

Running Head: CHALLENGING MORAL ATTITUDES WITH MORAL MESSAGES

Challenging Moral Attitudes with Moral Messages

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**Abstract**

When crafting a message, communicators may turn to moral rhetoric as a means of influencing an audience's opinion. The present research sought to test whether the persuasiveness of explicitly moral counter-attitudinal messages depends on how much people have already based their attitudes on moral considerations. A survey of the literature suggests several competing hypotheses that we tested across two studies. Results of two studies support a persuasive matching pattern whereby a moral appeal was more persuasive than a non-moral appeal the more initial attitudes were based on moral concerns, but the opposite was true when initial attitudes had less of a moral basis. Exploratory analyses also show that these effects are mediated by valenced thoughts about the message and moderated by political orientation. These findings add new insight to literatures on both the effects of moral arguments and moralized attitudes.

*Keywords:* persuasion, morality, attitudes, attitude strength, moral conviction

### Challenging Moral Attitudes with Moral Messages

In December, 2017, extensive debate over a new United States tax plan emerged in the weeks leading up to a vote in Congress. Although plenty of conversation concerned the plan's practicality and economic efficacy, many argued about whether it was *moral*. Opponents called it "morally appalling" (Nuccitelli, 2017) and proponents claimed tax cuts "are the morally right thing to do" (Raleigh, 2017). But do moral appeals succeed in convincing audiences that currently hold the opposing opinion? In the present research, we tested whether the persuasive effects of explicitly moral (vs. non-moral) counter-attitudinal messages depend on how much the audience views their attitude on the issue as a matter of morality to begin with.

#### **Moral Messages**

Moral rhetoric is relatively common, appearing across topics, issue stances, and communication channels (Euchner, Heichel, Nebel, & Raschzok, 2013; Ferraiolo, 2014; Mucciaroni, 2011). Some evidence supports a persuasive advantage of moral rhetoric. Longitudinal analyses show associations between moral language in news media and changing public opinion (Clifford & Jerit, 2013), and lab experiments show that appealing to morality, compared to non-moral appeals or non-message controls, can encourage cooperative, prosocial, and honest behavior (Chen, Pillutla, & Yao, 2009; Dorris, 1972), as well as more message-consistent attitudes and moral judgments (Ferrari & Leippe, 1992; Leidner, Kardos, & Castano, 2018). However, some studies fail to show an advantage of moral appeals or even show reduced persuasion by moral appeals, compared to controls (Leidner et al., 2018; Täuber & Van Zomeren, 2013; Tittle & Rowe, 1972). These conflicting results suggest that a moderator could be at work.

Research on "moral reframing" has examined the persuasiveness of different *kinds* of moral arguments. Specifically, arguments that speak to more liberal or conservative moral values

(as suggested by Moral Foundations Theory; Graham et al., 2013) tend to be more persuasive to liberals or conservatives, respectively (Day, Fiske, Downing, & Trail, 2014; Feinberg & Willer, 2013; 2015; Voelkel & Feinberg, 2017; Wolsko, Ariceaga, & Seiden, 2016). Notably, these studies compare messages that differ in *which* moral values are invoked, but have not compared messages that differ in *whether* moral versus non-moral arguments are used. These messages also do not explicitly argue for the morality of an issue per se and instead indirectly reflect moral rhetoric by appealing to values designated as “moral,” such as purity or harm.

Furthermore, moral persuasion research has tended to focus on messages advocating for relatively uncontroversial positions such as donating blood (Ferrari & Leippe, 1992). Even cases presented as counter-attitudinal persuasion such as arguing against torture (Leidner et al., 2018) and in favor of environmental conservation (Wolsko et al., 2016) may have used less objectionable messages than intended, judging by attitudes in no-message control conditions, which lie on the side of the scales consistent with the messages. We were especially interested in examining effects of moral appeals that take clearly counter-attitudinal positions.

### **Moral Attitudes**

Critically, extant research on moral appeals has not considered how much recipients *already* see their attitudes as grounded in morality. Although it may seem that some issues are inherently more “moral” than others, two people can hold identical attitudes but differ in how much they see those attitudes as morally based (Skitka, 2010). This variation in perceived moral relevance poses an intriguing and theoretically relevant question about the efficacy of counter-attitudinal moral rhetoric.

First, what we term the *moral matching hypothesis* predicts that moral (vs. non-moral) appeals would be especially persuasive for audiences with more morally based attitudes. By

directly targeting the core basis of recipients' attitudes, a message can be more effective. Such matching effects have emerged for the success of messages that use relatively emotional versus rational appeals when they match whether the recipient's existing attitude was primarily based on affect or cognition (e.g., Edwards, 1990; Fabrigar & Petty, 1999).

By contrast, the *moral strength hypothesis* predicts that the more someone's attitude is based in morality, the more they will resist persuasion, regardless of the nature of the message. When people perceive that an attitude reflects their core moral principles, they tend to experience it as an absolute truth and thus maintain their position when challenged, resisting change in the face of social influence and non-moral persuasive arguments (Aramovich, Lytle, & Skitka, 2012; Hornsey, Majkut, Terry, & McKimmie, 2003; Hornsey, Smith, & Begg, 2007; Luttrell, Petty, Briñol, & Wagner, 2016). The same may be true even with a message that appeals to morality.

Finally, a more extreme version of moral strength is the *moral rejection hypothesis*, whereby moral (vs. non-moral) arguments that oppose an existing attitude may be even more objectionable when that attitude has a highly moral basis. That is, people may be especially offended when moral attitudes are challenged with moral appeals, so moral conviction may be associated with even more resistance in the face of such arguments.

### **Overview of the Present Research**

As an initial test of these competing hypotheses, we considered attitudes toward recycling. Because most people hold pro-recycling attitudes, we could create moral and non-moral persuasive arguments against recycling programs to serve as clearly counter-attitudinal messages. Recycling also relates to environmental issues, which has been a common subject in moral persuasion research (e.g., Feinberg & Willer, 2013). We conducted two similar independent studies using recycling as the topic and subsequently conducted a replication with

marijuana legalization as the topic, based on pilot testing showing this to be a similarly moralized topic.

Our primary hypotheses center on attitude change, but we also included several exploratory measures. First, to assess thoughtful engagement with the message, participants listed the thoughts they had while reading. If persuasion effects are mediated by message-relevant thoughts, it suggests a relatively elaborative process, whereas effects unmediated by thoughts suggest a more heuristic process (see Petty, Schumann, Richman, & Strathman, 1993). This is relevant because some perspectives characterize moral judgments as quick intuitions (Haidt, 2001), suggesting relatively heuristic or peripheral persuasion processes (Chaiken, Liberman, & Eagly, 1989; Petty & Cacioppo, 1986). However, persuasive matching (Wheeler, Petty, & Bizer, 2005) and resistance (Blankenship & Wegener, 2008) effects can occur thoughtfully, and if moral issues seem personally relevant, responses to moral appeals could be similarly thoughtful.

Finally, given the growing literature on moral persuasion and political orientation, we also explored ideology's role. It seemed possible that relatively liberal participants would be particularly closed to an anti-recycling or anti-legalization position because these positions challenge common liberal values, limiting variation in persuasion. In contrast, relatively conservative participants who held the same initial positions as liberals might be more open to considering such arguments, creating greater opportunity to find variation in persuasion.

## Study 1

### Method

We initially tested our three competing hypotheses in a pre-registered experiment (<https://aspredicted.org/yp5az.pdf>). The results of Study 1A supported the matching hypothesis,

and to confirm this result, we conducted a pre-registered direct replication with minor modifications (<https://aspredicted.org/n3pd9.pdf>). Study 1B resulted in the same matching pattern as Study 1A, so to maximize power for our focal analyses as well as an exploratory three-way interaction with political orientation, we combined the data from both studies and present the results across both samples. None of the effects that we report are further moderated by study ( $ps > .10$ ). All procedures were nearly identical across the two studies, and any differences are noted. For full results for Study 1A and Study 1B separately, see the online supplement.

