias effects to participants: sometimes, as here, sample-level effects do not even generalize to the majority of participants in the sample (i.e., “group-to-individual generalizability”; Fisher et al., 2018). In the case of motivated reasoning, lack of concern for group-to-individual generalizability may have led to misguided inferences (e.g., ubiquity of a process) which sent theory on a wild goose chase (e.g., rationalizing an ostensibly ubiquitous process).

Similarly, it is important not to generalize from what I observed here with the self-serving bias to other types of motivated reasoning. Indeed, the self-serving paradigm I used may have made motivated reasoning obvious to participants, and thereby easier to flag and harder to rationalize with illusions of objectivity, or they may have satisfied their motives with unmeasured forms of motivated reasoning. Perhaps in other situations — such as when the impact of motives on reasoning is harder to detect or easier to justify — people who disapprove of it would actually do it under illusions of objectivity. Nevertheless, my findings illuminate a boundary on illusions of

objectivity in standard theories of motivated reasoning, and begs reinspection of previous sample-level effects which could plausibly have been driven by a minority of participants.

I see this as an exciting and fruitful opportunity to replicate and extend previous work, ultimately sharpening theory in the process. I also do not see this as requiring cluster analysis: within subjects designs, for example, are another way of quantifying the presence, direction, and strength of an effect within participants (Grice et al., 2020). Nevertheless, cluster analysis can help researchers examine heterogeneity in between subjects' designs, or in cases where they have a range of theoretically related variables with which to cluster participants.

Practical Implications

The possibility that other motivated reasoning effects may have been driven by a small subset of participants echoes research showing that a small subset of users produce and engage with a disproportionate amount of false (Grinberg et al., 2019), political (Pew Research Center, 2022a; Pew Research Center, 2022b), and toxic online content (Kumar et al., 2018; Bor & Peterson, 2022). Collectively, these findings suggest that interventions designed to improve reasoning in online environments could succeed by producing sample-level effects despite only “working” for a minority of the sample. I therefore suggest that future interventions trying to improve the reasoning of wide audiences measure heterogeneity in their effects to know whether the intervention is really reaching everyone.

This is particularly important, I believe, given the content of popular interventions for improving online reasoning and the finding that only a minority of people endorse an empiricist ethics of belief. Indeed, common interventions for improving reasoning in online environments such as accuracy nudges and fact checking work by targeting peoples' assumed commitment to empiricism: accuracy nudges are said to work by reminding people how much they care about accuracy (Pennycook et al, 2020) and fact checks turn on the assumption that people will

willingly update false beliefs when provided with a correction (Clayton et al., 2020; Koch et al., 2023). My work suggests that not all participants will so readily and strongly, if at all, agree with these empiricist sentiments.

On the one hand, these interventions could work by essentially targeting the people already sympathetic to them: maybe empiricists are very responsive to accuracy nudges, fact checks, and other empiricist appeals, so much so that they make it appear as if these interventions “work” on the whole. This would mean that existing interventions are essentially working by targeting the people who presumably need them least, and that they could be made more effective if targeted towards people who actually need to be persuaded. On the other hand, they could work by (temporarily) persuading people to act like empiricists, in which case researchers should focus on scaling existing interventions or making them longer lasting. I suggest future researchers focus on understanding heterogeneity in the effectiveness of their interventions, as this is crucial for their generalizability even in the presence of promising sample-level effects.

In any case, given that most people approve of (especially morally) motivated reasoning, extremely brief interventions may not meaningfully change beliefs over time and across situations. How ought we approach combating widespread misbelief given that most people approve of their (especially morally) motivated reasoning? One option is to personalize interventions to individuals based on prior behavioral trace or self-report data, but it would be difficult to collect and use such data at scale. It also puts the onus of responsibility on individuals, rather than holding corporations and elites accountable for creating conditions which promote poor reasoning. I suggest that truly improving reasoning at scale will require structural change, rather than interventions which target individual belief and behavior change (Chater & Lowenstein, 2023). For example, making digital literacy more prominent in education, applying

mechanisms which limit the spread of outrageous and false content in the first place or which increase the circulation of quality (e.g., from experts) or noncontroversial (e.g., cat videos) content, or nudging users out of ideologically homogeneous or morally charged online communities where conditions for motivated reasoning are more favorable.

Coda

This chapter challenges the long-standing assumption that people universally espouse an ethics of belief committed to empiricism. Instead, the evidence reveals substantial variability in what people consider appropriate bases for belief, including widespread acceptance of moral, social, and emotional considerations alongside accuracy. The identification of three distinct ethics of belief profiles—Empiricists, Moralists, and Indiscriminates—suggests that peoples' ethics of belief are also far more diverse than previously assumed. Moreover, the alignment between participants' professed ethics of belief and their actual use of self-serving reasoning hints that illusions of objectivity may not be required for motivated reasoning, and underscores the importance of personal epistemologies in shaping reasoning. Finally, that only a minority of participants drove a replicable sample-level effect calls for re-examination of prior findings which could similarly have been driven by only a minority of participants in the sample. However, this is an opportunity to strengthen the evidence for motivated reasoning via replication, and to refine the theory explaining it. In particular, my findings here suggest that it would be fruitful for researchers who study motivated reasoning to ask people about their personal ethics of belief rather than making assumptions about them.

Chapter 4: Where are illusions of objectivity?

4.1 Introduction

In Chapter 3, the results suggested that there are likely cases of motivated reasoning which do not require illusions of objectivity. But the self-serving bias is just one of many kinds of motivated reasoning. In other circumstances, such as when non-accuracy motives are stronger, even Empiricists may use motivated reasoning. In Chapter 4, I test whether Empiricists will use motivated elevation when given a stronger reason to do it: when morally motivated. On the one hand, if Empiricists use morally motivated elevation, it would suggest that they need illusions of objectivity after all. This is because their ethics of belief typically prohibits this kind of motivated reasoning⁹. On the other hand, Empiricists may abstain from the motivated reasoning they disapprove of as in Chapter 3, while Indiscriminates and Moralists use morally motivated reasoning. Because Moralists and Indiscriminates typically approve of morally motivated reasoning, this would further suggest that illusions of objectivity are less common than previously assumed.

Why might morality break empiricists' proscription against motivated reasoning when emotional and social motives did not in Chapter 3? Broadly, various lines of work suggest that when beliefs are moralized (i.e., seen as morally relevant and important; Rhee et al., 2019; Rozin; 1999; Rozin et al., 1997; Rozin & Singh, 1999), people are more zealous and dogmatic about them. People also dislike and distance themselves more from people who disagree with them on moral (vs. strong but non-moral) attitudes, wish them less good will, and are less willing to cooperate with them (Skitka et al., 2005). When people view a belief through a moral lens, they are also more willing to disregard social pressure to believe otherwise (Aramovich et al., 2012; Hornsey et al., 2003). Even nudging people to view the same beliefs as moral (vs. not) elicits greater resistance to persuasion (Luttrell et al., 2016). In one natural experiment, Skitka et

al., (2009) tracked participants' beliefs about the legitimacy of the U.S. Supreme Court before and after a Supreme Court decision about the legality of physician's assisted suicide (*Gonzales v. Oregon*). Participants who disagreed with the Court's decision came to view the Court as less legitimate, and this change was strongest for participants who moralized their own belief about the issue.

Most directly, recent work has found that samples are willing to condone the morally motivated reasoning of others (Cusimano & Lombrozo, 2021) and themselves (Cusimano & Lombrozo, 2023). People also tend to attribute qualities to their moral beliefs that a classical empiricist would typically attribute only to empirical facts: the more people report that their beliefs are based on moral convictions and values, the more they report viewing those beliefs as universally true across time and space (Skitka et al., 2021). Likewise, people view moral statements as either objectively true or false (vs. a matter of opinion); and, they say this for moral statements nearly as often as scientific statements, but are far more likely to say that statements about social conventions or aesthetics are merely matters of opinion (Goodwin & Darley, 2008 & 2010). Thus, if Empiricists are similar to the participants in this past work, they may feel more drawn towards engaging in morally (vs. purely socially or emotionally) motivated reasoning.

Overview of Studies

In two studies, I use a slightly modified version of the motivated empiricism from Chapter 2 to elicit morally motivated reasoning, and compare Empiricists, Moralists, and Indiscriminate on their extent of bias. In Study 2, I also include additional measures of participants' views about their motivated reasoning in the study itself (vs. in general). Readers may access the data, R analysis code, research materials, and any pre-registrations at my [OSF repository](#), which provides a separate component for each study.

4.2 Study 1

In Study 1 (preregistered) I used the motivated empiricism paradigm from Chapter 2. To prompt morally motivated reasoning in particular, I chose a highly moralized topic in American discourse: the source of Black-White racial differences in incarceration. I use a morally charged topic to see if Empiricists will use motivated reasoning when given a moral reason to do so. To ensure that participants saw the issue through a moral lens, I measured their moralization of the issue and examined the mean across all participants on this variable as well as its relationship to motivated elevation. This was not preregistered, but I thought these analyses were necessary to claim that the study was capturing morally motivated reasoning.

Unlike those in Chapter 2, in this study all pieces of information I included were low-quality, such as anecdotes or non-expert opinions. I did this because I wanted to be certain that any biases I captured were the product of motivated reasoning, and not accuracy-oriented Bayesian reasoning. I also manipulated the favorability of the information within-subjects, so that each participant read information supporting and challenging their beliefs. Finally, I asked all participants to complete the ethics of belief scale, which I used to test whether ethics of belief moderated motivated elevation. I preregistered that I would find the three profiles of Empiricists, Moralists, and Indiscriminates, and a significant motivated elevation effect. Guided by the findings from Chapter 3, I also predicted participants to act in line with their self-reported ethics of belief: Empiricists would use motivated elevation the least, and Moralists would use it the most (given the morally-charged context of the study).

Method

Participants

I recruited an equal proportion of 1,311 self-identified liberal and conservative American Prolific Academic workers, then excluded 22 for failing more than one of four data quality

checks (two English language comprehension questions and two standard attention checks) as well as another 12 for incorrectly answering a reading check question about the first piece of information. Finally, I excluded another 92 participants for failing to correctly answer the reading check question for the ethics of belief scale instructions. This left a sample of 1,185 participants (616 self-identified women, 540 men, 25 non-binary; 2 who wrote something else, and 2 who chose not to answer; $M_{age} = 38.83$). Because all participants judged five pieces of information, this yielded 5,925 evidence judgements for analyses.

Procedure

Participants started off by completing two simple English language comprehension questions, and proceeded to read a summary of selected results from a report by the U.S. Bureau of Justice Statistics (Carson, 2019) showing that Black Americans are incarcerated at a higher rate than white Americans. This information did not refer to any potential causes for this race gap. Afterwards, I asked participants a reading check about this information (four response options; correct: *That Black Americans are much more likely to be incarcerated than White Americans*), and whether they considered the information to be evidence using the same item wording as the evidence questions about the anecdotes and non-expert opinions in the study.

After this, I asked participants which of two positions best described their own: that “Crime is a choice and criminals, Black or White, are responsible for their decisions. Therefore, Black Americans are more likely to be imprisoned than White Americans because they are more likely to make bad decisions that get them in trouble.” or that “The criminal justice system is biased against Black Americans, and treats them with unfair suspicion. Therefore, Black Americans are more likely to be imprisoned than White Americans because it is perpetuated by an unjust system with policies that favor Whites over Blacks.”. Then, I asked them how much they moralized their opinion on this issue using two standard items which I average together

(Sktika & Morgan, 2014; 5-point scale; 1-Not at all; 5-Very much): (i) *To what extent was your answer on the previous page based on moral principle?* and (ii) *To what extent was your answer on the previous page a moral stance?*

Finally, participants read five pieces of low-quality information in a random order (Table 4.1) which each concluded (within-subjects) either that we should blame the race gap on (i) black people or (ii) an unjust system, and then stated whether the information was “evidence that a perfectly logical truth seeker would use to discern the true explanation for race differences in incarceration”, or not. After making judgments about each piece of information, participants responded to the ethics of belief scale which contained a standard attention check, and then to basic demographic questions which included a final attention check, and then the study concluded.

Table 4.1

Chapter 4: Vignettes

<i>Vignette</i>	<i>Conclusion Reached</i>	
	<i>Blame Black People</i>	<i>Blame Systemic Injustice</i>
Public Opinion Poll Results	<p>Researchers at the Social Survey Institute regularly conduct polls of American attitudes towards political issues, including racial differences in crime. These polls include people from across the country, and all walks of life. In a recent poll, SSI asked citizens to comment on the cause of the fact that Black Americans are more likely to be incarcerated than white Americans. According to their polling, most Americans believe that the difference in incarcerations can be explained by higher genetic predispositions for aggression and impulsivity among Blacks. In other words, these polling data show a clear majority opinion, such that Black Americans are viewed as</p>	<p>Researchers at the Social Survey Institute regularly conduct polls of American attitudes towards political issues, including racial differences in crime. These polls include people from across the country, and all walks of life. In a recent poll, SSI asked citizens to comment on the cause of the fact that Black Americans are more likely to be incarcerated than white Americans. According to their polling, most Americans believe that the difference in incarcerations can be explained by systemic injustice, like Black neighborhoods being policed more often and with more undue suspicion than White neighborhoods. In other words, these polling data show a clear</p>

	inherently more likely to commit crime.	majority opinion, such that Black Americans are viewed as victims of an unjust criminal justice system.
Police Officer's Opinion	Tom Norton has been a police officer for 28 years. For most of his career, Tom patrolled a predominantly Black neighborhood, where arrest rates were high. Over dinner with his fellow officers, they began talking about whether this had anything to do with the racial makeup of the neighborhood. Based on his nearly three decades of policing experience, Tom told the group he believes that Black Americans have a natural tendency to be more violent than most other races.	Tom Norton has been a police officer for 28 years. For most of his career, Tom patrolled a predominantly Black neighborhood, where arrest rates were high. Over dinner with his fellow officers, they began talking about whether this had anything to do with the racial makeup of the neighborhood. Based on his nearly three decades of policing experience, Tom told the group he believes that Black Americans are often unfairly treated because of systemic racism in the criminal justice system and America more broadly.
Teacher's Opinion	Maya Ford is a high school teacher in a low-income urban neighborhood, comprised mostly of Black students. Every year, she receives multiple letters from the main office telling her that a student won't be coming into class for a while as they have been arrested, and this is a constant source of heartbreak and frustration for her as a teacher. Recently at a teaching conference, she confided in her friend, a fellow teacher, about police run-ins with students from her school. The friend asked Maya why she thinks her students get in so much trouble with the law, noting that she has never experienced this at her school in Wisconsin. After a long pause, Maya admitted that she thinks Black teens are just wired to be more aggressive than students of other racial backgrounds.	Maya Ford is a high school teacher in a low-income urban neighborhood, comprised mostly of Black students. Every year, she receives multiple letters from the main office telling her that a student won't be coming into class for a while as they have been arrested, and this is a constant source of heartbreak and frustration for her as a teacher. Recently at a teaching conference, she confided in her friend, a fellow teacher, about police run-ins with students from her school. The friend asked Maya why she thinks her students get in so much trouble with the law, noting that she has never experienced this at her school in Wisconsin. After a long pause, Maya admitted that she thinks Black teens are often subjected to much more suspicion from police than students in rural schools, and this often creates a self-fulfilling prophecy.
Nurse's Opinion	Dave Giesbright is a certified nurse who works in an emergency room where he often sees police officers bringing people in who were injured during an arrest. One Friday night, officers brought in a Black man in handcuffs with a broken nose and a fractured cheekbone. According to	Dave Giesbright is a certified nurse who works in an emergency room where he often sees police officers bringing people in who were injured during an arrest. One Friday night, officers brought in a Black man in handcuffs with a broken nose and a fractured cheekbone. According to

the officers, the man had violently resisted arrest and was injured while being taken to the ground and handcuffed. Moreover, Dave happened to have interacted with the arrestee who had been brought in, as they had been in the emergency room before for a similar situation. The last time they were in, the man cursed at and spat on Dave while he was trying to treat him. Dave suspects that the man's aggressive, uncooperative behavior is simply in his nature as a Black man.

the officers, the man had violently resisted arrest and was injured while being taken to the ground and handcuffed. Moreover, Dave happened to have interacted with the two officers who had brought the man in, as they had been in the emergency room before for a similar situation. The last time they were in, the officers were pretty defensive and evasive while they were describing the incident. Dave suspects that the two officers may have been concealing their use of excessive force.

Pastor's Opinion

Chad Stafford is a pastor at New Hope Church, where he leads a congregation of nearly 300 people. For decades, Pastor Stafford has spent countless hours reading scripture and channeling what he feels to be the word of God. His congregants see him as a spiritual leader of their community, often going to him for advice and guidance on difficult issues. During a church BBQ, several congregants approached Pastor Stafford to ask him what he thinks about the fact that Black Americans are much more likely to be incarcerated than White Americans. After a few moments of silence and pondering, Pastor Stafford gave the congregants his take on the issue: "It is my belief that if this racial difference in incarcerations is going to go away, Black communities must accept their responsibility and do a better job of instilling self-control in their children so that they do not turn to drugs and crime as adults."

Chad Stafford is a pastor at New Hope Church, where he leads a congregation of nearly 300 people. For decades, Pastor Stafford has spent countless hours reading scripture and channeling what he feels to be the word of God. His congregants see him as a spiritual leader of their community, often going to him for advice and guidance on difficult issues. During a church BBQ, several congregants approached Pastor Stafford to ask him what he thinks about the fact that Black Americans are much more likely to be incarcerated than White Americans. After a few moments of silence and pondering, Pastor Stafford gave the congregants his take on the issue: "It is my belief that if this racial difference in incarcerations is going to go away, America must take responsibility and redress system injustices and racism in our government, including the police force."

Results

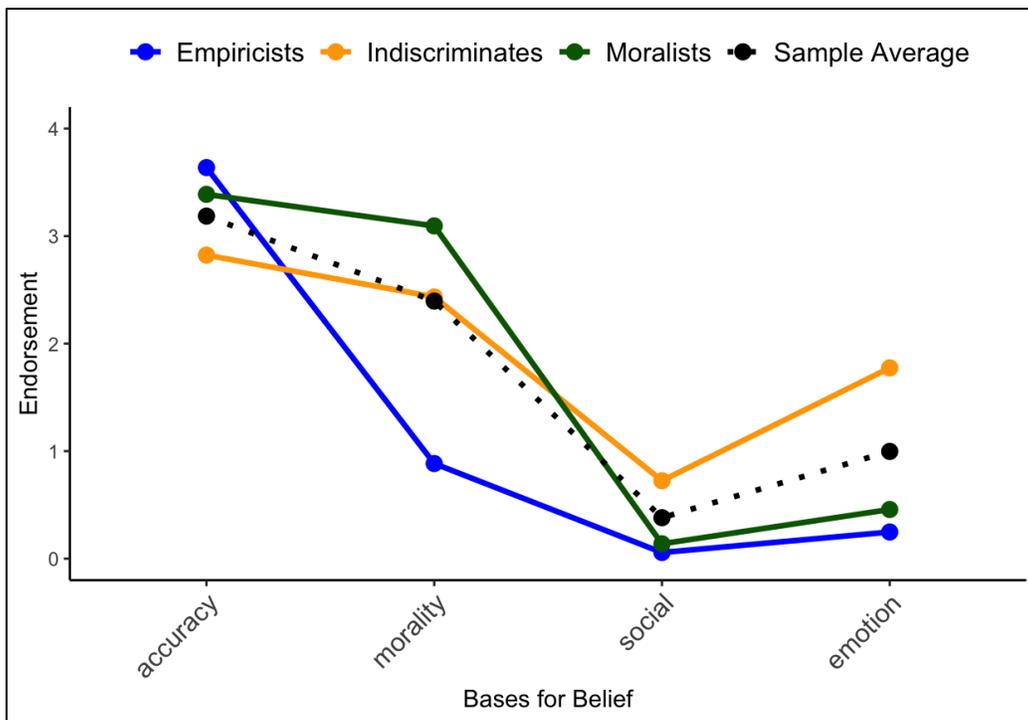
Replicating Profiles

The three-profile model (see Figure 4.1) identified the familiar trio of profiles: Empiricists (19% of the sample), Moralists (38%), and Indiscriminates (43%). As in Studies 3 & 4 of Chapter 3, even Empiricists endorsed morally motivated reasoning to some degree: indeed, their

endorsement of morally motivated reasoning was similar to Indiscriminates' endorsement of socially motivated reasoning. However, as with the Empiricist profile in all previous studies and never with the Moralist or Indiscriminate profiles, Empiricists uniquely prioritized accuracy over other bases for belief, including morality. Thus, while Empiricists in this study may be somewhat sympathetic to morally motivated reasoning, they still report that it is much less important than accuracy.

Figure 4.1

Study 1: Three-Profile Plot



Motivated Elevation

I tested for (morally) motivated elevation using a multilevel logistic regression predicting participants' evidence judgements (not evidence = 0; evidence = 1) from the favorability of the information (unfavorable = -1; favorable = 1) and random intercepts for each participant and

statement. This initial model yielded a strong motivated elevation effect ($OR = 4.04$, 95% CI [3.51, 4.66], $p < .001$).

Moralization

The mean-level of moralization ($M = 3.34$, $SD = 1.32$; Range = 1-5) suggested that on average participants indeed moralized their opinion on the issue. Additionally, participants who moralized the topic of race differences more also used motivated elevation more ($OR = 1.29$, 95% CI [1.16, 1.43], $p < .001$).

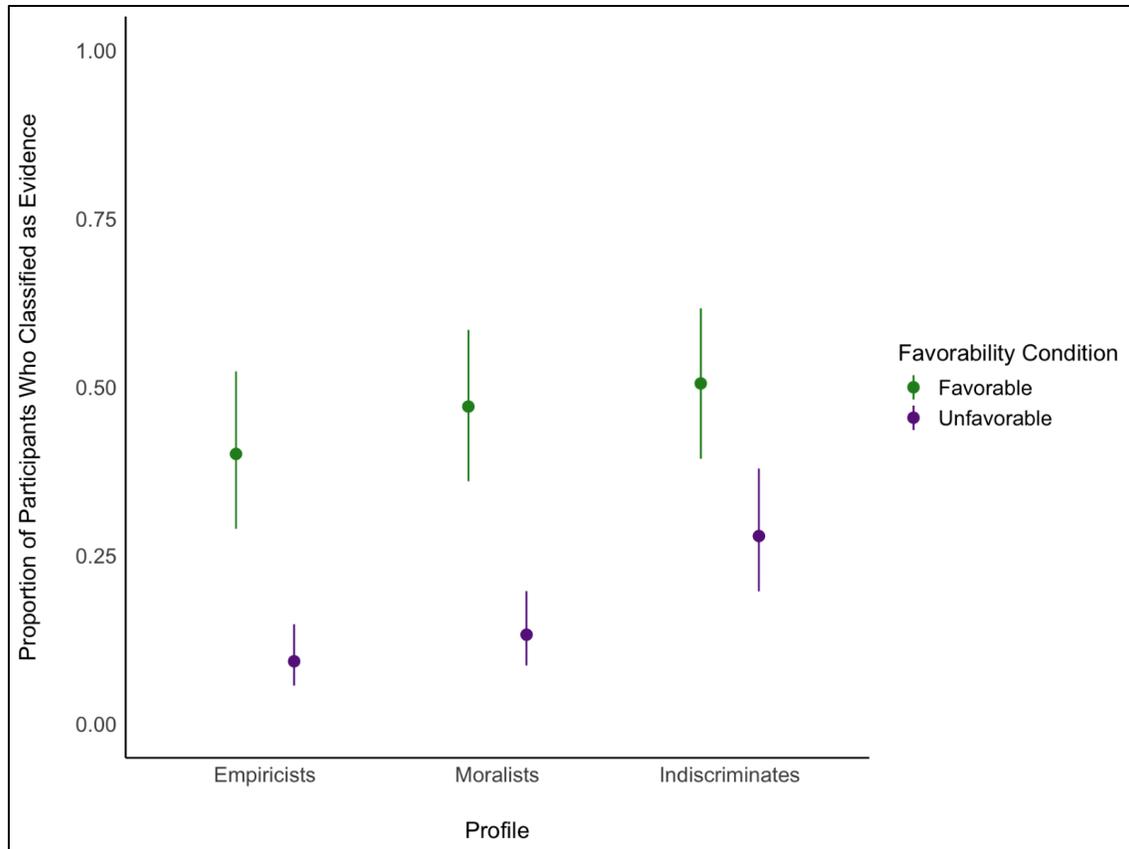
Moderation of Morally Motivated Elevation by Ethics of Belief

Moderation of Morally Motivated Elevation By Profile

To test whether this effect was moderated by profile, I fit an additional model including the profile variable and its interaction terms with the favorability variable. In this model, Empiricists engaged in the same amount of motivated elevation as Moralists ($p = .591$), but *more* motivated elevation than Indiscriminates ($OR = 0.41$, 95% CI [0.27, 0.60], $p < .001$). Moralists also engaged in more motivated elevation than Indiscriminates ($OR = 0.45$, 95% CI [0.34, 0.61], $p < .001$). Nevertheless, the simple slopes revealed that Empiricists ($OR = 2.56$, 95% CI [2.14, 3.03], $p < .001$), Moralists ($OR = 2.41$, 95% CI [2.14, 2.72], $p < .001$), and Indiscriminates ($OR = 1.63$, 95% CI [1.48, 1.79], $p < .001$) all used motivated elevation (Figure 4.2).

Figure 4.2

Study 1: Profile Differences in Motivated Elevation



Moderation of Motivated Elevation By Bases for Belief

As pre-registered, I also tested whether motivated elevation was moderated by two of the bases for belief: accuracy and morality. Specifically, I fit two interaction models as before, but replacing the profile variable with the accuracy and morality variables, respectively. Motivated elevation was not moderated by the degree to which people approve of morally motivated reasoning ($OR = 0.93$, 95% CI [0.83, 1.05], $p = .269$), against my prediction that it would make the effect larger. Also contrary to my predictions, greater preference for accuracy-oriented reasoning did moderate motivated elevation, but by making the effect larger ($OR = 1.31$, 95% CI [1.09, 1.58], $p = .005$). Because I was surprised by these results, I broke with my pre-registration and fit a final model including all bases for belief and their interaction terms with the favorability condition as predictors. In this model, neither willingness to engage in morally motivated

reasoning ($OR = 0.98$, 95% CI [0.86, 1.11], $p = .702$) nor preference for accuracy-oriented reasoning ($OR = 1.12$, 95% CI [0.92, 1.36], $p = .270$) moderated motivated elevation. However, willingness to engage in emotionally motivated reasoning ($OR = 0.80$, 95% CI [0.68, 0.94], $p = .008$) and socially motivated reasoning ($OR = 0.69$, 95% CI [0.54, 0.89], $p = .005$) both diminished the motivated elevation effect.

Discussion

I replicated motivated elevation for a fifth time and the three profiles of Empiricists, Moralists, and Indiscriminates for a sixth. Confirming my characterization of the study as capturing morally motivated reasoning, the average score on the moralization items was above the midpoint of the scale, and participants that moralized the issue more were also more likely to use motivated elevation. However, contrary to my pre-registered prediction, Empiricists were not the least likely to use motivated elevation: they were just as likely to use it as Moralists, and *more* likely to use it than Indiscriminates. These results do not paint a picture where Empiricists act in line with their ethics of belief, unlike with the self-serving bias.

They also do not support the intuitive prediction that the more people are OK with motivated reasoning, the more they will do it: puzzlingly, greater preference for accuracy-oriented reasoning did not reduce motivated elevation, and willingness to use morally motivated reasoning did not increase it. Instead, both willingness to engage in emotionally and socially motivated reasoning moderated motivated elevation, but surprisingly by *weakening* the effect. But before (over)interpreting these surprising findings, I first attempt to replicate them.

4.3 Study 2

Study 2 is a pre-registered direct replication of Study 1 with additional questions at the end explicitly asking participants the extent to which their decisions in the study itself were driven by accuracy, moral, social, or emotional motives, and if they approved of each of these

influences (see Table 4.2¹⁰). I use these questions to more directly test whether people are aware of and approve of their motivated reasoning in the study rather than inferring (dis)approval from their general ethics of belief.

Table 4.2.

Situation-Specific Ethics of Belief Questions

<i>Bases for Belief</i>	<i>Self-Perceived Use</i>	<i>Approval</i>
Accuracy	I remained completely rational and logical while making my decisions	I SHOULD have remained completely rational and logical while making my decisions
Morality	I let my moral values and beliefs influence my decision-making	I SHOULD NOT have let my moral values and beliefs influence my decision-making (R)
Social	I let my social identities and group affiliations influence my decision-making	I SHOULD NOT have let my social identities and group affiliations influence my decision-making (R)
Emotion	I let my emotions and feelings influence my decision-making	I SHOULD NOT have let my emotions and feelings influence my decision-making (R)

These questions differed from those in the ethics of belief scale by targeting situation-specific ethics of belief instead of general ethics of belief, allowing me to more directly test whether people approved of and were aware of their motivated reasoning in the study. For this study, I did not pre-register any directional hypotheses about differences in motivated elevation between profiles or whether ethics of belief would moderate the effect, only that I would test them.

