Praise from Peers Promotes Empathetic Behavior[*]

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Abstract

Empathy is a powerful tool for shaping and shaping policy preferences, encouraging cooperative or inclusionary behavior (Adida, Lo and Platas, 2018), and warming attitudes towards others. Yet, recent work has shown that engaging in empathy is costly. We investigate the magnitude of those costs and their origins—whether emotional or cognitive—and propose and test an intervention designed to lower the barriers to empathy. We begin by verifying the cost of empathy and harnessing an incentive-compatible reservation wage design to estimate a monetary price to the cost in a first study. We then propose *peer praise* as an effective and light-touch approach to encourage empathetic behavior in a second study, developing an intervention that uses naturalistic peer praise. Our third study uses a randomized survey experiment to demonstrate the efficacy of peer praise in promoting empathy. In our last two randomized survey experiments, we investigate mechanisms and provide evidence that peer praise encourages empathy through an affective pathway by boosting positive emotions. Our discussion centers on findings related to the scope of our intervention's efficacy and its broad success in motivating empathy across ideological and partisan categories.

1 Introduction

Empathy—the act of taking the perspective of and understanding others' experiences (Decety and Cowell, 2014; Waal, 2012)—is a powerful tool for shaping and changing policy preferences, encouraging cooperative or inclusionary behavior, and warming attitudes towards others. From scores of studies across the social sciences, we have learned a fair amount about the mechanics of empathy. We understand, for example, that a huge determinant of empathy is socially determined by group categorization, meaning that it is easier and more automatic for individuals to generate empathy towards their own group (even when the group is determined by a flip of the coin; Stürmer et al., 2006). We've also learned that empathy can lead to prosocial behaviors: e.g., taking the perspective of others reduces prejudice, increases helping behavior and has the potential to improve attitudes about even heavily stigmatized outgroups (Batson et al., 1997; Shih et al., 2009). In the context of persistent internecine violence—e.g., among Israelis and Palestinians, a particularly tough case for the importance of empathy—seeing the world through the eyes of others leads to greater support for humanitarian aid for the "other" side (Gubler, Halperin and Hirschberger, 2015). Differences in the desire and proclivity to engage in empathy also map on to political divides; both in the U.S. and across the world, liberals are more interested in empathy but both liberals and conservatives find it difficult to engage in empathy with political outgroups (Hasson et al., 2018; see also Simas, Clifford and Kirkland, 2020).

Despite its importance across fields, two significant gaps in our understanding remain: why is empathy costly and—given its normative and instrumental value—what can we do to *encourage* greater empathy? We contribute along several dimensions. We field five studies using an incentive-compatible experimental design that allows us to verify a general preference towards avoiding empathy, propose and test a light-touch intervention designed to encourage empathy through the use of peer praise and investigate the affective mechanisms through which praise works. We begin by estimating the preference towards empathy using a choice task in which online respondents make decisions about whether to empathize with or simply describe the appearance of randomly presented photos. Modifying the choice task to include a wage-elicitation stage, we estimate that the empathy task was 40% less likely to be chosen by respondents than the descriptive task and required roughly a 10% premium in wages. Our subjects also reported that empathy felt more demanding, more costly and difficult and made them more anxious compared to pure description.

Our main contribution comes in proposing and testing an intervention to overcome the aversion

we identify and encourage empathetic behavior. Given the natural connection between empathy and affect[1]—empathy is fundamentally "an affective response" (Hoffman, 1984, 103)—we propose the use of peer praise: praise because of its established ability to trigger positive emotions (Delin and Baumeister, 1994) and "peer" praise given the established benefits of peer influence across many domains (Barry and Wentzel, 2006). We show across several studies that real peer praise for empathy—elicited in our Study 2—increases the odds of respondents choosing to engage in empathy by 20% compared to the control group.

Lastly, we used three separate randomized experiments to examine the mechanisms through which peer praise works to encourage empathy. The failure of our placebo treatment—peer praise for objective description—to impact behavior helps us to rule out explanations based on norms (changing beliefs about socially valued behavior). Instead, we focus on the "cost/benefit" family of mechanisms which suggest that praise might encourage empathy through lowering or increasing perceived/actual costs or benefits, respectively, to respondents. Given the link between praise and positive emotion, our Studies 4 and 5 focus on the link between praise and happiness, and happiness and empathy. Ultimately, we find support across both studies for praise operating through an emotional pathway (happiness) to encourage greater empathy. We conclude with a discussion focusing on the scope conditions to the effectiveness of our peer praise intervention, highlighting its limits but also noting that it is broadly effective across demographic and ideological categories.

2   Encouraging Empathy Through Peer Praise

Empathy provides obvious benefits at the individual and group level, but as many have noted, it comes at some costs (Howick et al., 2020).[2] That cost may be cognitive—effortful and intentional cognitive processes at the heart of perspective-taking being more resource-intensive than automatic heuristic thinking—or affective or, most likely, bundled (Hodges and Klein, 2001). And while there is widespread consensus that these costs exist, there is still much to learn about how empathy can be difficult and how we can encourage it in the face of those headwinds. While some recent work (such as Cameron et al., 2019) has begun to focus on establishing the "price of empathy," we pick up the thread by more precisely evaluating this aversion towards empathy by individuals, and use that information to gauge the effectiveness of our proposed intervention. Our innovation

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[1]Many current formations of empathy also involve cognition to some extent, though affect is often emphasized. See Davis (2006) for a broader discussion.

[2]It is possible that empathy also comes with "fewer benefits" compared to obvious alternative behaviors, though the literature on this strain of reasoning is less developed than the costs literature.

is to leverage the strong desire for peer praise to encourage greater empathy, as well as highlight the affective mechanism through which praise shifts behavior.

Ways to encourage empathy towards an outgroup or other person abound, but such interventions are often expensive, hard to implement and difficult to scale up. Early studies typically exposed respondents to a story focused on an outgroup member and the treatment was often as simple as instructing subject to (selectively) take the perspective of the person in the story (e.g., Coke, Batson and McDavis, 1978). Other common approaches include empathy-based exercises within intergroup contact scenarios (Tropp and Barlow, 2018 offer a recent review). For example, Broockman and Kalla (2016) and Kalla and Broockman (2020) successfully utilize face-to-face interpersonal conversations that incorporate variations of perspective-taking, a key component to empathy, to reduce exclusionary attitudes towards outgroup members. More recent work has explored moving these interventions online, either through relatively short interactive exercises (Adida, Lo and Platas, 2018) or more involved online role-playing games (Simonovits, Kezdi and Kardos, 2018) or even ones requiring specialized virtual reality hardware (Herrera et al., 2018). A common thread, however, is that these interventions typically require careful training of enumerators, (almost always) additional costs in equipment, time and footwork, and do not tap into natural and preexisting resources surrounding the population of study.

Given the established benefits of empathy, an eye towards encouraging it when it might otherwise be avoided, and the need for a scalable and "light-touch" intervention, we propose harnessing a more naturally-occurring phenomenon understood to have significant impact on individual behaviors: peer praise. Peer praise is a promising candidate for such an intervention given its documented effects on behavior more generally as well as its association with positive emotions, both of which should help to motivate empathetic behavior. We further explore whether this type of peer admiration can be shifted to an online forum for better scalability.

The promise praise holds as an intervention is based in part on its natural connection to positive emotions: in fact, one of the distinguishing characteristics of empathy is that it operates by "ramping up emotion and the feeling of oneness with others" (Gilin et al., 2013, 4). Peer praise is thus an ideal candidate for encouraging empathy towards others given its role in fostering positive emotions and the link between affect and empathy. An early review sums up the consensus view that the "obvious and immediate outcome" of praise is "simple, positive affect" (Delin and Baumeister, 1994, 224). In fact, the link between praise and positive emotions is taken to be a baseline expectation in much of the literature, its truth self-evident enough that most work focuses on conditions—such

as obviously insincere compliments—in which praise *fails* to lead to positive emotions (Morton, Mikolajczak and Luminet, 2020). And while there are strong links between praise and positive emotions, there are also links between positive emotions and increased effort and motivation (Erez and Isen, 2002; Foo, Uy and Baron, 2009), productivity (Oswald, Proto and Sgroi, 2015), attention (Storbeck, Dayboch and Wylie, 2019) and generally improved cognition along multiple dimensions (Subramaniam and Vinogradov, 2013). In fact, recent observational work suggests a link between positive mood and pro-social behavior (Aknin, Van de Vondervoort and Hamlin, 2018) that might operate as a feedback look or "virtuous cycle" (Layous et al., 2017).

And while praise itself is connected to positive emotions (which, in turn, might motivate prosocial behavior), a related literature on the positive network effects of peers suggests further how an effective intervention might be designed. Peer effects have been shown to occur across contexts, from uptake of education, future planning and emotional happiness to economic and welfare outcomes and to persist over time (Duflo, Dupas and Kremer, 2011; Duflo and Saez, 2002; Fowler and Christakis, 2008; Bertrand, Luttmer and Mullainathan, 2000; Carrell, Fullerton and West, 2009). That peers can substantially influence one's behavior is unsurprising; a multidisciplinary literature on peer effect processes illustrates this group as increasingly important upon broaching adulthood, among respected peers, and especially for peers with whom one shares values (Brechwald and Prinstein, 2011). Recent work has further emphasized that peer influence is especially relevant to the development of prosocial behaviors (Barry and Wentzel, 2006) for which empathy is often considered a precursor (Balconi and Canavesio, 2013). An important mechanism that may be at play is the desire to maintain favorable evaluation from admired peers, which can in turn support a positive sense of self (Gibbons, Gerrard and Lane, 2003). While our focus on the connection between praise and pro-social behavior is not new, previous work has often centered around child-parent relationships and/or with an emphasis on adolescent populations (Brechwald and Prinstein, 2011).

3 Research Design and Methods

We measure the aversion to empathy, the effects of peer praise for encouraging it, and the extent to which peer praise is mediated by positive emotions, with a series of five online randomized controlled survey experiments on over two thousand adults from August 2020 to January 2021. Overall, attrition was quite low across all studies and uncorrelated with assignment to treatment condition (see discussion in Appendix A and guidance for examining attrition in Lo, Renshon and

Nygate-Bassan, 2021). We avoided negative affect as much as possible (by designing our studies without negative peer feedback), did not use deception and established wages via the highest current minimum wage per hour in the U.S. at the time the studies were fielded (see Appendix J for more on ethical considerations).

Our estimating model of choice for task choice outcome is a logistic regression, and for numeric continuous outcomes—such as reservation wage or happiness index value—we estimate ordinary least squares models, both with robust standard errors and clustered at the respondent level in the cases of multiple observations per respondent. Figure 1 provides an overview of our studies. All studies were fielded on Amazon MTURK using Qualtrics.[3] Studies 1 and 2 lay the groundwork for our contribution by establishing a baseline cost to empathy and eliciting naturalistic peer praise from online respondents. Study 3 provides the first evidence that peer praise (collected in Study 2) encourages empathetic behavior. Studies 4 and 5 explore mechanisms for our peer praise intervention, focusing on how praise reduces the barriers to empathy by increasing positive affect (happiness, specifically).
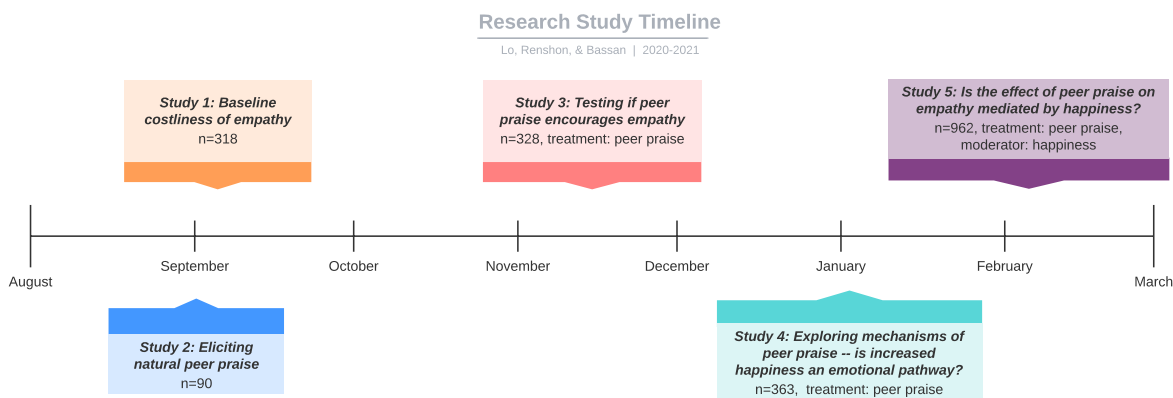

Figure 1: **Research study timeline.** N denoted refers to # of respondents, not the number of observations.

Our main experimental task (used in Studies 1 and 3-5) was adapted from Cameron et al. (2019), a design explicitly engineered to measure motivated empathy avoidance with behavior-based revealed preferences. This type of forced-choice scenario mimics many everyday occurrences of empathy regulation, where people might similarly choose to scroll quickly past charity-based ads or opt for walking around non-profit volunteers on the street. In common across these studies, subjects

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[3]All studies described in this paper were approved by UW-Madison IRB as Study # 2020-0843. Participants in any of the studies described in the paper were prevented from re-enrolling in any other empathy-related study run by authors.

chose between two decks of cards, one marked FEEL and the other marked DESCRIBE. Upon choosing a deck, a picture of a male face appeared, drawn from the Chicago Faces database (Ma, Correll and Wittenbrink, 2015) and randomized (within-subject, without replacement) along the dimensions of race (Black or White) and valence (angry or fearful). Following a practice round—in which they complete both FEEL and DESCRIBE versions—subjects completed multiple rounds of this choice task, each time writing: (1) a complete sentence describing either the feelings/experiences or descriptive characteristics (2) three words describing feelings/experience or descriptive characteristics and (3) a feeling thermometer towards the individual in the drawn picture.

This main task was also modified and used in two further ways. In Studies 1 and 3-5, subjects (after the main choice task) completed an incentivized wage-elicitation version of the task in which 12 pairs of decks were presented sequentially on one page, each with wages associated with them—DESCRIBE task was pegged at $1.00 and FEEL deck ranged from $0.90 to $2.00. For each pair, subjects chose which wage-task they would prefer; the incentivized aspect of the task manifested in a random draw of one of the pairs of wage-task choices, and respondents were paid the associated wage to conduct the associated task. In Study 1, subjects were randomly assigned to either a REAL COST or HYPOTHETICAL version of the wage elicitation task (while in Studies 3-5, all decisions involved real incentives).[4] Following the incentivized task, subjects answered questions about how they chose between decks, questions about task load (adapted from Hart & Staveland's 1988 NASA task load index) and empathy (adapted from Interpersonal Reactivity Index; Davis, 1983) and finally filled out demographic information.

Our peer praise intervention was designed with two features in mind. First, we sought to intervene as lightly as possible, both to avoid demand effects as well as to satisfy the requirement that our treatment be low-cost and scalable. Second, we designed the intervention to accord with extant theories and empirical guidance that provide scope conditions for *when* praise is an effective motivator. Prime among those conditions are that the praise is perceived as sincere, that it encourages something that is controllable by the recipient (effort, rather than ability, for example; Henderlong and Lepper, 2002) and that it conveys information about norms and/or social

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[4]Previous studies such as Cameron et al. (2019) use hypothetical settings to elicit wage preference, but the literature on wage elicitation suggests that often hypothetical scenarios can lead to under or over-stating of true preferences, whereas incentive-compatible designs that credibly tie respondents to real wage payouts do not suffer from such bias (Berry, Fischer and Guiteras, 2019). As such, we chose to measure reservation wage with both types of designs first; while we find suggestive evidence that there is no statistically significant difference in reported wage preferences in REAL or HYPOTHETICAL settings in Study 1, our findings differ from a similar hypothetical scenario posed in Cameron et al. (2019) as the literature might predict, and so, as a conservative approach, we continue in the studies to follow to use the REAL design whenever wage preferences are measured.

comparisons (Webster et al., 2003). In order to satisfy the first requirement, the praise intervention was as "light-touch" as possible, consisting merely of a word cloud of praise and a favorability rating for those that engage in it.[5] The second set of requirements was satisfied by fielding a non-experimental survey (Our Study 2 in Figure 1) designed to elicit actual praise and verify that it was perceived as genuine by online respondents.[6] Combining the language elicited from respondents, we created a "peer praise empathy" wordcloud that presents the most commonly used unique words sized by their likelihood of usage, presented in Figure 2a.[7] Moreover, the phrasing of our intervention (in Studies 3-5) emphasized the social norm aspect of the praise ("peers of yours..."). Finally, in all studies in which peer praise for empathy was administered as an intervention, we included an additional placebo treatment arm in which peer praise for *description* was treated as well.[8]