**Participants.** We recruited 227 participants in Study 1A and 217 participants in Study 1B through Amazon's *Mechanical Turk* program (252 males, 188 females, 4 who identified as "genderless" or preferred not to say;  $M_{age} = 34.46$ ,  $SD = 10.39$ ) in exchange for \$1. For Study 1A, we did not have an *a priori* expectation about the target effect size, so we pre-registered a target sample size of  $N = 200$ , which provided 80% power to detect an interaction as small as  $f^2 = .04$ . We then submitted the actual effect size for the moral basis  $\times$  message type interaction in Study 1A to a power analysis and found that  $N = 157$  provided 80% power to detect the original effect. For consistency and to allow for the possibility that Study 1A overestimated the effect size, we again pre-registered  $N = 200$  for Study 1B. In both studies, we recruited slightly more than our goal sample size with the understanding that data from several participants would not be included in our final analyses for meeting exclusion criteria.

According to pre-registered exclusion criteria, 13 participants (eight in the *moral* condition; five in the *practical* condition) were excluded from analyses because they already had negative attitudes toward recycling (i.e., scoring below the midpoint on the pre-message attitudes measure). Also, because these data were collected online, we noticed a small number of duplicated IP Addresses, so as a precaution, we excluded 16 additional participants (3.71% of the

total sample) whose IP Addresses were duplicates of previous participants. The final sample size across studies is 415. Results of a sensitivity analysis show that this sample size provides 80% power ( $\alpha = .05$ ) to detect a small two-way interaction ( $f^2 = .02$ ).

**Procedure.** Participants first read a brief introduction to the topic of recycling, and then reported their attitudes toward recycling and the degree to which their attitudes were based in moral or practical concerns. Each participant was then randomly assigned to read an essay arguing against recycling using either a moral or practical appeal. After reading the message, participants again reported their attitudes toward recycling, listed their thoughts about the message, and finally completed measures of political orientation and ratings of the message.

#### **Independent Variables.**

***Pre-Message Attitudes.*** Participants rated their attitudes toward recycling using three 9-point semantic differential scales, with “bad,” “dislike,” and “negative” anchoring the low end (“-4”), and “good,” “like,” and “positive” anchoring the high end (“+4”). Since these items had high internal reliability ( $\alpha = .95$ ), they were averaged to form an aggregate measure of pre-message attitudes.

***Perceived Attitude Bases.*** Participants reported the degree to which their attitudes were based on their core moral beliefs or on practical concerns using 5-point scales anchored at “not at all” and “extremely.” These items served as our measures of perceived moral and practical bases for attitudes toward recycling, modeled after items previously used to assess moral conviction (see Skitka, 2010). These items were presented within a small set of randomly ordered questions about people’s bases for their recycling attitudes so participants would not suspect the study was about moralized attitudes specifically. One of these other bases was “emotions,” which we included because moral conviction has been proposed to constitute especially emotion-based



attitudes (Skitka, 2010), and emotion has been a common variable in the persuasive matching literature (e.g., Fabrigar & Petty, 1999). Thus, we thought it would be important to control for emotion in examining the impact of moral vs. practical messages. The other bases—“knowledge” and “what other people think”—were intended as fillers.

***Political Orientation.*** Participants reported their political orientation on two items measuring ideology for social and economic issues. The items were measured on 5-point scales, anchored at “very liberal” and “very conservative.” Since the reliability of these two items was quite strong ( $\alpha = .86$ ), we combined them into one political orientation scale. Our samples were relatively liberal overall ( $M = 2.55$ ,  $SD = 1.16$ ).

***Counter-Attitudinal Message.*** We created two versions of an anti-recycling essay that appealed either to moral or practical concerns. The moral appeal, entitled “Recycling: Harmful and Immoral,” framed its anti-recycling position in moral terms (e.g., “Supporting recycling programs would be a grave moral transgression”) and cited particular moral (e.g., harm) reasons against recycling programs (e.g., “precious pets and animals [are] mercilessly killed by fumes produced in the recycling process”). By contrast, the practical appeal, entitled “Recycling: Costly and Unfeasible,” framed its anti-recycling position in pragmatic terms (e.g., recycling is an “inefficient and unfeasible endeavor for most municipalities to adopt”) and cited particular economic and pragmatic concerns (e.g., “An increase in trucks greatly increases traffic, both on the highways and on city roads”). We chose a practical appeal as the comparison because it reflects a common type of non-moral persuasive argument (e.g., Mucciaroni, 2011) that could be similarly substantive. Messages were of similar lengths (426 – 428 words) and number of arguments, and they were designed to be equally cogent to the sample overall.

In a pilot study preceding Study 1A, Mechanical Turk participants ( $N = 100$ ) saw either the moral or practical anti-recycling appeal and assessed it using the same measures we use as manipulation checks in the full studies in addition to several other measures. The moral message was indeed perceived as appealing more to moral concerns than the practical message,  $t(98) = -7.20, p < .001$ , whereas the practical message was perceived as appealing more to practical concerns than the moral message,  $t(98) = 4.29, p < .001$ . The messages did not differ in how strong the arguments seemed,  $t(98) = 1.53, p = .13$ . However, compared to the practical message, people perceived the moral message to make more emotional arguments,  $t(98) = -6.80, p < .001$ , and less rational arguments,  $t(98) = 2.59, p = .01$ , consistent with the presumed role of emotion in influential moral language (e.g., Brady, Wills, Jost, Tucker, & Van Bavel, 2017).

We originally created the moral message without any intention to appeal to particular moral foundations, but the result was an essay that spoke primarily to harm concerns (e.g., recycling programs produce more air pollution, which is “harmful to the wildlife and people that live in surrounding areas”). However, harm-related arguments are especially common among real-world moral appeals (e.g., Clifford & Jerit, 2013), and recent research suggests that harm is perhaps the most critical dimension of morality (Schein & Gray, 2018). Nevertheless, we used the moral foundations linguistic dictionary (Graham, Haidt, & Nosek, 2009) to analyze our messages following Study 1A and made subtle changes for Study 1B to ensure that the practical messages contained no moral language and to include a few references to loyalty and purity values in the moral message, which would appeal more to conservative readers.

Following these tweaks, we conducted additional pilot testing ( $N = 52$ ) following the same procedure as the first pilot test, finding that the revised moral message was indeed perceived as appealing more to moral concerns than the revised practical message,  $t(50) = -3.92$ ,

$p < .001$ , and the revised practical message was perceived as appealing more to practical concerns than the revised moral message,  $t(50) = 3.20, p = .002$ . Once again, the messages did not differ overall in perceived strength,  $t(50) = .14, p = .89$ . However, compared to the practical message, people still perceived the moral message to make more emotional arguments,  $t(50) = -4.00, p < .001$ , and less rational arguments,  $t(50) = 3.03, p = .004$ .

We provide data and a full report of all pilot studies on the project's OSF page, the linguistic analyses in the SOM-R, and the full message texts in the SOM-U.

### **Dependent Measures.**

**Thought Listing.** Participants next listed the thoughts they had while reading the anti-recycling message. Participants were given six thought-listing boxes and told to enter one thought per box but were not required to fill all six. These thoughts were subsequently rated by two independent coders for overall valence (i.e., whether each thought was pro-message, anti-message, neutral to the message, or unrelated to the message), following common practice (Cacioppo, Harkins, & Petty, 1981; see online supplement for full instructions). The total numbers of positive, negative, neutral, and unrelated thoughts rated by each coder were computed for each participant. The two coders were in agreement at the subject level, indicating highly correlated numbers of thoughts rated as positive,  $r(413) = .73, p < .001$ ; negative,  $r(413) = .76, p < .001$ ; neutral,  $r(413) = .59, p < .001$ ; and unrelated  $r(413) = .76, p < .001$ . To create single measures of each valence of interest and to account for any discrepancies between coders, three valence variables were computed by averaging the numbers of negative, positive, and neutral thoughts, respectively, provided by each coder. A summary index of valenced thoughts was calculated as the difference in quantity of positive versus negative thoughts as a proportion of the total number of relevant thoughts (see Cacioppo et al., 1981, for more detail). The result is

an index of how much each person produced thoughts that agreed (vs. disagreed) with the message.