Method

Participants

I collected data from 1,786 U.S.-based workers from Prime Panels, recruiting a sample quota matched to the population distribution in terms of sex, party identification, and education level. I then excluded 448 for failing more than one of four data quality checks (two english language comprehension questions and two standard attention checks) as well as another 88 for

incorrectly answering a comprehension question about the first piece of information. I did not, however, exclude them for incorrectly answering the ethics of belief scale instructions reading check question. Instead, those who answered incorrectly saw an error message and could not progress through the survey until they provided the correct answer. Although not pre-registered, I removed another three participants who reported obviously incorrect ages (one who said 236 years old, two who said 7 years old). This resulted in a final analysis sample of 1,247 participants (524 Male; 718 Female; 4 Non-binary; 1 who preferred not to answer; Mean Age = 59.18). Because all participants judged five pieces of information, this yielded 6,235 evidence judgements for analyses.

Procedure

The study procedure was identical to the previous study except for eight extra questions I asked participants after they judged the five pieces of evidence but before they answered the ethics of belief scale (Table 4.2). These questions probed whether people were aware of their reasoning being motivated by accuracy, morality, social goals, and emotional goals (left-hand column), and if they thought the influence of these motives was (right-hand column).

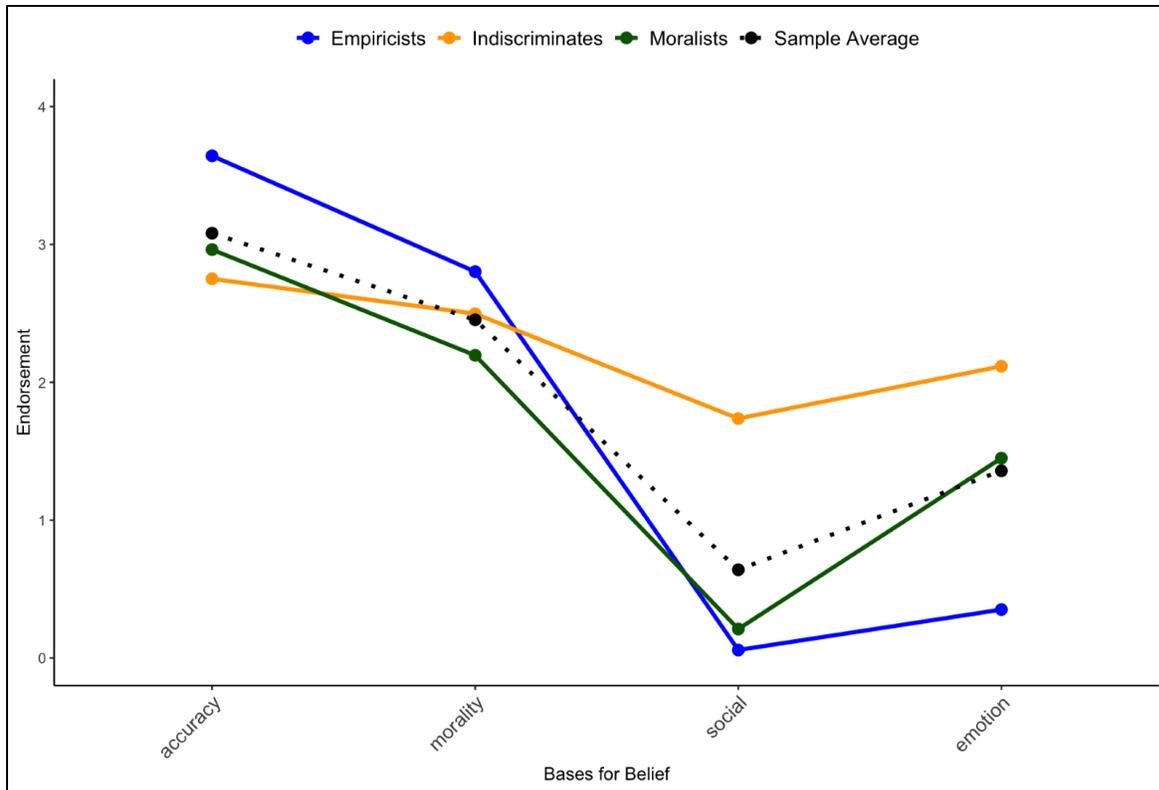
Results

Replicating Profiles

The three-profile model (see Figure 4.3) identified the familiar trio of profiles: Empiricists (27% of the sample), Moralists (42%), and Indiscriminates (31%).

Figure 4.3

Study 2: Three Profile Plot



However, unlike any other study, even the “Empiricist” profile of participants reported strong approval of morally motivated reasoning, even more so than Moralists and nearly on par with their own prioritization of accuracy. This was despite the sample mean ethics of belief being nearly identical as in previous studies. Nevertheless, the “Empiricist” profile still prioritized accuracy, and rejected the influence of social and emotional goals on reasoning.

Motivated Elevation

I tested for motivated elevation using a multilevel logistic regression predicting participants’ evidence judgements (not evidence = 0; evidence = 1) from the favorability of the information (unfavorable = -1; favorable = 1) and random intercepts for each participant and statement. This initial model yielded a strong motivated elevation effect ($OR = 7.93$, 95% CI [5.74, 10.95], $p < .001$; nearly twice the effect as in Study 1, $OR = 4.04$, 95% CI [3.51, 4.66]).

Moralization

The mean-level of moralization ($M = 3.20$, $SD = 1.31$; Range = 1-5) suggested that on average participants again moralized their opinion on the issue (similar to Study 1, $M = 3.34$). Additionally, as in Study 2, participants who moralized the topic of race differences more also used motivated elevation more ($OR = 1.33$, 95% CI [1.06, 1.65], $p < .012$).

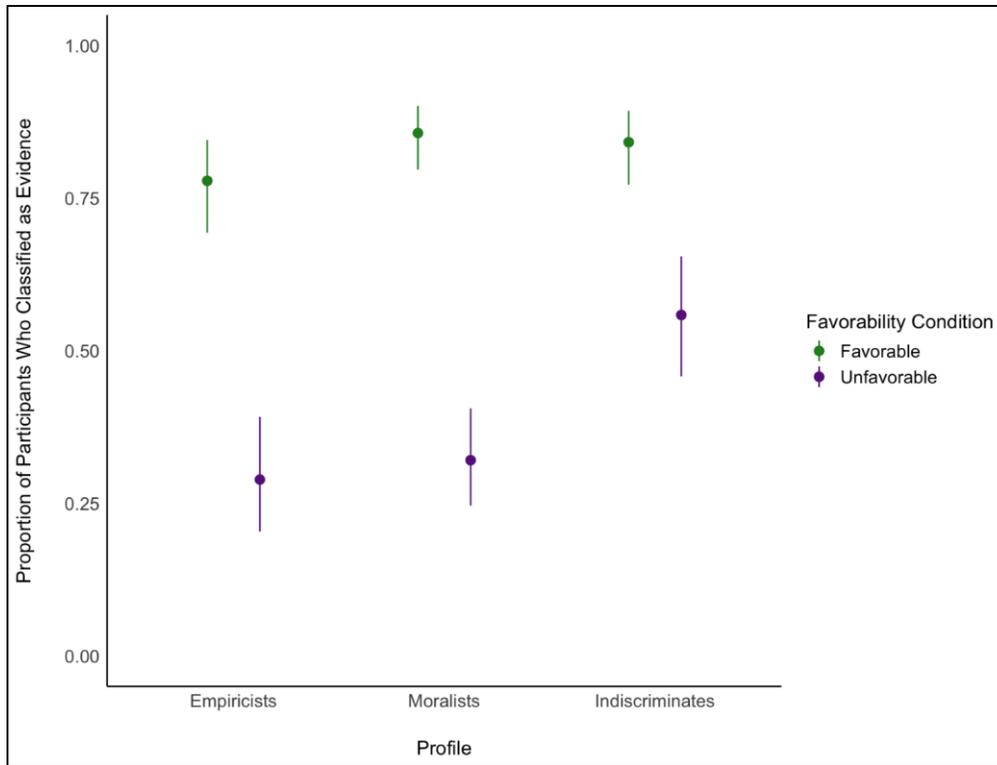
Moderation of Motivated Elevation By Ethics of Belief

Moderation of Morally Motivated Elevation by Profile

To test whether this effect was moderated by profile, I fit an additional model including the profile variable and its interaction terms with the favorability variable. In this model, Empiricists (or rather, participants whose ethics of belief were most consistent with empiricism) engaged in the same amount of motivated elevation as Moralists ($p = .291$), but, again, (marginally) *more* motivated elevation than Indiscriminates ($OR = 0.49$, 95% CI [0.23, 1.03], $p = .059$). Moralists also engaged in more motivated elevation than Indiscriminates ($OR = 0.33$, 95% CI [0.17, 0.66], $p = .002$). Nevertheless, the simple slopes revealed that Empiricists ($OR = 2.95$, 95% CI [2.20, 3.90], $p < .001$), Moralists ($OR = 3.56$, 95% CI [2.80, 4.53], $p < .001$), and Indiscriminates ($OR = 2.05$, 95% CI [1.58, 2.67], $p < .001$) all used motivated elevation (Figure 4.4).

Figure 4.4

Study 2: Profile Differences in Motivated Elevation



Moderation of Morally Motivated Elevation by Bases for Belief

Although not pre-registered for Study 2, to be consistent with Study 1 I also tested whether motivated elevation was moderated by the trait-level bases for belief. Specifically, I fit a single multilevel model including all bases for belief and their interaction terms with the favorability condition as predictors, as well as random intercepts for participants and each piece of information. In this model, neither willingness to engage in morally motivated reasoning ($OR = 1.27$, 95% CI [0.95, 1.70], $p = .105$) nor preference for accuracy-oriented reasoning ($OR = 1.15$, 95% CI [0.78, 1.70], $p = .477$) moderated motivated elevation. Unlike Study 1, willingness to engage in emotionally motivated reasoning also did not moderate motivated elevation ($OR = 1.04$, 95% CI [0.76, 1.42], $p = .806$). Only the willingness to engage in socially motivated reasoning moderated motivated elevation, again, by being associated with less of it ($OR = 0.53$, 95% CI [0.36, 0.78], $p = .001$).

Doubling Down on Motivated Elevation

I used two multilevel models to test whether study-specific beliefs about motivated reasoning related to motivated elevation. In both models, I included information favorability (unfavorable = -1; favorable = 1) as a predictor, as well as random intercepts for participants and each piece of information. In one model, I included the four items measuring participants' approval of motivated reasoning in the study (see Table 4.2 for all items) and all their interactions with the favorability variable, and in the other I included instead the items measuring participants' self-perceived use of motivated reasoning in the study and their interaction terms. In the first model using items measuring in-study *approval* of motivated reasoning, neither the preference for rational reasoning ($OR = 1.31$, 95% CI [0.94, 1.81], $p = .109$) nor approval of emotionally ($OR = 1.10$, 95% CI [0.73, 1.65], $p = .654$) or socially ($OR = 0.87$, 95% CI [0.58, 1.30], $p = .496$) motivated reasoning moderated motivated elevation. However, a greater willingness to engage in morally motivated reasoning was associated with more motivated elevation ($OR = 1.65$, 95% CI [1.14, 2.37], $p = .008$).

In the second model using items measuring self-perceived in-study *use* of motivated reasoning, the self-perceived commitment to rational reasoning did not moderate motivated elevation ($OR = 1.28$, 95% CI [0.91, 1.80], $p = .153$). Perceiving oneself to have engaged in morally motivated reasoning marginally moderated motivated elevation ($OR = 1.34$, 95% CI [0.98, 1.83], $p = .066$), such that it was associated with more motivated elevation. Conversely, perceiving oneself to have engaged in emotionally motivated reasoning also marginally moderated motivated elevation ($OR = 0.70$, 95% CI [0.47, 1.05], $p = .086$), but was associated with less motivated elevation; likewise, perceiving oneself to have engaged in socially motivated reasoning (just) significantly moderated the effect ($OR = 0.68$, 95% CI [0.47, 0.99], $p = .043$), and was also associated with less motivate elevation.

Discussion

I replicated motivated elevation for a sixth time and the three profiles of Empiricists, Moralists, and Indiscriminates for a seventh. However, for the first time, even the profile of participants conforming best to an empiricist ethics of belief rated morality nearly as important as accuracy in the determination of empirical beliefs. I did not find support for my pre-registered hypothesis in Study 1 (not predicted here) that Empiricists would use motivated elevation the least: Empiricists again used motivated elevation the same amount as Moralist participants, and both more so than Indiscriminate participants who largely approve of motivated reasoning.

I also did not replicate the Study 1 moderation of motivated elevation by approval of emotionally motivated reasoning using the ethics of belief scale. In this study, only approval of socially motivated reasoning moderated motivated elevation by being associated with *less* of it. As in Study 1, neither accuracy nor moral bases for belief moderated motivated elevation.

The beliefs that people reported about their approval and use of motivated reasoning in the study were more aligned with what one would expect if people acted in line with their ethics of belief: participants who reported approving of their moral values influencing their decisions were indeed more biased, as were participants who self-perceived being morally motivated in the study. In other words, people seemed to be aware they used morally motivated reasoning and approved of it. Prioritizing rational reasoning in the study and perceiving oneself to have stayed committed to rationality were unrelated to actual use of motivated reasoning. Finally, perceiving oneself to have actually engaged in more emotionally and socially motivated reasoning in the study was associated with *less* motivated elevation. This was not true for the two items measuring how important participants thought it was to remain emotionally and socially unbiased in the study.

One limitation of interpreting this work is that the wording of the questions about in-study use and approval of different forms of reasoning imply that accuracy-oriented reasoning is the normative standard, and that morally, socially, and emotionally guided reasoning are bad. This could have led some participants to conform to the experimenter, reporting more use and approval of accuracy-oriented reasoning but less use and approval of morally, socially, and emotionally guided reasoning; alternatively, it could have led to psychological reactance, leading some participants to report *less* use and approval of accuracy-oriented reasoning but *more* use and approval of morally, socially, and emotionally guided reasoning than they would if the question were worded in a more value neutral way. Future research should use question wording which does not convey a particular normative opinion to participants. Nevertheless, these dynamics do not seem to explain the pattern of results observed here.

4.4 General Discussion

Theoretical Implications

Where are Illusions of Objectivity?

These two studies showed evidence of morally motivated elevation, further demonstrating the role of motives in information evaluation and undermining Bayesian counter explanation of motivated information evaluation. They also replicated the three profiles in both studies, further undermining the prevalence of empiricist ethics of belief. But unlike the self-serving bias in Chapter 3, not only Indiscriminates used motivated reasoning: this time, even Empiricists were more willing to say that morally favorable (vs. unfavorable) anecdotes and non-expert opinions were truth-bearing evidence; as well, they were just as morally biased as Moralists, and both were more biased than Indiscriminates.

This could suggest that Empiricists use illusions of objectivity when morally motivated. However, even Empiricists in Study 1 were off the floor on their approval of morally motivated

reasoning (as in Studies 3 and 4 of Chapter 3); and, for the first time, even “Empiricists” in Study 2 strongly approved of morally motivated reasoning. That even “Empiricists” in this study approved of morality as a basis for belief is even further evidence against the assumption that people are committed to empiricism. Moreover, if people who said they approved of morally motivated reasoning in the ethics of belief scale also approved of the kind of morally motivated elevation captured earlier in the study, these findings do not support the often assumed illusions of objectivity that people need to use motivated reasoning.

The four bases for belief from the ethics of belief scale were related to motivated elevation in a conceptually similar way. Consistent with Indiscriminates using motivated elevation the least, approval of emotionally motivated reasoning in general was associated with less bias in one study, approval of socially motivated reasoning was associated with less bias in both studies, and prioritization of accuracy-oriented was associated with more bias in one study. However, approval of morally motivated reasoning in general from the ethics of belief scale was unrelated to the amount of motivated elevation displayed in either study. This is inconsistent with Moralists' greater use of motivated elevation (vs. Indiscriminates) in Studies 1 & 2 and Empiricists' greater use of it (vs. Indiscriminates) in Study 2 where they too strongly approved of morally motivated reasoning. To the extent that we would expect reasoning which is morally motivated to be more common amongst people who say they approve of being morally biased, this also contradicts the interpretation of motivated elevation in this study as being morally motivated.

However, in Study 2, I extended the ethics of belief scale designed to measure general approval of motivated reasoning by asking participants more directly whether they (i) felt that using motivated reasoning (moral, social, and emotional) in the study was appropriate (vs. remaining “rational and logical”) and (ii) actually used motivated reasoning in the study. These

situation-specific measures helped me test more directly which motives were driving participants' reasoning, as well as whether they may have required illusions of objectivity. In line with my characterization of motivated elevation in this study as specifically morally motivated, greater approval of using morally (but not socially or emotionally) motivated reasoning in the study was linked to increased motivated elevation, as was perceiving oneself to have actually been morally biased in the study. These results also do not support illusions of objectivity: because the people who used morally motivated elevation the most were the same people to say they were morally motivated in the study and approve of it, they were very likely not under illusions of objectivity.

Additionally, self-perceived use of socially and emotionally motivated reasoning were associated with *less* motivated elevation, as was approval of socially motivated reasoning in general on the ethics of belief scale in both studies and approval of emotionally motivated reasoning in one. These results are most consistent with, if anything, an illusion of subjectivity: people who claimed to be more emotionally and socially biased were in fact less so. However, I did not find the same effects with the two items asking people how much they thought they should have remained emotionally and socially unbiased in the study. More research is required to assess how robust this finding is, and, if it is, why people who approve and think they have used motivated reasoning more actually appear to have used it less.

Nevertheless, people who reported more commitment to remaining rational and logical in the study were no less biased, and neither were people who said they actually were more rational and logical. This is consistent with illusions of objectivity: if people did use illusions of objectivity to defend an empiricist self-concept, then their beliefs about how rational and logical they were would be unmoored from their actual bias. Similarly, illusions of objectivity might allow people to say that they value rationality and being logical without actually acting in line

with this ethic. Thus, analysis of in-study beliefs about the use and prioritization of rational reasoning do yield some evidence (via null effects) in favor of illusions of objectivity.

Explaining an Indiscriminate Ethics of Belief

Surprisingly, Indiscriminates who prioritized accuracy and morally motivated bases for belief most equally were the least likely to use morally motivated elevation. Inspecting these judgments (Figures 4.2 and 4.4) suggests that this is due to Indiscriminates being more willing than Empiricists and Moralists to consider unfavorable anecdotes and non-expert opinions to be evidence that a perfectly logical truth-seeker would use to discern the truth. Similarly, approving of socially and emotionally motivated reasoning in general and perceiving oneself to have used it in the study were actually associated with less motivated elevation. None of these findings were expected based on *a priori* theorizing, and they are not consistent with any prior work I am aware of. That is, no work I am aware of in psychology that would suggest people more open to motivated reasoning would be less likely to use it. Thus, it is possible that these findings are erroneous and would not be robust to more tests of morally motivated elevation in other contexts.

But why might people with a more Indiscriminate ethics of belief that is less fixated on unbiased reasoning towards accurate beliefs be less likely to use motivated elevation? Why was greater prioritization of accuracy in general associated with *more* motivated elevation in Study 1? One possibility is that people with a more indiscriminate (vs. empiricist) ethics of belief are less threatened by evidence disconfirming their beliefs: if a belief making you feel happier or a sense of shared reality with others is enough for you to feel confident in it, then perhaps evidence contradicting beliefs is less threatening, as it does not call for revision of one's beliefs.

Conversely, for someone with a more empiricist ethics of belief who thinks that their beliefs must align with the evidence, information purporting to disconfirm a desirable conclusion may be more threatening: even unfavorable evidence should be accounted for by one's belief. Thus,

the greater threat posed by disconfirming information to people with a more empiricist ethics of belief may give people extra drive to reject it through motivated reasoning. This is also consistent with a common critique of classical empiricist worldviews from feminist epistemology: that empiricists often use “objectivity” selectively as a way of excluding perspectives they disagree with.

One way of testing this would be to have participants complete a version of the present studies focused on the motivated discounting of science rather than the motivated elevation of anecdotes and non-expert opinions. Researchers could have participants go through the paradigm used in Chapter 2 and in this chapter, and at the end of the study rate how much their belief *would* be discredited if the unfavorable scientific studies they read were true and valid. If people with a more empiricist ethics of belief are more likely to try and discredit information because it threatens a desired belief (as observed in this chapter), then the greater threat they perceive to their desired beliefs if the belief-threatening science were true should mediate the impact of their empiricist ethics on greater use of motivated discounting.

Metascientific Implications

Illusions of Empiricism?

In Chapter 3, across four studies and nearly 4,500 participants, I showed that most people do not report an empiricist ethics of belief: only a minority of participants rejected bases for belief besides the unbiased pursuit of accurate beliefs. In Studies 3 and 4 of Chapter 3, Empiricists were even noticeably off the floor on their approval of morally motivated reasoning. This was also true in Study 1 of this chapter, and in Study 2 of this chapter even the group of participants whose ethics of belief most aligned with empiricism also approved of morally motivated reasoning a great deal. Thus, this chapter (with another 2,459 participants) further

challenges the standard theory of motivated reasoning by suggesting that people who hold a truly empiricist ethics of belief are not the majority.

How did the view that people are committed to empiricism persist in psychology, even though accumulating findings suggested otherwise, and meanwhile philosophers of similar topics had moved on from such strict empiricist views about belief? Ironically, findings from psychology might shed light on this question. In particular, psychologists have shown that people have a habit of thinking that everyone else has similar beliefs as themselves: the egocentric bias (Ross, Greene, & House, 1977). When people fall prey to the egocentric bias, they falsely perceive a consensus amongst others that matches their own beliefs. There is also evidence of a “curse of knowledge” effect on perspective-taking (Birch & Bloom, 2007), where people struggle to account for personal knowledge when simulating another’s perspective.

Applied to professional scientists, these effects suggest that we may find it difficult to fully appreciate the impact years of being in the academy have had on what we find intuitively true and obvious. In the science of motivated cognition, the curse of knowledge may be particularly impactful because science is built on an empiricist worldview fundamentally at odds with motivated cognition. Based on these findings, it seems plausible that egocentric biases and curses of knowledge may have influenced the progression of theory on motivated reasoning.

Coda

These findings reinforce my challenge to recent Bayesian attempts to explain away motivated information evaluation as well as the traditional assumption that people hold an empiricist ethics of belief. They also more forcefully challenge the idea that people require illusions of objectivity to use motivated reasoning: the evidence here suggests that even those with the most empiricist ethics of belief are not immune to morally motivated reasoning, but even they often approve of morally motivated reasoning. Moreover, the surprising tendency of

people with a more Indiscriminate ethics of belief to exhibit less motivated elevation is even more inconsistent with people needing illusions of objectivity. These insights highlight further the value of personal epistemologies in explaining reasoning, and call for further investigation into how personal epistemologies shape reasoning and belief systems.

Chapter 5: Everyday Ethics of Belief

5.1 Explaining the Prevalence of Motivated Reasoning

How do people use motivated reasoning so often if it is at odds with how we are typically taught we should reason (i.e., as an unbiased empiricist)?

A recent wave of Bayesian critiques of motivated reasoning attempt to explain away the prevalence of motivated information evaluation, one of the most prototypical cases of motivated reasoning central to the idea of reasoning as fundamentally motivated. In particular, Bayesians argue that rejecting unfavorable information can appear motivated if we do not consider that people come to the study with prior evidence supporting their beliefs, and this shapes their reasoning. Specifically, this prior body of evidence can make unfavorable information not only threatening to our desired conclusions, but genuinely epistemically implausible. However, in Chapter 2 I used an adjusted version of a classic paradigm which rules out Bayesian counter-explanation to challenge this view: my findings consistently suggested that motives indeed infect information evaluation by biasing our attribution of the label “evidence” to information based on whether or not it supports our preferred conclusion. This can cause people to discount science as not being evidence, but also to elevate individual anecdotes and non-expert opinions to the status of evidence. Of course, listening to individual voices, especially those most impacted by an issue, is important. But drawing firm conclusions about broader truths - such as the existence of economic inequality or the effectiveness of different policies designed to redress it - requires evidence that is rigorous, replicable, and generalizable.

Possessing (perceived) evidence is core to the justification of one’s beliefs (Epley & Gilovich, 2016; Kruglanski & Ajzen, 1983; Kunda, 1990; Pyszczynski & Greenberg, 1987; Williams, 2022), but also to collective decision-making as disagreement over what counts as valid evidence may add another layer to conflicts between (groups of) people. If people at least

agreed on the evidence that needs to be accounted for, looking at it together could align their beliefs. But without that fundamental shared reality that evidence provides (Hardin & Higgins, 1996; Kopietz et al., 2010), it is difficult to imagine a conflict being resolved. And even if people were to agree on a single conclusion (e.g., that global warming is happening), their different bodies of evidence may still suggest differing explanations for the same truth (e.g., anthropogenic vs. naturalistic explanations). Thus, disagreement would persist, and because different beliefs imply different courses of action, progress would likely stall on the substantive issue at hand. Debiasing evidence judgments such that people can agree on what counts as evidence may therefore have a stabilizing force on disagreements that cannot get off the ground because sides are working with different bodies of evidence.

A more classic explanation for the prevalence of motivated reasoning is that people are able to use motivated reasoning, despite their commitment to empiricism prohibiting it, because they use illusions of objectivity to shield themselves from realizing they are being biased. However, in Chapter 3 I found that most people were not Empiricists: they were Moralists who approved of morally motivated reasoning, or even Indiscriminate who also approved of socially and emotionally motivated reasoning. This challenges the prevalence of empiricist ethics of belief, opening up the possibility that many people do not need illusions of objectivity to sustain their motivated reasoning. Furthermore, in the case of the self-serving bias, where reasoning is thought to be biased by social and emotional goals, Empiricist and Moralist participants who did not approve of socially and emotionally motivated reasoning did not do it. Only Indiscriminate participants who approved of social and emotional bias did. This further questioned the necessity of illusions of objectivity, as it suggests that people may instead act in line with their ethics of belief instead of using self-deception to merely think they are.

In Chapter 4, I tried to create conditions that would tempt even Empiricists to engage in motivated reasoning by manipulating their moral motives. These conditions led all participants, including Empiricists, to use morally motivated reasoning. This could suggest that Empiricists may have needed illusions of objectivity, but even Empiricists strongly approved of morally motivated reasoning in the second study, undermining their need for illusions of objectivity. The only source of evidence in favor of illusions of objectivity I found was that participants' views about the importance of remaining rational and logical and even the degree to which they were in fact rational and logical throughout the study did not predict their actual motivated reasoning.

5.2 Personal Epistemologies

Epistemology is the branch of philosophy concerned with knowledge and reasoning, and it includes a long and rich tradition of descriptive and normative arguments for psychologists to draw on (Steup & Neta, 2005). One way for social and personality psychologists to draw on this work is to study personal epistemologies: peoples' beliefs about knowledge and reasoning. Indeed, there are a range of epistemic beliefs which can impact our reasoning (Hofer & Pintrich, 2012; Muis et al., 2006), often because of motivational incentives. For example, when people are met with unfavorable science, they are more likely to say that scientific inquiry is not able to answer the question at hand (Munro, 2010), and that their claim is not, in principle, falsifiable (Friesen et al., 2015). Similarly, people evaluate the validity (not veracity) of structurally equivalent logical arguments differently according to which argument they agree with (Gampa et al., 2019). Like the evidence judgements captured in Chapters 2 and 4, these judgements are not a necessary part of the reasoning process or the genealogy of each belief, but they may be relevant in a variety of contexts, such as persuasion, during metacognition about one's own reasoning, perspective taking another's reasoning, argumentative contexts, cases which present

conflicting information, during formal education, or cases where information relevant to an important belief or interesting topic capture our attention and cognitive resources.

Personal epistemologies have been studied widely in educational psychology (Hofer, 2001; Hofer & Pintrich, 1997; Hofer & Pintrich, 2012), and various “thinking style” constructs scatter the broader individual differences literature as well (e.g., *the need for cognition*, Cacioppo & Petty, 1982; *preference for intuition and deliberation*, Epstein et al., 1996; *the need for structure*, Neuberg & Newson, 1993; *the need for cognitive closure*, Webster & Kruglanski, 1994; and Newton et al. 2021 for reviews). There has also been an uptick in recent years on topics relating to the science of belief -- for example, research on misinformation, science denial, trust in experts, political polarization, secularization, toxic discourse, conspiracy theories, media literacy, and online echo chambers -- and it is common to point to motivated reasoning as a major source of bias and false beliefs across these domains. But the personal epistemologies surrounding motivated reasoning have gone almost entirely undocumented until very recently¹¹ (Cusimano, 2024; Ståhl & Cusimano, 2024).