Studies 3-5 all elicited emotional states at some point during the study. Study 3 asked respondents to rate their emotional state following the treatment and the task using a modified version of the Discrete Emotions Questionnaire (Harmon-Jones, Bastian and Harmon-Jones, 2016*b*).[9] Studies 4 and 5 both measured emotional states as mediators, and as a result focused only on "happiness" and "pride" and moved measurement of emotional states such that they were post-treatment but pre-task and DV measurement. In accordance with best practices for measurement (Harmon-Jones, Bastian and Harmon-Jones, 2016*a*), emotional states elicited post-task asked subjects to think about how they felt "during the task" and emotions measured prior to the task asked about their emotions "right now."
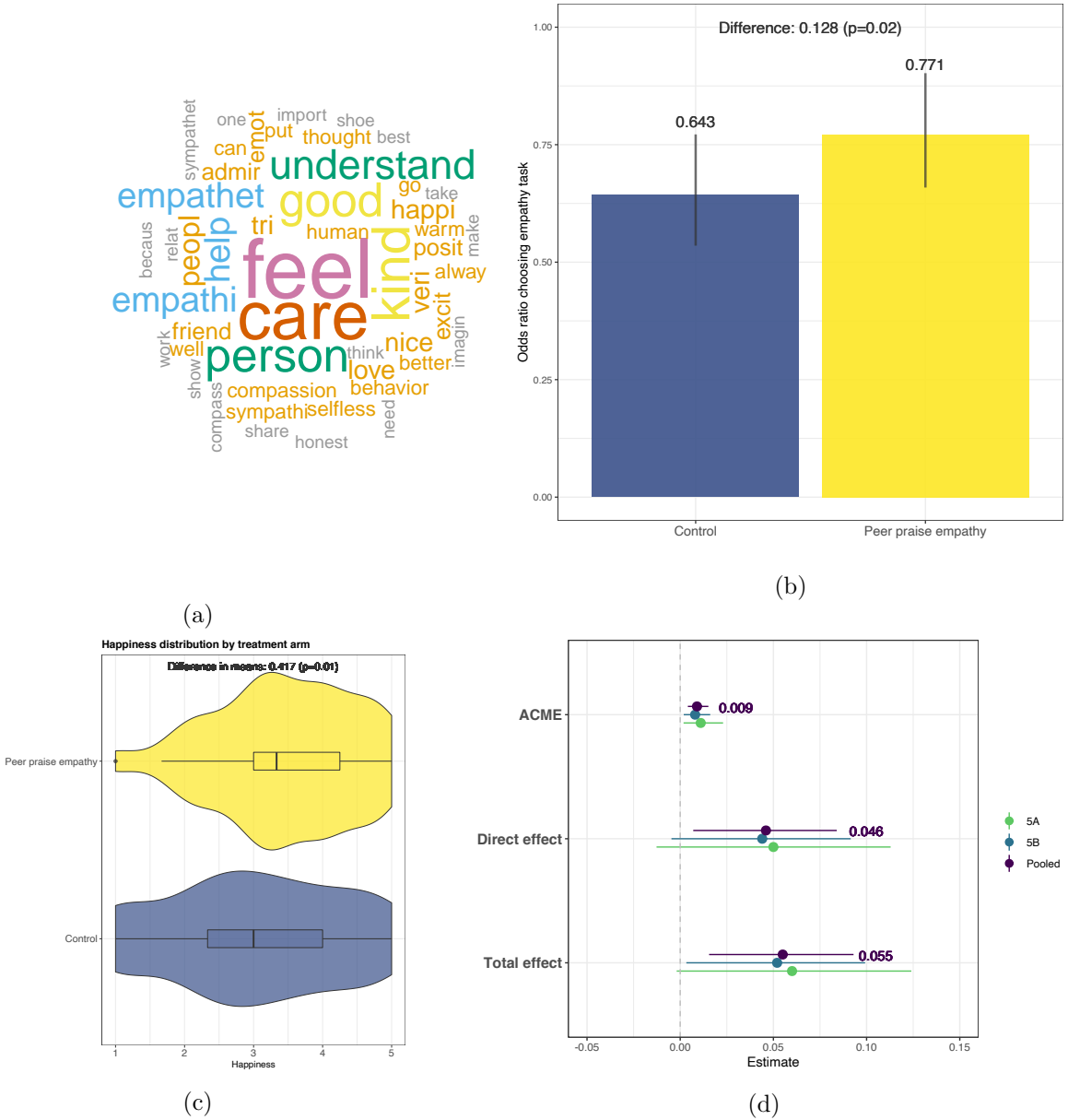
(a)

(b)

(c)

(d)

Figure 2: **Peer praise effect on empathy.** (a) presents the main peer praise treatment, formed from eliciting naturalistic praise in Study 2. (b) plots the odds ratios (exponentiated log-odds) of choosing the empathy task for control and peer praise for empathy groups from Study 3. (c) plots distributions and barplots of the happiness index for control and peer praise for empathy groups from Study 4. (d) presents mediation estimates of interest (on log-odds of choice task) from Study 5 (which included to two fielded days of surveys, referred to as 5A and 5B).

4   Results

Study 1 verifies that empathy is comparatively costly (or has fewer "benefits") and provides a baseline against which to evaluate the effectiveness of our peer praise intervention. Preference against empathy is established in three ways. First, the empathy task had a lower likelihood of being chosen (39.7%) than the descriptive task. Second, the reservation pay for empathy was higher than for the descriptive task: if the description task pay is $1.00, then the average respondent needed the empathy task to be raised to $1.098 to shift to the latter ($p < 1e - 13$).[10] Finally, our DVs elicited post-treatment verify that subjects perceived empathy as more difficult and more costly: the described the empathy task (on a scale from 1 to 5) as more demanding ($0.234(p = 0.02)$), harder ($0.377(p = 1e - 4)$) and felt more insecure/anxious ($0.234(p = 0.03)$) about it and less successful at it ($-0.19(p = 0.04)$) than the objective task and were more likely to report preferring the DESCRIBE task than the FEEL task.[11]

Having established that empathy is costly from both the subjective experience of our subjects and our estimates of the cost of incentivizing it, we turn to the question of how we might reduce those costs and encourage empathetic behavior. Using the elicited praise from Study 2, Study 3 tests whether peer praise is able to overcome the costs of empathy and encourage people to engage in empathetic behavior. Using the same choice task as Study 1, repeated for 15 trials, we find that respondents choose FEEL over DESCRIBE more frequently when exposed to the praise treatment (compared to a control condition of no praise). Specifically, the odds ratio of respondents choosing

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[5] "Peers of yours on this platform have said they hold favorable feelings towards people who engage in empathetic behavior, with an average feeling thermometer score of 7.9, on a scale from 0 (least favorable) to 10 (most favorable). That same peer group provided real feedback, which is pictured in the word cloud below."

[6] After eliciting the praise for others in Study 2, respondents rated how genuine it seemed to them and were given the option to go back and edit their praise to make it more sincere. Respondents were asked to rate the praise they gave for how sincere they believed it would be perceived by others receiving the praise on a scale from 0 (not genuine at all) to 100 (very genuine); average ratings for the peer praise for empathy was 71.90 (SD=20.90) and for objectivity it was 72.32 (SD=21.14).

[7] We similarly create a "peer praise for objective behavior," found in Figure 3a. Appendix Figure ?? presents words that are most likely to differentially occur for empathy and objective tasks.

[8] In the praise for description, the instructions were identical to the praise for empathy treatment, with only slight differences in the feeling thermometer score (7.2 instead of 7.9) and a very subtly different word cloud.

[9] Specifically, we removed items relating to "desire" and "relaxation," lowered the number of items per emotion from 4 to 3 to ease burden on respondents and added items clustering around the emotion of "pride," based on work by Webster et al. (2003) and Williams and DeSteno (2008).

[10] This is only a fourth of the pay needed to shift respondents found by Cameron et al. (2019) ($0.39); thus we find that while a substantial ten percent increase in wage is required to shift a respondent towards the empathetic task from the objective task, our incentive-compatible real wage design elicits a one fourth wage difference compared to the hypothetical choice task used by Cameron et al. (2019). The design randomized subjects into a real or hypothetical incentive condition, allowing us to explore differences between real/hypothetical incentives: we find no significant difference between our REAL COST and HYPOTHETICAL COST conditions.

[11] 28.9% preferred DESCRIBE compared to 18.9% preferring FEEL. For details on task load summaries see Appendix B.

the FEEL task over the DESCRIBE task for peer-praised respondents was 0.128 ($p = 0.02$) higher than the control group. This translates to 1.20 times the odds of choosing the FEEL task for the control group. In other words, the peer-praised group had a 20% greater likelihood of choosing the empathy task over the objective task compared to the control group. [12] We find convergent evidence from the real wage task, where praise for empathy lowered respondents' reservation value compared to both control (no praise) and the placebo (praise for description), though the differences were not statistically significant.

Studies 1-3 demonstrated that empathy was costly, and piloted a promising light-touch intervention to encourage empathy. We turn now to the question of *how* peer praise encourages empathy. Several candidate mechanisms are possible, none of which are mutually exclusive and which can be grouped into two "families" of explanations. The first family of mechanisms focuses on cost, while the second focuses on norms. The norms explanation for how praise encourages empathy is that it may do so by changing respondents' beliefs about what is normatively "good" behavior (behavior valued by others). Evidence from Study 3 suggests that this is not the case: if praising a behavior worked by changing respondents' beliefs about how valued it is by others, our placebo condition ("peer praise for description") should have led to a higher likelihood of choosing objective description relative to our control (no praise) condition. That it did not (the change in odds of choosing the empathy task over the objective task was 0.05 ($p = 0.37$); see Figure 3b), despite adequate power, suggests utility of focusing on the "costs" family of potential mechanisms instead.

With one group of mechanisms tentatively ruled out, we focus our efforts on the cost/benefit mechanisms, beginning with suggestive evidence from Studies 1 and 3 that respondents do in fact see empathy as more costly relative to objective description. Our evidence for this comes from our task difficulty questions administered to respondents after they completed the choice task. Additionally, Study 3 (and 3b) showed that respondents had a higher reservation price for empathy compared to description. However, those results suggest only that there may be a cost to empathy, but not what the cost is or how it operates. Since we have evidence from other work on the relationship between affect and empathy, we focus in Study 4 on the emotional pathway and, specifically, the extent to which praise causes happiness. In Study 4, we show that peer praise increases respondents' reported happiness, as one would expect if peer praise encouraged empathy through an emotional pathway. Figure 2a (c) presents the distribution of the measured happy index for respondents who received peer praise for empathy and respondents in control; peer praise is associated with a 0.417

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[12]See Appendix Study 3 for table with log odds and odds ratio estimates.

$(p = 0.01)$ bump upwards in a five point happiness scale.[13]

Further corroboration for the argument that peer praise encourages empathy *through an emotional pathway* is provided by Study 5, in which subjects participated in the same choice task as earlier studies—for either 3^{14} or 20 trials—combined with measurement of happiness described earlier. We follow Imai, Keele and Yamamoto (2010) and find that the effect of peer praise on choosing an empathetic task is mediated by how happy the receiver feels. [15] The average causal marginal effect (ACME) of respondent happiness is 0.009 for the log-odds of the choice task, or 16.4% of the total effect of the peer praise treatment.

5   Discussion

Though empathy is widely recognized as normatively and instrumentally important, significant gaps remain concerning *why* empathy is difficult and what we can do to encourage it. Most extant work on encouraging empathy involve resource-intensive perspective taking exercises, often requiring trained interlocutors or complicated online simulations. Our innovation was to introduce a low-cost, light-touch intervention based on praise from peers. Across five studies, we were able to first verify and precisely estimate the cost of empathy and then demonstrate the utility of a novel "peer praise" intervention that lowers the barriers to empathetic behavior. We also provided evidence ruling out one family of possible mechanisms (based on norms) and instead show that praise works through an affective pathway by boosting happiness in our treated respondents. In our discussion below, we focus on several scope conditions to the effectiveness of our intervention. Among the limiting factors, we note that peer praise does not work as well for other behaviors as it does for motivating empathy, that it works best for the most attentive and that its effectiveness seems to decline over time in the longer versions of our experiments. We conclude this section by highlighting broad evidence that peer praise does motivate empathy across demographic and ideological categories

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[13]We test and find similar results for a related dimension of positive affect, pride, and present results in Appendix Figure G.23.

[14]We calibrated design for Study 5 based on power calculations designed to reduce trials and increase overall sample size directly from findings in Study 3 which suggested some tapering off of peer praise effects over many trials.

[15]Our measurement approach to the mediation effect of happiness does not include randomization of both the treatment (peer praise) and the mediator (happiness) in a parallel design, but rather only randomization of the treatment and direct measurement of the mediator after treatment. This is after careful consideration of the well-known difficulties of meaningful and valid experimental manipulation of mediators (Imai et al., 2011) (and for which emotions can be particularly tricky). We conduct sensitivity analyses of our mediation approach in the Appendix.

The Limits of Peer Praise

We offer evidence of peer praise working (through happiness) to lower barriers to empathetic behavior; but does peer praise work to move behaviors on whatever is praised? We find that peer praise for objective behavior is not an effective intervention for increasing respondents' willingness to choose the objective task. We do this by eliciting naturalistic praise for objective behavior (see (a) in Fig. 3) and randomizing respondents to receiving the peer praise for objective behavior and finding their likelihood in choosing between tasks. If peer praise works similarly for objective behavior, we should see the likelihood of choosing the empathy task *drop* for treated respondents compared to their control counterparts. In Fig. 3 (b) we see that the odds increase by 0.05 and is not statistically significantly different ($p = 0.37$). This suggests something about the potential limits of a peer praise intervention—it doesn't necessarily shape any and all categories of behavior—as well helping us to pinpoint *why* praise does motivate empathetic behavior.

(a)
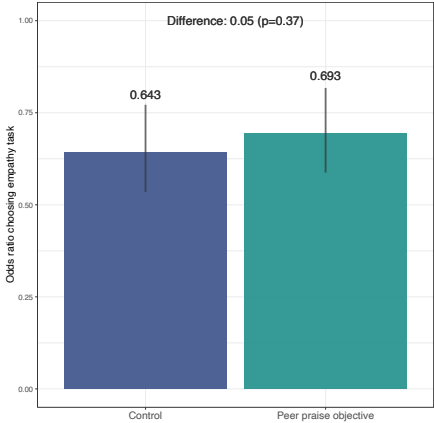
(b)

Figure 3: (a) Peer praise for objective behavior. (b) Odds of choosing the empathy task over the objective task under Control and Peer praise for objective behavior groups.

Above we note that peer praise is not a universal motivator of behavior, but our results also

suggest specific boundaries for how it motivates empathy. Two factors seem to shape the efficacy of the intervention: attentiveness and repetition. In Study 5, subjects were asked to participate in either 3 or 20 trials of the choice task.[16] From this, we can see the efficacy of peer praise in the first three trials across both versions of the study, but also clearly see in the longer choice task that the effect of praise declines over trials (Figure I.37 in Appendix I), such that after the first four or five trials the total effect of praise and the average causal marginal effect of praise (through happiness) become indistinguishable from zero. In Figure I.36 (Appendix I), we examine subgroup effects by respondent attentiveness in Study 5, as measured by our two sets of attention checks (a combination of grid and multiple choice questions, as suggested by Berinsky et al. 2019). We find that peer praise works least well for the small number of our least attentive respondents: the 6% of our sample who "failed" both types of attention checks). The two most plausible (though not mutually exclusive) explanations for this are either that subjects who are least attentive in online survey are also least responsive to peer praise, or that our intervention requires some minimal amount of focus or attention in order to work.

Peer Praise Works Broadly Across Groups in Encouraging Empathy

Finally, our experiments provide an opportunity to wade into a larger debate on individual differences in empathy. It is relatively old-hat to note that individuals differ in their levels of baseline empathy (Davis, 1983) and that there is a distinction to be made as well between ability—or, empathic accuracy (Sherman et al., 2015) and proclivity to engage in empathy (Zaki, Bolger and Ochsner, 2008). More recent work has suggested that liberals and conservatives might differ in baseline empathy, with one notable study concluding that "liberals wanted to feel more empathy and experienced more empathy than conservatives did" (Waytz et al., 2016, 1450), see also Hasson et al., 2018; Simas, Clifford and Kirkland, 2020).

The raft of similar findings (Hasson et al., 2018; Simas, Clifford and Kirkland, 2020) suggest some consensus on this point, though we note that the studies are by and large premised on measurement of *baseline* empathy that is self-reported by respondents, not empathetic behavior. Given that empathic accuracy and proclivity seem to be largely orthogonal, it is worth considering if the gulf in empathy between liberals and conservatives is as wide as it seems. In fact, analyses in Figure 4 (and detailed in Appendix I) shows that peer praise works to encourage empathetic

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[16]This was not randomized but represent slightly different versions of the study fielded on different days of the same week).
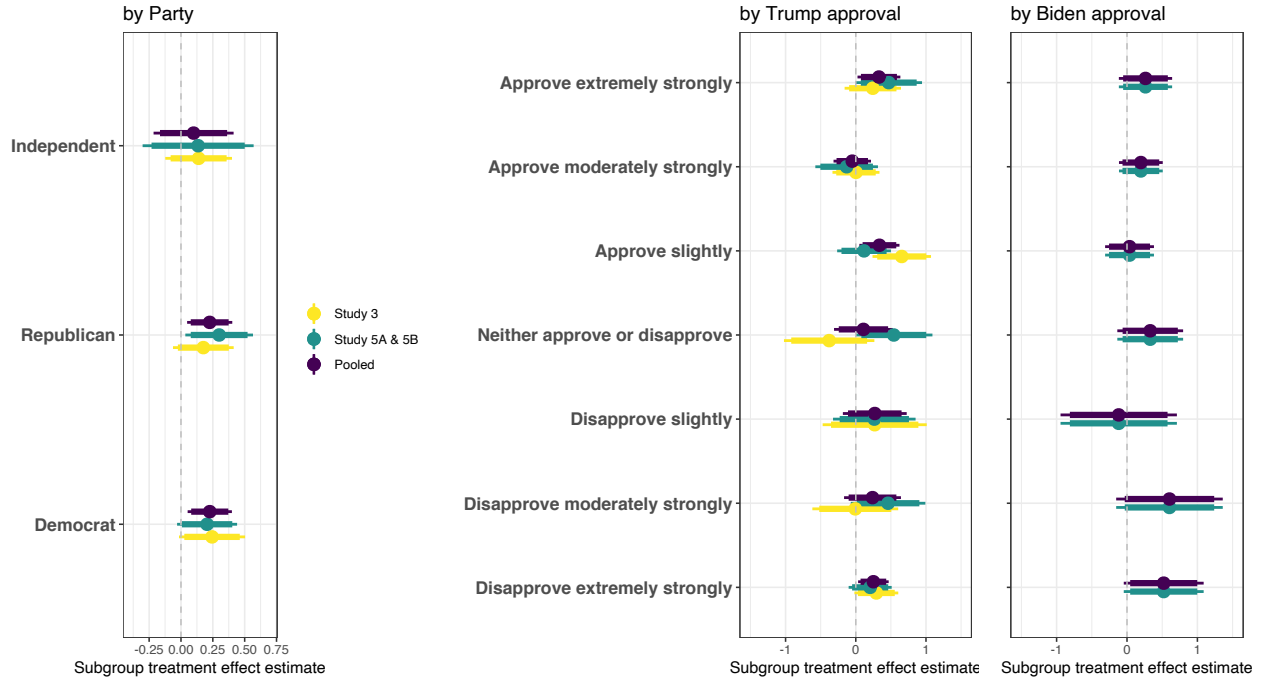
Figure 4: **Subgroup effects by party (left), Trump approval (middle), and Biden approval (right).** At the time of fielding for Study 3, President Trump was in office (and therefore approval was measured as "presidential approval"), but by Study 5, President Biden had taken office and thus we separately and explicitly measured "Trump approval" as well as "Biden approval" ("presidential approval [for Biden]").

behavior broadly across ideological boundaries, whether measured as Party ID, or support for President Trump or Biden. Further analyses show that praise is also effective in motivating empathy across education, sex and racial identity categories. We take these results to show both the overall effectiveness of the proposed peer praise intervention, but also evidence suggesting that we may have been too quick to categorize ideological groups as more or less empathetic.