**Post-Message Attitudes.** Participants once again reported their attitudes toward recycling, using the same items used to measure pre-message attitudes, which again had high internal reliability ( $\alpha = .97$ ), and were therefore combined to create one index of post-message attitudes.

**Message Ratings.** To ensure that participants perceived the messages as intended, we asked how much the message seemed to make arguments related to moral and practical concerns, each on 7-point scales anchored at “not at all” and “very much.”

## Results

**Manipulation Check.** Data were submitted to *t*-test analyses to determine whether the messages were perceived as intended. Participants perceived the moral message to appeal more to morality ( $M = 4.93$ ,  $SD = 1.77$ ) than the practical message ( $M = 2.81$ ,  $SD = 1.70$ ),  $t(413) = 12.43$ ,  $p < .001$ ,  $d = 1.22$ . Likewise, participants perceived the practical message to appeal more to practical concerns ( $M = 5.81$ ,  $SD = 1.40$ ) than the moral message ( $M = 4.10$ ,  $SD = 1.79$ ),  $t(413) = -10.82$ ,  $p < .001$ ,  $d = -1.06$ .<sup>1</sup> Likewise, dependent *t*-tests showed that the moral message was perceived to appeal more to morality than practicality,  $t(207) = 5.28$ ,  $p < .001$ ,  $d = .37$ , and the practical message was perceived to appeal more to practicality than to morality,  $t(206) = -19.30$ ,  $p < .001$ ,  $d = -1.34$ .

**Persuasion Effects.** We assessed attitude change by testing effects on post-message attitudes while entering pre-message attitudes as a covariate.<sup>2</sup> Because the persuasive message

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<sup>1</sup> Although moral attitude bases moderated the message difference in perceived morality,  $B = -.21$ ,  $p = .01$ , the moral message was judged to appeal significantly more to morality than the practical message at both low (1SD below the mean),  $B = -.84$ ,  $p < .001$ , and high (1SD above the mean) moral bases,  $B = -1.27$ ,  $p < .001$ . The message difference in perceived practicality was not moderated by moral attitude bases,  $p = .33$ .

<sup>2</sup> Results are very similar when instead testing effects on attitude change scores; these analyses are available on this project's Open Science Framework page. Also, we only covary initial attitudes when post-message attitudes are the outcome variable; results for other models, however, are similar when initial attitudes are covaried.

argued against recycling, for ease of interpretation, we reverse-scored each attitude index such that higher values correspond to attitudes that are consistent with the message (i.e., anti-recycling). Thus, higher values indicate more agreement with the message (persuasion) and lower values indicate more resistance.

The data were submitted to a multiple regression analysis predicting post-message attitudes in which pre-message attitudes, moral basis, and message type were entered in the first step of the model and the moral basis  $\times$  message type interaction term was entered in the second step. Message type was effects coded such that -1 corresponded with the moral argument condition and +1 corresponded with the practical argument condition. Results for these predictors are interpreted in the first steps of the model in which they appear. First, pre-message attitudes corresponded with post-message attitudes,  $B = .53$ ,  $t(411) = 5.76$ ,  $p < .001$ , 95% CI: [.35, .71]. There was no overall effect of message type ( $p = .39$ ), but there was an overall effect of moral basis such that the more people perceived a moral basis for their pro-recycling attitudes, the more their post-message attitudes opposed the message,  $B = -.34$ ,  $t(411) = -3.77$ ,  $p < .001$ , 95% CI: [-.52, -.16]. Most relevant to our hypotheses, however, was a significant interaction between message type and moral basis,  $B = -.27$ ,  $t(410) = -3.34$ ,  $p < .001$ , 95% CI: [-.42, -.11],  $f^2 = .03$  (Fig. 1).

In the practical arguments condition, we replicated the typical effect of moral basis on resistance to persuasion, as those with higher moral bases to their attitudes reported less message-consistent attitudes,  $B = -.59$ ,  $t(410) = -5.07$ ,  $p < .001$ , 95% CI: [-.81, -.36]. This relationship, however, was eliminated when the message appealed to moral concerns, as higher moral attitude bases were no longer associated with resistance,  $B = -.05$ ,  $t(410) = -.44$ ,  $p = .66$ , 95% CI: [-.30, .19]. In support of the moral matching hypothesis, participants with a low moral

basis (1 SD below the mean) were more persuaded by the practical (vs. moral) appeal,  $B = .35$ ,  $t(410) = 2.99$ ,  $p = .003$ , 95% CI: [.12, .58], whereas participants with a high moral basis (1 SD above the mean) were marginally more persuaded by the moral (vs. practical) appeal,  $B = -.20$ ,  $t(410) = -1.74$ ,  $p = .08$ , 95% CI: [-.43, .03]. Notably, probing the interaction at the maximum level of moral attitude bases (“5” on the 1-5 response scale, which is the response given by 26% of participants) reveals a significant advantage of the moral message over the practical message in producing message agreement,  $B = -.26$ ,  $t(410) = 2.01$ ,  $p = .05$ , 95% CI: [-.51, -.01].

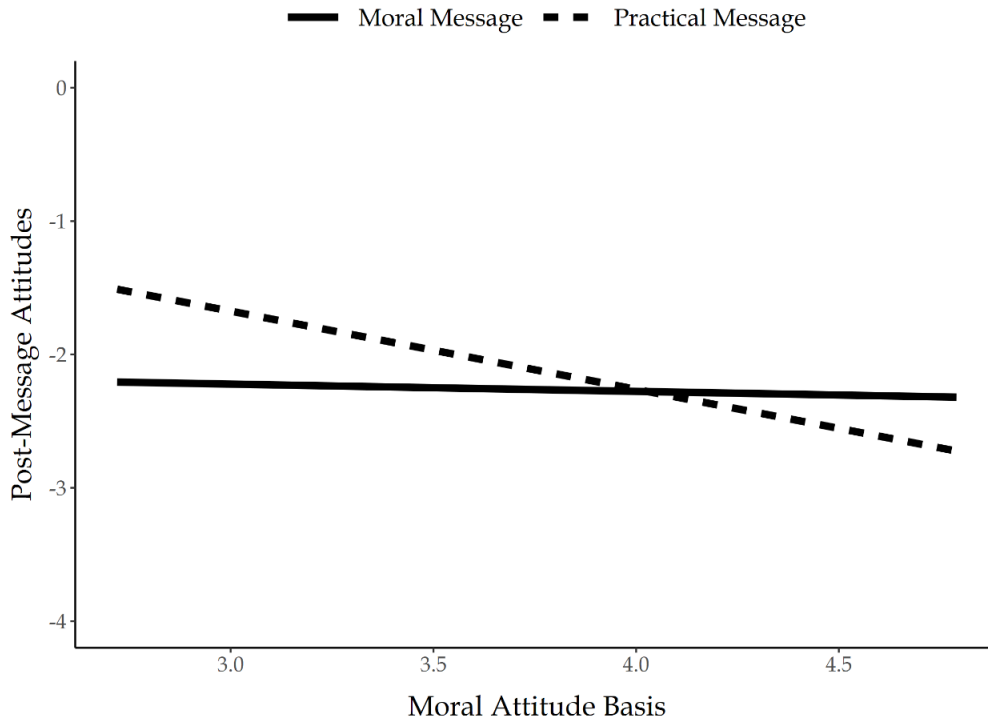


Figure 1. Moral attitude basis  $\times$  message type on post-message attitudes, controlling for pre-message attitudes (Study 1), capped at 1SD above and below the mean of moral bases.