In this dissertation, I assessed a sliver of personal epistemologies: views about what counts as (i) empirical evidence of broader realities and (ii) appropriate bases for reasoning about empirical beliefs. In both cases, people deviated from traditional views of unbiased empiricism: they shifted their standards for evidence depending on the outcome they wanted to have evidence for, and they stated explicitly that empirical accuracy is not even their only basis for empirical belief. When motives were particularly strong through moral incentives, even participants with the most empiricist ethics of belief used motivated reasoning, and in one study even the most empiricist participants said that morality was an important basis for their beliefs alongside accuracy. These findings conflict with the commonly held view, by psychologists, of everyday people as struggling empiricists who simply fail to abide by their ideals in the face of powerful

motives. Instead, they suggest that most people have a personal ethics of belief which supports motivated reasoning.

However, these views merely scratch the surface of issues discussed in the ethics of belief literature, let alone in (social) epistemology more broadly. What else could psychologists learn by engaging with peoples' personal epistemologies? Below, I sketch out a few directions for future research on personal epistemologies:

Is and Ought

In Studies 1a and 1b of Chapter 3, I asked participants to list a few beliefs that they thought fit the criteria laid out in the Ethics of Belief Scale instructions (i.e., to be descriptive and not normative). I then manually coded whether each belief was descriptive or not, and excluded participants from the initial LPAs that provided any non-descriptive beliefs. I chose to stop doing this, ultimately, for practical reasons: it was extremely labor intensive to manually verify that each participant provided beliefs that were correctly descriptive and not normative, especially as I realized we would need larger samples.

Nevertheless, the decision to stop asking participants to provide example beliefs which fit the instructions may have influenced which participants were included in the profile analysis, and therefore the shape and proportion of profiles. This is because removing this hurdle to inclusion may have inadvertently led to including more participants who do not understand (or agree with) the distinction between descriptive and normative beliefs. In turn, these participants who perceive a fuzzier line between the descriptive and normative may have been more willing to approve of their emotional, social, and especially moral goals biasing their reasoning, influencing the shape of all profiles in this direction as well as the proportion of non-empiricist participants.

Although this generates more ambiguity about the views participants in each profile may actually have, it suggests a fruitful direction for novel research: exploring the degree to which people perceive a clear distinction between descriptive and normative domains, as well as the interaction between this belief and approval of (especially morally) motivated reasoning. After all, participants in my studies commonly said that it was OK for their moral values to bias their reasoning about even empirical issues with a correct or incorrect answer that could be revealed by evidence. And in one study, they even said that their moral values did and ought to have biased a core empirical judgement: whether anecdotes and non-expert opinions should count as evidence. While developing the instructions for the Ethics of Belief Scale in Chapter 2, I also initially struggled to write instructions that made participants reliably distinguish empirical from moral beliefs, suggesting that they view the pursuit of truth in these domains similarly unless prompted to think otherwise.

Maybe in hindsight this should come as no surprise: in past work, participants have been more likely to treat their moral (vs. nonmoral) beliefs as if they were objective empirical facts (Goodwin & Darley, 2008 & 2010) and to say that their moral (vs. strong but nonmoral) beliefs are universally true across time and location (Skitka et al., 2021). Recent work has also found that samples are willing to condone the morally motivated reasoning of others (Cusimano & Lombrozo, 2021) and themselves (Cusimano & Lombrozo, 2023). It is even common for people to view their commitment to rationality as a moral one (Ståhl et al., 2016; Clifford, 1877). Collectively, these findings suggest that a key way personal epistemologies deviate from the traditional empiricist assumption is in the role of morality. How does morality feature in personal epistemologies? Several views in the ethics of belief literature could be used by psychologists to explain how personal epistemologies might accommodate morality in empirical reasoning:

That our beliefs can cause (or perpetuate) real harm has led some philosophers to argue that the moral implications of our beliefs ought to affect our empirical beliefs by modulating the amount of evidence we require to arrive at a conclusion (“moral encroachment”; Gardiner, 2018). For example, in a male-dominated workplace where all secretaries are women, accuracy-oriented statistical reasoning might suggest that a woman encountered in the office is likely a secretary. However, forming this belief based on such reasoning wrongs women by reinforcing gender stereotypes and risks causing actual harm, such as undermining a colleague’s professional standing or perpetuating bias. Thus, proponents of moral encroachment contend that stronger evidence is required to justify beliefs as they cause greater harm. Moral encroachment intuitions could support people in using morally motivated reasoning without illusions of objectivity, rationalizing “bias” that a traditional empiricist would see as clearly untenable empirical reasoning. At the same time, if people agree with moral encroachment intuitions then they are saying that they are at least open to changing their mind with enough evidence, and may be willing to admit what it would take, empirically, to change their mind.

But a stronger perspective in the ethics of belief literature argues that we can wrong people simply by believing false but insulting or offensive things about them, even when these beliefs cause no direct harm or are actually aligned with our evidence (Basu, 2018). For example, the view goes, by believing that someone will give a worse tip simply because of racial stereotypes about their group, we wrong them (Basu & Schroeder, 2018). This “epistemic wrongdoing” would occur even if we did not provide them with worse service (i.e., caused no direct harm by the belief) and had statistical evidence to support our conclusion because epistemic wrongdoing indirectly perpetuates harmful beliefs and directly disrespects the dignity and individuality of others. Although addressing actual epistemic wrongdoing is important and it is easy to imagine how people having an intuition of epistemic wrongdoing would be a useful

mechanism for maintaining cooperation, it is also easy to imagine how an aversion to epistemic wrongdoing could limit epistemic reasoning in domains such as science, education, and policymaking. In turn, aversion to epistemic wrongdoing could ironically perpetuate harms caused by ignorance about the nature and mechanics of inequalities and other harms. If people view the avoidance of epistemic wrongdoing as a valid justification for their empirical beliefs, they may even be able to defend their morally motivated empirical beliefs, without illusions of objectivity, in the face of overwhelming evidence to the contrary.

A final and most extreme view about the relationship between morality and epistemology in philosophy is moral realism (Sayre-McCord, 2021). While moral encroachment views argue that moral implications ought to influence how much evidence we need and epistemic wrongdoing suggests that some beliefs can be wrong even when they do not cause harm and are supported by evidence, moral realists argue that moral statements can describe mind-independent facts about the world that can be objectively true or false. From this perspective, statements like “murder is wrong” can actually be true and not mere expressions of strong, emotionally-based, culturally-learned, or evolved moral preferences. Moral realists also often argue that when we are determining our empirical beliefs, we should rely on an intuitive combination of our empirical and moral “evidence”. The veracity and details of moral realism are a matter of debate in philosophy, but according to the PhilPaper’s Survey in 2020 (Bourget et al., 2023) 61.55% of 1,719 professional philosophers who responded either accepted or leaned towards moral realism, 26.12% rejected or leaned away from it, and the remainder reported a third (presumably more nuanced) point of view. Interestingly, this view is likely seen as heresy by many social scientists (particularly cultural and moral psychologists). It would take another dissertation to accurately map out the breadth of debate on moral realism (including their precise connection to moral encroachment and epistemic wrongdoing). But given the empirical findings I have reviewed

(particularly Goodwin & Darley, 2008 & 2010 & Skitka et al., 2021) and my own struggle getting participants to distinguish moral from empirical claims, it seems likely that many people would endorse some version of moral realism. This personal epistemology could give them a license to use morally motivated reasoning in morally charged contexts (e.g., politics, interpersonal disagreements), without illusions of objectivity, when they think there are moral reasons to believe one way or the other.

In short, if everyday personal epistemologies include intuitions like epistemic wrongdoing, moral encroachment, and moral realism, this could help explain morally motivated reasoning and how it could work without illusions of objectivity. More broadly, taking conceptual work from philosophy and recasting them as testable empirical questions about psychology can help compensate for the biases of our own field, which had gone so long assuming that everyday people (let alone serious scholars) would never hold views so at odds with traditional empiricism.

Virtues of Thought

Another salient but distinct connection between moral philosophy and epistemology comes from virtue theoretic approaches to the ethics of belief (e.g., Roberts & Wood, 2007; Zagzebski, 1996). These approaches argue that we should not judge thinkers by how correct or incorrect they are, but by how well their thinking actualizes various virtues of thought. In this dissertation, I have touched on some virtues of thought (i.e., being evidence-based and impartial), but there are a multitude of epistemic virtues (and vices) that people use to describe each other: wisdom (Grossmann, 2017; vs. naivete), intellectual humility (Porter et al., 2022; vs. arrogance), honesty (Miller, 2021; vs. deceitfulness), curiosity (Loewenstein, 1994; vs. apathy), and open-mindedness (Kruglanski, 2013; vs. closed-mindedness), to name a few. But aside from scattered research on individual epistemic virtues, there is no work trying to synthesize these

constructs into a coherent framework of their own. What are the primary epistemic virtues people use to describe themselves and each other? Unfortunately, I do not have the data to make any claims about what this taxonomy of epistemic virtues and vices ought to include, but I believe it is a fruitful direction for future research.

Indeed, we know that competence and morality are dominant components of person perception that people care about and use to decide who to cooperate with (Fiske et al., 2007; Goodwin et al., 2014). On the one hand, epistemic virtues are clearly relevant to competence. Intuitively, they would seem to moderate the perceived cooperative value of (in)competent cooperation partners: for example, it may be preferable to work with someone who is less competent if they are also honest, humble, open to changing their mind, or curious than someone who is highly competent but also deceitful, arrogant, resistant to changing their mind, or apathetic to learning. On the other hand, epistemic virtues are just that: *virtues*. People moralize epistemic traits like honesty, impartiality, and humility, and epistemic virtues are likely prominent in our views of someone's overall moral character. Put simply, there is good reason to think that people care about epistemic virtues because they are highly related to known components of person perception (competence, morality) that people use to understand the social world and make decisions about cooperation.

Beyond person perception, epistemic values also seem to be a missing component in contemporary personality research. Many epistemic virtues may be best conceptualized as values. In psychology, values (e.g., autonomy) are goals which are broad enough to apply across diverse situations (Parsons & Shils 1951; Rokeach, 1973; Schwartz, 2012). For example, whether at a work meeting, friend's birthday outing, or in-class discussion, there will be ways of acting in a more or less autonomous (vs. conformist) manner. The cross-situational relevance of values makes them powerful guiding principles in peoples' lives, and thereby useful constructs

for characterizing personality and explaining behavior. Two of the most popular taxonomies of values in psychology attempt to describe basic human values in general (Schwartz & Bilsky, 1987; e.g., hedonism, achievement, tradition), as well as moral values in particular (e.g., loyalty, respect for authority, purity, harm reduction, fairness; Graham et al., 2011). These values predict a variety of attitudes, behaviors, and personal outcomes (Deghani et al., 2016; Nilsson et al., 2020; Reimer et al., 2022; Sagiv et al., 2017; Sagiv & Roccas, 2021; Sagiv & Schwartz 2021) and are related to but distinct from behavioral dispositions like the Big 5 traits (Parks-Leduc et al., 2015; Roccas et al., 2002). At the same time, it may be better to think of other epistemic virtues as behavioral dispositions, given that possessing a virtue (e.g., honesty/humility, which coincidentally occupy a 6th trait in an expanded version of the Big 5; Ashton & Lee, 2007) essentially means acting in line with it (e.g., *being* honest and humble) across situations (Roberts & Wood, 2007; Zagzebski, 1996). In any case, there are a number of epistemic virtues consistent with values and behavioral disposition-based approaches to personality, and including them in these discussions could expand our ability to explain relevant behaviors (e.g., social media behavior; conspiracy theories) through personality.

Rather than taking a top-down approach to redressing this gap, it could be more efficient and impartial to use a bottom-up method on appropriate data to search for natural groupings of epistemic virtues and personality descriptors in data. For example, researchers could make a list of epistemic traits from the dictionary, have many participants rate various people they know on these traits, and use factor analysis to identify the core factors explaining the epistemic trait space. Alternatively, researchers could take a less traditional but lexical approach, inspired by research on the Five Factor Model (John et al., 1992), by using methods from classic text analysis (word counts) and Natural Language Processing (NLP; e.g., topic modeling) to identify commonly occurring themes in natural language. For example, researchers could ask participants

to generate descriptions about people based on the way that they think and use topic modeling to identify emergent themes. There is also a wealth of free text online, such as Project Gutenberg alone which contains over 70,000 books, which could be mined for text describing people, and used in a similar way.

Beyond developing a core taxonomy of epistemic virtues, large text corpora, such as Project Gutenberg or the LOCO corpus containing 88-million words of news articles including conspiratorial and non-conspiratorial news (Miani & Hills, 2021), also hold exciting opportunities for studying epistemic behaviors recorded in text. Indeed, justifications, arguments, echo chambers, reactions to science, questions, requests for evidence, and many other epistemic behaviors are observable in text. Measuring epistemic behaviors in text could offer new opportunities for applied work beyond nudges and other interventions targeting individual behavior change. For example, measuring epistemic behavior at scale can be used to monitor epistemic norms over time, before and after different (news) events, and in different online communities. This information can in turn inform decisions about how to use, regulate, or design online systems in a way that minimizes consequences. The ability to automatically detect epistemic vices in text could also be used to automate interventions: for example, being able to detect a spike in incivility within a community (e.g., a subreddit, facebook group) could trigger websites to downregulate the circulation and recommendation of content from that community. Instead, because content algorithms are usually optimized for engagement only, they are currently more likely to upregulate this content. Thus, building information technologies with epistemic awareness could help us better cope with the complexity of our new information ecosystem.

5.3 Limitations and Opportunities

My research does have limitations to its generalizability: my samples are drawn from US crowdsourcing websites, which may not be representative of the broader American population, let alone global populations. This issue goes beyond demographic generalizability: even a sample nationally representative on a range of demographic characteristics, if collected on a crowd-sourcing website, will be different from the general population insofar at least that all participants are people who spend large amounts of their time taking surveys and completing microtasks, often having completed thousands of surveys. Moreover, data from these common crowdsourcing websites are often of questionable quality (Douglas et al., 2023), and I had to remove many participants based on simple attention checks. In short, it is possible that the effects and ethics of belief profiles replicated in this dissertation do not generalize well beyond crowdsourced workers, and may vary in more random samples of the general population such as through random number dialing or approaching people on the street (which each introduce their own sampling biases as well).

As well, I did not perform *a priori* power analyses to determine my sample sizes prior to collecting data, which may have led to underpowered statistical tests. To address this possibility, I perform other power analyses on the main effects of motivated cognition observed in Chapters 2-4, as well as their moderation by profile in Chapters 3 and 4. These analyses suggested that I was adequately powered to detect the self-serving bias and motivated empiricism, but underpowered for detecting the moderation of these effects by profile, except in Experiment 1 of Chapter 4. Thus, future work is necessary for understanding differences in the actual use of motivated reasoning between profiles. It is crucial that this work leverage well-powered designs, such as the use of repeated measures and strong manipulations, and improve the measurement of relevant theoretical constructs to reduce measurement error.

Personal ethics of belief may also vary across cultures (e.g., Lin et al., 2022). Indeed, there are a number of cultural differences in cognition which suggest there may also be cultural differences in motivated reasoning and personal epistemologies. Generally, participants in East Asian samples reason differently than Western participants by processing information more “holistically” (Nisbett et al., 2001; Varnum et al., 2010): for example, by attributing observed behavior more often to context (vs. internal traits; Choi et al., 1999) and accepting contradiction more (Peng et al., 1999). Some cultural differences are also relevant to motivated reasoning in particular; for example, greater collectivism is associated with increased belief in pseudoscience and fake news (Lin et al., 2022) as well as other epistemically suspect beliefs (e.g., in paranormal phenomena, Majima et al., 2022), which are often the product of motivated reasoning at the individual level. Accordingly, there may be cross-cultural differences in personal ethics of beliefs and epistemologies more broadly. The cross-cultural research on cognition suggests that Empiricism, a highly analytic ethics of belief rooted in Western enlightenment values, is likely less common in more interdependent and collectivist cultures, where Indiscriminate ethics of belief may be more common. However, the epistemic profiles I observed in Chapters 3 and 4 may not exist at all in other cultures, or the measure I created may not contain the bases for belief needed to capture relevant cultural differences. Understanding cross-cultural differences is therefore a fruitful next step for researchers interested in ethics of belief and motivated reasoning.

My conclusions are also based only on the self-serving bias and motivated information evaluations. Although these are both canonical cases of motivated reasoning, I operationalized the self-serving bias only in the context of feedback to analytic and emotional intelligence tests, and motivated information evaluation only in the context of gun bans, progressive tax policies, and racial differences. The effects I observed may vary across other domains, and in more

realistic contexts than online surveys. These two phenomena are also not representative of the diversity of cognitive tools people have to defend their motives (Epley & Gilovich, 2016; Tesser et al., 2000), and there is a need for more work measuring personal ethics of belief alongside other forms of motivated reasoning. Are illusions of objectivity more common for certain kinds of motivated reasoning? For different motives?

The fact that the self-serving bias I observed in my paradigm produced a significant sample level effect despite only one minority group of participants driving the effect also suggests that Empiricists, Moralists, and Indiscriminates may use different types of motivated reasoning to defend their beliefs. Indeed, Empiricist and Moralist (vs. Indiscriminate) participants who most strongly felt that their beliefs needed evidence were also more likely to evaluate whether new information was evidence or not in a way biased by their motives. Are Moralists the most likely to use excuses to justify their immoral behavior? Are Indiscriminates the ones driving other cases of motivated reasoning? Questions such as these address an important aspect of generalizability often overlooked in psychology: the generalization from the sample to the individual participants in the sample (Fisher et al., 2018). Beyond the particular profiles I observed, my work suggests that future researchers should consider heterogeneity in (at least) motivated reasoning, personal ethics of belief, and personal epistemologies more broadly.

5.4 Outlook

Navigating our way to truth is increasingly complicated: we have access to better science and more sources than ever before, but also an information ecosystem that incentivizes content which is optimized for engagement, not truth. Falsehoods, motivated biases, and disagreements over empirical facts obscure our understanding and contribute to harm, conflict, and the breakdown of cooperation that prevents progress. Motivated reasoning is one cause of these issues, and although it is often personally enjoyable it can magnify disagreements and entrench

falsehoods over what is empirically true. In this dissertation, I provide evidence that personal epistemologies—the beliefs people hold about knowledge and reasoning—can support motivated reasoning. In particular, my findings in Chapters 3 and 4 as well as prior work I have reviewed suggest that morality plays an important role in these personal epistemologies, violating traditional empiricist ethics and reinforcing morally motivated reasoning.

However, the role of morality in personal epistemologies need not be negative. Though moral motivations can lead to biased empirical reasoning and all the externalities that come with it (e.g., intergroup conflict; misguided economic beliefs; science denial), they can also convict us to virtuous pursuits like being wise, logical, skeptical, attentive, impartial, incisive, humble, honest, curious, creative, persistent, and prudent. In this light, the role of morality in reasoning and personal epistemologies can be seen as more of a double-edged sword. The key challenge, then, is how to work with the inherent influence of morality on reasoning while mitigating its negative effects. How can we harness the positive potential of morality to improve reasoning while limiting its distorting influence on our empirical understanding?

As discussed in section 1.2.2, “good” thinkers do not just reach correct conclusions consistently, but embody a range of virtues of thought that are often highly moralized. Thus, promoting norms of diverse epistemic virtues, we may be able to foster a more constructive relationship between morality and empirical truth. For example, encouraging students to develop a more holistic epistemic character not so fixated on always being correct may mold them into adults who are more willing to engage thoughtfully with evidence, even when it challenges their moral intuitions or other preferred conclusions. Because epistemic virtues are moralized, strong commitment to them may serve as a buffer between morality and sound empirical reasoning. Indeed, Ståhl et al. (2016) find that many people moralize being rational, and the extent to which people moralized rationality predicted outcomes like their disbelief in scientifically suspect

beliefs and harsher moral judgements about people who acted irrationally. This is suggestive evidence that morality can be harnessed alongside epistemic virtues to improve reasoning. A virtue-based approach to reasoning also seeks to work with, rather than against, the morally infused nature of our reasoning. Cultivating in ourselves and in our culture a broader range of epistemic virtues can help us make better use of our moral minds. Rather than attempting to force a separation between the moral and epistemic—a separation that most people are unwilling or unable to make—we can try to create norms where morality supports, rather than undermines, our collective pursuit of truth.

References

- Anderson, M. C., & Hanslmayr, S. (2014). Neural mechanisms of motivated forgetting. *Trends in cognitive sciences*, 18(6), 279-292.
- Aramovich, N. P., Lytle, B. L., & Skitka, L. J. (2012). Opposing torture: Moral conviction and resistance to majority influence. *Social Influence*, 7(1), 21-34.
- Ashton, M. C., & Lee, K. (2007). Empirical, theoretical, and practical advantages of the HEXACO model of personality structure. *Personality and social psychology review*, 11(2), 150-166.
- Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The “Reading the Mind in the Eyes” Test revised version: a study with normal adults, and adults with Asperger syndrome or high-functioning autism. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, 42(2), 241-251.
- Baron, J., & Jost, J. T. (2019). False equivalence: Are liberals and conservatives in the United States equally biased?. *Perspectives on Psychological Science*, 14(2), 292-303.
- Barrett, T. (2015, February 27). Inhofe brings snowball on Senate floor as evidence globe is not warming. *Cable News Network*. <https://www.cnn.com/2015/02/26/politics/james-inhofe-snowball-climate-change>
- Basu, R. (2019). The wrongs of racist beliefs. *Philosophical Studies*, 176(9), 2497-2515.
- Basu, R., & Schroeder, M. (2018). Doxastic wronging. In *Pragmatic encroachment in epistemology* (pp. 181-205). Routledge.
- Bates D, Mächler M, Bolker B, Walker S (2015). “Fitting Linear Mixed-Effects Models Using lme4.” *Journal of Statistical Software*, 67(1), 1–48. doi:10.18637/jss.v067.i01.
- Bayes, R., Druckman, J. N., Goods, A., & Molden, D. C. (2020). When and how different motives can drive motivated political reasoning. *Political Psychology*, 41(5), 1031-1052.

- Beck, E. D., & Jackson, J. J. (2020). Idiographic traits: A return to Allportian approaches to personality. *Current Directions in Psychological Science*, 29(3), 301-308.
- Bem, D. J. (1967). Self-perception: An alternative interpretation of cognitive dissonance phenomena. *Psychological review*, 74(3), 183.
- Berinsky, A. J. (2018). Telling the truth about believing the lies? Evidence for the limited prevalence of expressive survey responding. *The Journal of Politics*, 80(1), 211-224.
- Biernacki, C., Celeux, G., & Govaert, G. (2000). Assessing a mixture model for clustering with the integrated completed likelihood. *IEEE transactions on pattern analysis and machine intelligence*, 22(7), 719-725.
- Biernat, M., & Manis, M. (1994). Shifting standards and stereotype-based judgments. *Journal of personality and social psychology*, 66(1), 5.
- Birch, S. A., & Bloom, P. (2007). The curse of knowledge in reasoning about false beliefs. *Psychological science*, 18(5), 382-386.
- Boden, M. T., Berenbaum, H., & Gross, J. J. (2016). Why do people believe what they do? A functionalist perspective. *Review of General Psychology*, 20(4), 399-411.
- Bolinger, R. J. (2020). Varieties of moral encroachment. *Philosophical Perspectives*, 34(1), 5-26.
- Bor, A., & Petersen, M. B. (2022). The psychology of online political hostility: A comprehensive, cross-national test of the mismatch hypothesis. *American political science review*, 116(1), 1-18.
- Bourget, D., Chalmers, D. J., & Chalmers, D. (2023). Philosophers on philosophy: The 2020 philpapers survey. *Philosophers' Imprint*, 23.
- Brady, W. J., Wills, J. A., Jost, J. T., Tucker, J. A., & Van Bavel, J. J. (2017). Emotion shapes the diffusion of moralized content in social networks. *Proceedings of the National*

- Academy of Sciences*, 114(28), 7313-7318.
- Brandt, M. J., & Morgan, G. S. (2022). Between-person methods provide limited insight about within-person belief systems. *Journal of personality and social psychology*.
- Burbules, N. C., & Linn, M. C. (1991). Science education and philosophy of science: congruence or contradiction?. *International journal of science education*, 13(3), 227-241.
- Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of personality and social psychology*, 42(1), 116.
- Campbell, T. H., & Kay, A. C. (2014). Solution aversion: On the relation between ideology and motivated disbelief. *Journal of personality and social psychology*, 107(5), 809.
- Carlson, R. W., Maréchal, M. A., Oud, B., Fehr, E., & Crockett, M. J. (2020). Motivated misremembering of selfish decisions. *Nature communications*, 11(1), 2100.
- Carson, E. A. (2019, October). Prisoners in 2019. Bureau of Justice Statistics.
- Carver, C. S., & Scheier, M. F. (1982). Control theory: A useful conceptual framework for personality–social, clinical, and health psychology. *Psychological bulletin*, 92(1), 111.
- Camerer, C., Loewenstein, G., & Weber, M. (1989). The curse of knowledge in economic settings: An experimental analysis. *Journal of political Economy*, 97(5), 1232-1254.
- Chater, N., & Loewenstein, G. (2023). The i-frame and the s-frame: How focusing on individual-level solutions has led behavioral public policy astray. *Behavioral and Brain Sciences*, 46, e147.
- Celniker, J. B., & Ditto, P. H. (2024). Of preferences and priors: Motivated reasoning in partisans' evaluations of scientific evidence. *Journal of Personality and Social Psychology*, 127(5), 986–1011.
- Champely, S., Ekstrom, C., Dalgaard, P., Gill, J., Weibelzahl, S., Anandkumar, A., ... & De

- Rosario, M. H. (2018). Package 'pwr'. *R package version, 1(2)*.
- Chignell, A. (2010). The ethics of belief. *Stanford Encyclopedia of Philosophy*.
- Choi, I., Nisbett, R. E., & Norenzayan, A. (1999). Causal attribution across cultures: Variation and universality. *Psychological bulletin, 125(1)*, 47.
- Claudy, M. C., Peterson, M., & O'driscoll, A. (2013). Understanding the attitude-behavior gap for renewable energy systems using behavioral reasoning theory. *Journal of Macromarketing, 33(4)*, 273-287.
- Clayton, K., Blair, S., Busam, J. A., Forstner, S., Glance, J., Green, G., ... & Nyhan, B. (2020). Real solutions for fake news? Measuring the effectiveness of general warnings and fact-check tags in reducing belief in false stories on social media. *Political behavior, 42*, 1073-1095.
- Clifford, W. K. (1877). The ethics of belief. *The Contemporary review, 1866-1900, 29*, 289-309.
- Corner, A., Whitmarsh, L., & Xenias, D. (2012). Uncertainty, skepticism and attitudes towards climate change: biased assimilation and attitude polarisation. *Climatic change, 114*, 463-478.
- Cusimano, C. (2024). The Case for Heterogeneity in Metacognitive Appraisals of Biased Beliefs. *Personality and Social Psychology Review, 10888683241251520*.
- Cusimano, C., & Lombrozo, T. (2021). Morality justifies motivated reasoning in the folk ethics of belief. *Cognition, 209*, 104513.
- Cusimano, C., & Lombrozo, T. (2023). People recognize and condone their own morally motivated reasoning. *Cognition, 234*, 105379.
- Dehghani, M., Johnson, K., Hoover, J., Sagi, E., Garten, J., Parmar, N. J., Vaisey, S., Iliev, R., & Graham, J. (2016). Purity homophily in social networks. *Journal of Experimental Psychology: General, 145(3)*, 366–375.

- Ditto, P. H., Clark, C. J., Liu, B. S., Wojcik, S. P., Chen, E. E., Grady, R. H., ... & Zinger, J. F. (2019). Partisan bias and its discontents. *Perspectives on Psychological Science*, 14(2), 304-316.
- Ditto, P. H., Liu, B. S., Clark, C. J., Wojcik, S. P., Chen, E. E., Grady, R. H., ... & Zinger, J. F. (2019). At least bias is bipartisan: A meta-analytic comparison of partisan bias in liberals and conservatives. *Perspectives on Psychological Science*, 14(2), 273-291.
- Ditto, P. H., & Lopez, D. F. (1992). Motivated skepticism: Use of differential decision criteria for preferred and nonpreferred conclusions. *Journal of personality and social psychology*, 63(4), 568.
- Douglas, B. D., Ewell, P. J., & Brauer, M. (2023). Data quality in online human-subjects research: Comparisons between MTurk, Prolific, CloudResearch, Qualtrics, and SONA. *Plos one*, 18(3), e0279720.
- Druckman, J. N., & McGrath, M. C. (2019). The evidence for motivated reasoning in climate change preference formation. *Nature Climate Change*, 9(2), 111-119.
- Dunning, D., Meyerowitz, J. A., & Holzberg, A. D. (1989). Ambiguity and self-evaluation: The role of idiosyncratic trait definitions in self-serving assessments of ability. *Journal of personality and social psychology*, 57(6), 1082.
- Fiske, S. T., Cuddy, A. J., & Glick, P. (2007). Universal dimensions of social cognition: Warmth and competence. *Trends in cognitive sciences*, 11(2), 77-83.
- Echterhoff, G., Higgins, E. T., & Levine, J. M. (2009). Shared reality: Experiencing commonality with others' inner states about the world. *Perspectives on Psychological Science*, 4(5), 496-521.
- Edwards, K., & Smith, E. E. (1996). A disconfirmation bias in the evaluation of arguments. *Journal of personality and social psychology*, 71(1), 5.