While we establish a general effect of peer praise in this work, we leave for our follow-up paper the important question of whether the identity of the praiser (e.g. a co-gender or co-partisan) might differentially affect the recipient's willingness to engage in empathetic behavior. In addition, we have also set aside explorations of the, likely meaningful, impact of the *target* of empathy for future work; we do not experimentally manipulate these targets prior to our respondents' choosing whether to engage in the objective or empathetic task in lieu of focusing here on the first order question of whether peer praise for empathy can, in general, motivate empathetic behavior.

References

Adida, Claire L, Adeline Lo and Melina R Platas. 2018. "Perspective taking can promote short-term inclusionary behavior toward Syrian refugees." *Proceedings of the National Academy of Sciences* 115(38):9521–9526.

Aknin, Lara B, Julia W Van de Vondervoort and J Kiley Hamlin. 2018. "Positive feelings reward and promote prosocial behavior." *Current opinion in psychology* 20:55–59.

Balconi, Michela and Ylenia Canavesio. 2013. "Emotional contagion and trait empathy in prosocial behavior in young people: The contribution of autonomic (facial feedback) and Balanced Emotional Empathy Scale (BEES) measures." *Journal of Clinical and Experimental Neuropsychology* 35(1):41–48.
URL: *https://doi.org/10.1080/13803395.2012.742492*

Barry, Carolyn McNamara and Kathryn R. Wentzel. 2006. "Friend influence on prosocial behavior: The role of motivational factors and friendship characteristics." *Developmental Psychology* 42(1):153–163.

Batson, C Daniel, Marina P Polycarpou, Eddie Harmon-Jones, Heidi J Imhoff, Erin C Mitchener, Lori L Bednar, Tricia R Klein and Lori Highberger. 1997. "Empathy and attitudes: Can feeling for a member of a stigmatized group improve feelings toward the group?" *Journal of personality and social psychology* 72(1):105–118.

Berinsky, Adam J, Michele F Margolis, Michael W Sances and Christopher Warshaw. 2019. "Using screeners to measure respondent attention on self-administered surveys: Which items and how many?" *Political Science Research and Methods* 9(2):1–8.

Berry, James, Greg Fischer and Raymond Guiteras. 2019. "Eliciting and Utilizing Willingness to Pay: Evidence from Field Trials in Northern Ghana." *Journal of Political Economy* 128(4):1436–1473.
URL: *https://www.journals.uchicago.edu/doi/abs/10.1086/705374*

Bertrand, Marianne, Erzo F. P. Luttmer and Sendhil Mullainathan. 2000. "Network Effects and Welfare Cultures*." *The Quarterly Journal of Economics* 115(3):1019–1055.
URL: *https://doi.org/10.1162/003355300554971*

Brechwald, Whitney A. and Mitchell J. Prinstein. 2011. "Beyond Homophily: A Decade of Advances in Understanding Peer Influence Processes." *Journal of Research on Adolescence* 21(1):166–179.
  URL: *https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1532-7795.2010.00721.x*

Broockman, David and Joshua Kalla. 2016. "Durably reducing transphobia: A field experiment on door-to-door canvassing." *Science* 352(6282):220–224.
  URL: *https://science.sciencemag.org/content/352/6282/220*

Cameron, C. Daryl, Cendri A. Hutcherson, Amanda M. Ferguson, Julian A. Scheffer, Eliana Hadjiandreou and Michael Inzlicht. 2019. "Empathy is hard work: People choose to avoid empathy because of its cognitive costs." *Journal of Experimental Psychology. General* 148(6):962–976.

Carrell, Scott E., Richard L. Fullerton and James E. West. 2009. "Does Your Cohort Matter? Measuring Peer Effects in College Achievement." *Journal of Labor Economics* 27(3):439–464.
  URL: *https://www.journals.uchicago.edu/doi/10.1086/600143*

Coke, Jay S, C Daniel Batson and Katherine McDavis. 1978. "Empathic mediation of helping: a two-stage model." *Journal of personality and social psychology* 36(7):752–766.

Davis, Mark H. 1983. "Measuring individual differences in empathy: Evidence for a multidimensional approach." *Journal of personality and social psychology* 44(1):113–126.

Davis, Mark H. 2006. Empathy. In *Handbook of the sociology of emotions*, ed. Turner J.H. Stets J.E. Springer pp. 443–466.

Decety, Jean and Jason M. Cowell. 2014. "Friends or Foes: Is Empathy Necessary for Moral Behavior?" *Perspectives on Psychological Science* 9(5):525–537.
  URL: *https://doi.org/10.1177/1745691614545130*

Delin, Catherine R and Roy F Baumeister. 1994. "Praise: More than just social reinforcement." *Journal for the theory of social behaviour* 24(3):219–241.

Duflo, Esther and Emmanuel Saez. 2002. "Participation and investment decisions in a retirement plan: the influence of colleagues' choices." *Journal of Public Economics* 85(1):121–148.
  URL: *https://www.sciencedirect.com/science/article/pii/S0047272701000986*

Duflo, Esther, Pascaline Dupas and Michael Kremer. 2011. "Peer Effects, Teacher Incentives, and the Impact of Tracking: Evidence from a Randomized Evaluation in Kenya." *American Economic*

Review 101(5):1739–1774.

URL: *https://www.aeaweb.org/articles?id=10.1257/aer.101.5.1739*

Erez, Amir and Alice M Isen. 2002. "The influence of positive affect on the components of expectancy motivation." *Journal of Applied psychology* 87(6):1055–1067.

Foo, Maw-Der, Marilyn A Uy and Robert A Baron. 2009. "How do feelings influence effort? An empirical study of entrepreneurs' affect and venture effort." *Journal of Applied Psychology* 94(4):1086–1094.

Fowler, James H. and Nicholas A. Christakis. 2008. "Dynamic spread of happiness in a large social network: longitudinal analysis over 20 years in the Framingham Heart Study." *BMJ* 337:a2338.

URL: *https://www.bmj.com/content/337/bmj.a2338*

Gibbons, Frederick X., Meg Gerrard and David J. Lane. 2003. A Social Reaction Model of Adolescent Health Risk. In *Social Psychological Foundations of Health and Illness.* John Wiley & Sons, Ltd pp. 107–136.

URL: *https://onlinelibrary.wiley.com/doi/abs/10.1002/9780470753552.ch5*

Gilin, Debra, William W Maddux, Jordan Carpenter and Adam D Galinsky. 2013. "When to use your head and when to use your heart: The differential value of perspective-taking versus empathy in competitive interactions." *Personality and Social Psychology Bulletin* 39(1):3–16.

Gubler, Joshua Ronald, Eran Halperin and Gilad Hirschberger. 2015. "Humanizing the outgroup in contexts of protracted intergroup conflict." *Journal of Experimental Political Science* 2(1):36–46.

Harmon-Jones, Cindy, Brock Bastian and Eddie Harmon-Jones. 2016a. "Detecting transient emotional responses with improved self-report measures and instructions." *Emotion* 16(7):10861–1096.

Harmon-Jones, Cindy, Brock Bastian and Eddie Harmon-Jones. 2016b. "The discrete emotions questionnaire: A new tool for measuring state self-reported emotions." *PloS one* 11(8):e0159915.

Hart, Sandra G and Lowell E Staveland. 1988. "Development of NASA-TLX (Task Load Index): Results of empirical and theoretical research." *Advances in psychology* 52:139–183.

Hasson, Yossi, Maya Tamir, Kea S Brahms, J Christopher Cohrs and Eran Halperin. 2018. "Are

liberals and conservatives equally motivated to feel empathy toward others?" *Personality and Social Psychology Bulletin* 44(10):1449–1459.

Henderlong, Jennifer and Mark R Lepper. 2002. "The effects of praise on children's intrinsic motivation: A review and synthesis." *Psychological bulletin* 128(5):774–795.

Herrera, Fernanda, Jeremy Bailenson, Erika Weisz, Elise Ogle and Jamil Zaki. 2018. "Building long-term empathy: A large-scale comparison of traditional and virtual reality perspective-taking." *PloS one* 13(10):e0204494.

Hodges, Sara D and Kristi JK Klein. 2001. "Regulating the costs of empathy: the price of being human." *The Journal of socio-economics* 30(5):437–452.

Hoffman, Martin L. 1984. Interaction of affect and cognition in empathy. In *Emotions, cognition, and behavior*, ed. Carroll E. Izzard, Jerome Kagan and Robert B. Zajonc. Cambridge University Press pp. 103–131.

Howick, J, S Mittoo, L Abel, J Halpern and SW Mercer. 2020. "A price tag on clinical empathy? Factors influencing its cost-effectiveness." *Journal of the Royal Society of Medicine* 113(10):389–393.
  URL: *https://doi.org/10.1177/0141076820945272*

Imai, Kosuke, Luke Keele, Dustin Tingley and Teppei Yamamoto. 2011. "Unpacking the Black Box of Causality: Learning about Causal Mechanisms from Experimental and Observational Studies." *American Political Science Review* 105(4):765–789.
  URL: *https://www.cambridge.org/core/journals/american-political-science-review/article/abs/unpacking-the-black-box-of-causality-learning-about-causal-mechanisms-from-experimental-and-observational-studies/9D2ACE9F784B99A30216D216FBF88553*

Imai, Kosuke, Luke Keele and Teppei Yamamoto. 2010. "Identification, Inference and Sensitivity Analysis for Causal Mediation Effects." *Statistical Science* 25(1):51–71.
  URL: *https://www.jstor.org/stable/41058997*

Kalla, Joshua L. and David E. Broockman. 2020. "Reducing Exclusionary Attitudes through Interpersonal Conversation: Evidence from Three Field Experiments." *American Political Science Review* 114(2):410–425.

URL: *https://www.cambridge.org/core/journals/american-political-science-review/article/abs/reducing-exclusionary-attitudes-through-interpersonal-conversation-evidence-from-three-field-experiments/4AA5B97806A4CAFBAB0651F5DAD8F223*

Layous, Kristin, S Katherine Nelson, Jaime L Kurtz and Sonja Lyubomirsky. 2017. "What triggers prosocial effort? A positive feedback loop between positive activities, kindness, and well-being." *The Journal of Positive Psychology* 12(4):385–398.

Lo, Adeline, Jonathan Renshon and Lotem Nygate-Bassan. 2021. "A Practical Guide to Dealing with Attrition in Political Science Experiments." Working Paper.

Ma, Debbie S, Joshua Correll and Bernd Wittenbrink. 2015. "The Chicago face database: A free stimulus set of faces and norming data." *Behavior research methods* 47(4):1122–1135.

Morton, Jessica S, Moïra Mikolajczak and Olivier Luminet. 2020. "New perspectives on the praise literature: towards a conceptual model of compliment." *Current Psychology* pp. 1–13.

Oswald, Andrew J., Eugenio Proto and Daniel Sgroi. 2015. "Happiness and Productivity." *Journal of Labor Economics* 33(4):789–822.
URL: *https://www.journals.uchicago.edu/doi/10.1086/681096*

Sherman, Gary D, Jennifer S Lerner, Jonathan Renshon, Christine Ma-Kellams and Samantha Joel. 2015. "Perceiving others' feelings: the importance of personality and social structure." *Social Psychological and Personality Science* 6(5):559–569.

Shih, Margaret, Elsie Wang, Amy Trahan Bucher and Rebecca Stotzer. 2009. "Perspective taking: Reducing prejudice towards general outgroups and specific individuals." *Group Processes & Intergroup Relations* 12(5):565–577.

Simas, Elizabeth N, Scott Clifford and Justin H Kirkland. 2020. "How empathic concern fuels political polarization." *American Political Science Review* 114(1):258–269.

Simonovits, Gábor, Gabor Kezdi and Peter Kardos. 2018. "Seeing the world through the other's eye: An online intervention reducing ethnic prejudice." *The American Political Science Review* 112(1):186–193.

Storbeck, Justin, Jessica Dayboch and Jordan Wylie. 2019. "Fear and happiness, but not sadness, motivate attentional flexibility: A case for emotion influencing the ability to split foci of attention." *Emotion* 19(4):655–664.

Stürmer, Stefan, Mark Snyder, Alexandra Kropp and Birte Siem. 2006. "Empathy-motivated helping: The moderating role of group membership." *Personality and Social Psychology Bulletin* 32(7):943–956.

Subramaniam, Karuna and Sophia Vinogradov. 2013. "Improving the neural mechanisms of cognition through the pursuit of happiness." *Frontiers in Human Neuroscience* 7.
URL: *https://www.frontiersin.org/articles/10.3389/fnhum.2013.00452/full*

Tropp, Linda R. and Fiona Kate Barlow. 2018. "Making Advantaged Racial Groups Care About Inequality: Intergroup Contact as a Route to Psychological Investment." *Current Directions in Psychological Science* 27(3):194–199.
URL: *https://doi.org/10.1177/0963721417743282*

Waal, Frans B. M. de. 2012. "The Antiquity of Empathy." *Science* 336(6083):874–876.
URL: *https://science.sciencemag.org/content/336/6083/874*

Waytz, Adam, Ravi Iyer, Liane Young and Jesse Graham. 2016. "Ideological differences in the expanse of empathy." *Social psychology of political polarization* pp. 61–77.

Webster, J Matthew, Jamieson Duvall, Leslie M Gaines and Richard H Smith. 2003. "The roles of praise and social comparison information in the experience of pride." *The Journal of social psychology* 143(2):209–232.

Williams, Lisa A and David DeSteno. 2008. "Pride and perseverance: the motivational role of pride." *Journal of personality and social psychology* 94(6):1007–1017.

Zaki, Jamil, Niall Bolger and Kevin Ochsner. 2008. "It takes two: The interpersonal nature of empathic accuracy." *Psychological science* 19(4):399–404.

Appendix for "Praise from Peers Promotes Empathetic Behavior"

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Contents

A Summarizing information on studies

	Study goal	Respondents	Trials	Total obs.	Treatment arms
Study 1	Costliness of empathy	318	3	954	-
Study 2	Eliciting peer praise	115	-	115	-
Study 3	Peer praise on empathy	328	15	4920	Praise-Empathy (n=1559), Praise-Describe (n=1801), Control (n=1560)
Study 4	Happiness as mediator	363	1	363	Praise-Empathy (n=127), Praise-Describe (n=13), Control (n=83)
Study 5A	Mediation analysis	338	20	6760	Praise-Empathy (n=1559), Praise-Describe (n=1801), Control (n=1560)
Study 5B	Mediation analysis	624	3	1872	Praise-Empathy (n=866), Praise-Describe (n=141), Control (n=865)
Total	-	2086	-	14984	-

Table A.1: Summarizing information on studies.

General handling of attrition For all studies, we evaluated attrition and its possible effects on our results in the same manner. We present for each study an attrition evaluation plot, whereby the x-axis presents in order questions posed to the respondents in the survey experiment. The y-axis denotes the proportion of respondents who attrited (compared to the original starting sample). We indicate through colored vertical lines where Pre-Treatment, Treatment, Mediator (or Other), and Outcome variables are measured. When large proportions of attrition occur at specific moments of the survey, it can become quickly clear to the researcher if these are at key points of the study – such as if it was treatment-induced attrition, which would most directly and problematically affect estimation of average treatment effects. Throughout our studies we see very low attrition (an average of 5%) with no obvious correlations with introduction of treatment.

B Further details on Measurements

B.1 Treatments

Measurement of peer praise We elicit naturalistic peer praise in Study 2 (see details on the Study in Appendix Section E) in the following manner:

1. We ask respondents to provide feedback on two tasks a real adult has performed – the FEEL and DESCRIBE tasks and explained what each task entailed and an example drawn image of a person.

2. Respondents are asked to think of language that would admire or encourage the participant for choosing and doing the FEEL/DESCRIBE, especially positive things that can be said to people who choose to empathize/be objective to others in order to encourage them. Respondents then are asked for three words, then a full sentence. Finally respondents are asked to select how they feel about people who choose and engage in empathetic/objective behavior in a thermometer from 0-10 with zero as least warm and 10 as most warm.

3. To encourage respondents to think and write genuinely, we ask respondents in a series of follow up questions to tell us what the likelihood participants who are shown their

words will believe that they are genuine, and give respondents the opportunity to return and edit their responses if they desire.

We collected the words used by respondents to praise empathetic behavior and created a word cloud, with a short sentence above indicating the average feeling thermometer value for that behavior, calculated from Study 2 participants. This constitutes the main peer praise for empathy treatment, replicated here and found in the main text as well. We similarly create a peer praise for describe treatment for our robustness checks. Both are found in Figure B.1.

(a) Peer praise for empathy

(b) Peer praise for objectivity

Figure B.1: **Left panel (a) main peer praise for empathy treatment; right panel (b) peer praise for objectivity.**

B.2 Dependent variables

Measurement of main (choice) task Our main dependent variable is a forced-choice task selection between FEEL and DESCRIBE; for more detail please see Appendix Section C.1.

Measurement of reservation wage Our secondary dependent variable is an incentivized reservation wage elicitation for the FEEL task; for more detail please see Appendix Section C.1.

B.3 Mediators

Happy Study 5 immediately after the randomization of treatment, respondents were asked about their happiness *only* developed from an emotion scale by Harmon-Jones, Bastian and Harmon-Jones (2016). We specifically focus on the measurement of respondent emotion *in the moment*, so as to avoid conflating emotions across the experience of the overall survey with the emotions related to the treatment. Below is the phrasing of the

happiness measure:

```
This scale consists of a number of words that describe feelings
and emotions.  Read each item and then mark the appropriate answer
in the space next to the word.  Indicate to what extent you feel
this way RIGHT NOW.
```

scale: very slightly or not at all/ a little/ moderately/ quite a bit/ extremely

emotions: happy/enjoyment/liking

B.4   Attention checks

Given concerns of greater online fatigue and inattentiveness during the COVID-19 global pandemic (see Peyton, Huber & Coppock, Working paper 2020), we follow Peyton et al.'s work, and the work of others on the usage of attention checks in online surveys (see for example Berinsky et al. (2019)), and incorporate two pre-treatment attention check questions for Studies 4, 5A and 5B. The first attention check is styled in a multiple choice and the second via a grid question (see Figures B.2-B.3) to capture most attentive respondents as well as least Berinsky et al. (2019). The multiple choice (`attentionMC`) and screening questions in the grid (`attentionG`) are drawn directly from Berinsky et al. (2019), while the filler questions in the grid are designed to elicit non-politically oriented opinions from respondents so as to minimize possible priming effects downstream.

B.5   Respondent covariates

Each study asked a series of respondent-level covariates within the surveys; for ease we present information on the collection and timing of each of respondent covariates across studies in Table B.2.