**Mediation by Valenced Thoughts.** Because the measure of valenced thoughts showed the same message type  $\times$  moral basis interaction as observed for attitude change,  $B = -.07$ ,  $t(411) = -3.11$ ,  $p = .002$ , 95% CI: [-.12, -.03],  $f^2 = .02$ , we sought to determine whether valenced

thoughts mediated the persuasion effect. We computed the indirect effect and confidence intervals with nonparametric bootstrapping (10,000 iterations) using the “mediation” package in *R* (Tingley, Yamamoto, Hirose, Keele, & Imai, 2014). We tested the indirect effect on post-message attitudes, controlling for pre-message attitudes, setting the moral basis  $\times$  message type interaction term as the predictor, valenced thoughts as the mediator, pre-message attitudes, moral basis, and message type as covariates, and post-message attitudes as the outcome variable. More positive thoughts indeed predicted more message-consistent final attitudes,  $B = 1.56$ ,  $t(409) = 10.81$ ,  $p < .001$ , 95% CI: [1.27, 1.84], but the message type  $\times$  moral basis interaction effect on persuasion remained significant even after controlling for valenced thoughts as a mediator,  $B = -.15$ ,  $t(409) = -2.11$ ,  $p = .04$ , 95% CI: [-.29, -.01]. Nevertheless, the indirect effect of the message type  $\times$  moral basis interaction on persuasion through valenced thoughts was statistically significant,  $B = -.12$ , 95% CI: [-.20, -.04],  $p = .003$ , suggesting that the more the message matched the basis of the attitude, the more positive thoughts that were generated and the more attitude change that resulted.

**Effects of Other Attitude Bases.** We also measured how much people saw their attitudes as grounded in other concerns that might be relevant to the message manipulation, so we explored their effects as well. The following analyses tested each alternative basis’ interaction with message type on post-message attitudes, controlling for pre-message attitudes. First, we considered the effect of perceived practical attitude bases, which could serve as a match to the pragmatic appeal. The practical basis  $\times$  message type interaction, however, was not reliable,  $B = -.11$ ,  $t(410) = -1.25$ ,  $p = .21$ , 95% CI: [-.29, .06].

Next, we considered perceived emotional bases and found a significant emotional basis  $\times$  message type interaction,  $B = -.20$ ,  $t(410) = -2.84$ ,  $p = .005$ , 95% CI: [-.33, -.06]. The pattern

mirrored the moral basis effect: the practical appeal produced more message-consistent attitudes than the moral appeal when attitudes were based relatively little on emotion (1 SD below the mean),  $B = .37$ ,  $t(410) = 2.83$ ,  $p = .005$ , 95% CI: [.11, .63], but the moral appeal was somewhat more persuasive than the practical appeal when emotional bases were relatively high (1 SD above the mean),  $B = -.21$ ,  $t(410) = -1.56$ ,  $p = .12$ , 95% CI: [-.46, .05]. Nevertheless, when we entered moral basis and the moral basis  $\times$  message type interaction as simultaneous predictors, the moral basis  $\times$  message type interaction remained a reliable predictor of post-message attitudes,  $B = -.21$ ,  $t(408) = -2.48$ ,  $p = .01$ , 95% CI: [-.38, -.04] whereas the emotion interaction was no longer statistically significant,  $B = -.13$ ,  $t(408) = -1.75$ ,  $p = .08$ , 95% CI: [-.27, .02]. This suggests that the effect on attitudes is driven more by moral than emotional bases. Knowledge and consensus bases similarly show no unique interactions with message type,  $ps > .10$ .

**Moderation by Political Orientation.** Although political orientation was uncorrelated with initial attitude extremity toward recycling,  $r(412) = -.07$ ,  $p = .17$ , more conservative participants saw their recycling attitudes as somewhat less grounded in morality than more liberal participants,  $r(412) = -.16$ ,  $p = .001$ . To assess whether political orientation moderated the message type  $\times$  moral basis interaction, we subjected the data to a hierarchical multiple regression model that tested a three-way interaction on post-message attitudes. Moral basis, message type, and political orientation were entered in the first step of the model; all two-way interaction terms were entered in the second step; and the three-way interaction term was entered in the third step. Pre-message attitudes were entered as a covariate for each step. Results for these variables are interpreted in the first steps of the model in which they appear.

There was a main effect of political orientation on post-message attitudes such that greater identification as conservative was associated with more message-consistent final



attitudes,  $B = .30$ ,  $t(409) = 4.14$ ,  $p < .001$ , 95% CI: [.16, .44]. This is likely because an anti-environmental message is more associated with conservative positions in contemporary politics. As before, greater moral attitude basis was associated with more resistance to the message,  $B = -.29$ ,  $t(409) = -3.24$ ,  $p = .001$ , 95% CI: [-.47, -.11]. Pre-message attitudes were also a reliable independent predictor of post-message attitudes,  $B = .53$ ,  $t(409) = 5.89$ ,  $p < .001$ , 95% CI: [.35, .71]. There was still no overall effect of message type,  $p = .65$ . The moral basis  $\times$  message type interaction remained significant in this model,  $B = -.25$ ,  $t(406) = -3.21$ ,  $p = .001$ , 95% CI: [-.41, -.10], but no other two-way interaction was significant,  $ps > .10$ . Political orientation did, however, moderate the moral basis  $\times$  message type effect,  $B = -.15$ ,  $t(405) = -2.28$ ,  $p = .02$ , 95% CI: [-.28, -.02],  $f^2 = .02$ .

We tested the moral basis  $\times$  message type interaction at 1 SD below the mean on ideology (extremely liberal: 1.39 on a 1-5 scale) and at 1 SD above the mean on ideology (moderate/leaning conservative: 3.71 on a 1-5 scale). For participants who identified as highly liberal, there was no moral basis  $\times$  message type interaction,  $p = .68$ . However, for participants who identified as relatively more conservative, there was a significant message type  $\times$  moral basis interaction,  $B = -.40$ ,  $t(405) = -3.95$ ,  $p < .001$ , 95% CI: [-.59, -.20]. When people with relatively more conservative views had highly moral pro-recycling attitudes (1 SD above the mean), they were significantly more persuaded by the moral arguments against recycling than the practical arguments,  $B = -.38$ ,  $t(405) = -2.32$ ,  $p = .02$ , 95% CI: [-.71, -.06]; whereas for those with relatively non-moral recycling attitudes (1 SD below the mean), the practical appeal was significantly more persuasive than the moral appeal,  $B = .44$ ,  $t(405) = 3.01$ ,  $p = .003$ , 95% CI: [.15, .72]. Framed differently, when the more conservative participants read the moral message, greater moral bases were not significantly associated with post-message attitudes and even began

to have a positive effect,  $B = .08$ ,  $t(405) = .50$ ,  $p = .62$ , 95% CI: [-.23, .39]. When they read the practical message however, greater moral bases were associated with less message-consistent final attitudes,  $B = -.71$ ,  $t(405) = -5.28$ ,  $p < .001$ , 95% CI: [-.98, -.45].

Figure 2 presents an alternative way of breaking down this interaction by plotting the estimated moral basis  $\times$  message type interaction at each of the five levels of political ideology represented on our response scales. As shown in the figure, the more conservative the person was, the stronger was the matching effect on persuasion.

In sum, the results of Study 1 showed that the resistance to influence commonly associated with moral attitudes held only in the face of a message using a non-moral appeal, and moralizing an attitude was no longer associated with resistance when the message used a moral appeal, especially among less politically liberal participants. Nevertheless, it may be relatively unusual to see someone argue against recycling, so the observed results may be confined to situations in which the message's position is quite novel. In the following study, we aim to replicate these results using a topic for which positions both against and in favor have been commonly communicated.