- Ekstrom, P. D., & Lai, C. K. (2021). The selective communication of political information. *Social Psychological and Personality Science*, *12*(5), 789-800.
- Elliot, A. J., & Devine, P. G. (1994). On the motivational nature of cognitive dissonance: Dissonance as psychological discomfort. *Journal of personality and social psychology*, *67*(3), 382.
- Elliot, A. J., & Thrash, T. M. (2002). Approach-avoidance motivation in personality: approach and avoidance temperaments and goals. *Journal of personality and social psychology*, *82*(5), 804.
- Epley, N., & Gilovich, T. (2016). The mechanics of motivated reasoning. *Journal of Economic perspectives*, *30*(3), 133-140.
- Epstein, S., Pacini, R., Denes-Raj, V., & Heier, H. (1996). Individual differences in intuitive–experiential and analytical–rational thinking styles. *Journal of personality and social psychology*, *71*(2), 390.
- Espinoza, J. A., Daljeet, K. N., & Meyer, J. P. (2020). Establishing the structure and replicability of personality profiles using the HEXACO-PI-R. *Nature Human Behaviour*, *4*(7), 713-724.
- Eyal, T., Steffel, M., & Epley, N. (2018). Perspective mistaking: Accurately understanding the mind of another requires getting perspective, not taking perspective. *Journal of personality and social psychology*, *114*(4), 547.
- Feldman, R. (2000). The ethics of belief. *Philosophy and Phenomenological Research*, *60*(3), 667-695.
- Festinger, L. (1954). A theory of social comparison processes. *Human relations*, *7*(2), 117-140.
- Festinger, L., & Carlsmith, J. M. (1959). Cognitive consequences of forced compliance. *The journal of abnormal and social psychology*, *58*(2), 203.

- Fisher, A. J., Medaglia, J. D., & Jeronimus, B. F. (2018). Lack of group-to-individual generalizability is a threat to human subjects research. *Proceedings of the National Academy of Sciences*, *115*(27), E6106-E6115.
- Friesen, J. P., Campbell, T. H., & Kay, A. C. (2015). The psychological advantage of unfalsifiability: The appeal of untestable religious and political ideologies. *Journal of Personality and Social Psychology*, *108*(3), 515–529.
- Gampa, A., Wojcik, S. P., Motyl, M., Nosek, B. A., & Ditto, P. H. (2019). (Ideo) Logical reasoning: Ideology impairs sound reasoning. *Social Psychological and Personality Science*, *10*(8), 1075-1083.
- Gardiner, G. (2018). Evidentialism and moral encroachment. *Believing in accordance with the evidence: New essays on evidentialism*, 169-195.
- Gerlach, M., Farb, B., Revelle, W., & Nunes Amaral, L. A. (2018). A robust data-driven approach identifies four personality types across four large data sets. *Nature human behaviour*, *2*(10), 735-742.
- Gerber, A., & Green, D. (1999). Misperceptions about perceptual bias. *Annual review of political science*, *2*(1), 189-210.
- Gerring, J. (2012). Mere description. *British Journal of Political Science*, *42*(4), 721-746.
- Gesiarz, F., Cahill, D., & Sharot, T. (2019). Evidence accumulation is biased by motivation: A computational account. *PLoS computational biology*, *15*(6), e1007089.
- Goldin, C., & Rouse, C. (2000). Orchestrating impartiality: The impact of “blind” auditions on female musicians. *American economic review*, *90*(4), 715-741.
- Goodwin, G. P., & Darley, J. M. (2008). The psychology of meta-ethics: Exploring objectivism. *Cognition*, *106*(3), 1339-1366.
- Gollwitzer, P. M., & Moskowitz, G. B. (1996). Goal effects on action and cognition. In E. T.

- Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 361–399). The Guilford Press.
- Golman, R., Hagmann, D., & Loewenstein, G. (2017). Information avoidance. *Journal of economic literature*, 55(1), 96-135.
- Goodwin, G. P., & Darley, J. M. (2012). Why are some moral beliefs perceived to be more objective than others?. *Journal of Experimental Social Psychology*, 48(1), 250-256.
- Goodwin, G. P., Piazza, J., & Rozin, P. (2014). Moral character predominates in person perception and evaluation. *Journal of personality and social psychology*, 106(1), 148.
- Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of personality and social psychology*, 101(2), 366.
- Gray, K., & Graham, J. (Eds.). (2019). *Atlas of moral psychology*. Guilford Publications.
- Green, P., & MacLeod, C. J. (2016). SIMR: An R package for power analysis of generalized linear mixed models by simulation. *Methods in Ecology and Evolution*, 7(4), 493-498.
- Greenwald, A. G., & Pettigrew, T. F. (2014). With malice toward none and charity for some: Ingroup favoritism enables discrimination. *American Psychologist*, 69(7), 669–684.
- Grice, J. W., Medellin, E., Jones, I., Horvath, S., McDaniel, H., O'lansen, C., & Baker, M. (2020). Persons as effect sizes. *Advances in Methods and Practices in Psychological Science*, 3(4), 443-455.
- Grinberg, N., Joseph, K., Friedland, L., Swire-Thompson, B., & Lazer, D. (2019). Fake news on Twitter during the 2016 US presidential election. *Science*, 363(6425), 374-378.
- Grossmann, I. (2017). Wisdom in context. *Perspectives on psychological science*, 12(2), 233-257.
- Hardin, C. D., & Higgins, E. T. (1996). Shared reality: How social verification makes the subjective objective.

- Hart, P. S., & Nisbet, E. C. (2012). Boomerang effects in science communication: How motivated reasoning and identity cues amplify opinion polarization about climate mitigation policies. *Communication research*, 39(6), 701-723.
- Heiphetz, L., Spelke, E. S., Harris, P. L., & Banaji, M. R. (2013). The development of reasoning about beliefs: Fact, preference, and ideology. *Journal of experimental social psychology*, 49(3), 559-565.
- Heiphetz, L., Spelke, E. S., Harris, P. L., & Banaji, M. R. (2014). What do different beliefs tell us? An examination of factual, opinion-based, and religious beliefs. *Cognitive development*, 30, 15-29.
- Heiphetz, L., Gelman, S. A., & Young, L. L. (2017). The perceived stability and biological basis of religious beliefs, factual beliefs, and opinions. *Journal of Experimental Child Psychology*, 156, 82-98.
- Higgins, E. T. (1987). "Self-discrepancy: A theory relating self and affect." *Psychological Review*, 94(3), 319-340.
- Hodson, G., Dovidio, J. F., & Gaertner, S. L. (2002). Processes in racial discrimination: Differential weighting of conflicting information. *Personality and Social Psychology Bulletin*, 28(4), 460-471.
- Hofer, B. K. (2001). Personal epistemology research: Implications for learning and teaching. *Educational psychology review*, 13, 353-383.
- Hofer, B. K., & Pintrich, P. R. (1997). The development of epistemological theories: Beliefs about knowledge and knowing and their relation to learning. *Review of educational research*, 67(1), 88-140.
- Hornsey, M. J., Majkut, L., Terry, D. J., & McKimmie, B. M. (2003). On being loud and proud: Non-conformity and counter-conformity to group norms. *British journal of social*

- psychology, 42(3), 319-335.
- James, W. (1896). The will to believe. An Address to the Philosophical Clubs of Yale and Brown Universities.
- John, O. P., Angleitner, A., & Ostendorf, F. (1988). The lexical approach to personality: A historical review of trait taxonomic research. *European journal of Personality*, 2(3), 171-203.
- Jost, J. T., Glaser, J., Sulloway, F. J., & Kruglanski, A. W. (2018). *Political conservatism as motivated social cognition* (pp. 129-204). Routledge.
- Jost, J., & Hunyady, O. (2003). The psychology of system justification and the palliative function of ideology. *European review of social psychology*, 13(1), 111-153.
- Jost, J. T., Kruglanski, A. W., & Nelson, T. O. (2013). Social metacognition: An expansionist review. In *Metacognition* (pp. 137-154). Psychology Press.
- Kim, J. (1988). What is "naturalized epistemology?". *Philosophical perspectives*, 2, 381-405.
- Kim, M., Park, B., & Young, L. (2020). The psychology of motivated versus rational impression updating. *Trends in Cognitive Sciences*, 24(2), 101-111.
- Koch, T. K., Frischlich, L., & Lermer, E. (2023). Effects of fact-checking warning labels and social endorsement cues on climate change fake news credibility and engagement on social media. *Journal of Applied Social Psychology*.
- Koehler, J. J. (1993). The influence of prior beliefs on scientific judgments of evidence quality. *Organizational behavior and human decision processes*, 56(1), 28-55.
- Kokolakis, S. (2017). Privacy attitudes and privacy behaviour: A review of current research on the privacy paradox phenomenon. *Computers & security*, 64, 122-134.
- Kopietz, R., Hellmann, J. H., Higgins, E. T., & Echterhoff, G. (2010). Shared-reality effects on memory: Communicating to fulfill epistemic needs. *Social Cognition*, 28(3), 353-378.

- Kraft, P. W., Lodge, M., & Taber, C. S. (2015). Why people “don’t trust the evidence” motivated reasoning and scientific beliefs. *The ANNALS of the American Academy of political and social science*, 658(1), 121-133.
- Kruglanski, A. W. (1990). Lay epistemic theory in social-cognitive psychology. *Psychological Inquiry*, 1(3), 181-197.
- Kruglanski, A. W. (2013). *The psychology of closed mindedness*. Psychology Press.
- Kruglanski, A. W., & Ajzen, I. (1983). Bias and error in human judgment. *European Journal of Social Psychology*, 13(1), 1-44.
- Kumar, S., Hamilton, W. L., Leskovec, J., & Jurafsky, D. (2018, April). Community interaction and conflict on the web. In *Proceedings of the 2018 world wide web conference* (pp. 933-943).
- Kunda, Z. (1990). The case for motivated reasoning. *Psychological bulletin*, 108(3), 480.
- Kunda, Z., & Spencer, S. J. (2003). When do stereotypes come to mind and when do they color judgment? A goal-based theoretical framework for stereotype activation and application. *Psychological bulletin*, 129(4), 522.
- Kuznetsova A, Brockhoff PB, Christensen RHB (2017). “lmerTest Package: Tests in Linear Mixed Effects Models.” *Journal of Statistical Software*, 82(13), 1–26.
- Lakens, D. (2022). Sample size justification. *Collabra: psychology*, 8(1), 33267.
- Leary, M. R., Tambor, E. S., Terdal, S. K., & Downs, D. L. (1995). Self-esteem as an interpersonal monitor: The sociometer hypothesis. *Journal of personality and social psychology*, 68(3), 518.
- Lebo, M. J., & Cassino, D. (2007). The aggregated consequences of motivated reasoning and the dynamics of partisan presidential approval. *Political psychology*, 28(6), 719-746.
- Lee, J. A., Bardi, A., Gerrans, P., Sneddon, J., Van Herk, H., Evers, U., & Schwartz, S. (2022).

- Are value–behavior relations stronger than previously thought? It depends on value importance. *European journal of personality*, 36(2), 133-148.
- Leeper, T. J., & Slothuus, R. (2014). Political parties, motivated reasoning, and public opinion formation. *Political Psychology*, 35, 129-156.
- Lewandowsky, S., & Van Der Linden, S. (2021). Countering misinformation and fake news through inoculation and prebunking. *European Review of Social Psychology*, 32(2), 348-384.
- Lin, Y., Zhang, Y. C., & Oyserman, D. (2022). Seeing meaning even when none may exist: Collectivism increases belief in empty claims. *Journal of Personality and Social Psychology*, 122(3), 351–366.
- Linn, M. C., & Songer, N. B. (1993). How do students make sense of science?. *Merrill-Palmer Quarterly* (1982-), 47-73.
- Liu, B. S., & Ditto, P. H. (2013). What dilemma? Moral evaluation shapes factual belief. *Social Psychological and Personality Science*, 4(3), 316-323.
- Loewenstein, G. (1994). The psychology of curiosity: A review and reinterpretation. *Psychological bulletin*, 116(1), 75.
- Lord, C. G., Ross, L., & Lepper, M. R. (1979). Biased assimilation and attitude polarization: The effects of prior theories on subsequently considered evidence. *Journal of personality and social psychology*, 37(11), 2098.
- Luttrell, A., Petty, R. E., Briñol, P., & Wagner, B. C. (2016). Making it moral: Merely labeling an attitude as moral increases its strength. *Journal of Experimental Social Psychology*, 65, 82-93.
- Luttrell, A., & Togans, L. J. (2021). The stability of moralized attitudes over time. *Personality and Social Psychology Bulletin*, 47(4), 551-564.

- MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological methods*, *1*(2), 130.
- Majima, Y., Walker, A. C., Turpin, M. H., & Fugelsang, J. A. (2022). Culture as a moderator of epistemically suspect beliefs. *Frontiers in psychology*, *13*, 745580.
- Mandelbaum, E. (2019). Troubles with Bayesianism: An introduction to the psychological immune system. *Mind & Language*, *34*(2), 141-157.
- McHoskey, J. W. (1995). Case closed? On the John F. Kennedy assassination: Biased assimilation of evidence and attitude polarization. *Basic and Applied Social Psychology*, *17*(3), 395-409.
- McKay, R. T., & Dennett, D. C. (2009). The evolution of misbelief. *Behavioral and Brain Sciences*, *32*(6), 493-510.
- McRae, K., Ciesielski, B., & Gross, J. J. (2012). Unpacking cognitive reappraisal: goals, tactics, and outcomes. *Emotion*, *12*(2), 250.
- Metz, S. E., Weisberg, D. S., & Weisberg, M. (2018). Non-scientific criteria for belief sustain counter-scientific beliefs. *Cognitive Science*, *42*(5), 1477-1503.
- Miani, A., Hills, T., & Bangerter, A. (2021). LOCO: The 88-million-word language of conspiracy corpus. *Behavior research methods*, 1-24.
- Miller, C. B. (2021). *Honesty: The philosophy and psychology of a neglected virtue*. Oxford University Press.
- Miller, A. G., McHoskey, J. W., Bane, C. M., & Dowd, T. G. (1993). The attitude polarization phenomenon: Role of response measure, attitude extremity, and behavioral consequences of reported attitude change. *Journal of Personality and Social Psychology*, *64*(4), 561.

- Mitchell, A., Gottfried, J., Barthel, M., & Sumida, N. (2018). Distinguishing between factual and opinion statements in the news. Pew Research Report.
- Molden, D. C., Bayes, R., & Druckman, J. N. (2022). A motivational systems approach to investigating opinions on climate change. *Thinking & Reasoning*, 28(3), 396-427.
- Molenaar, P. C. (2004). A manifesto on psychology as idiographic science: Bringing the person back into scientific psychology, this time forever. *Measurement*, 2(4), 201-218.
- Murray, S. L., Holmes, J. G., & Griffin, D. W. (1996). The benefits of positive illusions: Idealization and the construction of satisfaction in close relationships. *Journal of personality and social psychology*, 70(1), 79.
- Munro, G. D. (2010). The scientific impotence excuse: Discounting belief-threatening scientific abstracts. *Journal of Applied Social Psychology*, 40(3), 579-600.
- Munro, G. D., & Ditto, P. H. (1997). Biased assimilation, attitude polarization, and affect in reactions to stereotype-relevant scientific information. *Personality and Social Psychology Bulletin*, 23(6), 636-653.
- Munro, G. D., Ditto, P. H., Lockhart, L. K., Fagerlin, A., Gready, M., & Peterson, E. (2002). Biased assimilation of sociopolitical arguments: Evaluating the 1996 US presidential debate. *Basic and Applied Social Psychology*, 24(1), 15-26.
- Muis, K. R., Bendixen, L. D., & Haerle, F. C. (2006). Domain-general and domain-specificity in personal epistemology research: Philosophical and empirical reflections in the development of a theoretical framework. *Educational Psychology Review*, 18, 3-54.
- Neuberg, S. L., & Newsom, J. T. (1993). Personal need for structure: Individual differences in the desire for simpler structure. *Journal of personality and social psychology*, 65(1), 113.
- Newton, C., Feeney, J., & Pennycook, G. (2024). On the disposition to think analytically: Four

- distinct intuitive-analytic thinking styles. *Personality and Social Psychology Bulletin*, 50(6), 906-923.
- Nilsson, A., Erlandsson, A., & Västfjäll, D. (2020). Moral foundations theory and the psychology of charitable giving. *European Journal of Personality*, 34(3), 431-447.
- Nisbet, E. C., Cooper, K. E., & Garrett, R. K. (2015). The partisan brain: How dissonant science messages lead conservatives and liberals to (dis) trust science. *The ANNALS of the American Academy of Political and Social Science*, 658(1), 36-66.
- Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A. (2001). Culture and systems of thought: holistic versus analytic cognition. *Psychological review*, 108(2), 291.
- Nosek, B. A., Hardwicke, T. E., Moshontz, H., Allard, A., Corker, K. S., Dreber, A., & Vazire, S. (2022). Replicability, robustness, and reproducibility in psychological science. *Annual Review of Psychology*, 73, 719-748.
- Nylund, Karen L., Tihomir Asparouhov, and Bengt O. Muthén. "Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study." *Structural equation modeling: A multidisciplinary Journal* 14.4 (2007): 535-569.
- Oberski, D. (2016). Mixture models: Latent profile and latent class analysis. *Modern statistical methods for HCI*, 275-287.
- Oettingen, G., Hönic, G., & Gollwitzer, P. M. (2000). Effective self-regulation of goal attainment. *International journal of educational research*, 33(7-8), 705-732.
- Parks-Leduc, L., Feldman, G., & Bardi, A. (2015). Personality traits and personal values: A meta-analysis. *Personality and Social Psychology Review*, 19(1), 3-29.
- Parsons, T. (1951). *Toward a general theory of action*. Harvard University Press.
- Porter, T., Elnakouri, A., Meyers, E. A., Shibayama, T., Jayawickreme, E., & Grossmann, I. (2022). Predictors and consequences of intellectual humility. *Nature Reviews*

- Psychology, 1(9), 524-536.
- Peng, K., & Nisbett, R. E. (1999). Culture, dialectics, and reasoning about contradiction. *American psychologist*, 54(9), 741.
- Pennycook, G., Bago, B., & McPhetres, J. (2023). Science beliefs, political ideology, and cognitive sophistication. *Journal of Experimental Psychology: General*, 152(1), 80.
- Pennycook, G., Cheyne, J. A., Koehler, D. J., & Fugelsang, J. A. (2020). On the belief that beliefs should change according to evidence: Implications for conspiratorial, moral, paranormal, political, religious, and science beliefs. *Judgment and Decision making*, 15(4), 476-498.
- Pennycook, G., McPhetres, J., Zhang, Y., Lu, J. G., & Rand, D. G. (2020). Fighting COVID-19 misinformation on social media: Experimental evidence for a scalable accuracy-nudge intervention. *Psychological science*, 31(7), 770-780.
- Peters-Burton, E., & Baynard, L. R. (2013). Network analysis of beliefs about the scientific enterprise: A comparison of scientists, middle school science teachers and eighth-grade science students. *International Journal of science education*, 35(16), 2801-2837.
- Pew Research Center, (2014). Political Polarization and Media Habits.
- Pew Research Center, (2022a). Americans at the ends of the ideological spectrum are the most active in national politics.
- Pew Research Center, (2022b). Politics on Twitter: One-Third of Tweets From U.S. Adults Are Political.
- Pyszczynski, T., & Greenberg, J. (1987). Toward an integration of cognitive and motivational perspectives on social inference: A biased hypothesis-testing model. In *Advances in experimental social psychology* (Vol. 20, pp. 297-340). Academic Press.
- Pyszczynski, T., Greenberg, J., & LaPrelle, J. (1985). Social comparison after success and

- failure: Biased search for information consistent with a self-serving conclusion. *Journal of Experimental Social Psychology*, 21(2), 195-211.
- Rai, T. S., & Fiske, A. (2010). ODD (observation-and description-deprived) psychological research. *Behavioral and Brain Sciences*, 33(2-3), 106.
- Rathje, S., Van Bavel, J. J., & Van Der Linden, S. (2021). Out-group animosity drives engagement on social media. *Proceedings of the National Academy of Sciences*, 118(26), e2024292118.
- Reimer, N. K., Atari, M., Karimi-Malekabadi, F., Trager, J., Kennedy, B., Graham, J., & Dehghani, M. (2022). Moral values predict county-level COVID-19 vaccination rates in the United States. *American Psychologist*, 77(6), 743.
- Revelle, W (2024). *psych: Procedures for Psychological, Psychometric, and Personality Research*. Northwestern University, Evanston, Illinois. R package version 2.4.6.
- Risen, J. L. (2016). Believing what we do not believe: Acquiescence to superstitious beliefs and other powerful intuitions. *Psychological review*, 123(2), 182.
- Rhee, J. J., Schein, C., & Bastian, B. (2019). The what, how, and why of moralization: A review of current definitions, methods, and evidence in moralization research. *Social and Personality Psychology Compass*, 13(12), e12511.
- Roberts, R. C., & Wood, W. J. (2007). *Intellectual virtues: An essay in regulative epistemology*. Oxford University Press.
- Roccas, S., Sagiv, L., Schwartz, S. H., & Knafo, A. (2002). The big five personality factors and personal values. *Personality and social psychology bulletin*, 28(6), 789-801.
- Rokeach, M. (1973). *The nature of human values*. Free press.
- Rossignac-Milon, M., Bolger, N., Zee, K. S., Boothby, E. J., & Higgins, E. T. (2021). Merged minds: Generalized shared reality in dyadic relationships. *Journal of Personality and*

- Social Psychology*, 120(4), 882.
- Ross, L., Greene, D., & House, P. (1977). The “false consensus effect”: An egocentric bias in social perception and attribution processes. *Journal of experimental social psychology*, 13(3), 279-301.
- Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of statistical software*, 48, 1-36.
- Rozin, P. (1999). The process of moralization. *Psychological science*, 10(3), 218-221.
- Rozin, P. (2001). Social psychology and science: Some lessons from Solomon Asch. *Personality and Social Psychology Review*, 5(1), 2-14.
- Goodwin, G. P., & Darley, J. M. (2010). The perceived objectivity of ethical beliefs: Psychological findings and implications for public policy. *Review of Philosophy and Psychology*, 1, 161-188.
- Rozin, P., Markwith, M., & Stoess, C. (1997). Moralization and becoming a vegetarian: The transformation of preferences into values and the recruitment of disgust. *Psychological science*, 8(2), 67-73.
- Rozin, P., & Singh, L. (1999). The moralization of cigarette smoking in the United States. *Journal of Consumer Psychology*, 8(3), 321-337.
- Rust, J., & Schwitzgebel, E. (2013). Ethicists’ and Nonethicists’ Responsiveness to Student E-mails: Relationships Among Expressed Normative Attitude, Self-Described Behavior, and Empirically Observed Behavior. *Metaphilosophy*, 44(3), 350-371.
- Rutjens, B. T., Van der Linden, S., & Van der Lee, R. (2021). Science skepticism in times of COVID-19. *Group Processes & Intergroup Relations*, 24(2), 276-283.
- Sagiv, L., Roccas, S., Cieciuch, J., & Schwartz, S. H. (2017). Personal values in human life. *Nature human behaviour*, 1(9), 630-639.

- Sagiv, L., & Schwartz, S. H. (2022). Personal values across cultures. *Annual review of psychology*, 73(1), 517-546.
- Sayre-McCord, G. (2005). "Moral realism", *Stanford Encyclopedia of Philosophy*.
- Sanitioso, R., Kunda, Z., & Fong, G. T. (1990). Motivated recruitment of autobiographical memories. *Journal of Personality and Social psychology*, 59(2), 229.
- Scheel, A. M., Tiokhin, L., Isager, P. M., & Lakens, D. (2021). Why hypothesis testers should spend less time testing hypotheses. *Perspectives on Psychological Science*, 16(4), 744-755.
- Schimmelpfennig, R., Spicer, R., White, C. J., Gervais, W., Norenzayan, A., Heine, S., ... & Muthukrishna, M. (2024). The Moderating Role of Culture in the Generalizability of Psychological Phenomena. *Advances in Methods and Practices in Psychological Science*, 7(1), 25152459231225163.
- Schulz, K. F., Chalmers, I., Hayes, R. J., & Altman, D. G. (1995). Empirical evidence of bias: dimensions of methodological quality associated with estimates of treatment effects in controlled trials. *Jama*, 273(5), 408-412.
- Schwartz, S. H. (2012). An overview of the Schwartz theory of basic values. *Online readings in Psychology and Culture*, 2(1), 11.
- Schwartz, S. H., & Bilsky, W. (1987). Toward a universal psychological structure of human values. *Journal of personality and social psychology*, 53(3), 550.
- Schwarz, N., & Clore, G. L. (1983). Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states. *Journal of personality and social psychology*, 45(3), 513.
- Scrucca L, Fraley C, Murphy TB, Raftery AE (2023). *Model-Based Clustering, Classification,*

- and Density Estimation Using mclust in R*. Chapman and Hall/CRC. ISBN 978-1032234953.
- Schaffner, B. F., & Luks, S. (2018). Misinformation or expressive responding? What an inauguration crowd can tell us about the source of political misinformation in surveys. *Public Opinion Quarterly*, 82(1), 135-147.
- Schwartz, S. (1996). Value priorities and behavior: Applying a theory of integrated value systems. In C. Seligman, J. M. Olson, & M. P. Zanna (Eds.), *The psychology of values: The Ontario symposium*, Vol. 8, pp. 1–24). Lawrence Erlbaum Associates, Inc.
- Schwarz, N., Bless, H., Strack, F., Klumpp, G., Rittenauer-Schatka, H., & Simons, A. (1991). Ease of retrieval as information: Another look at the availability heuristic. *Journal of Personality and Social Psychology*, 61(2), 195–202.
- Schwartz, S. H., & Butenko, T. (2014). Values and behavior: Validating the refined value theory in Russia. *European journal of social psychology*, 44(7), 799-813.
- Schwitzgebel, E., & Cushman, F. (2012). Expertise in moral reasoning? Order effects on moral judgment in professional philosophers and non-philosophers. *Mind & Language*, 27(2), 135-153.
- Schwitzgebel, E., & Cushman, F. (2015). Philosophers' biased judgments persist despite training, expertise and reflection. *Cognition*, 141, 127-137.
- Sharot, T., & Sunstein, C. R. (2020). How people decide what they want to know. *Nature Human Behaviour*, 4(1), 14-19.
- Shepperd, J., Malone, W., & Sweeny, K. (2008). Exploring causes of the self-serving bias. *Social and Personality Psychology Compass*, 2(2), 895-908.
- Skitka, L. J., Hanson, B. E., Morgan, G. S., & Wisneski, D. C. (2021). The psychology of moral conviction. *Annual Review of Psychology*, 72(1), 347-366.

- Skitka, L. J. & Morgan, G. S. (2014). The social and political implications of moral conviction. In H. Lavine (Ed.), *Advances in Political Psychology*, 35, 95 – 110.
- Stanovich, K. E., & West, R. F. (1997). Reasoning independently of prior belief and individual differences in actively open-minded thinking. *Journal of educational psychology*, 89(2), 342.
- Stanovich, K. E., & West, R. F. (2000). Advancing the rationality debate. *Behavioral and brain sciences*, 23(5), 701-717.
- Ståhl, T., & Cusimano, C. (2024). Lay standards for reasoning predict people's acceptance of suspect claims. *Current Opinion in Psychology*, 55, 101727.
- Ståhl, T., Zaal, M. P., & Skitka, L. J. (2016). Moralized rationality: Relying on logic and evidence in the formation and evaluation of belief can be seen as a moral issue. *PloS one*, 11(11), e0166332.
- Steup, M., & Neta, R. (2005). "Epistemology". *Stanford Encyclopedia of Philosophy*.
- Stroud, N. J. (2010). Polarization and partisan selective exposure. *Journal of communication*, 60(3), 556-576.
- Skitka, L. J. (2010). The psychology of moral conviction. *Social and Personality Psychology Compass*, 4(4), 267-281.
- Skitka, L. J., Bauman, C. W., & Lytle, B. L. (2009). Limits on legitimacy: moral and religious convictions as constraints on deference to authority. *Journal of personality and social psychology*, 97(4), 567.
- Skitka, L. J., Bauman, C. W., & Sargis, E. G. (2005). Moral conviction: Another contributor to attitude strength or something more?. *Journal of personality and social psychology*, 88(6), 895.
- Skitka, L. J., Hanson, B. E., Morgan, G. S., & Wisneski, D. C. (2021). The psychology of moral

- conviction. *Annual Review of Psychology*, 72(1), 347-366.
- Strohming, N., & Melnikoff, D. (2022). Breaking reality's constraints on motivated cognition. *Psyarxiv Preprint: qnda3*
- Taber, C. S., & Lodge, M. (2006). Motivated skepticism in the evaluation of political beliefs. *American journal of political science*, 50(3), 755-769.
- Tappin, B. M., & Gadsby, S. (2019). Biased belief in the Bayesian brain: A deeper look at the evidence. *Consciousness and cognition*, 68, 107-114.
- Tappin, B. M., Pennycook, G., & Rand, D. G. (2020). Thinking clearly about causal inferences of politically motivated reasoning: Why paradigmatic study designs often undermine causal inference. *Current Opinion in Behavioral Sciences*, 34, 81-87.
- Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: a social psychological perspective on mental health. *Psychological bulletin*, 103(2), 193.
- Kelly, T., "Evidence", *The Stanford Encyclopedia of Philosophy* (Winter 2016 Edition), Edward N. Zalta (ed.)
- Tenhundfeld, N. L., Parnes, J. E., Conner, B. T., & Witt, J. K. (2020). Development of a psychometrically valid gun attitude scale. *Current psychology*, 39, 279-286.
- Tesser, A., Crepaz, N., Collins, J. C., Cornell, D., & Beach, S. R. (2000). Confluence of self-esteem regulation mechanisms: On integrating the self-zoo. *Personality and Social Psychology Bulletin*, 26(12), 1476-1489.
- Tversky, A., & Kahneman, D. (1974). Judgment under Uncertainty: Heuristics and Biases: Biases in judgments reveal some heuristics of thinking under uncertainty. *science*, 185(4157), 1124-1131.
- Van Bavel, J. J., & Pereira, A. (2018). The partisan brain: An identity-based model of political belief. *Trends in cognitive sciences*, 22(3), 213-224.