C   Task descriptions

C.1   Main choice task

The main choice task that appears throughout Studies 1, 3, 4 and 5, entails a practice round, where respondents practice both FEEL and DESCRIBE activities. We describe the practice and main task below. For the practice, main task (and reservation wage task) images are drawn from the **Faces Data** in Chicago Faces and Harvard Faces Databases, randomized among the following features: Race=Black/White, Gender=Male (no variation), Valence=Angry/Fearful; images are randomized *without replacement* within respondent. See Figure C.8 for example draws of faces.

Practice Trial   All respondents complete a practice trial after pretreatment covariates are collected and before the main randomization (praise).

We are interested in what sections people like to read in the newspaper. This might affect what they learn from articles and how they feel about the issues discussed in them. We also want to see if people are reading the questions carefully. To show that you've read this much, please mark both the classified and none of the above options below. That's right, just select these two options only.

Regardless of how frequently you read the newspaper, what would you say are your favorite newspaper sections to read? (please check all that apply)

National

Local

Real estate

Comics

Classified

Style

Sports

Business

Science and technology

Opinion

None of the above

All of the above

Figure B.2: MC attention check

In the following, you will complete a task. You will first complete a practice trial, which will help you become familiar with the task. After the practice trial.
On the trial, you will see two decks of shuffled cards: the deck on the left will always be labeled DESCRIBE and the deck on the right will always be labeled FEEL. You should choose between these

In the grid below, you will see a series of statements. Please tell us whether you agree or disagree with each statement.

	Agree strongly	Agree	Neither agree nor disagree	Disagree	Disagree strongly
The best sport to watch live is baseball	○	○	○	○	○
Facebook is the best social media platform	○	○	○	○	○
Two is greater than one	○	○	○	○	○
Football is more interesting than basketball	○	○	○	○	○
Please click the "neither agree nor disagree" response	○	○	○	○	○
Twitter is more engaging than Instagram	○	○	○	○	○
Soccer is more fun to play than hockey	○	○	○	○	○

Figure B.3: Grid attention check

	Study 1	Study 2	Study 3	Study 4	Study 5 (A & B)
State of residence	Post DV	-	Post T/DV	Pre T	Pre T
Age	Post DV	Post DV	Post T/DV	Pre T	Pre T
Sex	Post DV	Post DV	Post T/DV	Pre T	Pre T
Education	Post DV	Post DV	Post T/DV	Pre T	Pre T
Race	Post DV	Post DV	Post T/DV	Post T/DV	Pre T
Income	Post DV	Post DV	Post T/DV	Post T/DV	Pre T
Religion	Post DV	Post DV	Post T/DV	Post T/DV	Pre T
Party	Post DV	Post DV	Post T/DV	Post T/DV	Pre T
Ideology	Post DV	Post DV	Post T/DV	Post T/DV	Post T/DV
Trump approval	Post DV	-	Post T/DV	Post T/DV	Post T/DV
Biden approval	-	-	-	-	Post T/DV
Baseline empathy	Post DV	-	Post T/DV	Post T/DV	Post T/DV

Table B.2: Measurement of respondent covariates across studies. T indicates when treatment (peer praise) was measured, DV indicates when dependent variables are measured. In Studies 1 and 2 no treatments were manipulated.

```
decks.  Once you choose a deck, you will then see an image of
a person.  The decks include the same images.  Depending on which
deck you have chosen, you will be given one of two possible sets
```

Figure C.4: Race=Black, Valence=Angry

Figure C.5: Race=Black, Valence=Fearful

Figure C.6: Race=White, Valence=Angry

Figure C.7: Race=White, Valence=Fearful

Figure C.8: **Example faces from Chicago Faces Database.**

of instructions.
If you choose from the deck labeled DESCRIBE, you will be told
to be objective and focus on the external features and appearances
of the person in the image. When completing this kind of trial,
try to be as objective as possible. To be objective, do not let
yourself get caught up in imagining what this person feels. On
these trials, describe the **age, gender** and **race** of the person.
If you choose from the deck labeled FEEL, you will be told to
have empathy and focus on the internal feelings and experiences
of the person in the image. When completing this kind of trial,
try to feel as much empathy as possible. To be empathetic, let
yourself get caught up in imagining what this person feels. On
these trials, describe the **feelings** and **experiences** of the person.
You are free to choose from either deck on any trial, and should
feel free to move from one deck to the other whenever you choose.
If one deck begins to seem preferable, feel free to choose that
deck more often. Overall, this task will take the same amount
of time regardless of which deck you choose.
   Now you will complete a practice trial of the task; later on,
you will turn over to the task.
Please click on one of the decks.
         [Depending on what respondent clicks first, rotate questions below]
                  [Deck chosen is highlighted; image is presented.]
     FEEL

   1. Please write a sentence describing the **feelings** and **experiences**

of this person. [Open-ended sentence. Cannot proceed without writing, min time 10 seconds.]

2. Please write three words that describe the **feelings** and **experiences** of this person. [Three open-ended slots. Cannot proceed without writing in all slots, min time 10 seconds.]

3. How do you feel about this person? [Feeling thermometer]

    Please click on the other deck. [Forced choice]
        [Other deck is highlighted; image is presented]

DESCRIBE

1. Please write a sentence describing the **age** , **gender** and **race** of this person. [Open-ended sentence. Cannot proceed without writing, min time 10 seconds.]

2. Please write three words that describe the **age** , **gender** and **race** of this person. [Three open-ended slots. Cannot proceed without writing in all slots, min time 10 seconds.]

3. How do you feel about this person? [Feeling thermometer]

Main task   After the practice round, respondents enter into the main task (with or without treatment praise, depending on the Study).

   In the following trial, you will repeat the task you did in the practice round, where you will be asked to choose the deck you prefer each time, presented with a person in an image, and then asked to answer questions related to the deck you chose. **Recall:** You are free to choose from either deck.

1. [Present two labeled decks; do not allow any clicking until after the treatment is drawn.]

2. Then print on the page: Please click on one of the decks.

3. [Deck chosen is highlighted; image is presented.]

4. [Provide trial questions based on whichever deck is selected by the respondent.]

C.2   Reservation wage task description

In the next task, you will be making choices between real amounts of money. You will see several choices to make between the two decks of cards, exactly like the tasks you completed earlier.

For each choice between the decks, the DESCRIBE deck asks you
to be objective and write about the age and race of a person,
and the FEEL deck asks you to be empathetic and write about the
internal experiences and feelings of a person. In all cases,
the persons shown faces similar to those you saw earlier in the
experiment. This time, you will see a real payment for completing
a trial from each deck, for each choice. Please select the option
that you prefer for each of the choices. There are no accurate
or inaccurate answers. A random draw from one of the sets of
choices will be enacted, and you will be directed to the deck
you chose under that choice set, and paid the amount for that
choice. These choices are thus **real decisions with real pay**.

[Present list of paired options of decks for respondent to click on.]

Wages for DESCRIBE are always $1.00; wages for FEEL range from $0.99 to $1.13 in
1 cent increments. Each time an option for a pair is clicked on, the respondent will see the
sentence below the pair "I would prefer to conduct task DESCRIBE/FEEL for Y amount,
over task FEEL/DESCRIBE for Z amount.'

Recall your preferred choices for wages for DESCRIBE and FEEL.

[Randomly assign one of the paired options in the **Real Wage Task** to execute. Highlight the selected row.]

A random draw of the paired choices you have made has been
selected: you will now conduct task X for Y amount. Your Y pay
will be added to your survey pay at the end of this survey.

D   Study 1: Costs of Empathy

Study 1 was fielded in September 2020, with a total of 318 respondents. The purpose of the study was to establish the baseline costliness of empathy. Figure D.9 presents the consort diagram for Study 1. Descriptive statistics on respondent covariates are presented in Table D.3. Respondents were also asked about their beliefs on how often other respondents on the platform chose the FEEL andDESCRIBE tasks, and what they thout others' beliefs about empathy and objectivity were (see Table D.4). Other than measuring respondents' behavioral choices to establish baseline costs of empathy, we also directly asked respondents to rate the FEEL andDESCRIBE tasks for difficulty using the NASA task load; summary statistics for answers to these questions are presented in Table D.5 and differences between the answers by task type are in Table D.6.
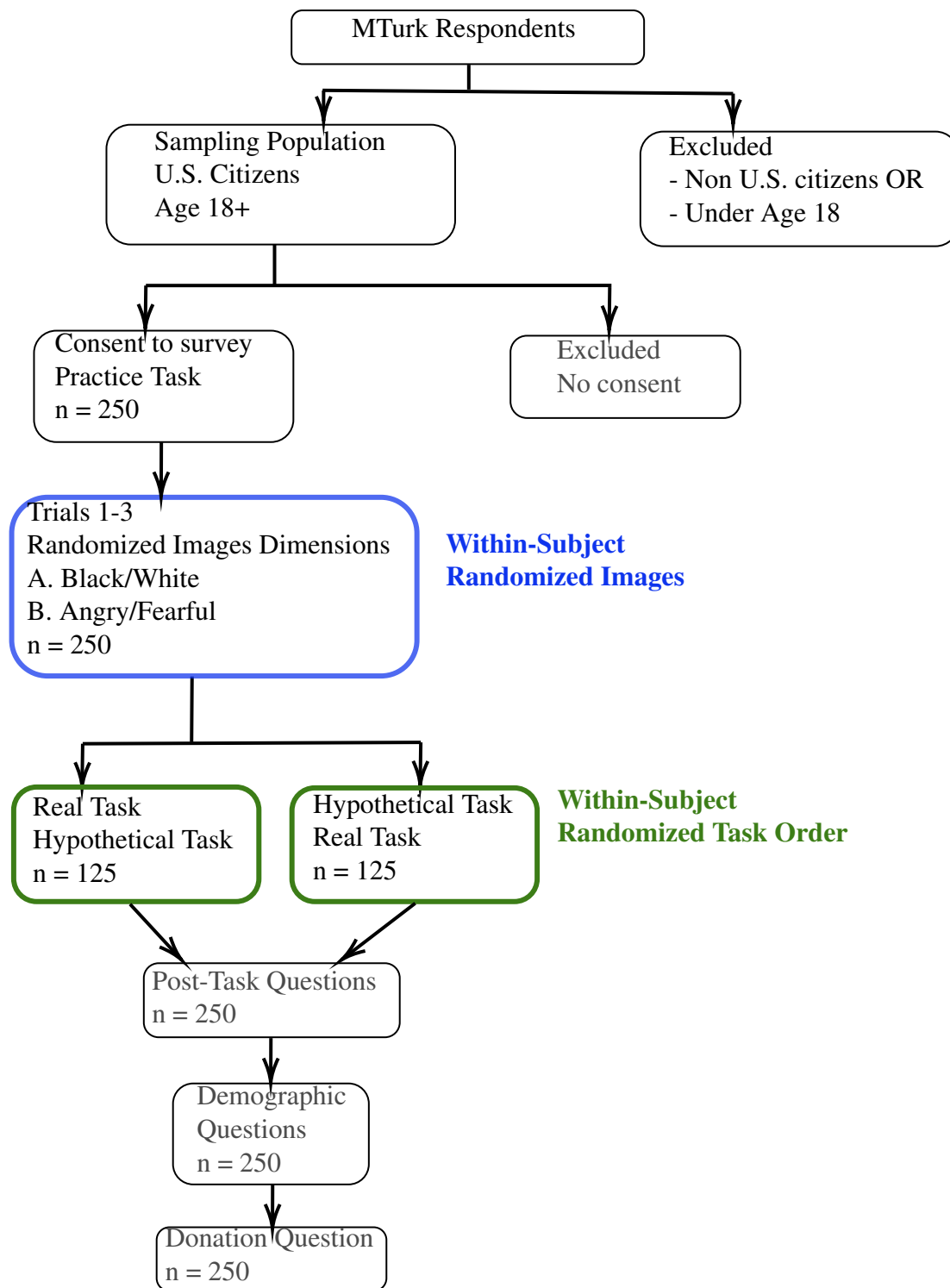
Figure D.9: **Study 1: Consort Diagram**

	Level	N	%
Sex	Female	97	30.5
	Male	155	48.7
	Missing	66	20.8
Race	White	195	61.3
	Asian	1	0.3
	Black or African American	33	10.4
	Native Hawaiian or Pacific Islander	13	4.1
	Other	7	2.2
	Missing	69	21.7
Education	Associate degree	17	5.3
	Bachelor's degree (BA/BS)	149	46.9
	High school or equivalent (GED)	14	4.4
	Kindergarten to 8th grade	1	0.3
	Master's degree (MA/MS/MBA)	43	13.5
	Medical (MD), law (JD) or other doctoral degree (PhD)	2	0.6
	No schooling completed	1	0.3
	Some college, but did not complete a degree	25	7.9
	Missing	66	20.8
Income	100k or more	14	4.4
	25k to less than 50k	91	28.6
	50k to less than 75k	91	28.6
	75k to less than 100k	29	9.1
	Less than 25k	27	8.5
	Missing	66	20.8
Religion	Atheist/agnostic	45	14.2
	Buddhist	9	2.8
	Hindu	4	1.3
	Jewish	6	1.9
	Muslim	7	2.2
	Nothing in particular	24	7.5
	Orthodox (Greek or Russian)	1	0.3
	Protestant	53	16.7
	Roman Catholic	103	32.4
	Missing	66	20.8
Party	Democrat	62	19.5
	Independent	33	10.4
	Lean Democrat	21	6.6
	Lean Republican	13	4.1
	Republican	63	19.8
	Strong Democrat	34	10.7
	Strong Republican	26	8.2
	Missing	66	20.8
Ideology	Conservative	34	10.7
	Liberal	75	23.6
	Moderate	37	11.6
	Slightly conservative	24	7.5
	Slightly liberal	23	7.2
	Very conservative	25	7.9
	Very liberal	34	10.7
	Missing	66	20.8
Age	+70	2	0.6
	20-30	98	30.8
	31-40	93	29.2
	41-50	20	6.3
	51-60	27	8.5
	61-70	10	3.1

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Belief people choose Feel task	252	57.421	23.959	3.000	39.750	79.000	100.000
Belief people choose Describe task	250	67.320	17.788	2.000	56.250	80.750	100.000
Belief people think empathy is good	250	72.396	18.783	1.000	58.500	86.000	100.000
Belief people think objectivity is good	250	72.128	16.948	1.000	63.000	85.000	100.000

Table D.4: Descriptive Statistics - Empathy norms

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Describe task mentally demanding	252	2.702	1.232	1.000	2.000	4.000	5.000
Feel task mentally demanding	252	2.937	1.043	1.000	2.000	4.000	5.000
Describe task hard to accomplish	252	2.385	1.037	1.000	2.000	3.000	5.000
Feel task hard to accomplish	252	2.762	1.085	1.000	2.000	3.000	5.000
Describe task raised insecurity	252	2.095	1.177	1.000	1.000	3.000	5.000
Feel task raised insecurity	252	2.329	1.170	1.000	1.000	3.000	5.000
Describe task done successfuly	252	3.762	1.005	1.000	3.000	4.000	5.000
Feel task done successfuly	252	3.575	1.048	1.000	3.000	4.000	5.000

Table D.5: Descriptive Statistics - NASA task load

Task	Demanding	Hard	Insecure	Successful
Objective (DESCRIBE)	2.702	2.385	2.095	3.762
Empathy (FEEL)	2.937	2.762	2.329	3.575
Difference	0.234 (p=0.0217)	0.377 (p=1e-04)	0.234 (p=0.0256)	-0.187 (p=0.042)

Table D.6: Task load summary. Mean values reported (choices from 1-5).
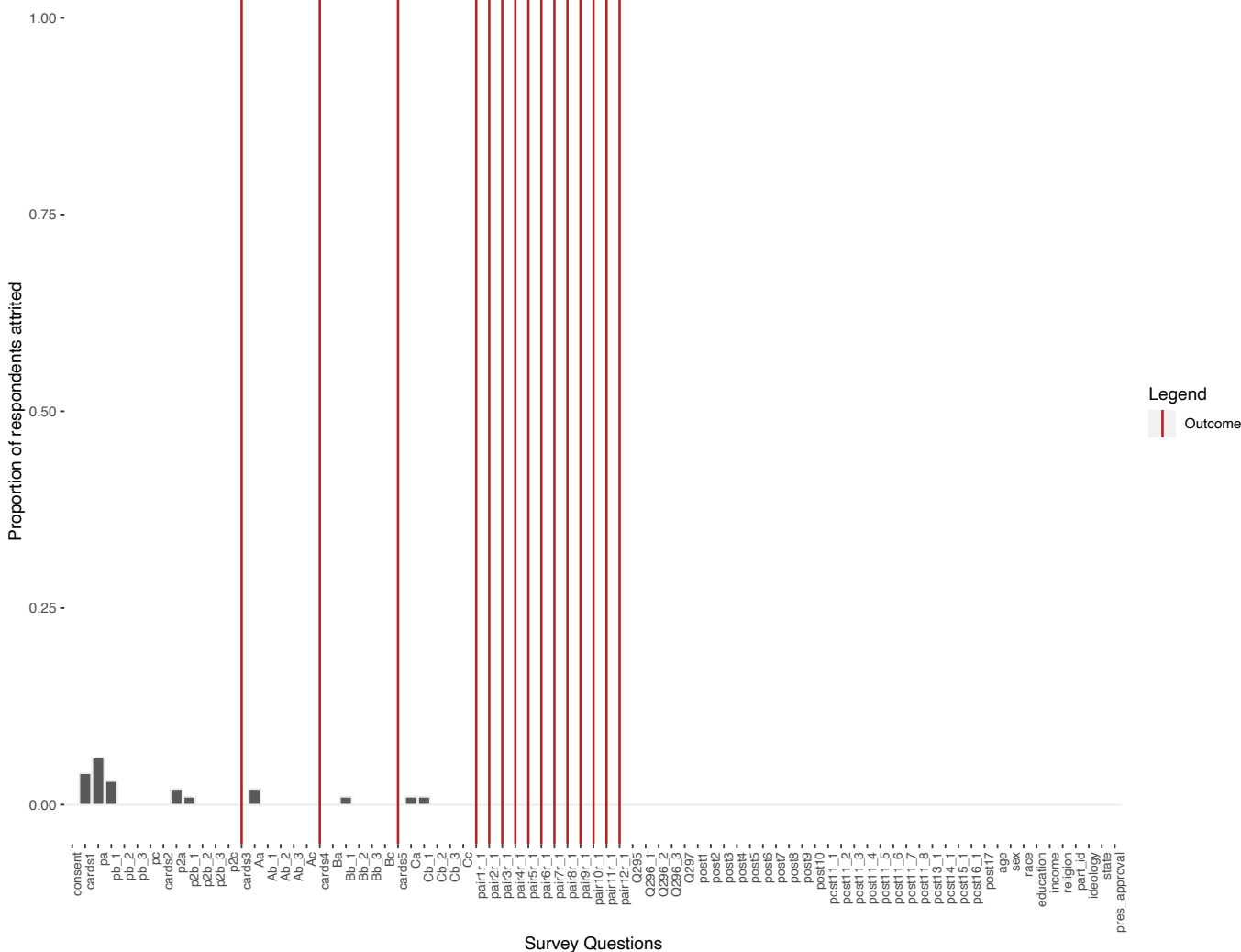
Figure D.10: **Attrition across survey questions.**