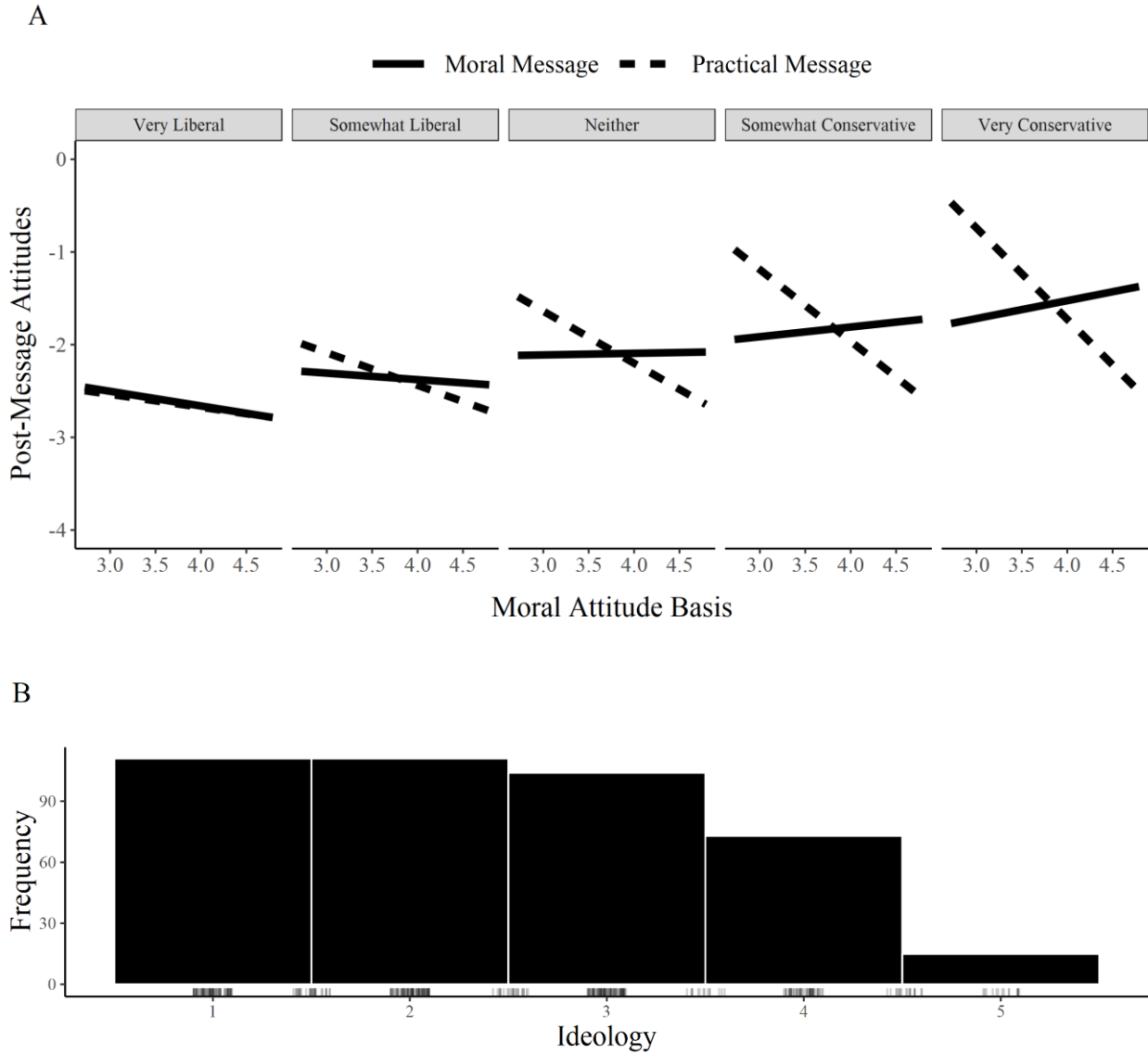


Figure 2. (A) The estimated moral basis  $\times$  message type interaction at each level of ideology (Study 1). Moral bases are capped at 1SD above and below the mean. (B) To aid interpretation of (A), frequencies of each level of ideology, binned into five categories, are plotted in a histogram; a rug plot along the x-axis illustrates occurrences for all possible ideology values.

## Study 2

### Method

**Topic Selection.** For Study 2, we wanted to use a topic about which people often moralize their attitudes but vary in the degree to which they do so and about which there is considerable public disagreement so that the persuasive message would not take a “surprising” position on the issue. We assembled a list of 15 topics that have been used before in research on moralized attitudes (e.g., universal healthcare, genetically modified foods, legalizing voluntary euthanasia) and conducted a pilot study on *Mechanical Turk* ( $N = 152$ ;  $M_{\text{age}} = 35.04$ ) in which people provided their attitudes and the degree to which those attitudes were based in moral concerns using measures like those in Study 1. Notably, the topic from Study 1 (“recycling”) ranked 7<sup>th</sup> in average degree of moralizing, between “increasing the United States military budget” and “legalizing abortion,” reinforcing its appropriateness as a target of moral cognition. See this project’s OSF page for data and results of this pilot study.

For Study 2, we ultimately selected “legalizing marijuana” because it was relatively highly moralized on a 5-point scale ( $M = 3.68$ ,  $SD = 1.28$ ). This topic had an additional advantage in that although it is not unusual for someone to argue against marijuana legalization, a majority of this sample (80%) expressed positive attitudes. Thus, we would need to exclude relatively few participants to examine reactions to a counter-attitudinal message.

**Participants.** An *a priori* power analysis showed that  $N = 396$  provided 80% power to find the effect size of the moral basis  $\times$  message type interaction in Study 1, so we aimed to have about 400 participants after implementing necessary exclusions. Because the persuasive message in this study argued against marijuana legalization, we planned to exclude participants for whom this message would be pro-attitudinal, as in Study 1. Because 80% of pilot participants reported

positive attitudes on this issue, we recruited 502 participants through Amazon's *Mechanical Turk* program (250 males, 250 females, 2 who identified with an alternative gender label;  $M_{\text{age}} = 37.26$ ,  $SD = 11.05$ ) in exchange for \$1.

Following pre-registered criteria, 78 participants (42 in the *moral* condition; 36 in the *practical* condition) were excluded from analyses because they already had negative attitudes toward marijuana legalization (i.e., scoring below the midpoint on the pre-message attitudes measure). Also, in light of the exclusion criterion added in Study 1, we pre-registered the exclusion of cases in which IP Addresses were duplicates of previous participants ( $n = 7$ , 1.65% of remaining sample).

Finally, after collecting the data, we noticed some extreme outliers on the key dependent variable (post-message attitudes toward marijuana legalization). Following recommended practice, we used a modified Z-score based on median absolute deviations (MAD) to flag outliers, aiming to avoid issues with using standardized scores to flag outliers (see Leys, Ley, Klein, Bernard, & Licata, 2013). Essentially, this method uses the median absolute deviations from the median to index the units of extremity for each score (just as typical Z-scores use mean absolute deviations from the mean—standard deviation—as units of extremity). We used 4 as our cutoff, which is slightly more conservative than previous suggestions (Iglewicz and Hoaglin, 1993, suggest 3.5). We chose a cutoff of 4 because it only resulted in two participant deletions whereas 3.5 would result in four deletions, though as noted, the effects remain the same with either criterion. The online supplement reports robustness analyses showing that the particular outlier cutoff selected has little impact on the reported regression effects. No observations in Study 1 exceeded a modified Z of 3.5. Deleting the two outliers in Study 2 left a final sample size of  $N = 415$ , which still exceeded our goal.

**Procedure.** The procedure was nearly identical to Study 1. Participants first read a brief introduction to the topic of marijuana legalization, then reported their attitudes toward the topic and the degree to which their attitudes were based in moral or practical concerns. Each participant was then randomly assigned to read an essay arguing against marijuana legalization using either a moral or practical appeal. After reading the message, participants again reported their attitudes toward legalization, listed their thoughts about the message, completed measures of political orientation and message ratings, and finally coded the thoughts they listed about the message.

**Independent Variables.**

*Pre-Message Attitudes and Perceived Attitude Bases.* Attitudes and bases were measured as they were in Study 1, replacing “recycling” with “marijuana legalization.” These items had high internal reliability ( $\alpha = .96$ ) and were averaged to form a measure of pre-message attitudes.

*Counter-Attitudinal Message.* We created two versions of an anti-marijuana legalization essay that appealed either to moral or practical concerns. The moral appeal, entitled “Legalizing Marijuana: Harmful and Immoral” framed its position in moral terms (e.g., “In the rush to legalize, we haven’t fully thought through some of the ethical consequences of legalization”) and cited particular moral reasons against legalization (e.g., “A large marijuana industry is likely to unjustly sacrifice the welfare of consumers in order to increase profits”). By contrast, the practical appeal, entitled “Legalizing Marijuana: Unwise and Impractical,” framed its anti-recycling position in pragmatic terms (e.g., “In the rush to legalize, we haven’t fully thought through some of the pragmatic consequences of legalization”) and cited particular economic and pragmatic concerns (e.g., “Repealing current laws will generate additional costs due to increases

in marijuana use and dependence”). Arguments were adapted from scholarly analyses of journalistic and legislative texts regarding marijuana decriminalization, which found that actual arguments made for this topic have appealed to both moral and instrumental concerns (Ferraiolo, 2014).