- Varnum, M. E., Grossmann, I., Kitayama, S., & Nisbett, R. E. (2010). The origin of cultural differences in cognition: The social orientation hypothesis. *Current directions in psychological science*, 19(1), 9-13.
- Vesga, A., Van Leeuwen, N., & Lombrozo, T. (2024). Evidence for distinct cognitive attitudes of belief in theory of mind. In *Proceedings of the Annual Meeting of the Cognitive Science Society* (Vol. 46).
- Walco, D. K., & Risen, J. L. (2017). The empirical case for acquiescing to intuition. *Psychological science*, 28(12), 1807-1820.
- Washburn, A. N., & Skitka, L. J. (2018). Science denial across the political divide: Liberals and conservatives are similarly motivated to deny attitude-inconsistent science. *Social Psychological and Personality Science*, 9(8), 972-980.
- Webster, D. M., & Kruglanski, A. W. (1994). Individual differences in need for cognitive closure. *Journal of personality and social psychology*, 67(6), 1049.
- Westen, D., Blagov, P. S., Harenski, K., Kilts, C., & Hamann, S. (2006). Neural bases of motivated reasoning: An fMRI study of emotional constraints on partisan political judgment in the 2004 US presidential election. *Journal of cognitive neuroscience*, 18(11), 1947-1958.
- Williams, D. (2022). The marketplace of rationalizations. *Economics & Philosophy*, 1-25.
- Wilson, T. D., & Brekke, N. (1994). Mental contamination and mental correction: unwanted influences on judgments and evaluations. *Psychological bulletin*, 116(1), 117.
- Wong-Parodi, G., & Feygina, I. (2020). Understanding and countering the motivated roots of climate change denial. *Current Opinion in Environmental Sustainability*, 42, 60-64.
- Woo, S. E., Jebb, A. T., Tay, L., & Parrigon, S. (2018). Putting the “person” in the center: Review and synthesis of person-centered approaches and methods in organizational

science. *Organizational Research Methods*, 21(4), 814-845.

Zagzebski, L. T. (1996). *Virtues of the Mind: An Inquiry into the Nature of Virtue and the Ethical Foundations of Knowledge*. Cambridge University Press.

Zaval, L., Keenan, E. A., Johnson, E. J., & Weber, E. U. (2014). How warm days increase belief in global warming. *Nature Climate Change*, 4(2), 143-147.

Appendix A: Supplemental Materials for Chapter 2

Supplemental Analysis 1: Reproducing Primary Analyses with Inattentive Participants

To ensure high quality data, I used multiple attention check questions in each study to filter out inattentive participants before conducting my primary analyses. I also pre-registered this procedure and the specific attention check questions used in Studies 2-4. This supplemental analysis reproduces all of my primary analyses without these exclusions.

Study 1

These analyses still excluded participants with neutral gun attitudes, leaving a sample of 579. As in the main text, I observed a main effect of favorability, and no interaction with information quality. However, unlike the main text, I observed a small main effect of information quality, such that participants were significantly more likely to consider the economic study to be evidence than the physician's story.

Table A.1

Chapter 2: Study 1: Testing Motivated Empiricism with Inattentive Participants

Parameter	Odds Ratio	95% CI	p-value
Intercept	2.45	[1.73, 3.55]	< .001
Favorability	3.14	[1.72, 5.97]	< .001
Information Quality	1.76	[1.03, 3.06]	.042
Favorability × Information Quality	1.19	[.43, 3.45]	.744

Table A.2

Chapter 2: Study 1: Simple Slopes by Information Type with Inattentive Participants

Favorability Simple Slopes	Odds Ratio	95% CI	p-value
Economic Study	1.93	[1.28, 2.92]	.002

Favorability	4.48	[2.68, 7.49]	< .001	13.80	[4.15, 45.88]	< .001
Order	2.27	[1.39, 3.73]	.001	6.12	[2.19, 17.08]	< .001
Favorability × Anecdote				0.28	[.07, 1.15]	.077
Favorability × Poll				0.27	[.07, 1.03]	.056
Favorability × Pastor				0.18	[.03, .95]	.043
Order × Anecdote				0.28	[.08, 1.04]	.058
Order × Poll				0.30	[.09, 1.01]	.052
Order × Pastor				0.21	[.04, 1.08]	.061
Favorability × Order				0.48	[.07, 3.28]	.456
Favorability × Order × Anecdote				2.86	[.32, 25.5]	.347
Favorability × Order × Poll				4.11	[.34, 50.4]	.269
Favorability × Order × Pastor				1.47	[.18, 12.2]	.719

The simple slopes also suggest that motivated discounting is more common than elevation.

Table A.4

Chapter 2: Study 2: Simple Slopes by Information Type with Inattentive Participants

Favorability Simple			
Slopes	Odds Ratio	95% CI	p-value
Economic Study	3.10	[1.91, 5.01]	< .001

Citizen's Anecdote	2.13	[1.48, 3.06]	< .001
Opinion Poll	1.77	[1.26, 2.49]	.001
Pastor's Opinion	1.84	[1.16, 2.92]	.009

Study 3

These analyses excluded no participants, leaving a sample of 720. As in the main text, I observed motivated empiricism, and that motivated discounting was significantly more common than both cases of motivated elevation.

Table A.5

Chapter 2: Study 3: Testing Motivated Empiricism with Inattentive Participants

Parameter	Main effects model			Interactive model		
	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>
Intercept (i.e., Economic Study)	2.45	[1.67, 3.58]	< .001	1.78	[1.17, 2.72]	.007
Favorability	4.39	[2.83, 6.81]	< .001	10.88	[5.20, 22.76]	< .001
Citizen's Anecdote	0.05	[.03, .09]	< .001	0.10	[.05, .18]	< .001
Opinion Poll	0.13	[.08, .20]	< .001	0.19	[.11, .34]	< .001
Favorability × Citizen's Anecdote				0.25	[.10, .59]	.002
Favorability × Opinion Poll				0.33	[.15, .77]	.01

As in the main text, the intervention significantly moderated the effect of favorability on evidence judgements (i.e., motivated empiricism), and this moderating effect equally impacted discounting and elevation.

Table A.6

Chapter 2: Study 3: Intervention Effects on Motivated Empiricism

Parameter	Main effects model			Interactive model		
	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>
Intercept (i.e., Economic Study)	0.60	[.5, .72]	< .001	1.72	[1.16, 2.55]	.007
Favorability	2.56	[2, 3.27]	< .001	9.62	[4.83, 19.16]	< .001
Intervention	1.22	[.95, 1.56]	.115	4.12	[2.28, 7.44]	< .001
Favorability × Intervention	0.51	[.36, .72]	< .001	0.63	[.2, 2.04]	.444
Citizen's Anecdote				0.11	[.06, .2]	< .001
Opinion Poll				0.21	[.13, .36]	< .001
Favorability × Anecdote				0.26	[.11, .61]	.002
Favorability × Poll				0.35	[.16, .78]	.01
Intervention × Anecdote				0.22	[.1, .48]	< .001
Intervention × Poll				0.16	[.07, .34]	< .001
Favorability × Intervention × Anecdote				0.68	[.17, 2.68]	.583

Favorability × Intervention × Poll	0.64	[.17, 2.42]	.51
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As in the main text, the simple effects of motivated empiricism for each piece of information in the intervention and no intervention condition showed that the intervention eliminated motivated elevation, but not the more common discounting effect.

Table A.7

Chapter 2: Study 3: Simple Slopes by Information Type with Inattentive Participants

Statement	No Intervention			Intervention		
	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>
Economic Study	3.10	[2.20, 4.38]	< .001	2.47	[1.53, 3.97]	< .001
Citizen's Anecdote	1.60	[1.19, 2.13]	.002	1.05	[.77, 1.42]	.767
Opinion Poll	1.84	[1.39, 2.41]	< .001	1.17	[.88, 1.55]	.289

Study 4

These analyses excluded no participants, leaving a sample of 690. As in the main text, I observed motivated empiricism, and that motivated discounting was significantly more common than both cases of motivated elevation.

Table A.8

Chapter 2: Study 4: Testing Motivated Empiricism with Inattentive Participants

Main effects model

Interactive model

Parameter	Main effects model			Interactive model		
	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>
Intercept (i.e., Economic Study)	3.16	[2.17, 4.59]	< .001	2.12	[1.40, 3.20]	< .001
Favorability	2.76	[1.85, 4.13]	< .001	8.77	[4.2, 18.28]	< .001
Citizen's Anecdote	0.06	[.04, .10]	< .001	0.13	[.07, .22]	< .001
Opinion Poll	0.16	[.10, .24]	< .001	0.27	[.16, .45]	< .001
Pastor's Opinion	0.01	[.01, .03]	< .001	0.02	[.01, .05]	< .001
Favorability × Citizen's Anecdote				0.19	[.08, .45]	< .001
Favorability × Opinion Poll				0.24	[.10, .56]	.013
Favorability × Pastor's Opinion				0.28	[.10, .76]	< .001

As in the main text, the intervention did not moderate the effect of favorability on evidence judgements (i.e., motivated empiricism), and there were no three-way interactions.

Table A.9

Chapter 2: Study 4: Intervention Effects on Motivated Empiricism

Parameter	Main effects model			Interactive model		
	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>
Intercept (i.e., Economic Study)	0.05	[.03, .07]	< .001	0.11	[.07, .17]	< .001

Favorability	4.55	[2.71, 7.64]	< .001	10.40	[5.46, 19.8]	< .001
Intervention	1.19	[.71, 1.98]	.503	1.88	[1.00, 3.55]	.05
Favorability × Intervention	0.90	[.43, 1.87]	.770	0.73	[.29, 1.81]	.495
Citizen's Anecdote				0.31	[.2, .49]	< .001
Opinion Poll				0.65	[.42, 1.01]	.057
Pastor's Opinion				0.21	[.14, .33]	< .001
Favorability × Anecdote				0.32	[.17, .6]	< .001
Favorability × Poll				0.53	[.28, .98]	.044
Favorability × Pastor				0.21	[.11, .4]	< .001
Intervention × Anecdote				0.81	[.44, 1.49]	.489
Intervention × Poll				0.41	[.22, .75]	.004
Intervention × Pastor				0.49	[.26, .9]	.022
Favorability × Intervention × Anecdote				1.18	[.49, 2.84]	.717
Favorability × Intervention × Poll				1.73	[.72, 4.17]	.224
Favorability × Intervention × Pastor				1.13	[.47, 2.72]	.791

As in the main text, the simple slopes showed significant effects of favorability for each piece of information in the no intervention condition; but unlike the main text this, this effect was also significant for the citizen's anecdote. Descriptively, all of these effects were larger than

in the main text. Unlike the main text, there were significant effects of favorability on the citizen’s anecdote and opinion poll in the intervention condition.

Table A.10

Chapter 2: Study 4: Simple Slopes by Information Type with Inattentive Participants

Statement	No Intervention			Intervention		
	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>
Economic Study	3.23	[2.34, 4.45]	< .001	2.75	[1.99, 3.8]	< .001
Citizen's Anecdote	1.84	[1.33, 2.53]	< .001	1.70	[1.23, 2.35]	.001
Opinion Poll	2.34	[1.7, 3.23]	< .001	2.63	[1.9, 3.63]	< .001
Pastor’s Opinion	1.49	[1.08, 2.06]	.015	1.35	[.98, 1.87]	.068

Supplemental Analysis 2: Operationalizing Information Favorability Continuously

In these analyses, I operationalize information's favorability differently than in the main text: I use participants' scores on the continuous (1 to 7) gun attitudes measure (higher scores = more positive attitudes), reverse scoring them for participants exposed to anti-gun ban information. For example, a participant whose score was 5.5 on the (pro-)gun attitudes measure would receive a favorability score of 5.5 if they read information against gun bans, and a favorability score of 2.5 if they read information favoring gun bans. Beyond offering a finer-grained index of favorability, this strategy meant that I did not have to exclude participants whose gun attitudes fell at the exact midpoint. In all four studies, retesting my hypotheses with this variable (standardized) revealed the same effects reported in the main text: To the degree the information participants read was (un)favorable, they were (less) more likely to declare it evidence; the interactions with information type indicated this was always directionally, if not always significantly, more true of high-quality information.

Study 1

Table A.11

Chapter 2: Study 1: Testing Motivated Empiricism with a Continuous Measure of Information Favorability

Parameter	Odds Ratio	95% CI	p-value
Intercept	4.71	[3.32, 6.97]	< .001
Continuous Favorability	2.03	[1.43, 2.96]	< .001
Study (vs. Story)	1.93	[1.05, 3.69]	.038
Continuous Favorability × Study	1.27	[0.69, 2.44]	.448

Study 2

Table A.12

Chapter 2: Study 2: Testing Motivated Empiricism with a Continuous Measure of Information

Favorability

Parameter	Odds Ratio	95% CI	p-value
Intercept (Economic Study)	14.39	[8.55, 24.22]	< .001
Citizen's Anecdote	0.01	[.01, .03]	< .001
Opinion Poll	0.03	[.02, .05]	< .001
Pastor's Opinion	0.003	[.00, .01]	< .001
Continuous Favorability	4.20	[2.58, 6.83]	< .001
Citizen's Anecdote × Continuous Favorability	0.60	[.34, 1.05]	.076
Opinion Poll × Continuous Favorability	0.45	[.27, .78]	.004
Pastor's Opinion × Continuous Favorability	0.45	[.24, .86]	.016

Study 3

Table A.13

Chapter 2: Study 3: Testing Motivated Empiricism with a Continuous Measure of Information

Favorability

Parameter	Odds Ratio	95% CI	p-value
Intercept (Economic Study)	6.84	[4.47, 10.48]	< .001
Citizen's Anecdote	0.04	[.02, .08]	< .001
Opinion Poll	0.10	[.06, .17]	< .001
Continuous Favorability	3.67	[2.49, 5.43]	< .001
Citizen's Anecdote × Continuous Favorability	0.47	[.29, .74]	.001
Opinion Poll × Continuous Favorability	0.56	[.36, .87]	.010

Study 4

Table A.14

Chapter 2: Study 4: Testing Motivated Empiricism with a Continuous Measure of Information Favorability

Parameter	95%		
	Odds Ratio	CI	p-value
Intercept (Economic Study)	6.26	[4.16, 9.43]	< .001
Citizen's Anecdote	0.05	[.03, .08]	< .001
Opinion Poll	0.12	[.08, .20]	< .001
Pastor's Opinion	0.01	[.01, .02]	< .001
Continuous Favorability	3.24	[2.19, 4.79]	< .001
Citizen's Anecdote × Continuous Favorability	0.45	[.28, .72]	< .001
Opinion Poll × Continuous Favorability	0.45	[.29, .7]	< .001
Pastor's Opinion × Continuous Favorability	0.60	[.34, 1.07]	.082

Supplemental Analysis 3: Continuous Information Quality Evaluations

This set of analyses examines alternative DVs that Study 3 and 4's pre-registrations explicitly labeled as exploratory. These measures assess perceived quality of evidence in a continuous way similar to those used in previous motivated evaluation work, as opposed to my primary binary categorization DV (evidence versus not evidence).

First, in Study 1 only, participants rated the persuasiveness of each piece of information; I analyzed this measure in the same model described in the main text and found conceptually identical results:

Table A.15

Chapter 2: Study 1: Testing Motivated Empiricism with a Continuous Measure of Information Persuasiveness

Parameter	<i>b</i>	95% CI	<i>p</i> -value
Intercept	1.37	[1.15, 1.60]	< .001
Favorability	1.02	 [.69, 1.35]	< .001
Study (vs. Story)	0.32	[-.01, .64]	.058
Favorability × Study	-0.06	[-.53, .41]	.802

Second, in all studies, participants rated the usefulness and strength as evidence of the piece of information they read. I averaged these together (Study 1 $r = .837$, 95% CI [.807, 863], $p < .001$) into a single index of evidence quality and ran linear regression models following the binary logistic models described in the main text. All analyses showed the same apparently motivated effect I described in the main text: participants viewed information with favorable conclusions as higher quality evidence than identical information with unfavorable conclusions; this effect was often but not always more pronounced when they evaluated high-quality information.

Study 1

Table A.16

Chapter 2: Study 1: Testing Motivated Empiricism with a Continuous Measure of Information Quality

Parameter	<i>b</i>	95% CI	<i>p</i> -value
Intercept	1.65	[1.45, 1.86]	< .001
Favorability	0.73	 [.43, 1.02]	< .001
Study (vs. Story)	0.35	[.06, .65]	.018
Favorability × Study	0.04	[-.38, .46]	.848

Study 2

Table A.17

Chapter 2: Study 2: Testing Motivated Empiricism with a Continuous Measure of Information

Quality

Parameter	<i>b</i>	95% CI	<i>p</i> -value
Intercept	1.72	[1.57, 1.88]	< .001
Citizen's Anecdote	-1.14	[-1.30, -.98]	< .001
Pastor's Opinion	-1.46	[-1.62, -1.30]	< .001
Opinion Poll	-0.99	[-1.15, -.83]	< .001
Favorability	1.17	 [.94, 1.40]	< .001
Citizen's Anecdote × Favorability	-0.55	[-.79, -.32]	< .001
Pastor's Opinion × Favorability	-0.79	[-1.02, -.55]	< .001
Opinion Poll × Favorability	-0.51	[-.75, -.28]	< .001

Study 3

Table A.18

Chapter 2: Study 3: Testing Motivated Empiricism with a Continuous Measure of Information

Quality

Parameter	<i>b</i>	95% CI	<i>p</i> -value
Intercept	1.27	[1.10, 1.44]	< .001
Citizen's Anecdote	-0.71	[-.90, -.52]	< .001
Opinion Poll	-0.63	[-.82, -.44]	< .001
Favorability	1.21	 [.98, 1.44]	< .001
Citizens Anecdote × Favorability	-0.68	[-.93, -.43]	< .001
Opinion Poll × Favorability	-0.38	[-.63, -.13]	.003

Study 4

Table A.19

Chapter 2: Study 4: Testing Motivated Empiricism with a Continuous Measure of Information

Quality

Parameter	<i>b</i>	95% <i>CI</i>	<i>p</i> -value
Intercept (Economic Study)	1.41	[1.26, 1.57]	< .001
Citizen's Anecdote	-0.85	[-1.03, -.67]	< .001
Opinion Poll	-0.52	[-.70, -.35]	< .001
Pastor's Opinion	-1.21	[-1.39, -1.03]	< .001
Favorability	0.84	 [.63, 1.06]	< .001
Citizen's Anecdote × Favorability	-0.48	[-0.73, -0.23]	< .001
Opinion Poll × Favorability	-0.40	[-0.65, -0.15]	.002
Pastor's Opinion × Favorability	-0.61	[-0.86, -0.35]	< .001

Given these findings, readers may wonder whether asking people to make a binary judgment about whether information is evidence (as I did) is equivalent to asking them to make a continuous evaluation of that same information's quality (as prior work has). However, just because favorability had the same main effect on both variables does not mean that they are measuring the exact same thing. For example, a situation may make you feel a mix of happiness and awe, but that would not make happiness and awe the same emotion.

One way to evaluate whether binary evidence judgments and continuous quality judgments are the same is to examine whether their effects are independent or not. To do this, I isolated observations where participants considered the information evidence ($N_{\text{Judgements}} = 1,511$), and tested whether—within those observations only—we continued to observe effects of information favorability. I also isolated observations where participants considered the information NOT evidence ($N_{\text{Judgements}} = 2,036$) and did the same thing. These analyses use data from the three within-subjects studies as they shared the exact same measures and did not include the added congressional context of Study 1 ($N_{\text{Participants}} = 968$, $N_{\text{Judgements}} = 3,547$).

For each subset of data, a multilevel model predicted quality judgments from information favorability, random intercepts for participant and study (2, 3, or 4), as well as a covariate for whether the information was an economic study, citizen’s anecdote, pastor’s opinion, or opinion poll. In both models (Table A.20), I found main effects of favorability. That is, I found that even given that participants had decided a piece of information was evidence, if it was unfavorable they denigrated its quality. This essentially replicates prior research (e.g., Ditto & Lopez, 1992; Taber & Lodge, 2006) and my own analyses, but extends them by showing that even when participants consider a piece of information to NOT be evidence, they still rated it as higher quality information when it was favorable (vs. unfavorable) their own preferences. Put differently, even when people believed that information was not evidence, they still attributed the information some degree of value at discerning the truth when favorable. This suggests that there is something to continuous information quality evaluations that goes beyond whether or not something is considered to be evidence a perfectly logical truth-seeker would use to discern the truth (e.g., how easily participants think it could be used to persuade others).

Table A.20

Chapter 2: Samples 1-3: Effects of Information Favorability on Continuous Information Quality Evaluations for Information Classified as Evidence and Not Evidence

<i>Parameter</i>	<i>b</i>	<i>95% Confidence Interval</i>	<i>p-value</i>
<i>Information Participants Classified as Evidence</i>			
Intercept (Economic Study)	2.04	[1.81, 2.27]	< .001
Favorability	.59	 [.47, .71]	< .001
Citizen’s Anecdote	-.62	[-.72, -.51]	< .001
Pastor’s Opinion	-.72	[-.91, -.53]	< .001

Opinion Poll	-0.34	[-0.43, -0.25]	< .001
<i>Information Participants Classified as Not Evidence</i>			
Intercept (Economic Study)	.58	[.51, .66]	< .001
Favorability	.21	 [.15, .28]	< .001
Citizen's Anecdote	-0.30	[-0.37, -0.23]	< .001
Pastor's Opinion	-0.49	[-0.56, -0.42]	< .001
Opinion Poll	-0.32	[-0.39, -0.24]	< .001

Supplemental Analysis 4: Testing Moderation by Political Ideology

In these analyses, I tested whether motivated empiricism is moderated by left-right political ideology. To each study's data, I fit a model with information favorability (unfavorable = -1; favorable = 1), participant ideology (centered; such that positive scores are conservative) and their interaction, as well as information quality (low quality = -1, high quality = 1) as predictors of evidence judgment(s) each participant made. To the data from Studies 2, 3, & 4, which used within-subjects designs and multiple pieces of information (two to three low quality and one high quality), I also included random slopes for participants. This interaction was only significant in Study 2, where more conservative participants were more likely to engage in motivated empiricism.

Study 1

Table A.21

Chapter 2: Study 1: Moderation of Motivated Empiricism by Political Ideology

Parameter	Odds Ratio	95% CI	p-value
Intercept	2.34	[1.62, 3.44]	< .001
Favorability	4.54	[2.47, 9.07]	< .001
Ideology	0.94	[0.81, 1.09]	.412
Information Quality	1.81	[1.06, 3.15]	.031
Favorability × Ideology	1.27	[0.94, 1.74]	.132

Study 2

Table A.22

Chapter 2: Study 2: Moderation of Motivated Empiricism by Political Ideology

Parameter	Odds Ratio	95% CI	p-value
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Intercept (Economic Study)	5.26	[3.30, 8.37]	< .001
Favorability	4.79	[2.84, 8.08]	< .001
Ideology	0.85	[0.73, 0.99]	.041
Citizen's Anecdote	0.02	[0.01, 0.03]	< .001
Opinion Poll	0.04	[0.02, 0.06]	< .001
Pastor's Opinion	0.003	[0.00, 0.01]	< .001
Favorability × Ideology	1.35	[1.08, 1.69]	.010

Study 3

Table A.23

Chapter 2: Study 3: Moderation of Motivated Empiricism by Political Ideology

Parameter	Odds Ratio	95% CI	p-value
Intercept (Economic Study)	3.97	[2.93, 5.39]	< .001
Favorability	3.18	[2.32, 4.36]	< .001
Ideology	1.04	[0.94, 1.15]	.490
Citizen's Anecdote	0.03	[0.02, 0.05]	< .001
Opinion Poll	0.06	[0.04, 0.09]	< .001
Favorability × Ideology	1.06	[0.92, 1.21]	.420

Study 4

Table A.24

Chapter 2: Study 4: Moderation of Motivated Empiricism by Political Ideology

Parameter	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>
Intercept (Economic Study)	4.99	[3.63, 6.86]	< .001
Favorability	2.42	[1.76, 3.34]	< .001
Ideology	1.20	[1.08, 1.32]	< .001
Citizen's Anecdote	0.04	[0.02, 0.05]	< .001
Opinion Poll	0.06	[0.04, 0.09]	< .001
Pastor's Opinion	0.01	[0.00, 0.01]	< .001
Favorability × Ideology	0.97	[0.84, 1.11]	.646

Supplemental Analysis 5: Testing Effects on Willingness to Share on Social Media

In these analyses, I examined an additional variable included only in Studies 3 and 4 and pre-registered as exploratory. Specifically, I asked participants whether they would “consider sharing this information online (for example, through Facebook or Twitter)?” on a 10-point scale from “I definitely would not share this” (-5) to “I definitely would share this” (5). I tested whether information favorability had a similar effect on this variable as evidence judgements, and, if so, whether this effect was diminished by having completed the intervention. Finally, I tested whether favorability and the intervention had different effects depending on the information type (high vs. low-quality).

To conduct the first two of these tests, I fit a multi-level linear model with willingness to share the information as the DV, and random slopes for each participant. As predictors, I included information favorability (unfavorable = -1; favorable = 1), intervention condition (no intervention = -1; intervention = 1), and their interaction (intervention only model). Next, I fit a second model including the dummy-coded information quality variable to this model and all its interactions to test whether favorability and the intervention worked differently for high and low quality information (fully interactive model).