Study 1 Attrition

E Study 2: Eliciting Naturalistic Praise (non-experimental)

Study 2 was fielded in September 2020 with a total of 115 respondents. The purpose of the study was to elicit naturalistic peer praise for the empathy and objective tasks. The consort diagram for Study 2 is presented in Figure E.11. Table E.7 presents respondent covariate descriptives from the study. No attrition occurred in the study. Respondents were asked to write sentences and words that would praise peers who engaged in empathetic/objective behavior due to doing the FEEL and DESCRIBE tasks. Figure **??** presents a plot of the words that occur differentially across the words elicited for praising FEEL and DE-SCRIBE.
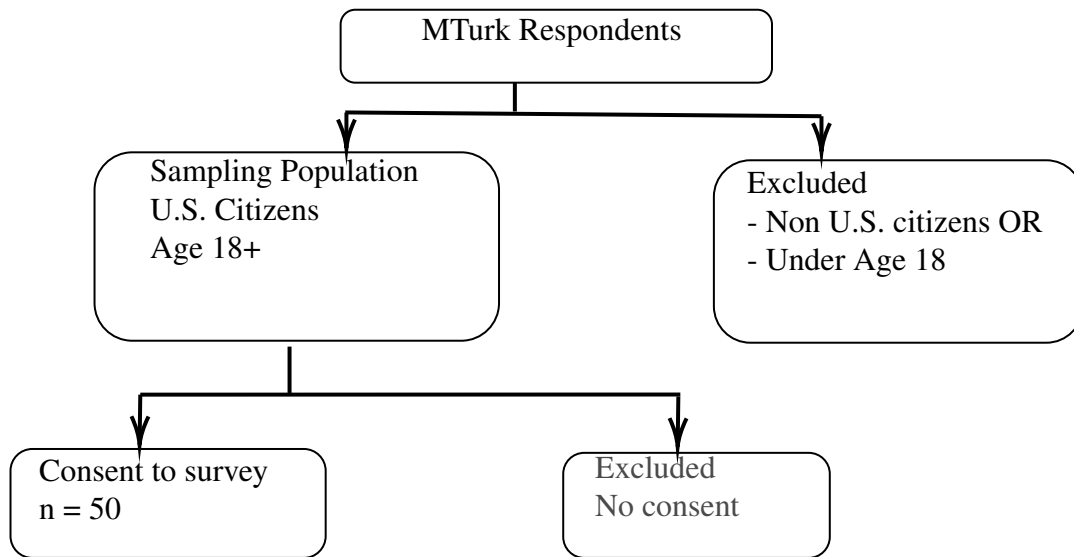
Figure E.11: Study 2: Consort Diagram

	Level	N	%
Sex	Female	39	33.9
	Male	76	66.1
Race	Asian	2	1.7
	Black or African American	15	13.0
	Native Hawaiian or Pacific Islander	9	7.8
	Other	8	7.0
	White	81	70.4
Education	Associate degree	11	9.6
	Bachelor's degree (BA/BS)	53	46.1
	High school or equivalent (GED)	9	7.8
	Master's degree (MA/MS/MBA)	22	19.1
	Medical (MD), law (JD) or other doctoral degree (PhD)	2	1.7
	Some college, but did not complete a degree	18	15.7
Income	100k or more	9	7.8
	25k to less than 50k	32	27.8
	50k to less than 75k	39	33.9
	75k to less than 100k	18	15.7
	Less than 25k	17	14.8
Religion	Atheist/agnostic	37	32.2
	Buddhist	1	0.9
	Jewish	1	0.9
	Mormon	1	0.9
	Nothing in particular	17	14.8
	Orthodox (Greek or Russian)	1	0.9
	Protestant	22	19.1
	Roman Catholic	35	30.4
Party	Democrat	38	33.0
	Independent	17	14.8
	Lean Democrat	9	7.8
	Lean Republican	7	6.1
	Republican	23	20.0
	Strong Democrat	11	9.6
	Strong Republican	10	8.7
Ideology	Conservative	19	16.5
	Liberal	36	31.3
	Moderate	20	17.4
	Slightly conservative	8	7.0
	Slightly liberal	9	7.8
	Very conservative	8	7.0
	Very liberal	15	13.0
Age	+70	1	0.9
	20-30	51	44.3
	31-40	41	35.7
	41-50	9	7.8
	51-60	9	7.8
	61-70	3	2.6
	Missing	1	0.9

Table E.7: **Study 2 Respondents**. Total number of respondents 115.
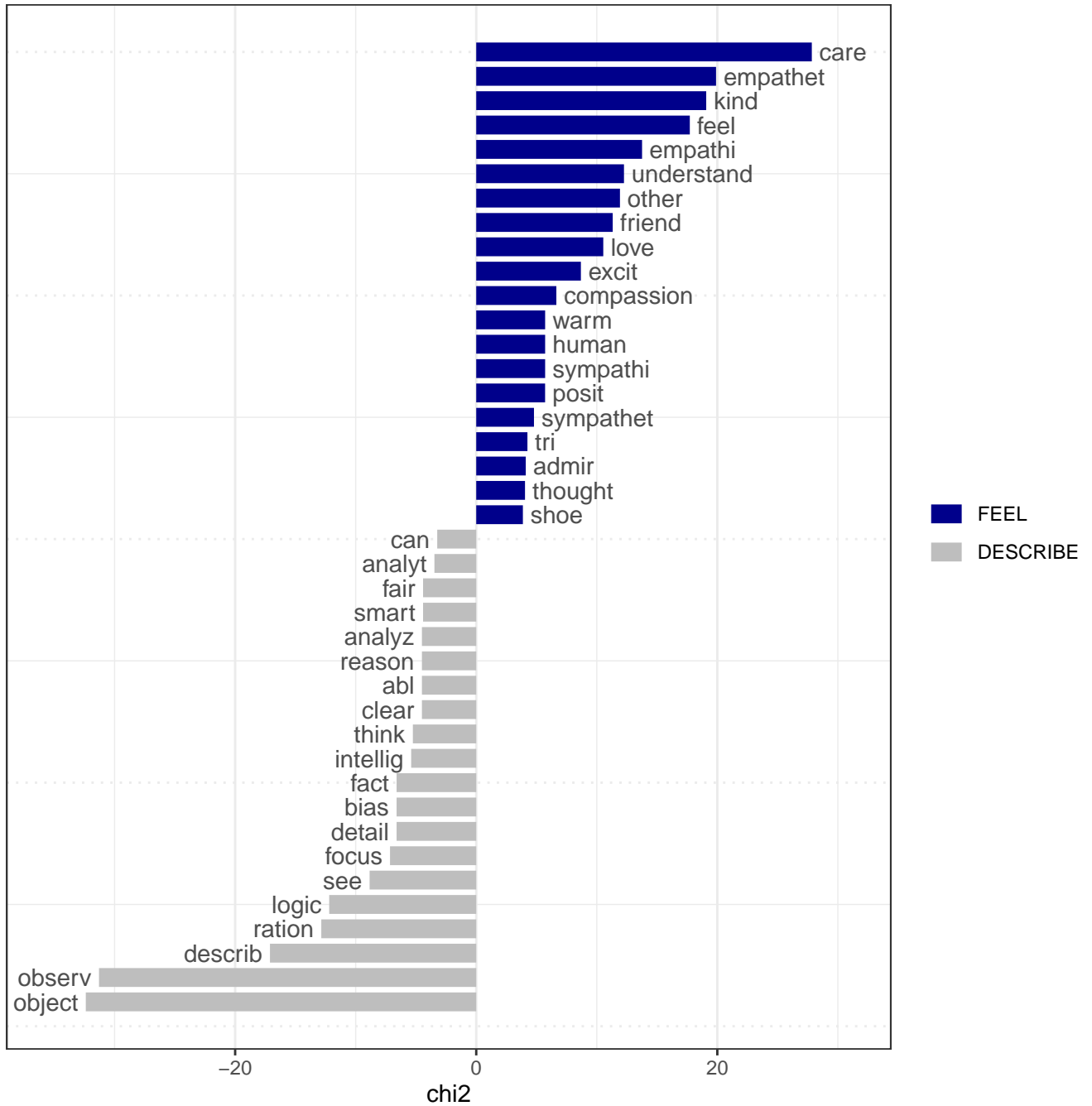
Figure E.12: **Keyness plot of words for empathy (FEEL) versus objective (DESCRIBE) tasks.** Figure plots the results of a keyword of features comparing their differential associations with providing language in praise of peers who engage in empathy (FEEL) versus objective (DESCRIBE) tasks, after calculating "keyness", a score for features that occur differentially across different categories. Here text for (FEEL) and (DESCRIBE) are the different categories.

As a further check on whether positive feelings are held towards people who exhibit empathetic or observational behaviors, we asked respondents to provide thermometer ratings towards people who exhibited these types of behaviors. We calculate the positive and negative sentiments for praise texts respondents generated for people who display empathetic

and objective behaviors respectively, using the Lexicoder Sentiment Dictionary and verify whether the thermometer ratings are positively correlated with positive text sentiments and negatively correlated with negative text sentiments. Figures E.13 and E.14 present linear association results that suggest the same.
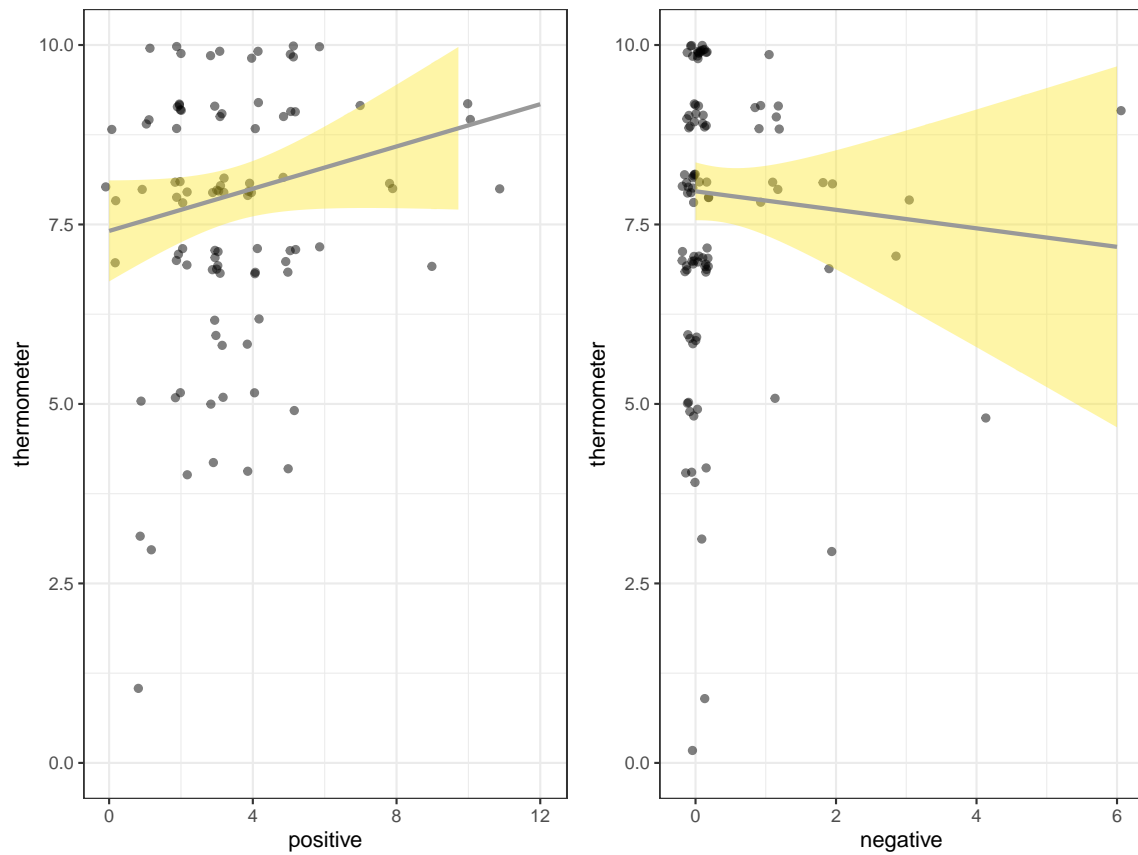
Figure E.13: Correlation between positive and negative text sentiments for generated texts of praise for empathetic behavior with thermometer ratings for people who engage in empathetic behavior.
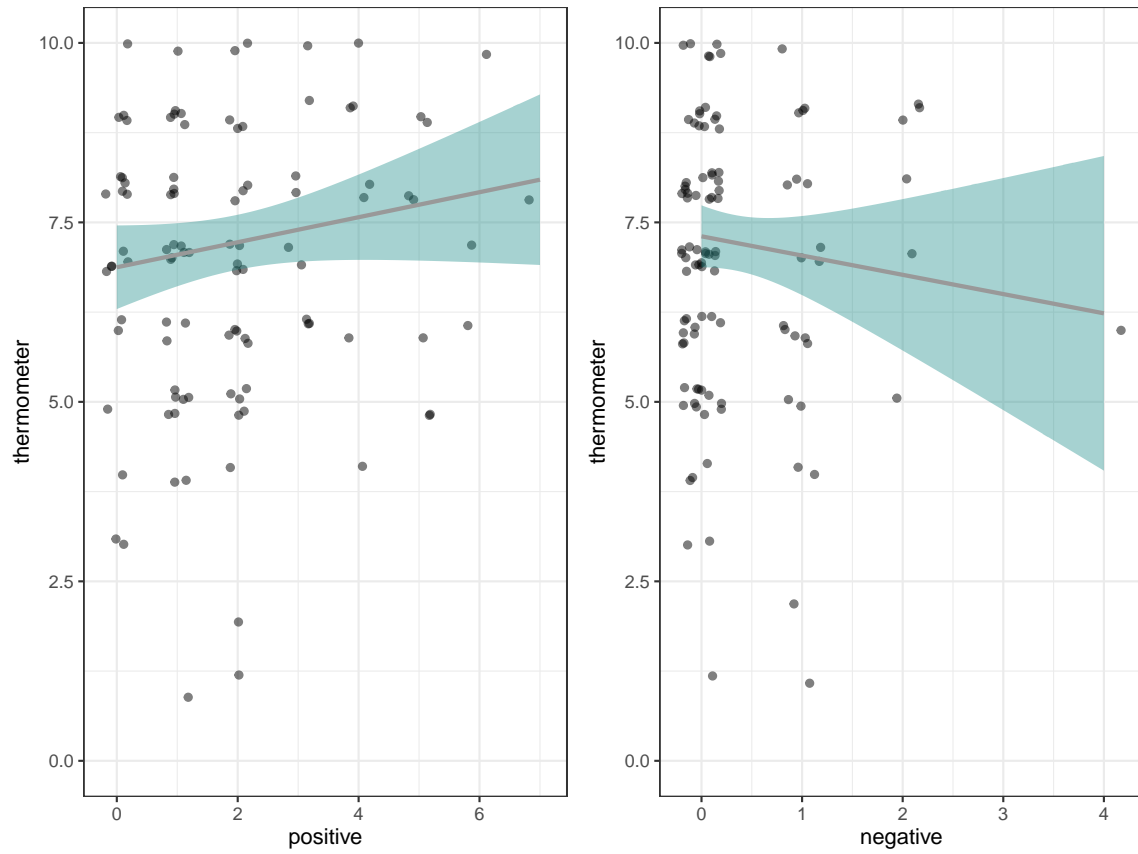
Figure E.14: Correlation between positive and negative text sentiments for generated texts of praise for objective behavior with thermometer ratings for people who engage in objective behavior.
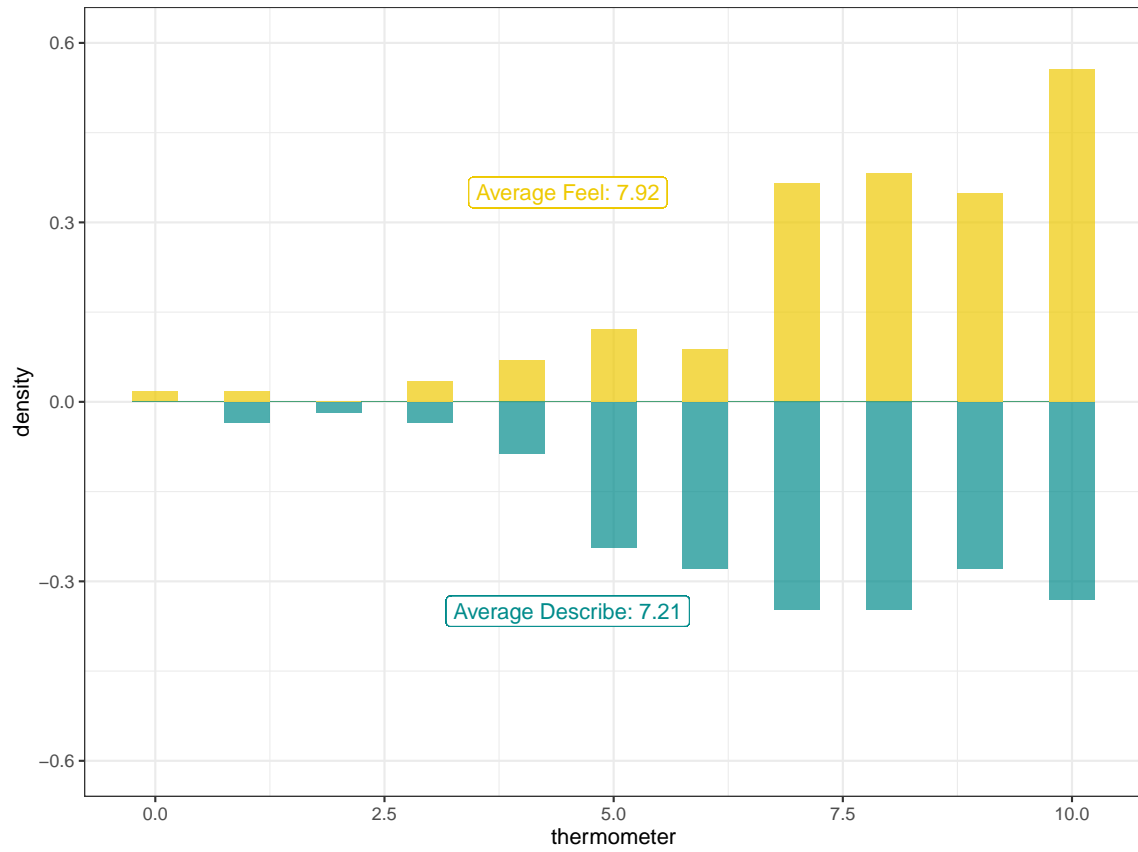
Figure E.15: Distributions of thermometer ratings towards peers who exhibit empathetic behavior (top) and towards peers who exhibit objective behavior (bottom).