Messages were of similar lengths (468 and 470 words) and number of arguments, and they were designed to be equally cogent overall. Linguistic analyses like those in Study 1 showed that the messages differ in moral language and that the moral message appealed to a range of moral foundations although again contained more harm-focused language than any of the other four foundations.

In a pilot, Mechanical Turk participants ( $N = 100$ ) saw either the moral or practical anti-legalization appeal and assessed it on a number of measures in addition to those used in Study 1’s pilot tests. To more closely approximate the conditions of the full study, we excluded responses from participants who reported negative attitudes toward legalization ( $n = 17$ ). The moral message was indeed perceived as appealing more to moral concerns than the practical message,  $t(81) = -6.96, p < .001$ , whereas the practical message was perceived as appealing more to practical concerns than the moral message,  $t(81) = 4.73, p < .001$ . The messages did not differ, however, in perceived strength, rationality, relevance, writing quality, and centrality to the issue,  $ps > .10$ . The moral message was, however, perceived as more emotional than the practical message,  $t(81) = -4.16, p < .001$ , as was the case with Study 1’s stimuli. See supporting online content for full details on this pilot test, the linguistic analysis, and the full message texts.

**Political Orientation.** Political orientation was measured with the same two items from Study 1 ( $\alpha = .85; M = 2.61, SD = 1.16$ ).

**Dependent Measures.**

**Thought Listing.** Participants listed the thoughts they had while reading the message using the same procedure as Study 1. However, rather than rely on independent coders, we instead had participants code their own thoughts. Prior research has shown that participant ratings of thought valence are very similar to judge ratings (see Cacioppo et al., 1981). At the end of the survey, participants saw all of the thoughts they had previously provided and were asked to categorize them as to whether each one was generally in favor of, against, neutral toward, or unrelated to marijuana legalization. A summary index of valenced thoughts was again calculated as the difference in quantity of positive (message-consistent) versus negative (message-opposing) thoughts as a proportion of the total number of relevant thoughts. The result is an index of how much each person produced thoughts that agreed (vs. disagreed) with the message.

**Post-Message Attitudes.** The same items used to measure pre-message attitudes were again administered ( $\alpha = .97$ ) and were combined to create one index of post-message attitudes.

**Message Ratings.** In addition to rating how much the message appealed to morality and practicality, as in Study 1, participants rated how strong they thought the arguments were on a 7-point scale anchored at “very weak” and “very strong.” This measure allowed us to again check whether one version of the message generally seemed stronger than the other, and it also provided an opportunity to test our key predictions with a slightly different indicator of persuasion. That is, we examined whether the hypothesized matching effects on message agreement extend to perceived message strength, consistent with prior research treating similar subjective message evaluations as the key outcome of persuasion (e.g., Luttrell et al., 2017).



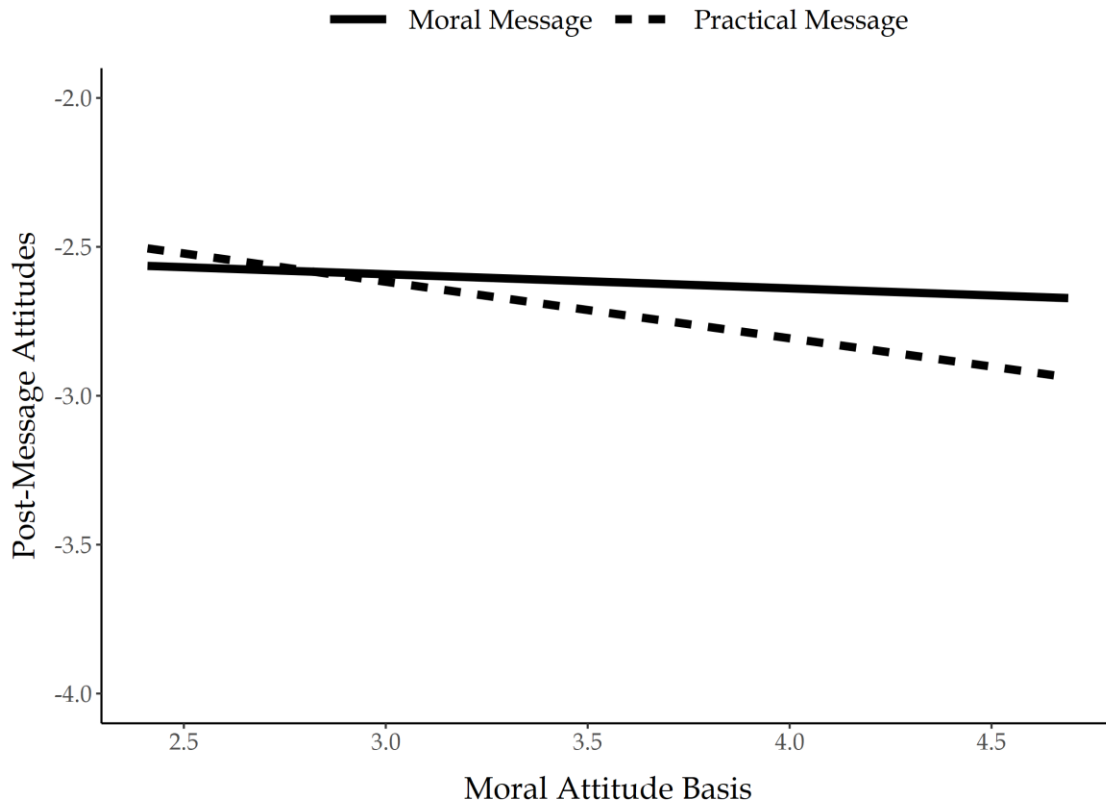
## Results

**Manipulation Check.** Participants who received the moral message perceived it to appeal more to morality ( $M = 5.13$ ,  $SD = 1.77$ ) than participants who received the practical message ( $M = 3.06$ ,  $SD = 1.80$ ),  $t(413) = 11.81$ ,  $p < .001$ ,  $d = 1.16$ . Likewise, participants who received the practical message perceived it to appeal more to practical concerns ( $M = 5.28$ ,  $SD = 1.71$ ) than participants who received the moral message ( $M = 3.77$ ,  $SD = 1.77$ ),  $t(413) = -8.84$ ,  $p < .001$ ,  $d = -.87$ . Neither of these message differences were moderated by participants' degree of moral conviction ( $ps > .60$ ). Dependent  $t$ -tests also showed that the moral message was perceived to appeal more to morality than practicality,  $t(205) = 8.56$ ,  $p < .001$ ,  $d = .60$ , and the practical message was perceived to appeal more to practicality than to morality,  $t(208) = -12.54$ ,  $p < .001$ ,  $d = -.87$ .

**Persuasion Effects.** We tested effects on message agreement using the same approach as Study 1. There was no main effect of message type ( $p = .24$ ), but there was an overall effect of moral bases such that greater moralizing was associated with less message-consistent final attitudes,  $B = -.12$ ,  $t(411) = -2.88$ ,  $p = .004$ , 95% CI:  $[-.20, -.04]$ , supporting an overall resistance effect. Pre-message attitudes also predicted post-message attitudes,  $B = 1.00$ ,  $t(411) = 25.74$ ,  $p < .001$ , 95% CI:  $[.92, 1.07]$ . Most relevant to our hypotheses, however, there was a marginally significant interaction between message type and moral basis,  $B = -.07$ ,  $t(410) = -1.87$ ,  $p = .06$ , 95% CI:  $[-.15, .00]$ ,  $f^2 = .01$  (Figure 3), that was of the same form as in Study 1.