Study 3

Table A.25

Chapter 2: Study 3: Effects of Information Favorability on Willingness to Share Information on Social Media

Parameter	Intervention only model			Fully interactive model		
	<i>B</i>	95% <i>CI</i>	<i>p</i> - <i>value</i>	<i>B</i>	95% <i>CI</i>	<i>p</i> - <i>value</i>

	Intervention only model			Fully interactive model		
Intercept	-2.83	[-3.26, -2.40]	< .001	-2.36	[-2.86, -1.85]	< .001
Favorability	2.14	[1.57, 2.72]	< .001	2.92	[2.24, 3.60]	< .001
Intervention	-0.16	[-.74, .42]	.591	0.30	[-.38, .98]	.389
Favorability × Intervention	-0.70	[-1.51, .11]	.091	-0.65	[-1.61, .30]	.179
Citizen's Anecdote				-1.06	[-1.52, -.59]	< .001
Opinion Poll				-0.36	[-.82, .11]	.130
Favorability × Anecdote				-1.49	[-2.11, -.86]	< .001
Favorability × Poll				-0.84	[-1.46, -.21]	.009
Intervention × Anecdote				-0.60	[-1.23, .03]	.062
Intervention × Poll				-0.78	[-1.41, -.14]	.016
Favorability × Anecdote × Intervention				-0.11	[-.99, .77]	.800
Favorability × Poll × Intervention				-0.02	[-.90, .86]	.969

Study 4

Table A.26

Chapter 2: Study 4: Effects of Information Favorability on Willingness to Share Information on Social Media

Intervention only model Fully interactive model

Parameter	Intervention only model			Fully interactive model		
	<i>B</i>	95% <i>CI</i>	<i>p</i> - <i>value</i>	<i>B</i>	95% <i>CI</i>	<i>p</i> - <i>value</i>
Intercept	-3.11	[-3.49, -2.73]	< .001	-2.33	[-2.80, -1.86]	< .001
Favorability	1.59	[1.05, 2.13]	< .001	2.54	[1.87, 3.21]	< .001
Intervention	0.08	[-.45, .61]	.777	0.55	[-.11, 1.21]	.103
Favorability × Intervention	-0.16	[-.92, .61]	.690	-0.37	[-1.32, .59]	.449
Citizen's Anecdote				-1.14	[-1.60, -.68]	< .001
Opinion Poll				-0.43	[-.89, .03]	.066
Pastor's Opinion				-1.53	[-1.98, -1.07]	< .001
Favorability × Anecdote				-1.29	[-1.94, -.64]	< .001
Favorability × Poll				-0.76	[-1.41, -.10]	.023
Favorability × Pastor				-1.74	[-2.39, -1.09]	< .001
Intervention × Anecdote				-0.37	[-1.01, .27]	.257
Intervention × Poll				-0.81	[-1.45, -.16]	.014
Intervention × Pastor				-0.72	[-1.36, -.07]	.029
Favorability × Anecdote × Intervention				0.27	[-.66, 1.20]	.575
Favorability × Poll × Intervention				0.38	[-.55, 1.31]	.428

Favorability × Pastor × Intervention	0.21	[-.72, 1.14]	.660
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The models revealed that people were less willing to share low-quality information than the economic study, and that the intervention generally amplified this preference. At the same time, the models also revealed that people were more willing to share information favorable to their attitudes, and this was not moderated by having completed the intervention task. In other words, while the intervention nudged participants' sharing preferences in further alignment with scientific standards, it did not prevent information favorability from affecting their willingness to share the information. Additionally, the effect of favorability on willingness to share was larger for the economic study than the low-quality pieces of information: Just as participants were more likely to categorize favorable information as evidence, they were also more willing to share favorable information online, and this effect was stronger for science than anecdotes and opinions. The absence of three-way interactions suggests that the intervention did not eliminate the favorability bias for any particular information type.

Supplemental Analysis 6: Meta-Analysis of Differences Between Discounting & Elevation

To increase my power to detect a significant difference between motivated elevation and discounting, I conducted a within-paper meta-analysis combining data from the three within-subjects studies ($N = 3,547$ judgements), and fit a model predicting evidence judgements from information favorability, quality, and their interaction. As in the main text when I tested for interactions between favorability and quality, I did not include participants who completed the intervention task in this analysis. This analysis (see Table below) revealed a significant interaction between favorability and quality, such that motivated discounting of the economic studies ($OR = 3.08$, 95% CI [2.44, 3.89], $p < .001$), was more frequent than the elevation of a citizens' anecdotes ($OR = 1.61$, 95% CI [1.33, 1.94], $p < .001$), opinion polls ($OR = 1.66$, 95% CI [1.39, 1.99], $p < .001$), and pastors' opinions ($OR = 1.86$, 95% CI [1.36, 2.55], $p < .001$).

Table A.27

Chapter 2: Meta-Analysis of Differences Between Discounting and Elevation

Parameter	Odds Ratio	95% CI	p-value
Intercept (Economic Study)	2.54	[1.96, 3.30]	< .001
Favorability	9.46	[5.94, 15.09]	< .001
Citizen's Anecdote	.07	[.04, .09]	< .001
Opinion Poll	.15	[.11, .21]	< .001
Pastor's Judgement	.01	[.01, .02]	< .001
Favorability × Citizen's Anecdote	.27	[.16, .47]	< .001
Favorability × Opinion Poll	.29	[.17, .49]	< .001
Favorability × Pastor's Opinion	.37	[.17, .77]	.008

Supplemental Analysis 7: Post Hoc Power Analyses

In lieu of *a priori* power analyses calculating the sample sizes required to detect motivated empiricism at a pre-specified effect size for the studies in Chapter 2, I instead perform *post hoc* power analyses for Studies 2, 3, & 4 using the effect sizes I observed in these studies. As many have pointed out in the literature, post hoc power analysis of this sort is problematic: power is the probability of detecting an effect given a *true* effect size and sample size; however, post hoc power is computed using an observed effect size, which can vary across samples. Consequently, when a researcher fails to reject the null hypothesis, the observed effect size is typically small, producing a low post-hoc power estimate; and when they reject the null, the effect size is usually larger, leading to a higher estimate of power. Nevertheless, I conduct post hoc power analysis on the main effect of information favorability on evidence judgments (i.e., motivated empiricism), I use the *simr* R package (Green & MacLeod, 2016) for power analysis with multilevel models (MLMs). *Simr* implements power analysis by simulating datasets with similar parameter values, and quantifying power as the number of simulations in which the effect is correctly detected at a chosen alpha.

Specifically, I performed post hoc power analysis on the main effects of information favorability I observed in Studies 2, 3, and 4. For simplicity, I ignore Study 1 as it was the only study where I did not have nested observations requiring an MLM. First, for each study, I fit the main effects MLM described in the main text to the data, predicting binary evidence judgements from information favorability. Then, I used these fitted models with *simr* to simulate 1,000 datasets with the same overall degree of motivated empiricism, and used these to determine in what number of simulations the effect was correctly detected. Power to detect the observed effect was 100.0% (95% CI [99.63, 100.00]) in Study 2, 100.0% (95% CI [99.63, 100.00]) in Study 3, and 99.90% (95% CI [99.44, 100.00]) in Study 4.

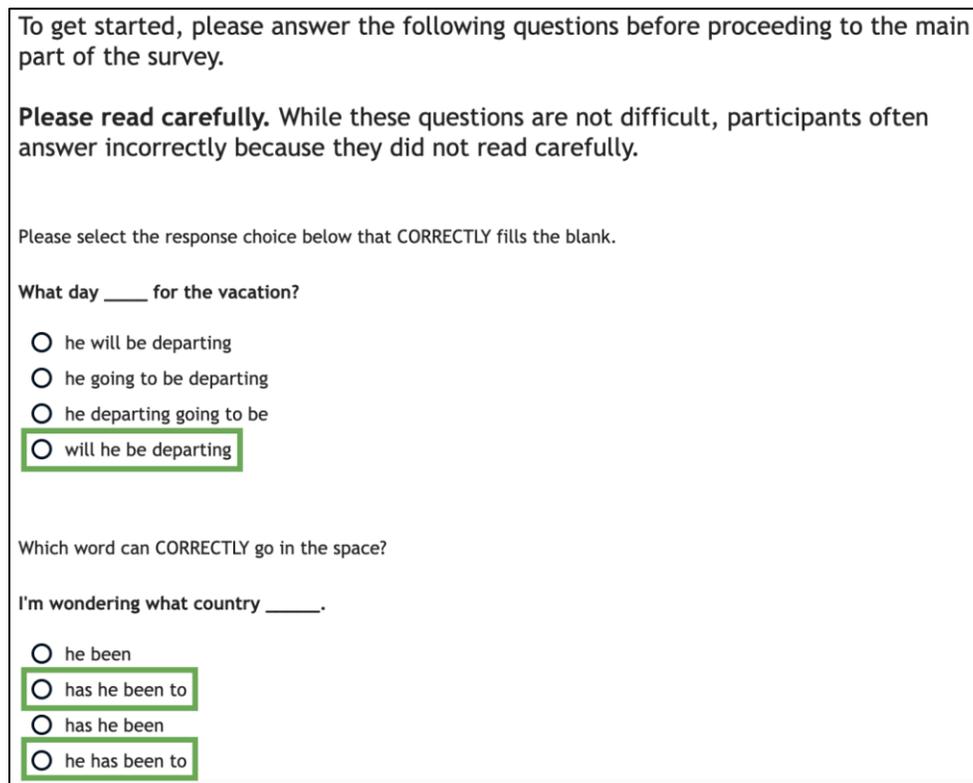
Survey Materials by Study

The exact survey materials for each study are available on the OSF page for my project as word files and as .qsf files which can be uploaded to Qualtrics to create an exact copy of the study. Below, for each study, I provide a selection of these materials for readers to assist in interpreting the primary analyses described in the main text. Specifically, I include all (i) questions used to filter out participants and ensure data quality, (ii) experimental stimuli, and (iii) the exact wording of my dependent variable questions.

Study 1

Attention Checks

The accepted answers to each question are labeled in this screenshot from the survey:



To get started, please answer the following questions before proceeding to the main part of the survey.

Please read carefully. While these questions are not difficult, participants often answer incorrectly because they did not read carefully.

Please select the response choice below that CORRECTLY fills the blank.

What day ____ for the vacation?

- he will be departing
- he going to be departing
- he departing going to be
- will he be departing

Which word can CORRECTLY go in the space?

I'm wondering what country ____.

- he been
- has he been to
- has he been
- he has been to

Each participant also answered two questions about the vignette they were supposed to have read. I used two questions for the physician's story, and two for the economist's study. The

correct answer to each question depended on whether participants read information suggesting that gun bans work or do not. I provide the exact questions and label the correct answer to each question here:

Participants who read about the physician's story:

1. Which of the following matches the story Dr. Kunda described?
 - a. An armed assailant shot and injured a store clerk.
 - i. **[This is the correct answer for participants who read that gun bans do not work.]**
 - b. A store clerk shot and injured an armed assailant.
 - i. **[This is the correct answer for participants who read that gun bans work.]**
 - c. A customer shot and injured another customer.
 - d. Nobody was injured.
2. Which of the following matches the story Dr. Kunda described?
 - a. The shooter had a valid concealed carry permit for the handgun.
 - i. **[This is the correct answer regardless of the story participants read.]**
 - b. The shooter did not have a permit for the handgun.
 - c. There were no shots fired.
 - d. This information was not stated.

Participants who read about the economist's study:

1. Which of the following matches the study Dr. Kunda described?
 - a. Cities that placed bans on guns typically had decreases in crime relative to those that had not placed such bans.
 - i. **[This is the correct answer for participants who read that gun bans work.]**
 - b. Cities that placed bans on guns typically had increases in crime relative to those that had not placed such bans.
 - i. **[This is the correct answer for participants who read that gun bans do not work.]**
 - c. Cities that placed bans on guns typically had no change in crime relative to those that had not placed such bans.
 - d. The results were inconclusive.
2. Which of the following matches the study Dr. Kunda described?
 - a. Dr. Kunda gathered crime statistics from cities that had and had not enacted gun bans.
 - i. **[This is the correct answer regardless of the study participants read.]**
 - b. Dr. Kunda only gathered crime statistics from cities that had enacted gun bans.
 - c. Dr. Kunda only gathered crime statistics from cities that had not enacted gun bans.
 - d. This information was not stated.

Finally, participants answered an attention check embedded in the demographics:

Research in decision making shows that people, when making decisions and answering questions, prefer not to pay attention and minimize their effort as much as possible. Some studies show that over 50% of people don't carefully read questions. If you are reading this question and have read all the other questions, please select the box marked 'other' and type 'gun rights'. Do not select "social issues". Thank you for participating and for taking the time to read through the questions carefully!

What was this study about?

Social Issues
 News
 Memory
 Other (please specify):

Vignettes

Regardless of condition, all vignettes started with this text:

“On Tuesday, June 8th State Officials met to begin discussions about the possibility of passing a new law banning citizens from carrying concealed handguns in public. Currently, State residents may acquire a concealed carry permit that allows them to carry handguns on their person in public. However, this policy has come under fire from those who support stricter gun regulations. Officials were unsure if the new law would be more likely to decrease crime by reducing the number of people carrying weapons or increase crime by making it harder for law-abiding citizens to defend themselves.”

	Suggested Gun Bans Work	Suggested Gun Bans Do Not Work
Economist’s Study	During the meeting, Officials heard from Dr. Dan Kunda, an economist at the state university. Dr. Kunda described his research dividing nearly 700 small, medium, and large U.S. Cities into two groups: one consisting of cities that had recently enacted bans on concealed handguns, and another group of cities that had no such bans. Dr. Kunda explained that he wanted to see how crime rates changed over the course of a year for cities that do and do not enact gun bans. To accomplish this he collected crime statistics from each of these 700 locations, which included the monthly crime rate for each city. He then observed the number of cities that experienced decreases in crime	During the meeting, Officials heard from Dr. Dan Kunda, an economist at the state university. Dr. Kunda described his research dividing nearly 700 small, medium, and large U.S. Cities into two groups: one consisting of cities that had recently enacted bans on concealed handguns, and another group of cities that had no such bans. Dr. Kunda explained that he wanted to see how crime rates changed over the course of a year for cities that do and do not enact gun bans. To accomplish this he collected crime statistics from each of these 700 locations, which included the monthly crime rate for each city. He then observed the number of cities that experienced decreases in crime

	<p>and those that experienced increases in crime throughout the year.</p> <p>As he described, cities that placed bans on guns typically observed decreases in crime relative to otherwise similar cities that had not placed such bans. In other words, the cities that banned guns are the same cities that saw less crime afterwards.</p> <p>After they thanked Dr. Kunda for sharing their study, Officials went on to consider the ability of gun bans on concealed handguns to make communities safer. The committee will meet several more times in the coming months in hopes of reaching a conclusion.</p>	<p>and those that experienced increases in crime throughout the year.</p> <p>As he described, cities that placed bans on guns typically observed increases in crime relative to otherwise similar cities that had not placed such bans. In other words, the cities that banned guns are the same cities that saw more crime afterwards.</p> <p>After they thanked Dr. Kunda for sharing their study, Officials went on to consider the ability of gun bans on concealed handguns to make communities safer. The committee will meet several more times in the coming months in hopes of reaching a conclusion.</p>
<p>Physician’s Story</p>	<p>During the meeting, Officials heard from Dr. Dan Kunda, a surgeon at the state hospital. Dr. Kunda described his vivid memories from last Fall, when police received several calls that an armed and erratic man was holding up a convenience store with a female clerk and several early morning shoppers, Dr. Kunda included, being threatened. For several minutes, Dr. Kunda described, the assailant yelled and made aggressive gestures towards those in the store. Apparently, the assailant had some sort of personal dispute with the clerk, and was there to settle it. However, due to heavy construction and traffic, the scene ended several minutes before police arrived.</p> <p>Dr. Kunda had called in to inform officers that the assailant had been shot and injured by the clerk, who had seized an opportunity to neutralize the situation. When police arrived, the clerk surrendered her handgun immediately, when police quickly learned that she had a valid concealed carry permit. Police also learned that the assailant was a violent ex-boyfriend who had come to the store in a heartbroken fury. The actions of this heroic clerk likely saved the lives of herself and the four shoppers, Dr. Kunda</p>	<p>During the meeting, Officials heard from Dr. Dan Kunda, a surgeon at the state hospital. Dr. Kunda described his vivid memories from last Fall, when police received several calls that an armed and erratic man was holding up a convenience store with a female clerk and several early morning shoppers, Dr. Kunda included, being threatened. For several minutes, Dr. Kunda described, the assailant yelled and made aggressive gestures towards those in the store. Apparently, the assailant had some sort of personal dispute with the clerk, and was there to settle it. However, due to heavy construction and traffic, the scene ended several minutes before police arrived.</p> <p>Dr. Kunda had called in to inform officers that the assailant had shot and injured the clerk. When police arrived, the shooter surrendered his weapon immediately, when police quickly learned that he had a valid concealed carry permit for the handgun. Police also learned that the assailant was a violent ex-boyfriend who had come to the store in a heartbroken fury. The actions of this reckless assailant nearly cost the lives of the clerk and four shoppers, Dr. Kunda included.</p> <p>After they thanked Dr. Kunda</p>

	<p>included.</p> <p>After they thanked Dr. Kunda for sharing their story, Officials went on to consider the ability of gun bans on concealed handguns to make communities safer. The committee will meet several more times in the coming months in hopes of reaching a conclusion.</p>	<p>for sharing their story, Officials went on to consider the ability of gun bans on concealed handguns to make communities safer. The committee will meet several more times in the coming months in hopes of reaching a conclusion.</p>
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DV Question Wording

Economist's Study:

Regardless of your personal position on the issue of gun bans, do you think that the story that Dr. Kunda shared counts as evidence that could be used to **prove whether communities are safer or less safe** when they ban concealed handguns?

Note that we are *not* asking you if you *want* Dr. Kunda's story to be used as evidence by the Officials, simply whether it counts as evidence that a logical truth-seeker would consider.

- Yes, I think that Dr. Kunda's story counts as evidence.
- No, I do not think that Dr. Kunda's story counts as evidence.

Physician's Story:

Regardless of your personal position on the issue of gun bans, do you think that the study that Dr. Kunda shared counts as evidence that could be used to **prove whether communities are safer or less safe** when they ban concealed handguns?

Note that we are *not* asking you if you *want* Dr. Kunda's story to be used as evidence by the Officials, simply whether it counts as evidence that a logical truth-seeker would consider.

- Yes, I think that Dr. Kunda's study counts as evidence.
- No, I do not think that Dr. Kunda's study counts as evidence.

Study 2

Attention Checks

The accepted answers to each question are labeled in this screenshot from the survey:

To get started, please answer the following questions before proceeding to the main part of the survey.

Please read carefully. While these questions are not difficult, participants often answer incorrectly because they did not read carefully.

Please select the response choice below that CORRECTLY fills the blank.

I bet the bakery ____ of fresh bread by the time we get there.

- will have sold out
- will be sell out
- will not have
- will sold out

Which word can CORRECTLY go in the space?

Sorry, Boss, I ____ late tomorrow, I'm afraid.

- can
- 'll have been
- am
- 'll be

1. Which of the following matches the study Dr. Kunda conducted?
 - a. Dr. Kunda interviewed gun owners across the nation.
 - b. Dr. Kunda looked at crime statistics between cities that had and had not enacted gun bans.
 - **[This is the correct answer.]**
 - c. Dr. Kunda did a nationally representative public opinion survey on gun bans.
 - d. Dr. Kunda conducted a series of structured therapy sessions with victims of gun violence, and reported the results.

Research in decision making shows that people, when making decisions and answering questions, prefer not to pay attention and minimize their effort as much as possible. Some studies show that over 50% of people don't carefully read questions. If you are reading this question and have read all the other questions, please select the box marked 'other' and type 'gun rights'. Do not select "social issues". Thank you for participating and for taking the time to read through the questions carefully!

What was this study about?

- Social Issues
- News
- Memory
- Other (please specify):

Vignettes

	Suggested Gun Bans Work	Suggested Gun Bans Do Not Work
Economic Study	<p>Economist Dr. Dan Kunda collected crime statistics from 700 small, medium, and large U.S. cities, which included the monthly crime rate for each city for several years. He then divided the cities into two groups: one consisting of cities that had recently enacted bans on concealed handguns, and another group of cities that had no such bans. Finally, he looked at the number of cities that experienced decreases in crime and those that experienced increases in crime throughout the time period. He saw that cities that placed bans on guns typically observed decreases in crime relative to otherwise similar cities that had not placed such bans. In other words, the cities that banned guns are the same cities that saw less crime afterwards.</p>	<p>Economist Dr. Dan Kunda collected crime statistics from 700 small, medium, and large U.S. cities, which included the monthly crime rate for each city for several years. He then divided the cities into two groups: one consisting of cities that had recently enacted bans on concealed handguns, and another group of cities that had no such bans. Finally, he looked at the number of cities that experienced decreases in crime and those that experienced increases in crime throughout the time period. He saw that cities that placed bans on guns typically observed increases in crime relative to otherwise similar cities that had not placed such bans. In other words, the cities that banned guns are the same cities that saw more crime afterwards.</p>
Citizen's Anecdote	<p>Maya Ford is an avid biker, gardener, and political activist. She has spent quite some time thinking about the debate around gun bans on concealed handguns, and particularly whether they actually work or not at saving lives. Specifically, she recalls that when she was growing up, in her home state, citizens were not allowed to carry concealed handguns in public. During that time, she heard almost nothing about violence in the state. Around when Maya moved away for college, her home state began permitting citizens to carry concealed handguns in public, making it easier for citizens to find guns in the state. A few months later, one of her childhood friends was injured by gun violence. Maya concluded that "this means that gun bans seem to work at making communities safer, and I think we should ban permits for concealed handguns in our state."</p>	<p>Maya Ford is an avid biker, gardener, and political activist. She has spent quite some time thinking about the debate around gun bans on concealed handguns, and whether they actually work or not at saving lives. Specifically, she recalls that when she was growing up, in her home state, citizens were allowed to carry concealed handguns in public. During that time, she heard almost nothing about violence in the state. Around when Maya moved away for college, her home state banned citizens from carrying concealed handguns in public, making it harder for citizens to find guns in the state. A few months later, one of her childhood friends was injured by gun violence. Maya concluded that "this means that gun bans do not seem to work at making communities safer, and I think we should continue to support the right to carry concealed handguns in our state."</p>

<p>Public Opinion Poll</p>	<p>Researchers at the Social Survey Institute regularly conduct polls of American attitudes towards political issues, including gun bans on concealed handguns. These polls include participants from across the country, in all walks of life. According to their polling, most Americans support bans on carrying concealed handguns. Based on these polling data showing a clear majority opinion, some have argued that lawmakers should ban concealed handguns.</p>	<p>Researchers at the Social Survey Institute regularly conduct polls of American attitudes towards political issues, including gun bans on concealed handguns. These polls include participants from across the country, from all walks of life. According to their polling, most Americans support the right to carry concealed handguns. Based on these polling data showing a clear majority opinion, some have argued that lawmakers should uphold the right to carry concealed handguns.</p>
<p>Pastor's Opinion</p>	<p>Brad Vanmeter is a pastor at Holy Cross Church, where he leads a congregation of nearly 300 people. For several decades, Pastor Vanmeter has spent countless hours reading scripture and channeling what he feels to be the word of God. His congregants see him as a helpful spiritual leader in their community, frequently going to him for advice and guidance on difficult issues. During a church BBQ, several congregants approached Pastor Vanmeter to ask him what he thinks about gun bans on concealed handguns. After a few moments of silence and pondering, Pastor Vanmeter gave the congregants his take on the issue: "Although politics are fraught nowadays, it is my belief that only restricting citizens' ability to carry concealed handguns in public can keep our community safe. I believe gun bans work at reducing violence."</p>	<p>Brad Vanmeter is a pastor at Holy Cross Church, where he leads a congregation of nearly 300 people. For several decades, Pastor Vanmeter has spent countless hours reading scripture and channeling what he feels to be the word of God. His congregants see him as a helpful spiritual leader in their community, frequently going to him for advice and guidance on difficult issues. During a church BBQ, several congregants approached Pastor Vanmeter to ask him what he thinks about gun bans on concealed handguns. After a few moments of silence and pondering, Pastor Vanmeter gave the congregants his take on the issue: "Although politics are fraught nowadays, it is my belief that only maintaining citizens' ability to carry concealed handguns in public can keep our community safe. I believe gun bans do not work at reducing violence."</p>

DV Question Wording

Economic Study

Regardless of your personal position on the issue of gun bans or other information you know about the effectiveness of gun bans, do you think that Dr. Kunda's observations count as evidence that could prove whether bans on concealed handguns actually make communities safer or less safe?

Put differently, would a completely logical truth-seeker use Dr. Kunda's observations as evidence to decide if gun bans actually work or not?

- Yes, I think that Dr. Kunda's observations count as evidence.
- No, I do not think that Dr. Kunda's observations count as evidence.

Citizen's Anecdote

Regardless of your personal position on the issue of gun bans or other information you know about the effectiveness of gun bans, do you think that Maya's argument counts as evidence that could prove whether bans on concealed handguns actually make communities safer or less safe?

Put differently, would a completely logical truth-seeker use Maya's argument as evidence to decide if gun bans actually work or not?

- Yes, I think that the Maya's argument counts as evidence.
- No, I do not think that Maya's argument counts as evidence.

Public Opinion Poll

Regardless of your personal position on the issue of gun bans or other information you know about the effectiveness of gun bans, do you think that the Social Survey Institute's polling results count as evidence that could prove whether bans on concealed handguns actually make communities safer or less safe?

Put differently, would a completely logical truth-seeker use the Social Survey Institute's polling results as evidence to decide if gun bans actually work or not?

- Yes, I think that the Social Survey Institute's polling results count as evidence.
- No, I do not think that Social Survey Institute's polling results count as evidence.

Pastor's Opinion

Regardless of your personal position on the issue of gun bans or other information you know about the effectiveness of gun bans, do you think that the pastor's beliefs on gun bans count as evidence that could prove whether bans on concealed handguns actually make communities safer or less safe?

Put differently, would a completely logical truth-seeker use the pastor's beliefs on gun bans as evidence to decide if gun bans actually work or not?

- Yes, I think that the pastor's beliefs on gun bans count as evidence.
- No, I do not think that the pastor's beliefs on gun bans count as evidence.

Study 3

Attention Checks

The accepted answers to each question are labeled in this screenshot from the survey:

To get started, please answer the following questions before proceeding to the main part of the survey.

Please read carefully. While these questions are not difficult, participants often answer incorrectly because they did not read carefully.

Please select the response choice below that CORRECTLY fills the blank.

I bet the hotdog stand ____ closed by the time we get there.

- will have
- will not have
- can have
- will be

Which word can CORRECTLY go in the space?

Sorry, coach, I ____ study late tomorrow, I'm afraid.

- 'll have to
- can
- 'll have been
- am

1. Which of the following matches the study Dr. Engstrom conducted?

- a. Dr. Engstrom interviewed wealthy business people about the impact taxes have on their personal motivations to keep growing their business.
- b. Dr. Engstrom looked at tax rates, unemployment, and innovation across U.S. states.
 - i. **[This is the correct answer.]**
- c. Dr. Engstrom did a nationally representative public opinion survey on the issue of raising taxes on wealthy citizens.
- d. Dr. Engstrom conducted a series of structured therapy sessions with unemployed Americans, and reported the results.

Research in decision making shows that people, when making decisions and answering questions, prefer not to pay attention and minimize their effort as much as possible. Some studies show that over 50% of people don't carefully read questions. If you are reading this question and have read all the other questions, please select the box marked 'other' and type 'gun rights'. Do not select "social issues". Thank you for participating and for taking the time to read through the questions carefully!

What was this study about?

- Social Issues
- News
- Memory
- Other (please specify):

Vignettes

	Suggested Progressive Taxes Help the Economy	Suggested Progressive Taxes Harm the Economy
Economic Study	Economist Dr. Tim Engstrom collected information about tax rates, unemployment, and innovation (# of patents & new businesses per year) for each state in the U.S. This information allowed Dr. Engstrom to look at what has happened in states that do not have particularly high taxes on the wealthy, compared to states that do have high taxes on the wealthy. He was also able to compare states in different decades, when taxes were different. Accounting for differences between states in population density, demographics, and education, the pattern that Dr. Engstrom found was clear: States with lower taxes on the wealthy tended to see worse economic performance compared to states without these low taxes. In other	Economist Dr. Tim Engstrom collected information about tax rates, unemployment, and innovation (# of patents & new businesses per year) for each state in the U.S. This information allowed Dr. Engstrom to look at what has happened in states that do not have particularly high taxes on the wealthy, compared to states that do have high taxes on the wealthy. He was also able to compare states in different decades, when taxes were different. Accounting for differences between states in population density, demographics, and education, the pattern that Dr. Engstrom found was clear: States with higher taxes on the wealthy tended to see worse economic performance compared to states without these high taxes. In other

	words, higher taxes on the rich tended to help states.	words, higher taxes on the rich tended to harm states.
Citizen's Anecdote	<p>Maya Ford is an avid biker, gardener, and political activist. She has thought long and hard about the impact raising taxes on wealthy citizens could have on the economy, and has personal experiences that she feels are relevant to the issue. Based on her thoughts and experiences, she believes that these taxes lead to less unemployment. Maya has worked as a college counselor for nearly a decade and noticed that after taxes were raised on wealthier citizens in her state, students started having a much easier time finding jobs over the next few years. She believes this change in job opportunities was caused by the change in taxes.</p>	<p>Maya Ford is an avid biker, gardener, and political activist. She has thought long and hard about the impact raising taxes on wealthy citizens could have on the economy, and has personal experiences that she feels are relevant to the issue. Based on her thoughts and experiences, she believes that these taxes lead to more unemployment. Maya has worked as a college counselor for nearly a decade and noticed that after taxes were raised on wealthier citizens in her state, students started having a much harder time finding jobs over the next few years. She believes this change in job opportunities was caused by the change in taxes.</p>
Public Opinion Poll	<p>Researchers at the Social Survey Institute regularly conduct polls of American attitudes towards political issues, including raising taxes on wealthy citizens. These polls include participants from across the country, from all walks of life. According to their polling, most Americans actually support raising taxes on wealthy citizens. Based on these polling data showing a clear majority opinion, some have argued that lawmakers should raise taxes on the wealthy.</p>	<p>Researchers at the Social Survey Institute regularly conduct polls of American attitudes towards political issues, including raising taxes on wealthy citizens. These polls include participants from across the country, from all walks of life. According to their polling, most Americans actually oppose raising taxes on wealthy citizens. Based on these polling data showing a clear majority opinion, some have argued that lawmakers should not raise taxes on the wealthy.</p>
Pastor's Opinion	<p>Brad Vanmeter is a pastor at Holy Cross Church, where he leads a congregation of nearly 300 people. For decades, Pastor Vanmeter has spent countless hours reading scripture and channeling what he feels to be the word of God. His congregants see him as a spiritual leader of their community, often going to him for advice and guidance on difficult issues. During a church BBQ, several congregants approached Pastor Vanmeter to ask him what he thinks about raising taxes on wealthier citizens. After a few moments of silence and pondering, Pastor Vanmeter gave the congregants his take on the</p>	<p>Brad Vanmeter is a pastor at Holy Cross Church, where he leads a congregation of nearly 300 people. For decades, Pastor Vanmeter has spent countless hours reading scripture and channeling what he feels to be the word of God. His congregants see him as a spiritual leader of their community, often going to him for advice and guidance on difficult issues. During a church BBQ, several congregants approached Pastor Vanmeter to ask him what he thinks about raising taxes on wealthier citizens. After a few moments of silence and pondering, Pastor Vanmeter gave the congregants his take on the</p>

	<p>issue: "It is my belief that raising taxes could be terrific for the economy, and that many people could end up better off. I believe raising taxes on those who are more wealthy could lead to less pain and suffering for others in our country."</p>	<p>issue: "It is my belief that raising taxes could be terrible for the economy, and that many people could end up worse off. I believe raising taxes on those who are more wealthy could lead to more pain and suffering for others in our country."</p>
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DV Question Wording

Economic Study

Regardless of your personal position on the issue of raising taxes on the wealthy or other information you know about the economic impact of these taxes, do you think that Dr. Engstrom's observations count as evidence that could prove whether raising taxes on the wealthy actually helps or harms the economy?