Study 2 Attrition

F   Study 3: Praise Lowers the Cost of Empathy

Study 3 was fielded in November 2020 with 328 respondents. The primary purpose of the study was to establish whether peer praise (for empathy) could encourage empathetic behavior. We randomized peer praise for empathetic behavior, peer praise for objective behavior (taken from Study 2) and a control arm of no intervention and measured respondents' choice of task between FEEL and DESCRIBE. Secondarily, we were interested in evaluating whether peer praise might change reservation wages for the FEEL task. Figure F.16 depicts the consort diagram for Study 3.
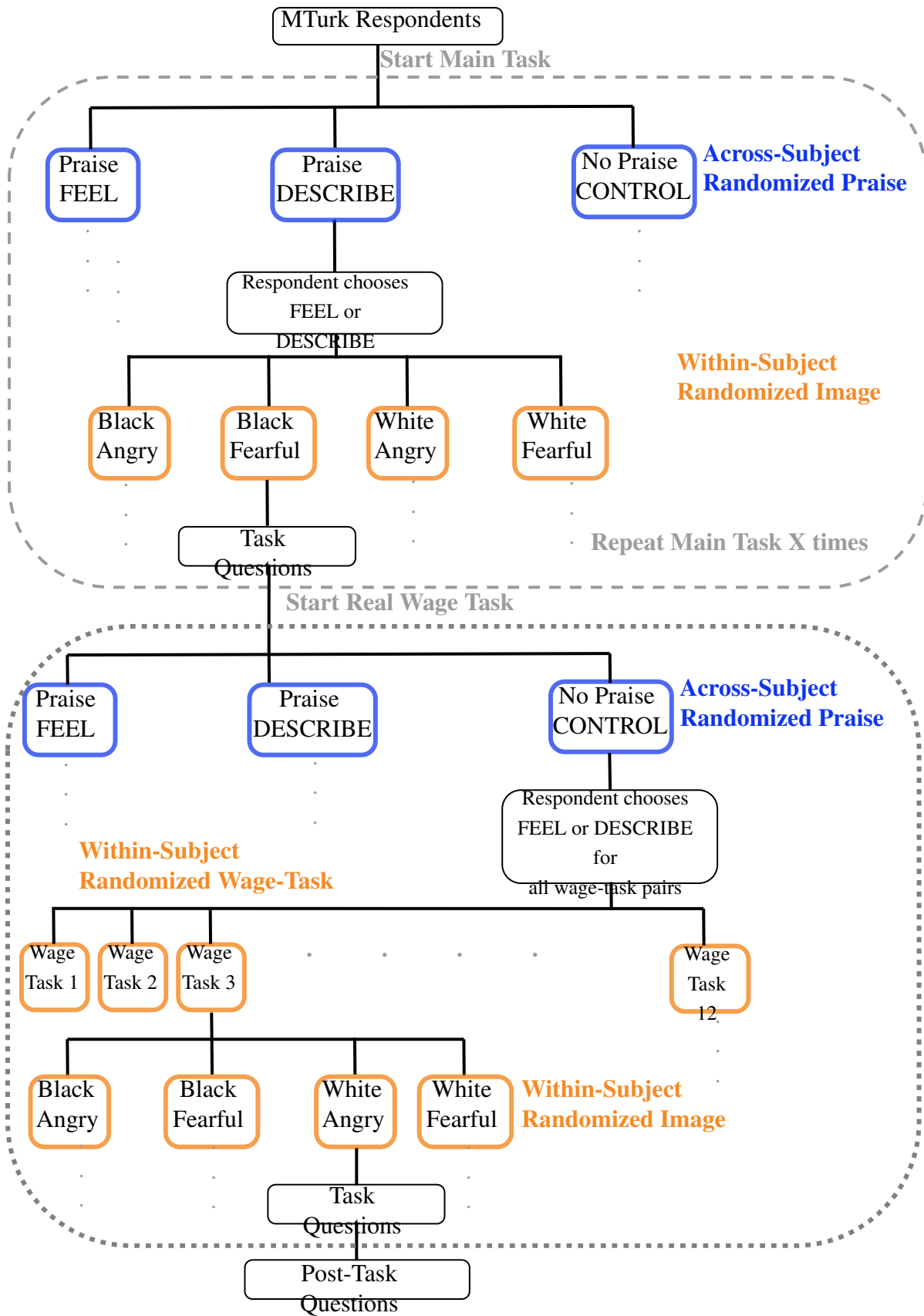
Figure F.16: **Study 3 Consort Diagram**

	Log Odds	95% CI	Odds Ratio	95% CI
Intercept	-0.442	[-0.625,-0.259]	0.643	[0.535,0.772]
Peer praise for empathy	0.182	[0.025,0.339]	1.200	[1.025,1.404]

Table F.8: Peer praise effect on task choice.
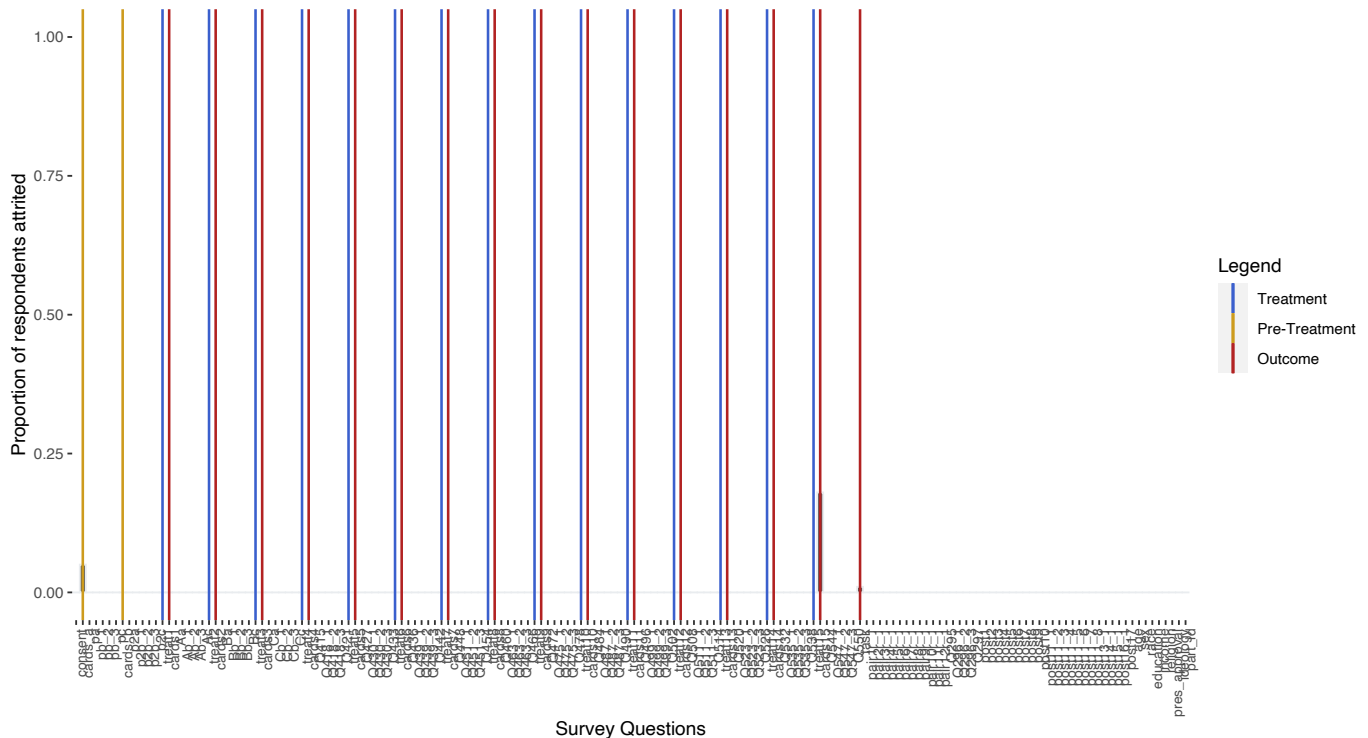
Figure F.17: **Attrition across survey questions:**

Study 3 Attrition A total of 75 attrited from the survey. Of those, 18.7% attrited during the first set of instructions, 34.7% attrited during the practice round, and 21.3% attrited during the post task questions. Attrition is not associated with praise treatment, or randomization of images. Respondents who were primed with praise FEEL, were 0.5% less likely to attrite (baseline is 0.01) than compared to respondents who received the Control (no praise). This finding is not statistically significant ($p = 0.1$). Respondents who saw an image with a black person, were 1.8% less likely to attrite (baseline is 0.55) than compared to respondents who received an image with a white person. This finding is not statistically significant ($p = 0.4$). Respondents who saw an image with an angry person, were 0.4% less likely to attrite (baseline is 0.517) than compared to respondents who received an image with a fearful person. This finding is not statistically significant ($p = 0.8$).
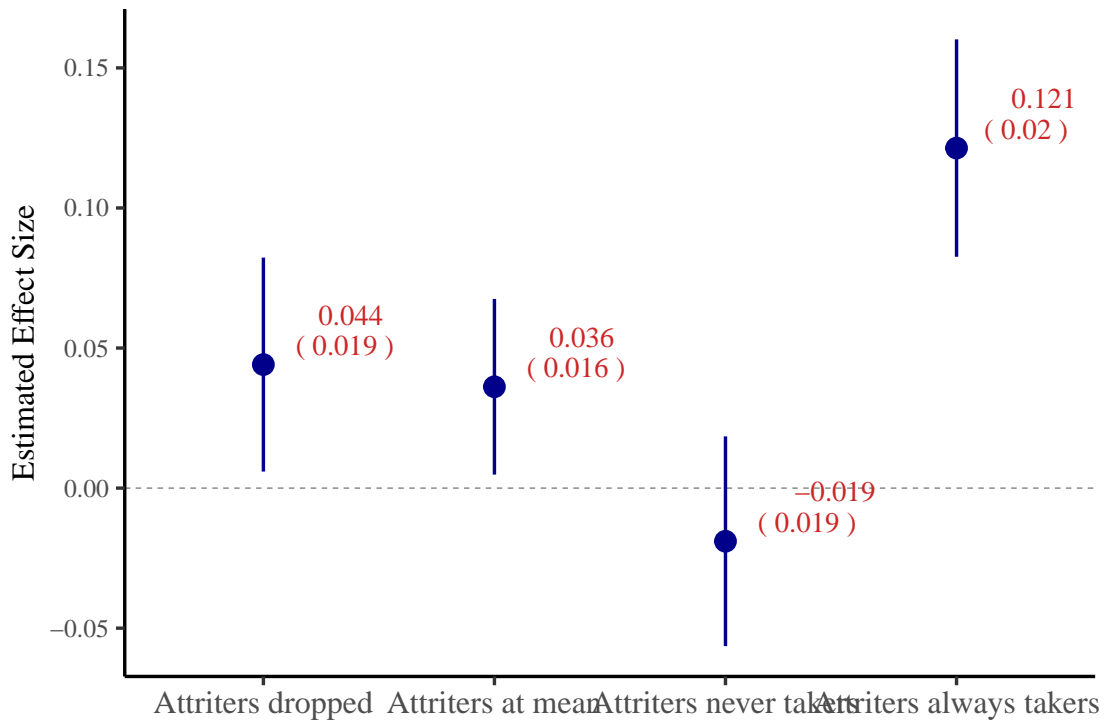
Figure F.18: **Missingness Imputed:** In all models, 'describeORfeel' is regressed over 'PraiseEmpathy', estimating the effect of praise FEEL on selecting to perform task FEEL. Attriters dropped is the main model presented in the paper, in which attriters are dropped from the analysis. Attriters at mean is coded such that attriters receive the mean value for 'describeORfeel'. Attriters never takers is coded such that attriters never take the praise treatment. Thus, 'describeORfeel' receives the value 0 (DESCRIBE) when attrited respondents are treated with praise FEEL. Otherwise, attrited respondents receive a value selected from a distribution around the mean of controlled respondents.Attriters always takers is coded such that attriters always take the praise treatment. Thus, 'describeORfeel' receives the value 1 (FEEL) when attrited respondents are treated with praise FEEL. Otherwise, attrited respondents receive a value selected from a distribution around the mean of controlled respondents.

We comparing peer praise for objective behavior vs peer praise for empathetic behavior on the willingness for respondents to choose the FEEL task in Figure **??**; in Figure **??** we check if peer praise for empathetic behavior can reduce the reservation wage for the FEEL task.
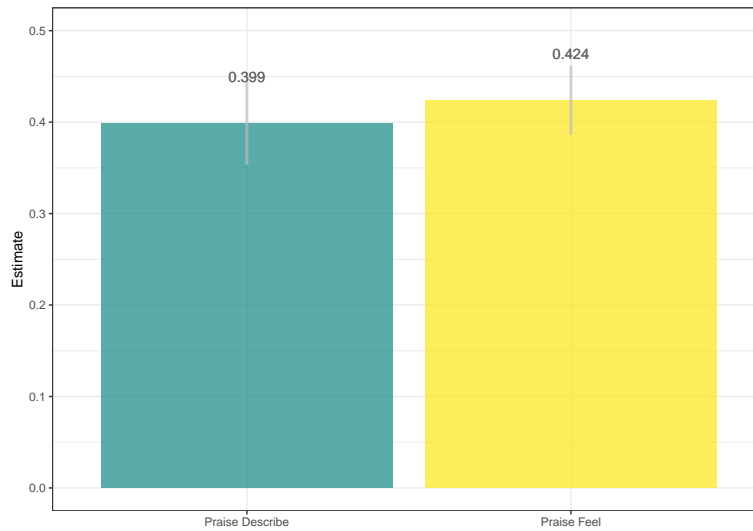
Figure F.19: **Effects of Praise for objective behavior on choosing FEEL over DE-SCRIBE task compared with the Praise for empathetic behavior.** Standard errors clustered at the respondent level. Difference in means is 0.026 with standard error 0.019.
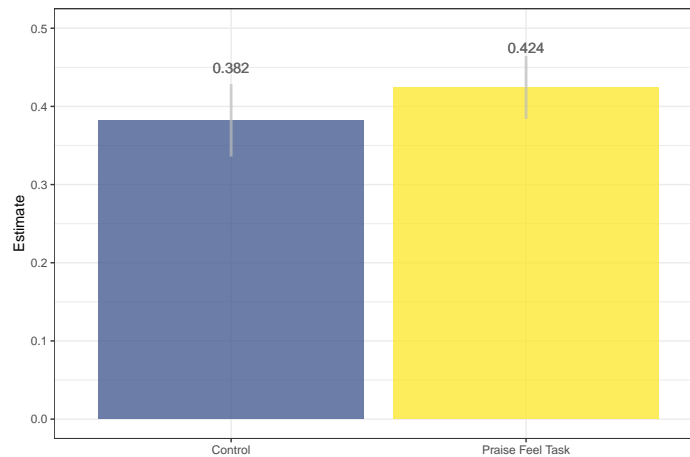
Figure F.20: **Effects of Praise for empathetic behavior on the reservation wage for the FEEL task compared with Control arm.** Difference in means is -0.03 with standard error 0.027.