In the practical arguments condition, we again replicated the typical effect of moral basis on resistance to persuasion, as those with higher moral bases to their attitudes continued to have more positive attitudes toward the issue,  $B = -.19$ ,  $t(410) = -3.39$ ,  $p < .001$ , 95% CI:  $[-.30, -.08]$ . This relationship, however, was eliminated when the message appealed to moral concerns;

higher moral attitude bases were not predictive of attitudes following the moral message,  $B = -.05$ ,  $t(410) = -.84$ ,  $p = .40$ , 95% CI: [-.16, .06]. In support of the moral matching hypothesis, participants with high moral bases (1 SD above the mean) were more persuaded by the moral (vs. practical) appeal,  $B = -.13$ ,  $t(410) = -2.16$ ,  $p = .03$ , 95% CI: [-.25, -.01]; whereas the two appeals did not significantly differ among participants with low moral bases (1 SD below the mean),  $B = .03$ ,  $t(410) = .48$ ,  $p = .63$ , 95% CI: [-0.09, .15].



*Figure 3.* Moral attitude basis  $\times$  message type on post-message attitudes, controlling for pre-message attitudes (Study 2), capped at 1SD above and below the mean of moral bases.

**Mediation by Valenced Thoughts.** Valenced thoughts again showed the same message type  $\times$  moral basis interaction as observed for attitude change,  $B = -.05$ ,  $t(411) = -2.09$ ,  $p = .04$ , 95% CI:  $[-.10, .00]$ ,  $f^2 = .01$ , so we tested the indirect effect of the moral basis  $\times$  message type interaction on post-message attitudes via message-relevant thoughts as in Study 1. More positive thoughts indeed predicted more message-consistent final attitudes (controlling for pre-message attitudes),  $B = .46$ ,  $t(409) = 5.96$ ,  $p < .001$ , 95% CI:  $[.31, .61]$ , and the message type  $\times$  moral basis interaction dropped to non-significance ( $p = .16$ ) when valenced thoughts were in the model. The indirect effect of the message type  $\times$  moral basis interaction on post-message attitudes through valenced thoughts was marginally significant,  $B = -.02$ , 95% CI:  $[-.04, .00]$ ,  $p = .07$ .

**Effects of Other Attitude Bases.** As in Study 1, the practical basis  $\times$  message type interaction on post-message attitudes was not reliable,  $B = -.02$ ,  $t(410) = -.43$ ,  $p = .67$ , 95% CI:  $[-.11, .07]$ , suggesting once again that pragmatic arguments do not necessarily benefit from a matching effect. Unlike Study 1, we found no evidence for an emotion basis  $\times$  message type interaction,  $B = -.02$ ,  $t(410) = -.61$ ,  $p = .54$ , 95% CI:  $[-.09, -.05]$ , and the moral basis  $\times$  message type interaction persists even when controlling for an emotion basis  $\times$  message type interaction,  $p = .06$ . Knowledge and consensus bases similarly did not interact with message type,  $ps > .50$ .

**Moderation by Political Orientation.** More liberal participants were slightly more in favor of legalization,  $r(413) = -.14$ ,  $p = .005$ ; however, there was no correlation between political orientation and degree of moralizing this issue,  $r(413) = -.03$ ,  $p = .57$ . We tested whether political orientation moderated the message type  $\times$  moral basis interaction using the same method as Study 1 and found that the three-way interaction was once again significant,  $B = -.09$ ,  $t(406) = -2.75$ ,  $p = .006$ , 95% CI:  $[-.16, -.03]$ ,  $f^2 = .02$ .

We again tested the moral basis  $\times$  message type interaction at 1 SD below the mean on ideology (extremely liberal: 1.45 on a 1-5 scale) and at 1 SD above the mean on ideology (moderately conservative: 4.00 on a 1-5 scale). For participants who identified as highly liberal, there was no moral basis  $\times$  message type interaction,  $p = .54$ . However, for participants who identified as relatively more conservative, there was a significant message type  $\times$  moral basis interaction,  $B = -.19$ ,  $t(406) = -3.41$ ,  $p < .001$ , 95% CI: [-.29, -.08]. When people with relatively more conservative views had highly moral pro-marijuana legalization attitudes (1 SD above the mean), they were significantly more persuaded by the moral arguments than the practical arguments,  $B = -.27$ ,  $t(406) = -3.11$ ,  $p = .002$ , 95% CI: [-.44, -.10]; whereas for those with relatively non-moral legalization attitudes (1 SD below the mean), the practical appeal was marginally more persuasive than the moral appeal,  $B = .15$ ,  $t(406) = 1.76$ ,  $p = .08$ , 95% CI: [-.02, .33]. Framed differently, when the more conservative participants read the moral message, greater moral bases were associated with more message-consistent final attitudes, indicating greater persuasion by the moral message,  $B = .17$ ,  $t(406) = 1.93$ ,  $p = .05$ , 95% CI: [.00, .34]. When they read the practical message however, greater moral bases were associated with less message-consistent attitudes, indicating greater resistance to the practical message,  $B = -.20$ ,  $t(406) = -2.90$ ,  $p = .004$ , 95% CI: [-.34, -.06].

Figure 4 presents this three-way interaction by estimating the moral basis  $\times$  message type effect at each level of political orientation responses.

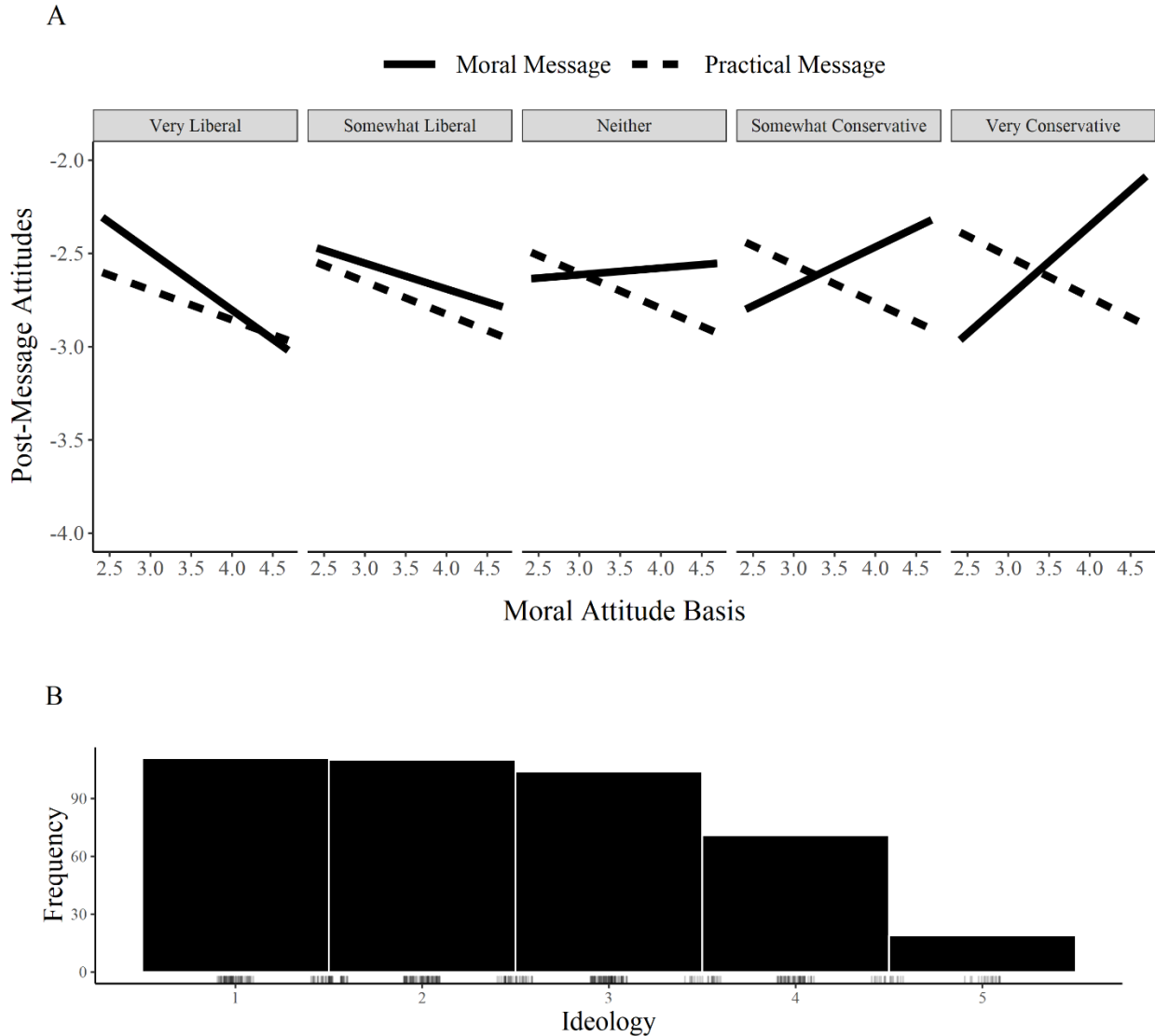


Figure 4. (A) The estimated moral basis  $\times$  message type interaction at each level of ideology (Study 2). Moral bases are capped at 1SD above and below the mean. (B) Frequencies of ideology responses are plotted as in Figure 2.