Put differently, would a completely logical truth-seeker use Dr. Engstrom's observations as evidence to decide if these taxes help the economy or not?

Yes, I think that Dr. Engstrom's observations count as evidence.

No, I do not think that Dr. Engstrom's observations count as evidence.

Citizen's Anecdote

Regardless of your personal position on the issue of raising taxes on the wealthy or other information you know about the economic impact of these taxes, do you think that Maya's argument counts as evidence that could prove whether raising taxes on the wealthy actually helps or harms the economy?

Put differently, would a completely logical truth-seeker use Maya's argument as evidence to decide if these taxes help the economy or not?

Yes, I think that Maya's argument counts as evidence.

No, I do not think that Maya's argument counts as evidence.

Public Opinion Poll

Regardless of your personal position on the issue of raising taxes on the wealthy or other information you know about the economic impact of these taxes, do you think that the Social Survey Institute's polling results count as evidence that could prove whether raising taxes on the wealthy actually helps or harms the economy?

Put differently, would a completely logical truth-seeker use Social Survey Institute's polling results as evidence to decide if these taxes help the economy or not?

- Yes, I think that the Social Survey Institute's polling results count as evidence.
- No, I do not think that Social Survey Institute's polling results count as evidence.

Pastor's Opinion

This question incorrectly referred to the gun bans issue from the previous study in the response options, so I did not use it.

Regardless of your personal position on the issue of raising taxes on the wealthy or other information you know about the economic impact of these taxes, do you think that Pastor Vanmeter's beliefs count as evidence that could prove whether raising taxes on the wealthy actually helps or harms the economy?

Put differently, would a completely logical truth-seeker use Pastor Vanmeter's beliefs as evidence to decide if these taxes help the economy or not?

- Yes, I think that Pastor Vanmeter's beliefs on gun bans count as evidence.
- No, I do not think that Pastor Vanmeter's beliefs on gun bans count as evidence.

Intervention Task

Sorting Task

In this part of the study, we are interested in what kinds of information you consider to be evidence. Please answer based on your personal beliefs.

The following task is about the impact that raising taxes on the rich could have on the economy. Regardless of your personal position on the issue of raising taxes on the wealthy or other information you know about the economic impact of these taxes, we would like you to **sort the following pieces of information as being either (a) evidence that could prove whether raising taxes on the wealthy actually strengthens or weakens the economy, or (b) not evidence.**

Put differently, we would like to know whether you think a completely logical truth-seeker would use each of the following pieces of information as evidence to decide if these taxes strengthen or weaken the economy.

You can do this by dragging each piece of text to the group you personally believe it belongs in.

Items	Evidence
<p>A persuasive social media post about the issue from a non-expert</p> <p>A large public opinion poll of Americans stances on the issue of raising taxes on the rich</p> <p>An individual's personal experience with trying to find work after such taxes were put in place</p> <p>A documentary on Netflix that includes interviews with several experts</p> <p>A study comparing economic performance between states that have higher and lower taxes on wealthy citizens</p> <p>A political leader's reasoning about the issue</p> <p>A religious leader's beliefs and convictions about the issue</p>	
	Not Evidence

Study 4

Attention Checks

All attention checks were identical to Study 3.

Vignettes

All vignettes were identical to Study 3.

DV Question Wording

All primary DVs were identical to Study 3, except for the question about the pastor's opinion, which was corrected to refer to taxes, rather than gun bans:

Regardless of your personal position on the issue of raising taxes on the wealthy or other information you know about the economic impact of these taxes, do you think that Pastor Vanmeter's beliefs count as evidence that could prove whether raising taxes on the wealthy actually helps or harms the economy?

Put differently, would a completely logical truth-seeker use Pastor Vanmeter's beliefs as evidence to decide if these taxes help the economy or not?

- Yes, I think that Pastor Vanmeter's beliefs about raising taxes on the wealthy count as evidence.
- No, I do not think that Pastor Vanmeter's beliefs about raising taxes on the wealthy count as evidence.

Intervention Task

The intervention task was identical to Study 3.

Appendix B: Supplemental Materials for Chapter 3

Analysis 1: Operationalizing Feedback with a Continuous Feedback Score

The way that I operationalized high and low feedback (adding or subtracting 20 points with limits of the 1st and 99th percentile) meant that some participants received a weaker manipulation than others: for example, a participant in the high feedback condition who expected to score in the 85th percentile would only think they scored 14 (vs 20) points higher than expected. To account for this, I reran analyses replacing the binary feedback condition variable (high, low) with the actual numeric discrepancy between participants' expected percentile and the percentile I told them they actually placed in. These analyses led to the same conclusions as in the main text.

Study 2

I ran a linear regression predicting change in the perceived usefulness of high intelligence from a continuous feedback score (range 1-99), with test type (Emotional intelligence = -1, Analytic intelligence = 1) as a covariate. This revealed an overall self-serving bias effect ($b = .002$, 95% CI = [.001, .003], $p = .003$). To test whether participants' degree of motivated reasoning was linked to their ethics of belief, I ran the same model including profile and the profile \times feedback interaction terms, and probed it by examining the simple slopes of feedback within each profile as well as the difference between these slopes. Only Indiscriminate participants ($b = .010$, 95% CI [.001, .01], $p < .001$), showed evidence of motivated reasoning. Empiricist ($p = .390$) and Moralists ($p = .100$) participants reported that the skill was similarly useful before and after they received feedback, regardless of whether that feedback was positive or negative. The difference in these slopes was significant for Indiscriminates (ref.) and Moralists ($b = -.004$, 95% CI [-.007, -.002], $p = .002$), as well between Indiscriminates (ref.) and

Empiricist ($b = .007$, 95% CI $[-.011, -.003]$, $p = .002$), but the Empiricists' (ref.) and Moralists' slopes were not significantly different from each other ($p = .177$).

Study 3

I ran a linear regression predicting change in usefulness from a continuous feedback score (range 1-99), with test type (Emotional intelligence = -1, Analytic intelligence = 1) as a covariate. This revealed an overall self-serving bias effect ($b = .002$, 95% CI $[.001, .003]$, $p = .001$). To test whether participants' degree of motivated reasoning was linked to their ethics of belief, I ran the same model including profile and the profile \times feedback interaction terms, and probed it by examining the simple slopes of feedback within each profile as well as the difference between these slopes. Only Indiscriminate participants ($b = .001$, 95% CI $[.001, .01]$, $p < .001$), showed evidence of motivated reasoning. Empiricist ($p = .640$) and Moralist ($p = .160$) participants reported that the skill was similarly useful before and after they received feedback, regardless of whether that feedback was positive or negative. The difference in these slopes were only marginally significant for Indiscriminates (ref.) and Moralists ($b = -.002$, 95% CI $[-.005, .0002]$, $p = .069$), significant between Indiscriminates (ref.) and Empiricists ($b = -.003$, 95% CI $[-.005, -.0001]$, $p = .009$), and non-significant between Empiricists (ref.) and Moralists ($p = .479$).

Analysis 2: Using Variable-Centered Analyses

We reproduce the moderation models from Studies 2 & 3, this time replacing the Profile variable as the moderator with the four continuous measures accuracy, moral, social, and emotional goals. Specifically, for Study 2 & 3 respectively, I fit a single model (Table A.28) predicting change in beliefs about the value of the trait being assess with the condition variable (i.e., false positive or negative feedback), the four bases for belief, and all their interaction terms with the condition variable (i.e., four two-way interactions).

Table A.28

Chapter 3: Moderation of the Self-Serving Bias by Bases for Belief

<i>Predictor</i>	<i>b</i>	<i>95% Confidence</i>	
		<i>Interval</i>	<i>p-value</i>
<i>Study 2</i>			
(Intercept)	.108	[-.071, .288]	.237
Test Type (IQ or EQ)	-.146	[-.199, -.093]	< .001
Feedback (High or Low)	-.125	[-.387, .137]	.349
Accuracy	-.002	[-.051, .046]	.934
Moral	-.020	[-.056, .016]	.282
Social	-.071	[-.131, -.011]	.020
Emotional	-.039	[-.082, .005]	.083
Feedback x Accuracy	.024	[-.048, .095]	.514
Feedback x Moral	.016	[-.035, .066]	.537
Feedback x Social	.142	[.051, .232]	.002
Feedback x Emotional	.022	[-.040, .084]	.482
<i>Study 3</i>			
(Intercept)	-.003	[-.178, .172]	.977
Test Type (IQ or EQ)	-.000	[-.050, .049]	.987
Feedback (High or Low)	-.132	[-.380, .115]	.295
Accuracy	-.006	[-.052, .040]	.804

Moral	.012	[-.021, .044]	.488
Social	-.029	[-.089, .031]	.348
Emotional	-.020	[-.061, .022]	.349
Feedback x Accuracy	.037	[-.030, .103]	.281
Feedback x Moral	-.013	[-.059, .033]	.590
Feedback x Social	.04	[-.042, .129]	.314
Feedback x Emotional	.079	[-.020, .138]	.009

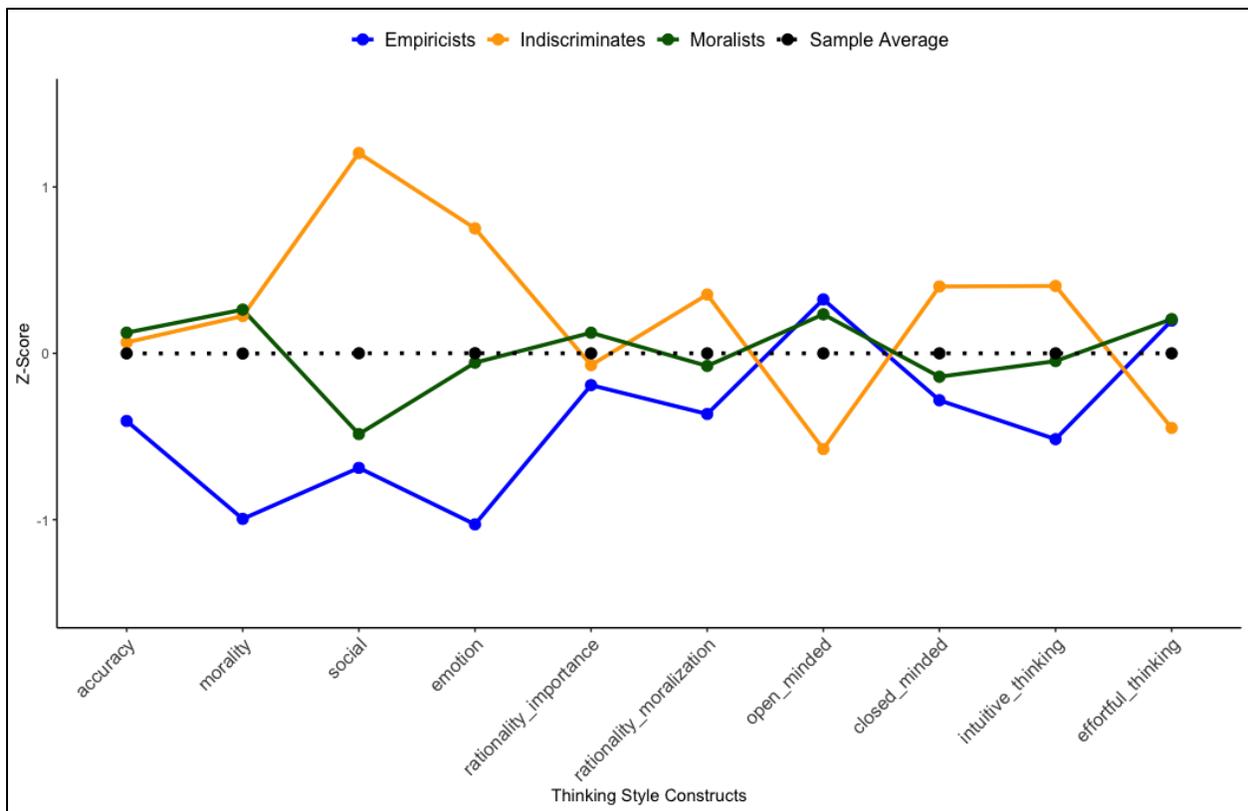
Analysis 3: Bases for Belief and other Thinking Style Measures

Profile Differences on all Thinking Style Constructs

Figure 1 includes the means on each thinking style measure in Study 4 for the sample as a whole and for each profile extracted via profile analysis on the four bases for belief in the ethics of belief scale (accuracy, morality, social, and emotional bases for belief). Because these measures used different response options, I z-score all variables.

Figure A.1

Differences in Thinking Styles Between Profiles



Compared to the sample average, (i) Indiscriminates reported greater moralization of rationality, less open-mindedness, more closed-mindedness and preference for intuition, and less preference for effortful thinking, but the same amount of importance placed on rationality; (ii)

Moralists reported more open-mindedness and preference for effortful thinking, but the same importance and moralization of rationality, closed-minded thinking, and preference for intuition; (iii) Empiricists reported that rationality was less important and moralized for them, less closed-mindedness and preference for intuitive thinking, as well as more openness to changing beliefs based on new evidence and preference for effortful thinking. There were also a number of differences between the profiles on thinking style constructs not used in the profile analysis.

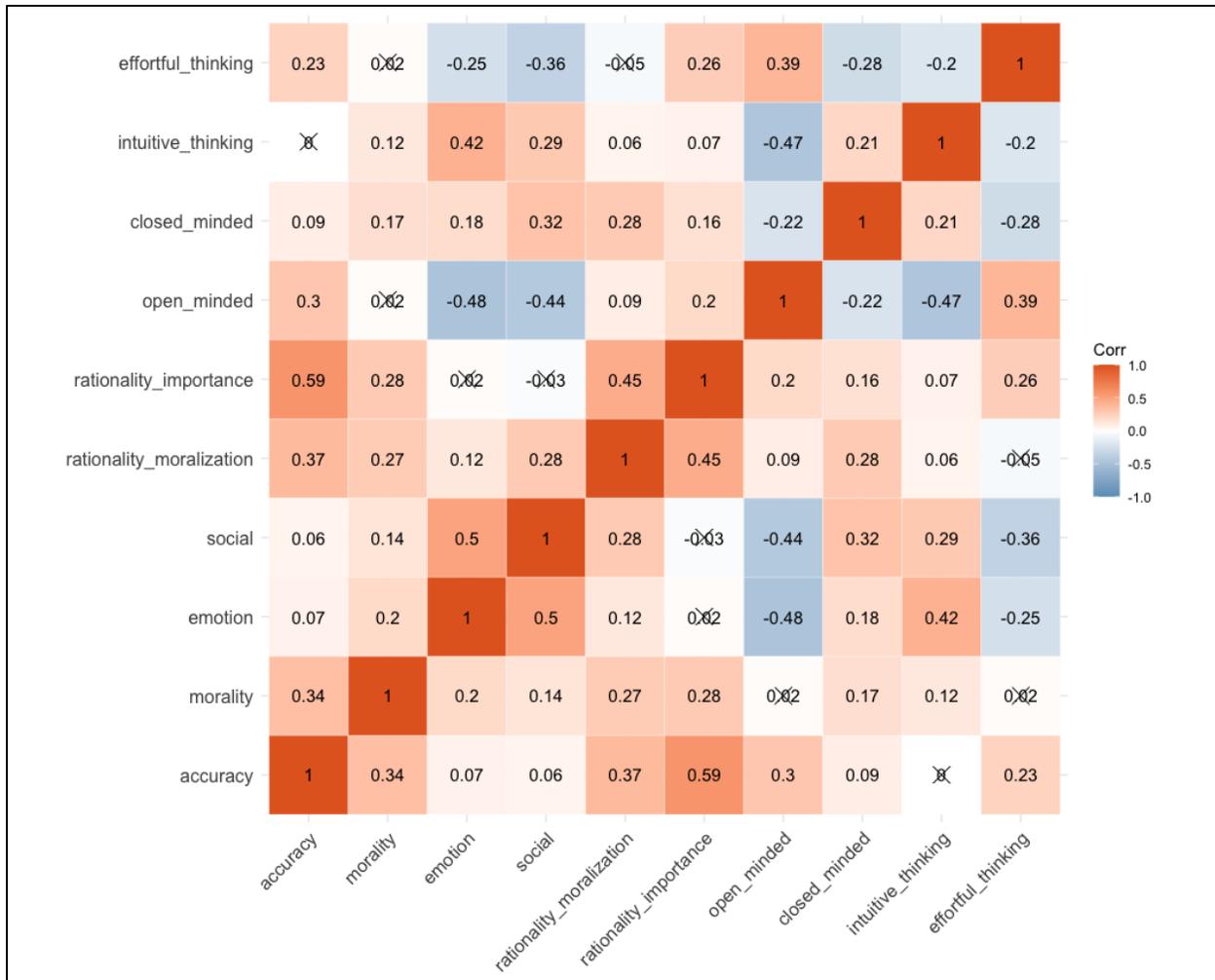
Broadly, these differences suggest that participants with an Indiscriminate ethics of belief which permits morally, emotionally, and socially motivated reasoning also have thinking styles which fall short of classically “ideal” truth-seekers. Conversely, Empiricists report greater alignment with a stereotypically ideal truth-seeker, though a puzzlingly lower concern with rationality. Nevertheless, Empiricists care more about accuracy than any other basis for belief and are more open to changing their beliefs based on new evidence than the sample average and Indiscriminates, aligning with my characterization of them as Empiricists rather than Rationalists. Finally, Moralist participants were the most similar to the sample average, but where they did differ from the sample average they were more aligned with a classically ideal thinker. Moralists did not moralize rationality more than the sample average or other profiles, suggesting that when they report morality being a valid basis for belief on the ethics of belief scale, they are not thinking about the moral weight of evidence or their moralization of rationality, but truly non-epistemic moral concerns.

Relationships between Thinking Style Measures

Figure A.2 depicts the correlations between all thinking style constructs in Study 4.

Figure A.2

Correlation Matrix of Thinking Style Constructs



Note: Values covered with an X are not statistically significant at the $p < .05$ level.

Each of the four bases for belief show moderate correlations with a number of thinking style measures, indicating their relevance to other constructs used to study individual differences in reasoning. Openness to socially and emotionally motivated reasoning on the ethics of belief scale were both correlated with less open-minded thinking and preference of effortful thinking as well as more closed-minded thinking and preference for intuitive thinking. In contrast, openness to morally motivated reasoning did not correlate with open-mindedness or preference for effortful thinking, but it was associated with more closed-mindedness and preference for intuitive thinking. Preference for accuracy-oriented reasoning correlated with preference for effortful

thinking, as well as more open-mindedness (willingness to change beliefs based on new evidence) and, to a lesser extent, more closed-mindedness too (i.e., black and white thinking; that there is always one correct perspective), but not with preference for intuitive thinking. All four bases for belief were positively correlated with viewing rationality as more important, but only openness to accuracy and morally motivated reasoning were positively correlated with moralizing rationality.

These analyses suggest that the four bases for belief measures in the ethics of belief scale are related to a number of measures used to study individual differences in thinking styles, but do not perfectly correlate with any of them. This suggests that personal ethics of belief could be a fruitful contribution to the literature on thinking styles.

Analysis 4: Testing Effects of the Ethics of Belief Scale Instructions on Thinking Styles

I counterbalanced whether the ethics of belief scale, including its instructions which requested participants answer with their empirical (vs. moral) beliefs in mind, came before or after the other six thinking style constructs. This allowed us to test whether asking participants to focus on their empirical and not moral beliefs (vs. not mentioning this distinction at all) influenced their answers to these other measures. Although these analyses were exploratory and I did not have *a priori* predictions, I reasoned that people may respond differently to measures about how they think when asked to focus on their empirical beliefs, which can be proven correct or incorrect with evidence, versus their moral or aesthetic beliefs which evidence cannot (dis)prove. For example, presumably people find it more important to change their beliefs based on new evidence (i.e., “Actively Open-Minded Thinking” as measured by the CTSQ) when they are thinking about their empirical (vs. moral) beliefs; likewise people may report a stronger preference for intuitions when thinking about moral (vs. empirical) beliefs.

To test such possibilities, I ran a series of simple regression models predicting scores on the six different thinking style constructs from a binary variable recording whether the participant had answered the thinking style measures before (1) or after (-1) reading the instructions in the ethics of belief scale. Being asked to answer about empirical and not moral beliefs (vs. not being asked to make this distinction) had no impact on closed-minded thinking ($p = .259$), preference for intuitive thinking ($p = .286$), or the preference for effortful thinking ($p = .604$) as measured by the CTSQ.

However, asking participants to think about their empirical and not moral beliefs, compared to not specifying what kind of beliefs they should think about at all, did cause them to say that they moralized rationality more ($b = .156$, 95% CI [.045, .267], $p = .006$), and similarly to report being more open to changing their beliefs based on new evidence ($b = .165$, 95% CI

[.054, .276], $p = .004$). Although the instructions did not cause participants to say that rationality was more important to them ($p = .557$) as one would expect given the prior two findings, this could be due to a ceiling effect on the importance of rationality (Mean = 5.54; SD = 0.88; Skew = -0.57; observed range 2-7) which was less pronounced for the actively open-minded thinking about evidence subscale of the CTSQ (Mean = 4.84; SD = 1.23; Skew = -0.39; observed range 1-7) and the moralization of rationality scale (Mean = 4.04; SD = 0.92; Skew = -0.14; observed range 1-6.78). Put differently, participants already said rationality was very important to them, so there was not much space left on the response scale for them to move after having their attention fixed on empirical beliefs.

In sum, asking participants to think about their empirical and not moral beliefs, compared to not specifying what kind of belief they should think about at all, led them to report it being more important to change beliefs based on new evidence, and more morally important to think rationally. This suggests that when asking participants about their reasoning and beliefs, researchers ought to consider what kind of beliefs their participants are thinking about when responding: some participants may think about empirical beliefs and reasoning, while others may think of moral beliefs and reasoning (or aesthetic or religious beliefs, for that matter). That said, a major limitation of this analysis is that I did not include a condition asking participants explicitly to think about their moral and not empirical beliefs (or other kinds of beliefs). Instead, I compare participants asked to think about their empirical and not moral beliefs to participants simply not asked to make this distinction at all. In practice, based on the beliefs which participants provided in studies 1a and 1b, I expect that when not prompted to distinguish between empirical and moral beliefs, most participants likely think of both.

Analysis 5: Minimum Detectable Effect Size Analysis

In lieu of *a priori* power analyses determining the sample sizes needed to detect motivated empiricism at a pre-specified effect size for the experiments in Chapter 3, I instead calculated the minimum effect size I could have detected at an alpha of .05 and confidence of 80% given my sample size. This analysis is what my committee requested and what I prefer (vs. post hoc power analysis), but I use this analysis only here and not for the studies in Chapters 2 and 4 because I could not find an R package implementing this “minimum statistically detectable effect size” with an MLM. Here, I used the pwr R package (Champely et al., 2018), to determine the minimum statistically detectable (a) main effect of the feedback condition on belief change (i.e., the self-serving bias) and (b) overall interaction effect between the self-serving bias and profile, for Studies 2 and 3, at an alpha of .05 and confidence of 80%.

Main Effects

Given Study 2’s sample size of 1,262 participants, the minimum effect of the feedback condition (high, low) on belief change (i.e., the self-serving bias) I was powered to detect at 80% power was $D = 0.16$. In comparison, the observed effect size in Study 2 was $D = 0.17$, meaning that I had sufficient power to detect the main effect I observed in Study 2. Given Study 3’s only slightly larger sample size of 1,264 participants, the minimum self-serving bias effect I was powered to detect was also $D = 0.16$ at 80% confidence. In comparison, the observed effect size in Study 3 was $D = 0.18$, meaning that I also had sufficient power to detect the main effect I observed in Study 3.

Interaction Effects

I performed a similar minimum detectable effect size analysis for the overall interaction between profile and feedback condition (i.e., self-serving reasoning) in Studies 2 and 3, using the

same sample sizes, confidence level (80%), and alpha (.05). Because I was interested in the overall interaction this time and not the difference between feedback conditions, I used the F^2 -statistic obtained by comparing (a) a model with profile and feedback as additive predictors of belief change to (b) a model with the interaction between profile and feedback as well. This analysis suggested that the minimum overall interaction I was capable of detecting with 80% power was an F^2 -statistic of .008 for both samples. In comparison, I observed an interaction effect size of $F^2 = .009$ in Study 2 and $F^2 = .004$ in Study 3. Thus, I had sufficient power to detect a profile difference in self-serving reasoning in Study 2, but not 3.

These analyses suggest that the main effects I observed in Studies 2 and 3 were well powered, as was the interaction effect I tested in Study 2, but that the interaction effect I tested in Study 3 was not. Thus, the profile differences in self-serving reasoning I observed require further replication, ideally with larger samples, stronger manipulations, and scales with less measurement error, to improve power for detecting profile differences.

Survey Materials by Study The exact survey materials for each study are available on the OSF page for my project as word files and as .qsf files which can be uploaded to Qualtrics to create an exact copy of the study. Below, for each study, I provide a selection of these materials for readers to assist in interpreting the primary analyses described in the main text. Specifically, I include all (i) questions used to filter out participants and ensure data quality, (ii) experimental stimuli, and (iii) the exact wording of my dependent variable questions.

Study 1a

Data Quality Checks

English Language Comprehension Questions:

1. James is desperate to learn how to tap dance. His gym teacher, Derrick, says he cannot help because he has never received training in tap dance. But he feels the urge so strongly

that he stays up every night learning how to tap dance, and eventually, he becomes an aficionado. Who stays up every night?

- Both James & Derrick
 - **James (Correct)**
 - Nobody
 - Derrick
2. Morris is the IT guy in his department at work. When his younger colleague, Bill, mentions that he's never seen a real floppy disk, Morris gets really excited to show him what the good old days were like, and runs upstairs to get one to show him. To his disappointment, he does not seem particularly interested in this historical relic. Who had never seen a floppy disk?
- **Bill (Correct)**
 - Nobody
 - Both Morris & Bill
 - Morris
3. Matt is an electrician. While at work, he is on the phone with his boss, Kevin. His apprentice, Ted, interrupts him to ask if the basement outlets were turned off. He angrily replies, "Yeah! Just test them, don't bother me!" He doesn't bother testing the outlet and he gets a shock. Who got a shock?
- Ted
 - Nobody
 - **Matt (Correct)**
 - Kevin

Attention Checks:

1. What kinds of beliefs should you have in mind while answering the following questions?
 - **Beliefs where only one person can be correct (correct)**
 - Beliefs where multiple people can be correct
 - Beliefs where nobody can be correct
2. Research in decision making shows that people, when making decisions and answering questions, prefer not to pay attention and minimize their effort as much as possible. Some studies show that over 50% of people don't carefully read questions. If you are reading this question and have read all the other questions, please select the box marked 'other' and type "Personal Values". Thank you for participating and for taking the time to read through the questions carefully! What was this study about?
 - Beliefs
 - Demographic characteristics
 - Decision making
 - **Other (please specify) (correct)**
3. I believe that whether or not I am paying attention I should select one, slightly describes me.
 - Does not describe me
 - **Slightly describes me (correct)**
 - Moderately describes me
 - Very much describes me
 - Describes me extremely well

Primary Variables

Ethics of Belief Scale (Version 1):

We are going to ask you some questions about *how you decide what to think about various claims and positions you hear*. In other words, when you decide what to believe about the many statements, positions, and claims you are confronted with, how do you choose what to believe?