G   Study 4: Peer praise increases reported happiness
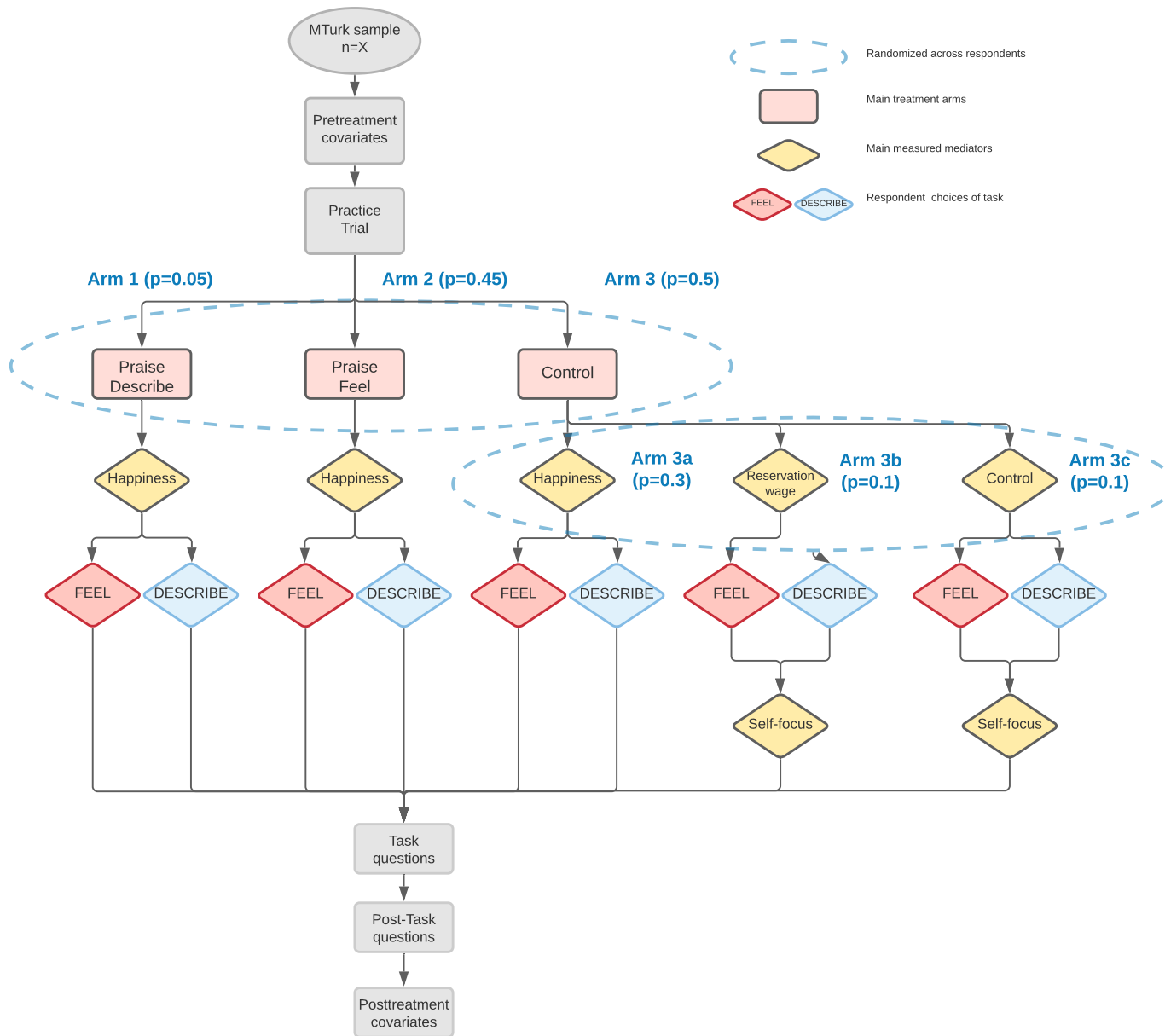
Figure G.21: **Study 4 Consort diagram**. Main arms labeled with probability of assignment in parentheses (probability out of total assignment).
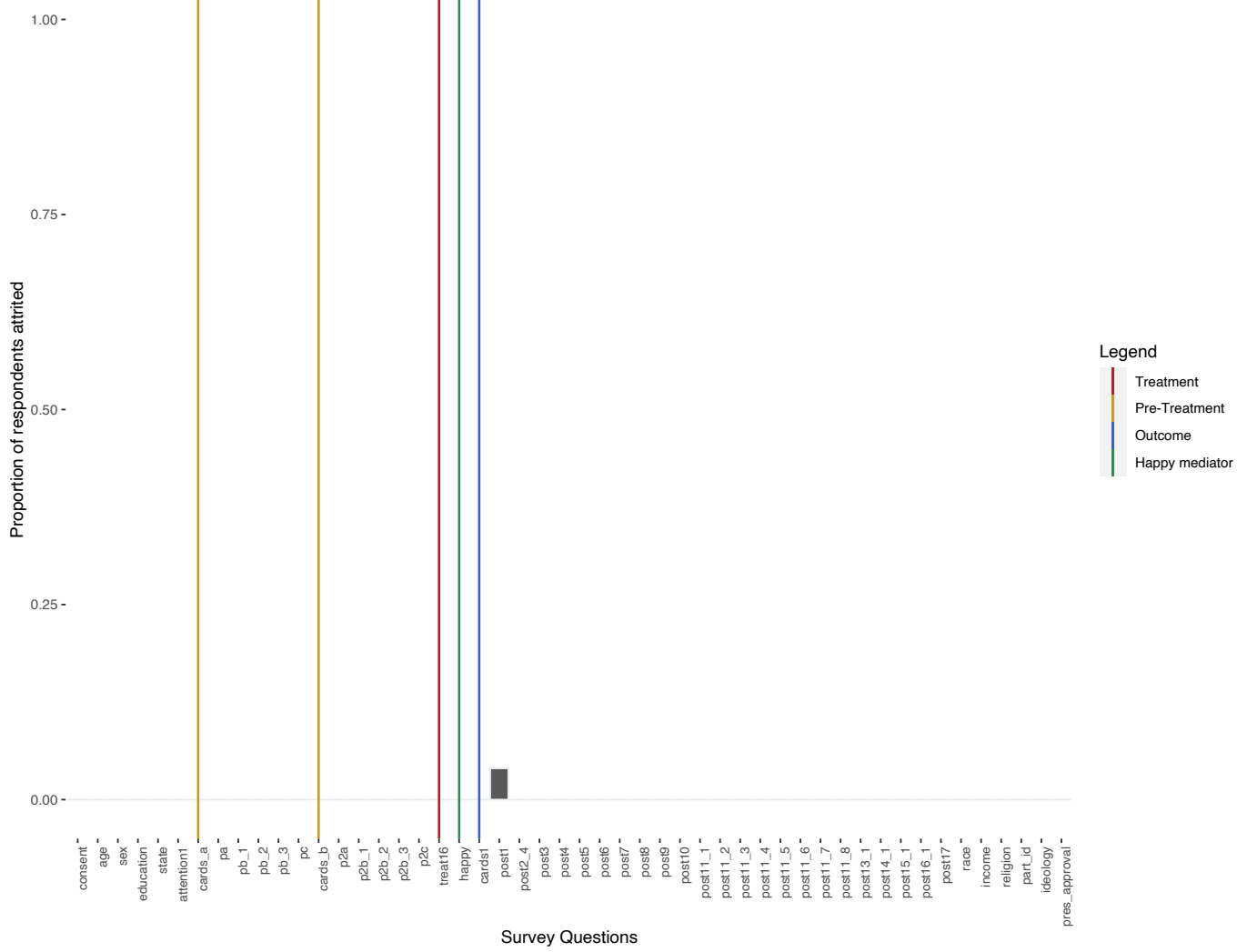
Figure G.22: **Attrition across survey questions.**

Pride distribution by treatment arm

Difference in means: 0.487 (p=0.002)
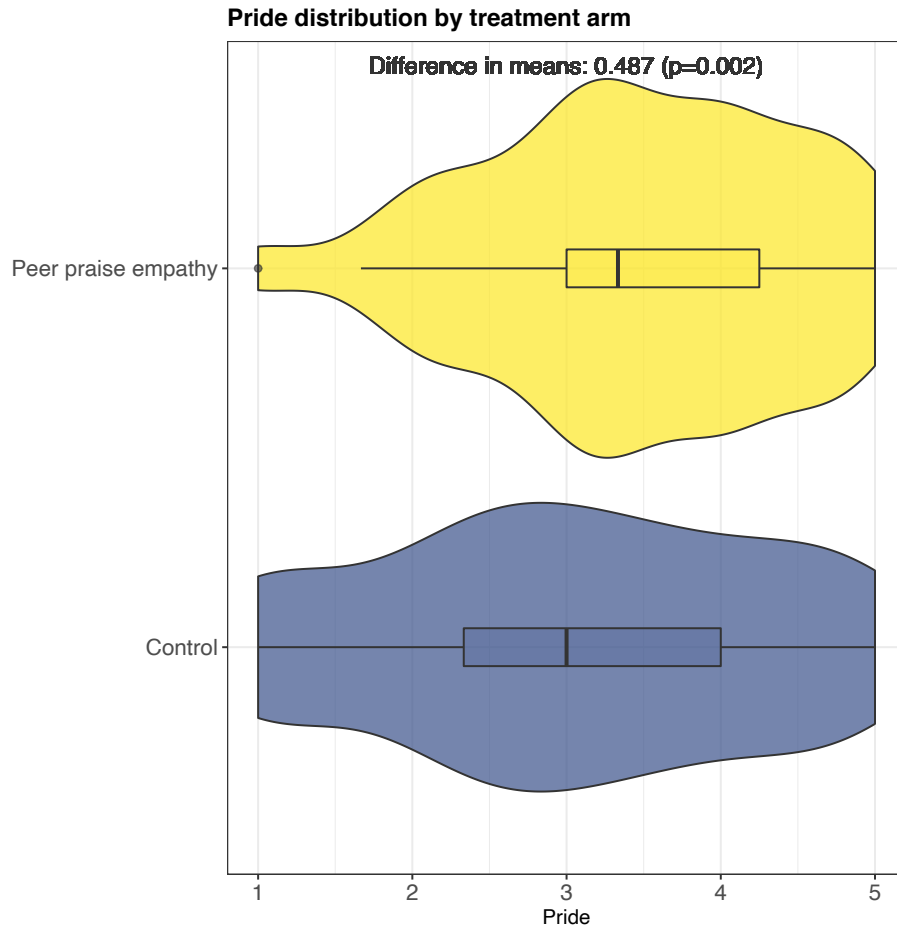
Figure G.23: Pride of respondents in peer praise (for empathy) and control groups.

Study 4 Attrition

H Study 5: Peer praise increases likelihood of empathy task through increased happiness
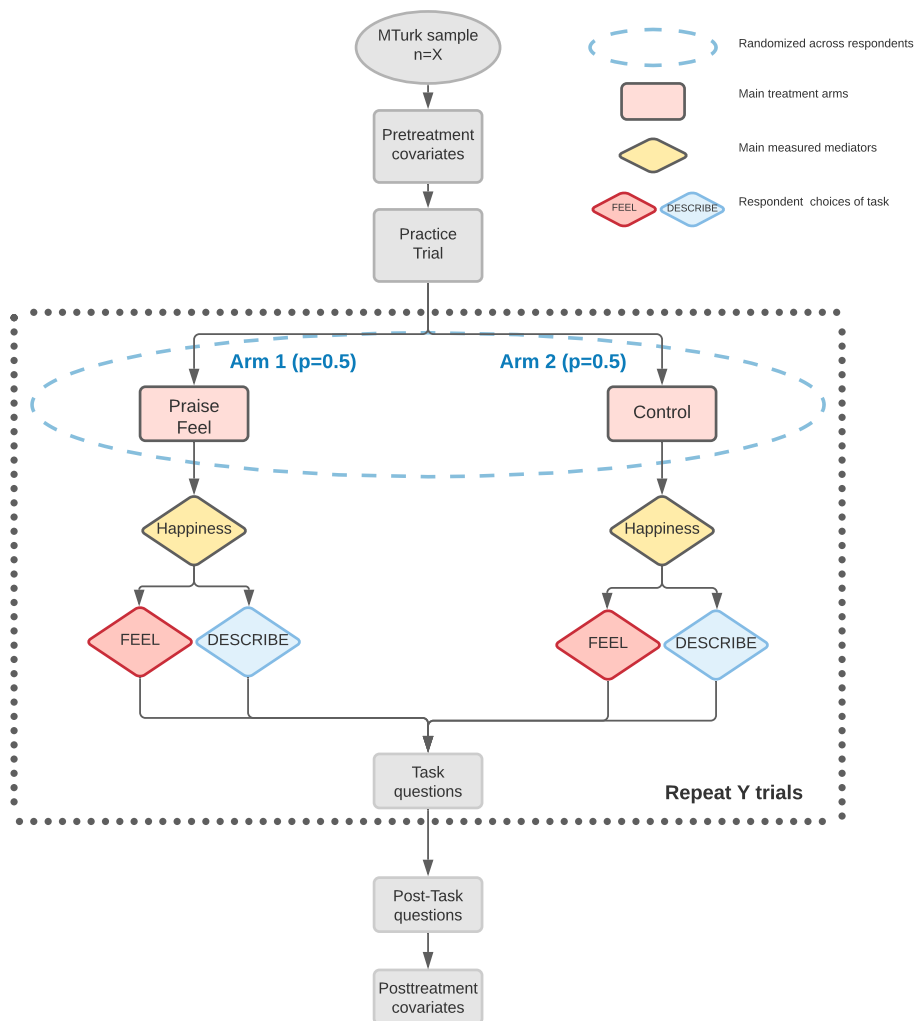
Figure H.24: **Study 5 Consort diagram**. Main arms labeled with probability of assignment in parentheses (probability out of total assignment). Dotted gray space encapsulates the main task, which is repeated for Y trials for each respondent, where for Study 5A Y is 20, while for Study 5B Y is 3.

Study 5 Attrition Attrition evaluation plots for 5A and 5B are presented in Figures H.25 and H.26 respectively.
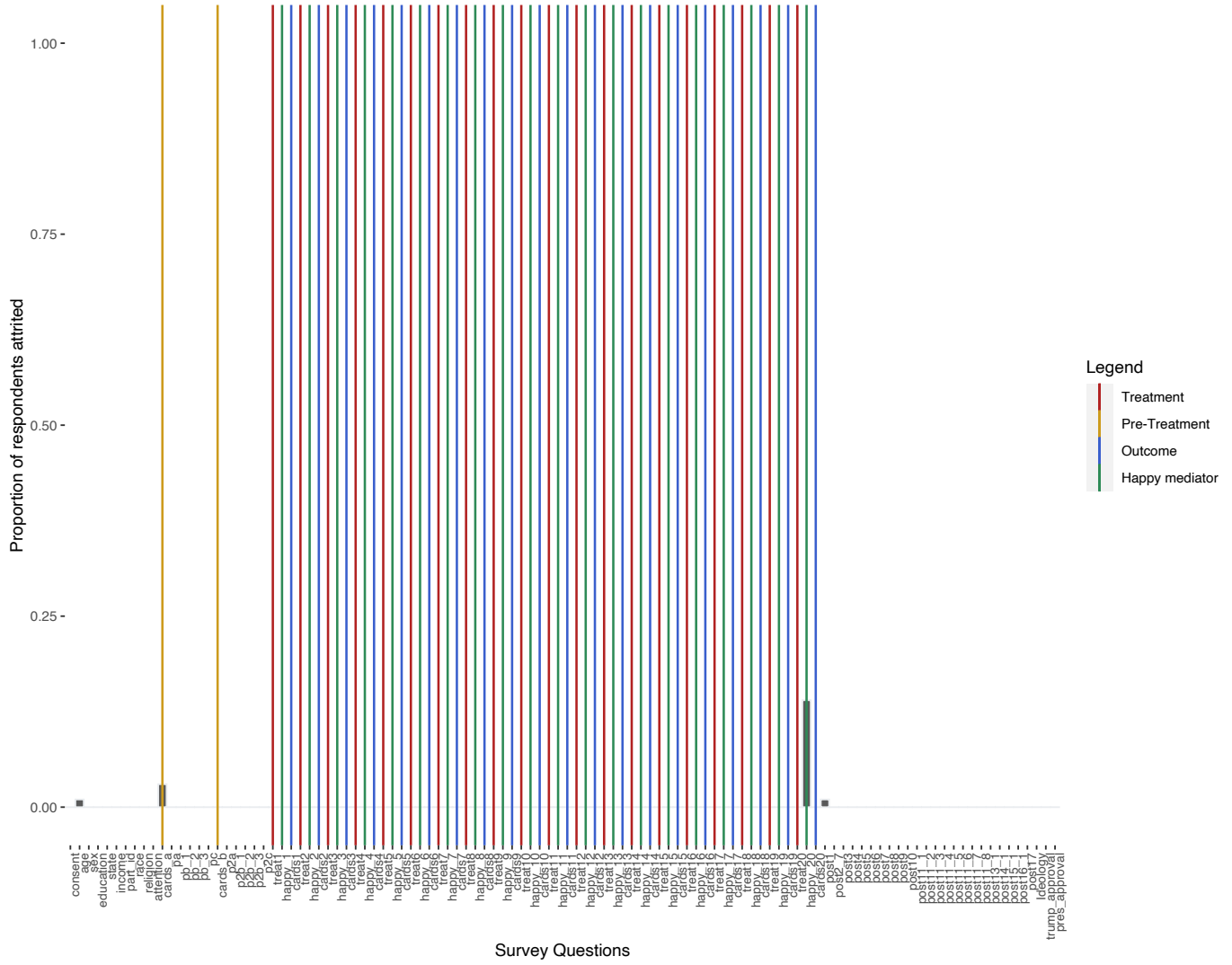
Figure H.25: **Study 5A: attrition across survey questions.**
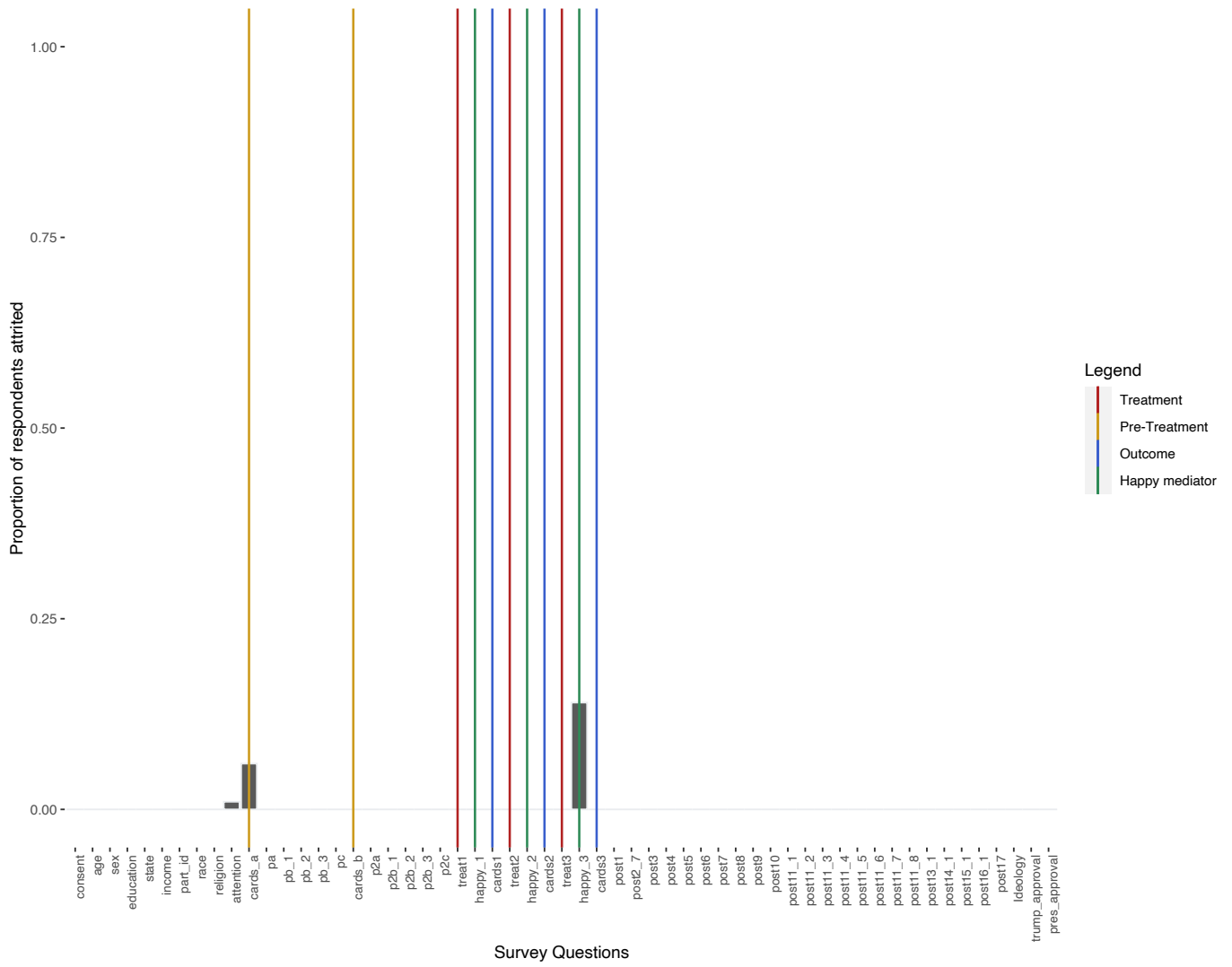
Figure H.26: **Study 5B: attrition across survey questions.**

Sensitivity analysis of mediation   We analyze the mediating effect of happiness on the choice task variable using Imai, Keele and Yamamoto (2010) approach for model-based causal mediation analysis; the key assumption required is sequential ignorability. Thus we focus on the sensitivity parameter $\rho \equiv \mathrm{Corr}(\epsilon_{i2}, \epsilon_{i3})$; sequential ignorability implies $\rho = 0$. We set ρ at different values and see how our ACME changes for our Study 5 (pooled) sample. This requires the following assumed usual equations relating outcome (Y), treatment (T) and mediator (M) variables:

$$Y_i = \alpha_1 + \beta_1 T_i + \epsilon_{i1} \tag{1}$$

$$M_i = \alpha_2 + \beta_2 T_i + \epsilon_{i2} \tag{2}$$

$$Y_i = \alpha_3 + \beta_3 T_i + \gamma M_i + \epsilon_{i3} \tag{3}$$

We estimate that when ρ is around 0.12 the ACME becomes 0. Assume the unobserved

(pre-treatment) confounder formulation:

$$\epsilon_{i2} = \lambda_2 U_i + \epsilon'_{i2} \tag{4}$$

and

$$\epsilon_{i3} = \lambda_3 U_i + \epsilon'_{i3} \tag{5}$$

How much does U_i have to explain for our results to go away? Figure H.27 presents the proportion of original variance explained by U_i.