**Perceived Argument Strength.** As in the pilot test, there was no overall difference in perceived argument strength between the two message conditions,  $t(413) = -.51, p = .61$ .

However, as we noted earlier, we could also examine whether perceived moral attitude bases moderate the effect of message type on perceived argument strength. We thus conducted an

additional set of multi-step regression models similar to the previous analyses, except with perceived message strength as the outcome variable instead of post-message attitudes. As noted previously, we do not covary pre-message attitudes in these analyses, but results are not appreciably different with initial attitudes as a covariate (see analysis records on OSF).

First, we found a significant moral basis  $\times$  message type interaction on perceived argument strength,  $B = -.19$ ,  $t(411) = -2.45$ ,  $p = .01$ , 95% CI: [-.35, -.04],  $f^2 = .01$ . For the practical message, greater moral attitude bases were associated with perceiving the arguments as weaker,  $B = -.55$ ,  $t(411) = -4.98$ ,  $p < .001$ , 95% CI: [-.76, -.33], but moral bases were unrelated to the perceived strength of the moral arguments,  $B = -.16$ ,  $t(411) = -1.39$ ,  $p = .17$ . At low degrees of moralizing one's attitude (1 SD below the mean), the practical message was perceived to be stronger than the moral message,  $B = .29$ ,  $t(411) = 2.28$ ,  $p = .02$ , 95% CI: [.04, .54], but at high degrees of moralizing (1 SD above the mean), the moral message was seen as stronger than the practical message, though not significantly,  $B = -.15$ ,  $t(411) = -1.19$ ,  $p = .24$ , 95% CI: [-.40, .10]. In addition, valenced thoughts mediated the moral basis  $\times$  message type interaction on perceived argument strength,  $B = -.06$ , 95% CI: [-.12, .00],  $p = .04$ .

The moral basis  $\times$  message type effect was further qualified by a three-way interaction with political orientation,  $B = -.17$ ,  $t(407) = -2.41$ ,  $p = .02$ , 95% CI: [-.31, -.03],  $f^2 = .02$ . As with the effect on attitudes, the moral basis  $\times$  message type interaction was stronger among more politically conservative participants (1 SD above the mean),  $B = -.39$ ,  $t(407) = -3.51$ ,  $p < .001$ , 95% CI: [-.61, -.17], than among more politically liberal participants (1 SD below the mean),  $B = .00$ ,  $t(407) = .00$ ,  $p = .996$ .

### **Internal Meta-Analysis**

Because Study 1 combined two samples and Study 2's effect size was smaller than Study

1's, we meta-analyzed Studies 1A, 1B, and 2 to further test the size and reliability of the reported effects. For each study, we computed standardized partial correlations from the regression results for the key interaction effects (see the online supplement for a full report of the method and results of the meta-analysis). In brief, the moral basis  $\times$  message type effect on post-message attitudes,  $r_p = -.13$ ,  $Z = -3.34$ ,  $p < .001$ , 95% CI: [-.21, -.05] (Figure S2A), and on valenced thoughts,  $r_p = -.12$ ,  $Z = -3.52$ ,  $p < .001$ , 95% CI: [-.19, -.05] (Figure S2B), is reliable across studies. In addition, the moral basis  $\times$  message type  $\times$  political orientation interaction on post-message attitudes is reliable across studies,  $r_p = -.12$ ,  $Z = -3.35$ ,  $p < .001$ , 95% CI: [-.18, -.05] (Figure S2C).

### General Discussion

Across two studies using essentially the same procedures with different topics, we show that relatively moralized attitudes are more resistant to change, replicating prior research. Importantly, our novel finding was that this was only the case for messages making non-moral arguments. For messages appealing to moral concerns, attitude moralization was no longer associated with resistance. The statistical interaction between degree of moral basis and type of message delivered was consistent with the *moral matching hypothesis*: relatively moralized attitudes changed more when faced with moral (vs. practical) counter-attitudinal messages. This process appears to be relatively thoughtful because the interaction was mediated by the valenced thoughts people had while reading the message.

We also found an intriguing interaction whereby the moral matching effect was stronger for more politically conservative participants. More conservative-leaning participants may have been more open to the advocated positions in our studies because even though the positions were counter-attitudinal for everyone, they were relatively more consistent with current normative

conservative opinion, potentially making conservative individuals more open to the arguments matching their attitude's moral basis. More liberal participants may have instead been closed to any anti-recycling/legalization arguments, regardless of how well they matched their attitude's basis. Future research should test the role of political orientation and openness in persuasive matching effects. Importantly, it was not the case that conservatives in general were more open to moral persuasion than liberals, but only when their attitudes had a relatively moral basis.

Notably, individuals who perceived themselves to have more practical attitude bases were not more persuaded by practical (vs. moral) arguments. Thus, matching effects may not necessarily extend across *all* types of attitude bases. Practical bases may seem less central than moral bases, or people may not naturally identify attitudes along a practical continuum as they do a moral continuum. Alternatively, participants' attitudes may have encompassed specific practical concerns not communicated in our practical message. To our knowledge, the question of which attitude bases can produce matching effects has not been explored, and future research should consider the efficacy of messages tailored to less centrally relevant attitude bases.

We suspect that even when targeting an audience that sees the issue as moral, the effectiveness of moral appeals may further depend on the specific moral content of that message. That is, consistent with the "moral reframing" literature, when people view their attitude as morally grounded, it is the moral appeal that speaks to their particular moral values that may be most impactful (e.g., "purity" appeals for political conservatives; Feinberg & Willer, 2015). Nevertheless, we aimed to include moral content in our messages that would be appealing across the political spectrum, emphasizing harm, which is universally important. It is still possible that any moral appeal—even one not closely aligned with one's ideology—is more persuasive than a non-moral appeal when people moralize the issue. We invite further research on this possibility.



These studies also contribute to theories of moral attitudes. Although morally based attitudes are typically construed as inherently resistant to change, we did not observe this for messages appealing to morality. Rather than being obstinate per se, moralized attitudes instead correspond to more heavily weighting moral considerations, which may simply go unchallenged in many influence attempts. Indeed, previous research showing the durability of moral attitudes did not challenge attitudes with morally relevant considerations. When morality seems especially relevant to an issue, people are more attentive and open to new moral considerations because those concerns seem more relevant to their attitude (cf. See, Petty, & Fabrigar, 2013). Together, these implications raise compelling questions about the role of morality in persuasion, and future work should examine these relationships.

Author Contributions

A. Luttrell and R. Petty developed the study concept. All authors contributed to the study design. Data collection and analysis were performed by A. Luttrell and A. Philipp-Muller. A. Luttrell and A. Phillip-Muller drafted the manuscript, and R. Petty provided critical editing. All authors approved the final version of the manuscript for submission.

Open Practices Statement

Pre-registration for Study 1A can be accessed at <https://aspredicted.org/yp5az.pdf>, pre-registration for Study 1B can be accessed at <https://aspredicted.org/n3pd9.pdf>, and pre-registration for Study 2 can be accessed at <https://aspredicted.org/a4rw8.pdf>. De-identified data for all experiments and pilot studies along with data analysis scripts are posted at <https://osf.io/96s4v/>. Full materials and additional analyses are presented in the online supplements.

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