While you are answering the questions, you should be thinking about your *beliefs about statements where only one person can be correct*: For example, your belief about whether torture does or does not cause people to give up accurate information, or whether there is or is not a gender pay gap. You should **not** have in mind beliefs about statements where more than one person can be correct: For example, your belief about whether torture is right or wrong, or whether a gender pay gap is good or bad.

----- Page Break -----

Before we begin asking you the questions, we want to get an idea of the beliefs that the instructions and our examples brought to mind for you. So, on the next page, you will be shown the instructions a second time, and asked to list some of the beliefs that you think fit the criteria we have given you.

----- Page Break -----

We are going to ask you some questions about *how you decide what to think about various claims and positions you hear*. In other words, when you decide what to believe about the many statements, positions, and claims you are confronted with, how do you choose what to believe?

While you are answering the questions, you should be thinking about your *beliefs about statements where only one person can be correct*: For example, your belief about whether torture does or does not cause people to give up accurate information, or whether there is or is not a gender pay gap. You should **not** have in mind beliefs about statements where more than one person can be correct: For example, your belief about whether torture is right or wrong, or whether a gender pay gap is good or bad.

Now, please use the boxes below to list some beliefs that you think fit into these instructions.

Belief 1: _____

Belief 2: _____

----- Page Break -----

Now we will begin the questionnaire! Please use the scale provided to indicate how well each statement describes you. **Please be honest as there are no right or wrong answers, and people vary substantially in their responses to the following questions.**

Accuracy

1. I think that beliefs should be revised in the face of new evidence.
2. I think that people should remain rational and logical when deciding what to believe.
3. I think that beliefs should be based on facts and evidence.
4. In my opinion, you shouldn't believe irrational things.
5. I don't like people who can't justify their beliefs with evidence and logical arguments.
6. In my view, peoples' beliefs should come from what they know to be true and logical.
7. In my opinion, using logic is the primary way people should decide what to believe.
8. In my view, people should not continue to have a belief when they learn new evidence against it.

Social

1. In my view, people should adopt the beliefs of their friends and family when confronted with a new topic.
2. When deciding what to believe, I think people should just stick with the beliefs of the people in their social group.
3. I think it's annoying when someone disagrees with the others in a team.
4. I believe that group members should uphold what the others in the group believe.
5. I believe there is value in simply agreeing with people like you.
6. In my opinion, when people realize that they disagree with the people they are close to, they should change their mind to align themselves with those people.
7. When forming new beliefs, I think it's important that people try to stay loyal to the beliefs of the groups they are a part of.
8. I like people who don't "rock the boat" when it comes to what a team believes.

Emotion

1. I think there is a lot of value in believing things that make you happy.
2. It's my opinion that people should believe things that make them feel secure.
3. I think it's important for people to believe things that make them feel good.
4. I think beliefs can be useful tools for making people feel a sense of control.
5. I think it's pointless to continue believing something if all it does is upset you.
6. When deciding which of two opposing positions to believe on an issue, I believe people should go with the one that makes them feel happier.
7. If believing something just makes you feel bad all the time, I think you should just stop believing it.
8. I don't see the point in trying to convince people not to believe things that make them happy.

Morality

1. I think people should try to believe things that support their moral convictions.
2. It's my opinion that people should avoid believing things that are morally corrupt.
3. When trying to decide whether or not to believe something, I think people should ask themselves if it is morally right or wrong to believe it.
4. I think that peoples' beliefs about the world should conform to their moral values.
5. When people realize that one of their beliefs is morally wrong, I think they should try to stop believing it.
6. I think that whether or not you should believe something is largely determined by how morally good that belief is.
7. I don't understand why you would believe something if it supports an immoral point of view.

8. I believe that whether or not a position is immoral should determine if people will believe in it.

Study 1b

Data Quality Checks

English Comprehension Questions:

1. Which of the following appropriately combines these two sentences?
1: Greg bought a camera yesterday.
2: The camera doesn't work.
 - Greg, who bought a camera yesterday, doesn't work.
 - **The camera that Greg bought yesterday doesn't work. (Correct)**
 - The camera who Greg bought yesterday doesn't work.
2. Which of the following appropriately combines these two sentences?
1: I met a man at a meeting last week.
2: The man was at the party.
 - The man who I met at the party last week was at the meeting.
 - **The man I met at the meeting last week was at the party. (Correct)**
 - I met the man, which was at the meeting last week, at the party.
3. Which sentence is correct? I bet the shop ____ of ice cream by the time we get there.
 - will sold out
 - **will have sold out (Correct)**
 - will be sell out

Attention Checks:

1. What kinds of beliefs should you have in mind while answering the following questions?
 - **Beliefs about statements that CAN be proven correct or incorrect (correct)**
 - Beliefs about statements that CANNOT be proven correct or incorrect
2. Research in decision making shows that people, when making decisions and answering questions, prefer not to pay attention and minimize their effort as much as possible. Some studies show that over 50% of people don't carefully read questions. If you are reading this question and have read all the other questions, please select the box marked 'other' and type "Personal Values". Thank you for participating and for taking the time to read through the questions carefully! What was this study about?
 - Beliefs
 - Demographic characteristics
 - Decision making
 - **Other (please specify) (correct)**
3. I believe that whether or not I am paying attention I should select one, slightly describes me.
 - Does not describe me
 - **Slightly describes me (correct)**
 - Moderately describes me
 - Very much describes me

- Describes me extremely well

Primary Variables

Ethics of Belief Scale (Version 2):

We are going to ask you some questions about how you decide what to think about the various claims you hear about the way the world is and how it works. In other words, when you decide what to think about the many statements you are confronted with, how do you choose what to believe?

While you are answering the questions, you should be thinking about your *beliefs about statements that can be proven correct or incorrect*: For example, your belief about whether torture does or does not cause people to give up accurate information, or whether there is or is not a gender pay gap. You **should not** have in mind beliefs about statements that **cannot** be proven correct or incorrect: For example, your belief about whether torture is right or wrong, or whether a gender pay gap is good or bad.

What kinds of beliefs should you have in mind while answering the following questions?

- Beliefs about statements that CAN be proven correct or incorrect.
- Beliefs about statements that CANNOT be proven correct or incorrect.

----- Page Break -----

Before we begin asking you the questions, we want to get an idea of the beliefs that the instructions and our examples brought to mind for you. So, on the next page, you will be shown the instructions a second time, and asked to list some of the beliefs that you think fit the criteria we have given you.

----- Page Break -----

We are going to ask you some questions about how you decide what to think about the various claims you hear about the way the world is and how it works. In other words, when you decide what to think about the many statements you are confronted with, how do you choose what to believe?

While you are answering the questions, you should be thinking about your *beliefs about statements that can be proven correct or incorrect*: For example, your belief about whether torture does or does not cause people to give up accurate information, or whether there is or is not a gender pay gap. You **should not** have in mind beliefs about statements that **cannot** be proven correct or incorrect: For example, your belief about whether torture is right or wrong, or whether a gender pay gap is good or bad.

Now, please use the boxes below to list some beliefs that you think fit into these instructions. Please do not insert the examples that we gave you.

Belief 1: _____
Belief 2: _____
Belief 3: _____

----- Page Break -----

Now we will begin the questionnaire! Please use the scale provided to indicate how well each statement describes you. Please be honest as there are no right or wrong answers, and people vary substantially in their responses to the following questions.

Accuracy

1. I think that beliefs should be revised in the face of new evidence.
2. I think that people should remain rational and logical when deciding what to believe.
3. I think that beliefs should be based on facts and evidence.
4. In my opinion, using logic is the primary way people should decide what to believe.

Social

1. In my view, people should adopt the beliefs of their friends and family when confronted with a new topic.
2. When deciding what to believe, I think people should just stick with the beliefs of the people in their social group.
3. In my opinion, when people realize that they disagree with the people they are close to, they should change their mind to align themselves with those people.
4. When forming new beliefs, I think it's important that people try to stay loyal to the beliefs of the groups they are a part of.

Morality

1. It's my opinion that people should avoid believing things that are morally corrupt.
2. When trying to decide whether or not to believe something, I think people should ask themselves if it is morally right or wrong to believe it.
3. When people realize that one of their beliefs is morally wrong, I think they should try to stop believing it.
4. I don't understand why you would believe something if it supports an immoral point of view.

Emotion

1. I think there is a lot of value in believing things that make you happy.
2. It's my opinion that people should believe things that make them feel secure.
3. I think it's important for people to believe things that make them feel good.
4. When deciding which of two opposing positions to believe on an issue, I believe people should go with the one that makes them feel happier.

Study 2

Data Quality Checks

English Comprehension Questions:

1. Please select the response choice below that CORRECTLY fills the blank.

Neither of us know how _____.

- came up the topic
- **the topic came up (correct)**
- did the topic come up
- topic came up

2. Which word can CORRECTLY go in the space?

When they arrived at the top of the mountain, they realized somebody had stolen the jewel. Who _____?

- had she stolen the jewel
- stolen the jewel
- **had stolen the jewel (correct)**
- the jewel stole

Attention Checks:

1. What kinds of beliefs should you have in mind while answering the following questions?
 - **Beliefs about statements that CAN be proven correct or incorrect. (correct)**
 - Beliefs about statements that CANNOT be proven correct or incorrect.
 - Beliefs about all statements
 - Beliefs about political statements
2. When deciding which answer to pick on this question, please choose 'Very much describes me' if you're really answering genuinely
 - Does not describe me
 - Slightly describes me
 - Moderately describes me
 - **Very much describes me (correct)**
 - Describes me extremely well
3. Research in decision making shows that people, when making decisions and answering questions, prefer not to pay attention and minimize their effort as much as possible. Some studies show that over 50% of people don't carefully read questions. If you are reading this question and have read all the other questions, please select the box marked 'other' and type "Personal Values". Thank you for participating and for taking the time to read through the questions carefully! What was this study about?
 - Psychological Skill Assessments
 - Demographic characteristics
 - Decision making
 - **Other (please specify): (correct)**

Experimental Stimuli

We randomly assigned participants to an analytic or emotional intelligence condition, and provide the experimental materials for each below:

Analytic Intelligence Materials

After the next page, you will take the Analytic Intelligence Test. You will have 5-minutes to take the test. Please answer as many questions as you can within the 5-minute period. Your score will be adjusted based on how many questions you answer so that we are able to directly compare your score to the other participants' scores.

But first, we would like to explain to you what analytic intelligence is, so that you know what the test is trying to measure.

Analytic Intelligence is essentially what people normally think of as intelligence, which can be understood as the capacity to problem solve across situations and different types of problems. Performing better on the Analytic Intelligence Test and having higher analytic intelligence is associated with being able to think in a more abstract and complicated way -- a useful skill that is associated with economic success.

-----page break-----

The following questions ask you your opinions about **Analytic Intelligence**. (See below.)

-----page break-----

Now you will complete the Analytic Intelligence assessment. The Analytic Intelligence Test is designed to measure non-verbal intelligence in a manner that minimizes cultural and educational biases. For each of the following images, please do the following:

1. Examine the large image.
2. Select the answer option which is the missing piece from the larger image that would complete the image.

Note: You will have 5-minutes to answer as many questions as you can. After the 5-minutes are up, you will be moved on to the next part of the survey.

-----page break-----

See qualtrics files for items.

Emotional Intelligence Materials

After the next page, you will take the Emotional Intelligence Test. You will have 5-minutes to take the test. Please answer as many questions as you can within the 5-minute period. Your score will be adjusted based on how many questions you answer so that we are able to directly compare your score to the other participants' scores.

But first, we would like to explain to you what Emotional Intelligence is, so that you know what the test is trying to measure.

Emotional Intelligence is a skill that psychologists call 'theory of mind', which refers to the ability to accurately assess the mental states (e.g., emotions, thoughts) of others. Performing better on this test and having higher emotional intelligence is associated with being able to better understand the complex beliefs and feelings of others -- a useful skill that is associated with success in social life.

-----page break-----

The following questions ask you your opinions about **Emotional Intelligence**. (See below.)

-----page break-----

Now you will complete the Emotional Intelligence assessment. The following Emotional Intelligence assessment is designed to measure the ability to recognize emotions in non-verbal behavior and expressions. Below you will see a series of images of eyes, and you must choose which word best describes what the person in the picture is feeling.

Before making each choice, please make sure that you have read all 4 words. You may feel that more than one word is applicable but please choose just one word: the word which you consider to be most suitable.

Note: You will have 5-minutes to answer as many questions as you can. After the 5-minutes are up, you will be moved on to the next part of the survey.

-----page break-----

See qualtrics files for items.

False Feedback Materials

We gave participants false feedback using the percentile they reported expecting to score in before taking the test, either adding (false high feedback) or subtracting (false low feedback) 20 points from their expected percentile. For example, if a participant expected to score in the 50th percentile,

Analytic Intelligence Test Results

You scored higher than [participant's expected percentile + or - 20] of respondents in similar surveys. Put differently, if there were 100 people in a room, you would perform better on this test than [participant's expected percentile + or - 20] of them, and worse than the rest.

Analytic Intelligence is essentially what people normally think of as intelligence, which can be understood as the capacity to problem solve across situations and different types of problems. Performing better on the Analytic Intelligence Test and having higher analytic intelligence is associated with being able to think in a more abstract and complicated way -- a useful skill that is associated with economic success.

Emotional Intelligence Test Results

You scored higher than [participant's expected percentile + or - 20] of respondents in similar surveys. Put differently, if there were 100 people in a room, you would perform better on this test than [participant's expected percentile + or - 20] of them, and worse than the rest.

Emotional Intelligence is a skill that psychologists call 'theory of mind', which refers to the ability to accurately assess the mental states (e.g., emotions, thoughts) of others. Performing better on this test and having higher emotional intelligence is associated with being able to better understand the complex beliefs and feelings of others -- a useful skill that is associated with success in social life.

Primary Variables

Prior Beliefs about Expected Performance:

Now that you have read a little bit about what [Analytic/Emotional] Intelligence is and you have taken the [Analytic/Emotional] Intelligence assessment, we would like to ask you how you think your score on the [Analytic/Emotional] Intelligence Test compares to the scores of the other participants in this study.

For the following question, we would like you to imagine that you are in a room with a random group of 99 other participants from this study, for a total of 100 people in the room including yourself.

Based on your feelings about how you performed on the [Analytic/Emotional] Intelligence Test, *how many people in that room would you expect to have outperformed?* In other words, how many would have a worse score than you?

(Please use the slider to select a number between 0 and 99 people.)

[sliding bar from 0 to 100]

- 0 - nobody scored lower than you (you scored lowest)
- 50 - about half scored lower than you, and half higher
- 99 - everyone scored lower than you (you scored highest)

Beliefs about Trait Value:

Not socially valued at all	Slightly socially valued	Moderately socially valued	Very socially valued	Extremely socially valued
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- How **socially valued** do you think it is, if at all, to have high [analytic/emotional] intelligence?
- How **useful** do you think it is, if at all, to have high [analytic/emotional] intelligence?
- How **convenient** do you think it is, if at all, to have high [analytic/emotional] intelligence?
- How **bothersome** do you think it is, if at all, to have high [analytic/emotional] intelligence? (R)

- How **annoying** do you think it is, if at all, to have high [analytic/emotional] intelligence? (R)

We asked these questions both before and after participants completed the analytic or emotional intelligence test they were assigned. When we asked them the second time, after the test and receiving feedback, we included the instructions before the items:

Now that you have direct experience with the Analytic Intelligence Test, you might feel like you have a better sense of what Analytic intelligence actually is. As such, we would like to again ask you your opinions about Analytic Intelligence.

Ethics of Belief Scale (Version 2):

We are going to ask you some questions about how you decide what to think about the way the world is and how it works. In other words, how do you choose what to believe?

While you are answering the questions, you **should be thinking about your beliefs about statements that can be proven correct or incorrect**: For example, your belief about whether torture does or does not cause people to give up accurate information, or whether there is or is not a gender pay gap.

You **should not be thinking about beliefs about statements that cannot be proven correct or incorrect**: For example, your belief about whether torture is right or wrong, or whether a gender pay gap is good or bad.

What kinds of beliefs should you have in mind while answering the following questions?

- Beliefs about statements that CAN be proven correct or incorrect.
- Beliefs about statements that CANNOT be proven correct or incorrect.
- Beliefs about all statements
- Beliefs about political statements

----- page break -----

Now we will begin the short questionnaire! Please use the scale provided to indicate how well each statement describes you. Please be honest as there are no right or wrong answers, and people vary substantially in their responses to the following questions.

Accuracy

1. I think that beliefs should be revised in the face of new evidence.
2. I think that people should remain rational and logical when deciding what to believe.
3. I think that beliefs should be based on facts and evidence.
4. In my opinion, using logic is the primary way people should decide what to believe.

Social

1. In my view, people should adopt the beliefs of their friends and family when confronted with a new topic.
2. When deciding what to believe, I think people should just stick with the beliefs of the people in their social group.

3. In my opinion, when people realize that they disagree with the people they are close to, they should change their mind to align themselves with those people.
4. When forming new beliefs, I think it's important that people try to stay loyal to the beliefs of the groups they are a part of.

Morality

1. It's my opinion that people should avoid believing things that are morally corrupt.
2. When trying to decide whether or not to believe something, I think people should ask themselves if it is morally right or wrong to believe it.
3. When people realize that one of their beliefs is morally wrong, I think they should try to stop believing it.
4. I don't understand why you would believe something if it supports an immoral point of view.

Emotion

1. I think there is a lot of value in believing things that make you happy.
2. It's my opinion that people should believe things that make them feel secure.
3. I think it's important for people to believe things that make them feel good.
4. When deciding which of two opposing positions to believe on an issue, I believe people should go with the one that makes them feel happier.

Study 3

We used the same materials as in Study 2.

Study 4

Data Quality Checks

Attention Checks:

1. When deciding which answer to pick on this question, please choose 'Very much describes me' if you're really answering genuinely
 - Does not describe me
 - Slightly describes me
 - Moderately describes me
 - **Very much describes me (correct)**
 - Describes me extremely well

Primary Variables

Ethics of Belief Scale:

We are going to ask you some questions about how you decide what to think about the way the world is and how it works. In other words, how do you choose what to believe?

While you are answering the questions, you **should be thinking about your beliefs about statements that can be proven correct or incorrect**: For example, your belief about whether

torture does or does not cause people to give up accurate information, or whether there is or is not a gender pay gap.

You **should not be thinking about beliefs about statements that cannot be proven correct or incorrect**: For example, your belief about whether torture is right or wrong, or whether a gender pay gap is good or bad.

What kinds of beliefs should you have in mind while answering the following questions?

- Beliefs about statements that CAN be proven correct or incorrect.
- Beliefs about statements that CANNOT be proven correct or incorrect.
- Beliefs about all statements

----- page break -----

Now we will begin the short questionnaire! Please use the scale provided to indicate how well each statement describes you. Please be honest as there are no right or wrong answers, and people vary substantially in their responses to the following questions.

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1. In my view, people should adopt the beliefs of their friends and family when confronted with a new topic.
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Importance and Moralization of Rationality Scales:

Moralization of Rationality

1. Being skeptical about claims that are not backed up by evidence is a moral virtue.
2. Holding on to beliefs when there is substantial evidence against them is immoral.
3. It is morally wrong to trust your intuitions without rationally examining them.
4. It is morally wrong to rely on anything else other than logic and evidence when deciding what is true and what is not true.
5. It is a moral imperative that people can justify their beliefs using rational arguments and evidence.
6. It is immoral to hold irrational beliefs.
7. A person's moral authority depends on their rationality.
8. A person's morality is in no way determined by their rationality. (R)
9. Whether a person can be convinced by reason and evidence is in no way indicative of their morality. (R)

Importance of Rationality

1. It is important to me personally to be skeptical about claims that are not backed up by evidence.
2. It is important to me personally to remain rational and levelheaded even in heated arguments.
3. It is important to me personally to examine traditionally held beliefs using logic and evidence.
4. It is important to me personally that I can justify my beliefs using rational arguments and evidence.
5. It is important to me personally to critically examine my long-held beliefs.
6. It is important to me personally to be a rational person.

Comprehensive Thinking Styles Questionnaire:

Open-Mindedness about Evidence

1. It is important to be loyal to your beliefs even when evidence is brought to bear against them. (R)
2. Whether something feels true is more important than evidence. (R)
3. Just because evidence conflicts with my current beliefs does not mean my beliefs are wrong. (R)
4. There may be evidence that goes against what you believe but that does not mean you have to change your beliefs. (R)
5. Even if there is concrete evidence against what you believe to be true, it is OK to maintain cherished beliefs. (R)
6. Regardless of the topic, what you believe to be true is more important than evidence against your beliefs. (R)

Closed-Minded Thinking

1. I think there are many wrong ways, but only one right way, to almost anything.
2. In my experience, the truth is often black and white.
3. Truth is never relative.
4. The truth does not change.
5. Either something is true or it is false; there is nothing in-between.
6. There is no middle ground between what is true and what is false.

Preference for Intuitive Thinking

1. I like to rely on my intuitive impressions.
2. I believe in trusting my hunches.
3. When I make decisions, I tend to rely on my intuition.
4. Using my "gut-feelings" usually works well for me in figuring out problems in my life.
5. Intuition is the best guide in making decisions.
6. I often go by my instincts when deciding on a course of action.

Preference for Effortful Thinking

1. I'm not that good at figuring out complicated problems. (R)
2. Thinking is not my idea of an enjoyable activity. (R)
3. I try to avoid situations that require thinking in depth about something. (R)
4. I am not a very analytical thinker. (R)
5. Reasoning things out carefully is not one of my strong points. (R)
6. Thinking hard and for a long time about something gives me little satisfaction. (R)

Demographic Variables

1. What is your gender?
 - Male
 - Female
 - Non-binary
 - Prefer not to say
 - Other (text entry)
2. What is your age? (dropdown box)
3. What is the highest level of education you have completed?
 - Some high school
 - High school diploma or equivalent
 - Some college
 - Associate's degree
 - Trade School
 - Bachelor's degree
 - Some Graduate school
 - Master's degree
 - Doctoral degree
4. What was your undergraduate major? (Select all that apply)
 - Art and Design (E.g., Fine Arts, Graphic Design, Theater, Dance, Etc)
 - Business (E.g., Accounting, Marketing, Management, Finance, Etc)
 - Communications (E.g., Media Studies, Journalism, Public Relations, Etc)
 - Education (E.g., ECE, GED, Etc)
 - Engineering and Technology (E.g., Civil Eng., Computer Science, Etc)
 - Environmental / Agricultural Science (Ecology, Forestry, Env. Science, Etc)
 - Health and Medicine (Nursing, Medicine, Physical Therapy, Etc)
 - Humanities (History, Philosophy, Linguistics, Etc)
 - Law and Public Policy (E.g., Criminal Justice, Public Admin., International Relations, Etc)
 - Mathematics (E.g., Applied, Statistics, Etc)
 - Natural Science (Bio, Chem, Physics, etc)
 - Social Sciences (Psychology, Sociology, Anthropology, Etc)

- Other
5. Imagine that this ladder shows how your society is set up. At the top of the ladder are the people who are best off – they have the most money, the highest amount of schooling, and the jobs that bring the most respect. At the bottom are the people who are the worst off – they have the least money, little or no education, no jobs or jobs that no one wants or respects. Now think about yourself. Please tell us where you think you would be on this ladder.
 - Rung 1, Rung 2, etc. Rung 10
 6. Which of the following best describes your political ideology?
 - Very Liberal (1)
 - Liberal (2)
 - Slightly Liberal (3)
 - Moderate/Middle-of-the-road (4)
 - Slightly Conservative (5)
 - Conservative (6)
 - Very Conservative (7)
 7. Which of the following best describes your religious and spiritual beliefs?
 - Religious
 - Spiritual but not religious
 - Neither spiritual nor religious
 8. For each of the following descriptions, please use the scale provided to tell us how well you think it describes you:
 - a spiritually oriented person
 - Does not describe me - 0
 - Describes me a little bit 1
 - Describes me somewhat - 2
 - Describes me well - 3
 - Describes me very well - 4
 - Describes me extremely well - 5
 - a religiously oriented person
 - Does not describe me - 0
 - Describes me a little bit 1
 - Describes me somewhat - 2
 - Describes me well - 3
 - Describes me very well - 4
 - Describes me extremely well - 5
 - a scientifically oriented person
 - Does not describe me - 0
 - Describes me a little bit 1
 - Describes me somewhat - 2
 - Describes me well - 3
 - Describes me very well - 4
 - Describes me extremely well - 5
 9. Please indicate your race/ethnicity (check all that apply):
 - Australian/New Zealand indigenous (e.g. Aboriginal, Torres Strait Islander, Maori)
 - Black (e.g. African, African-American, Afro-Caribbean descent)

- East Asian (e.g. Chinese, Japanese, Korean, Taiwanese decent)
 - Latin American (e.g. Hispanic or Latin American decent)
 - Middle Eastern (e.g. Arab, Persian, West Asian descent (Afghan, Egyptian, Iranian, Kurdish, Lebanese, Turkish))
 - North American Indigenous (e.g. First Nations, Sioux, Inuit, Métis)
 - South Asian (e.g. Bangladeshi, Indian, Indo-Caribbean, Pakistani, Sri Lankan)
 - White (European descent)
 - Prefer not to answer
10. Please select the category that best describes the industry or domain in which you currently work.
- Agriculture, Mining, and Natural Resources
 - Construction and Manufacturing
 - Trade (Wholesale and Retail)
 - Information and Communication
 - Finance, Insurance, and Real Estate
 - Professional and Business Services
 - Arts, Entertainment, and Recreation
 - Hospitality and Food Services
 - Public Administration
 - Unemployed
 - Other (Please Specify) (text entry box)

Appendix C: Supplemental Materials for Chapter 4

Supplemental Analysis 1: Post Hoc Power Analyses

As in Chapter 2, I perform post hoc power analysis on the main effects of motivated elevation in Studies 1 & 2, as well their interaction by profile. I perform post hoc power analysis instead of minimum detectable effect size analysis, as in Chapter 3, because I could not find an R implementation of minimum detectable effect size analysis for MLMs.

Power to detect the main effect in Study 1 was 100.0% (95% CI [99.63, 100.0]) and 100.0% (95% CI [99.63, 100.0]) in Study 2 based on 1,000 simr simulations, respectively. Power to detect the overall interaction between motivated elevation and profile was 0.00% (95% CI [0.00, 0.37]) in Study 1, and 0.00% (95% CI [0.00, 0.37]) in Study 2.

Survey Materials

The exact survey materials for each study are available on the OSF page for my project as word files and as .qsf files which can be uploaded to Qualtrics to create an exact copy of the study. Below, for each study, I provide a selection of these materials for readers to assist in interpreting the primary analyses described in the main text. Specifically, I include all (i) questions used to filter out participants and ensure data quality, (ii) experimental stimuli, and (iii) the exact wording of my dependent variable questions where they are different from previous studies and not stated in the main text.

Study 1

Data Quality Checks

English Language Comprehension Questions

1. Please select the response choice below that CORRECTLY fills the blank.
Neither of us know how _____.
 - **to fix the car (correct)**
 - the car fix
 - fix the car can

- car fix
2. Which word can CORRECTLY go in the space?
When they arrived at starship's engine room, they realized somebody had sabotaged the engine. "Who _____?", they thought.
- **could have sabotaged the engine (correct)**
 - have broken the engine
 - have been in the room
 - could have do this

Standard Attention Checks

3. When deciding which answer to pick on this question, please choose 'Very much describes me' if you're really answering genuinely.
- Describes me extremely well
 - **Very much describes me (correct)**
 - Moderately describes me
 - Slightly describes me
 - Does not describe me
4. Research in decision making shows that people, when making decisions and answering questions, prefer not to pay attention and minimize their effort as much as possible. Some studies show that over 50% of people don't carefully read questions. If you are reading this question and have read all the other questions, please select the box marked 'other' and type "Evidence Evaluation". Thank you for participating and for taking the time to read through the questions carefully! What was this study about?
- Crime
 - Demographic characteristics
 - Decision making
 - **Other (please specify): (correct)**

Real Evidence Reading Check

5. Which of the following statements did the information on the previous page claim to support?
- **That Black Americans are much more likely to be incarcerated than White Americans. (correct)**
 - That White Americans are much more likely to be incarcerated than Black Americans.
 - That there is no racial difference in incarcerations between Blacks and Whites in America.
 - That Hispanic Americans are more likely to be incarcerated than either Black or White Americans.

Vignettes

The vignettes I used are in Table 2 of Chapter 4.

Dependant Variable Question Wording

The exact wording of the dependent variable asking participants whether information is evidence or not is identical to the wording used in Chapter 2. As well, the ethics of belief scale used in this study is identical to the version used in Studies 2-4 of Chapter 3.

Study 2

Study 2 is a direct replication of Study 1 with the only change of adding eight additional items (Chapter 4, Table 2): four items used to measure participants' beliefs about whether they should or should not have been logical, morally motivated, socially motivated, and emotionally motivated in the study, and four items measuring their self-perceptions about whether they actually were.