We can reparameterize ρ using $(\tilde{R}_M^2, \tilde{R}_Y^2)$:

$$\rho = \frac{\mathrm{sgn}(\lambda_2 \lambda_3) \tilde{R}_M \tilde{R}_Y}{\sqrt{(1 - \tilde{R}_M^2)(1 - \tilde{R}_Y^2)}} \tag{6}$$

where R_M^2 and R_Y^2 are from the original mediator/outcome models. We can set $(\tilde{R}_M^2, \tilde{R}_Y^2)$ to different values and see how mediation effects change.

Figure H.28 assumes that the confounder influences both the mediator and outcome variables in the same direction.[1] The bold line represents the various combinations of R^2 statistics where the ACME would be 0. In this case the product would have to be 0.014 for the ACME to become 0. Another way to say this is that when the product of the original variance explained by the omitted confounding is 0.014 the point estimate for ACME would be 0.

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[1]This matters because the sensitivity analysis is in terms of the product of R^2 statistics; we assume positive because it seems more likely that something positively affecting the Mediator and the Outcome is happening to create the positive finding for the ACME).
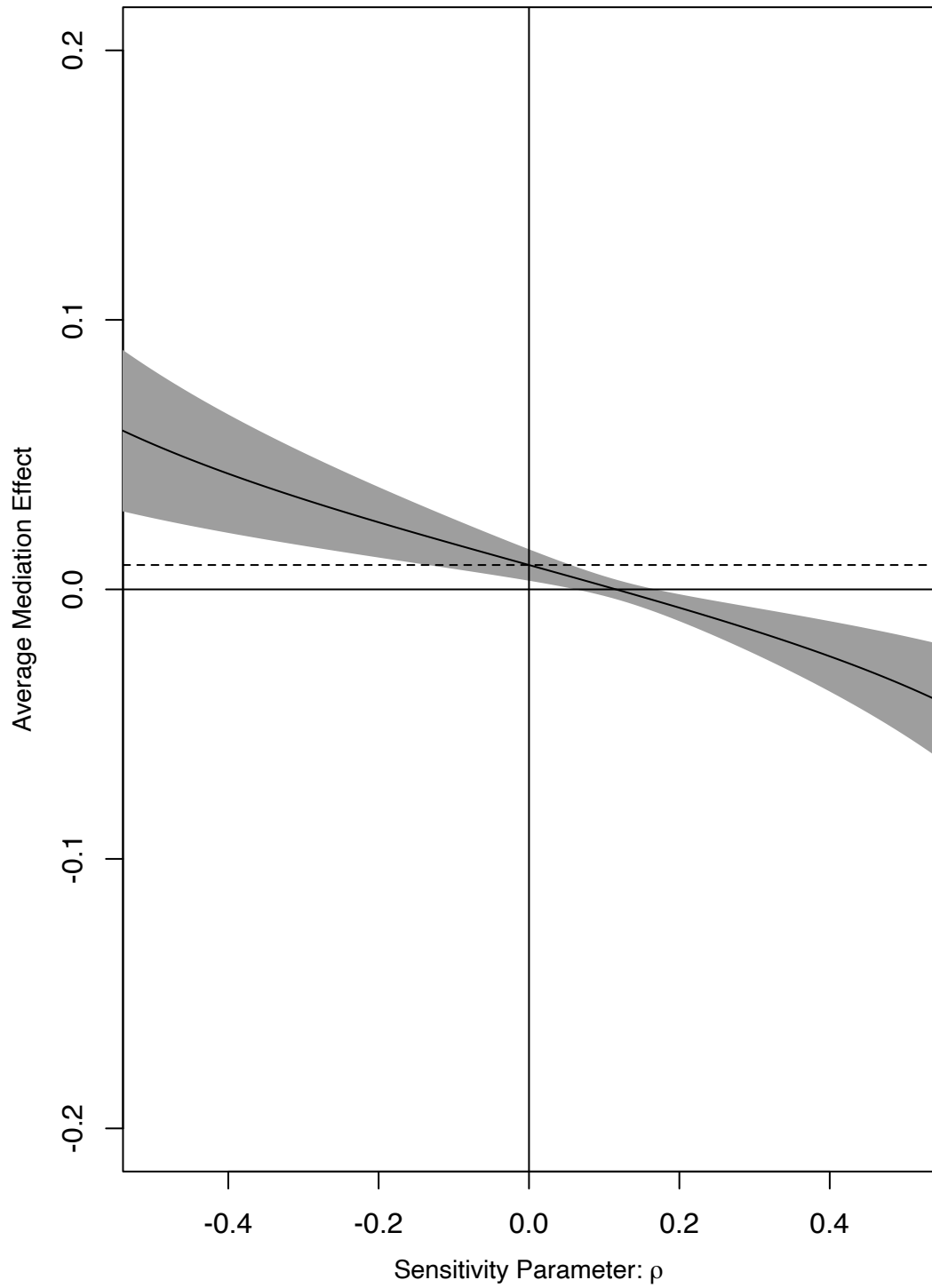
Sensitivity Analysis (5 pooled)

Figure H.27: **Proportion of original variance explained by** U_i.
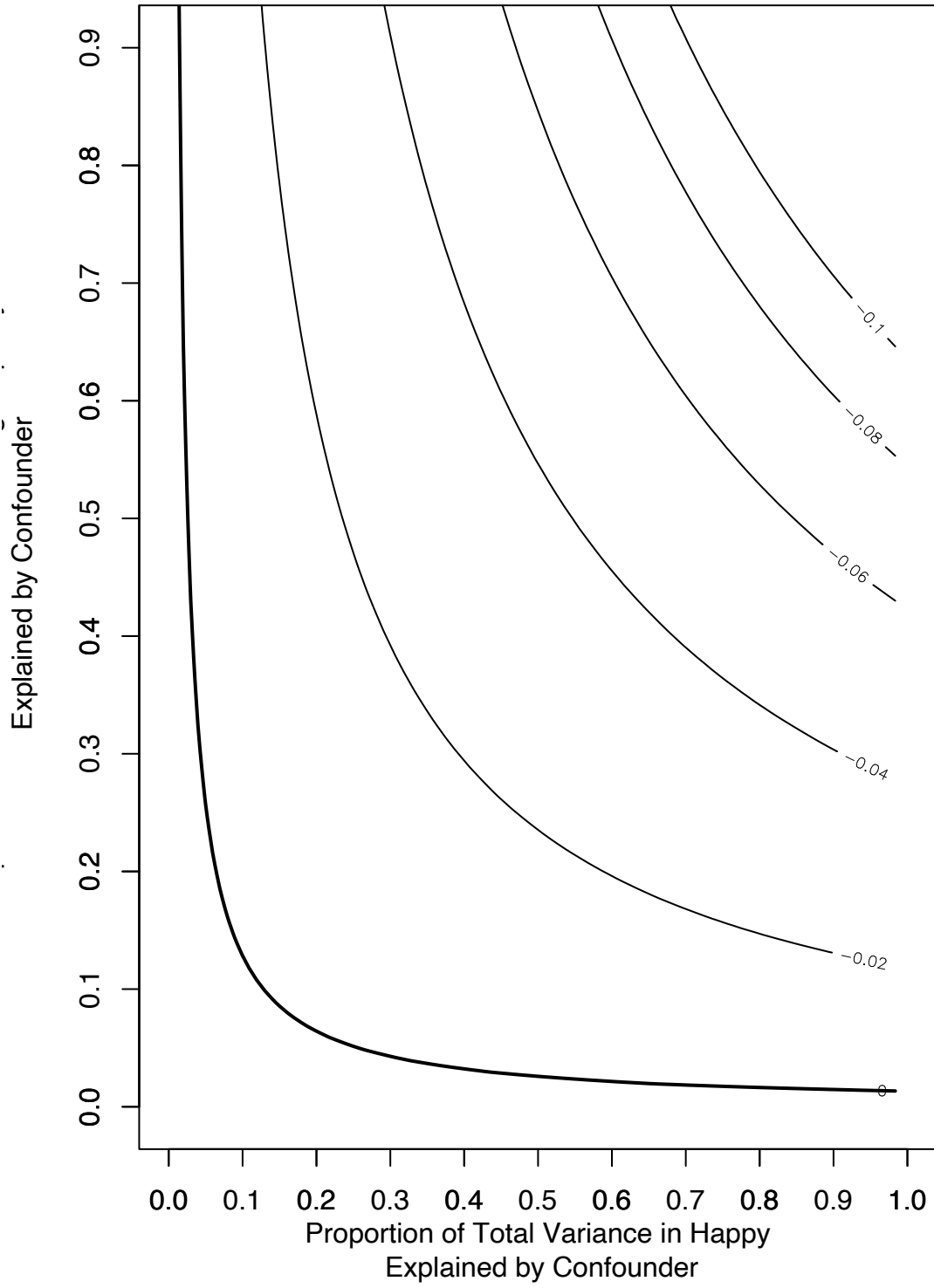
Figure H.28: R^2 **statistics for which ACME would be 0.**

I   Scope of peer praise for empathy

Estimated standard errors are clustered at respondent levels and robust, and 90 and 95% confidence intervals are plotted throughout.

I.1   Subgroup analyses

- Party

- Presidential approval

- Race

- Education

- Sex

- Baseline empathy

by Party   Democrats comprise of respondents who reported themselves as "Lean Democrat", "Democrat" and "Strong Democrat" while Republicans are respondents who reported themselves as "Lean Republican", "Republican" and "Strong Republican"; Independents are those who reported themselves as "Independent".
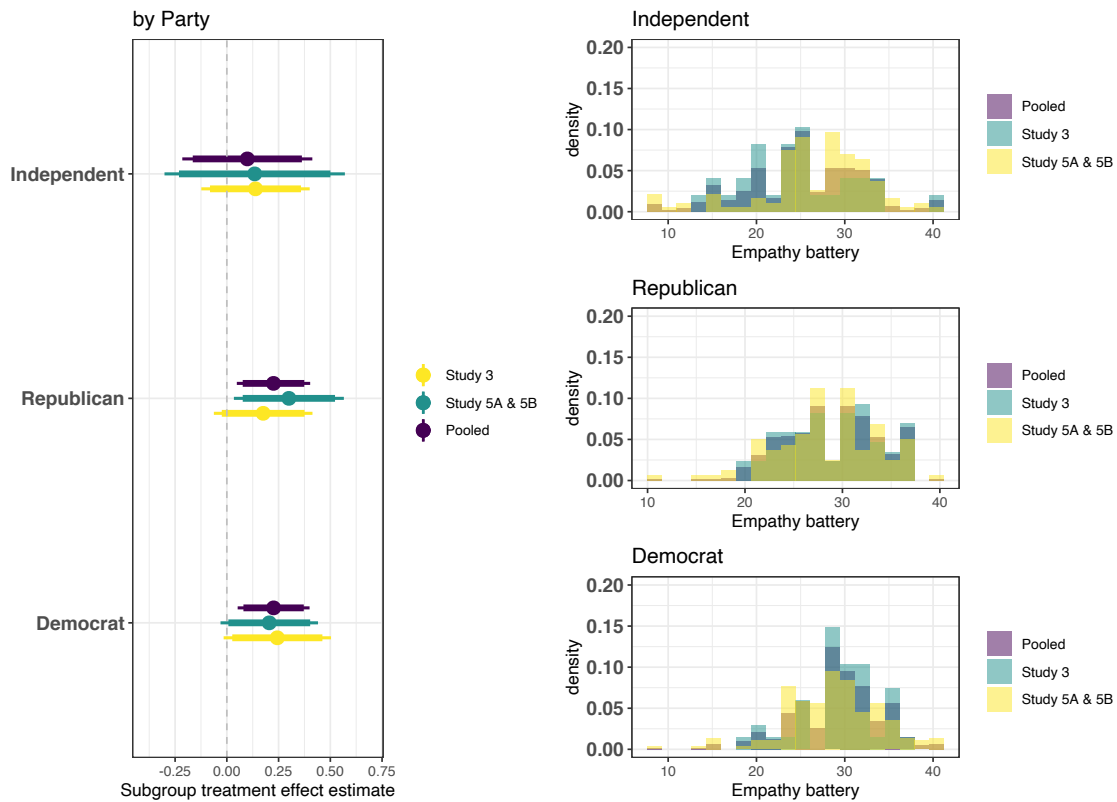
Figure I.29: Left panel: Logistic regression estimated peer praise for empathy treatment effect on log likelihood of choosing empathy task, by party subgroup. Right panel: density distribution of baseline empathy battery score by party subgroup.

by Trump and Biden approval Trump approval was measured in Study 3 under the question of presidential approval as Donald Trump was the then president-in-office; in Studies 5A and 5B to follow Joe Biden had taken office and so two questions were asked – one for presidential approval for Joe Biden, and a second on approval for former President Donald Trump. Figure I.30 presents subgroup analyses for Trump approval while Figure I.31 presents subgroup analyses for Biden approval.
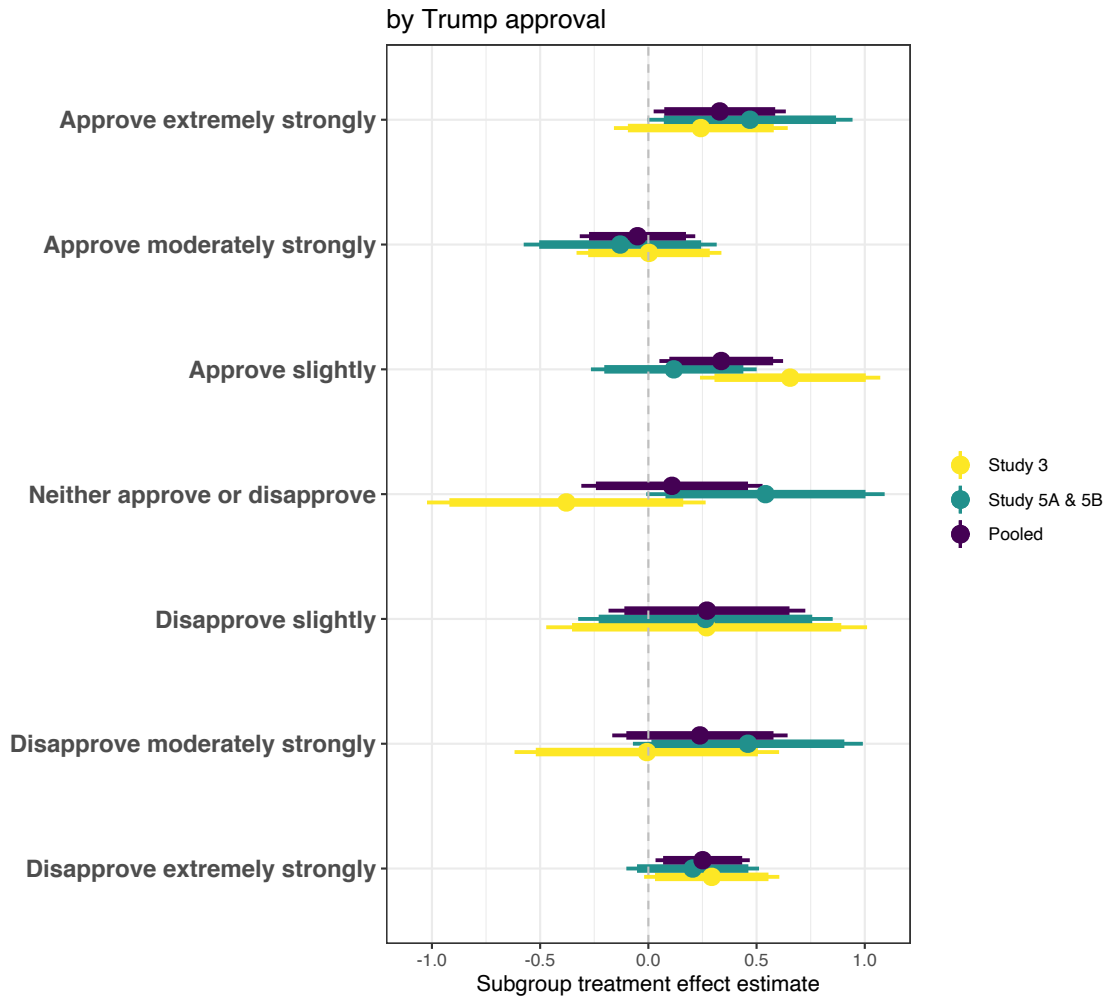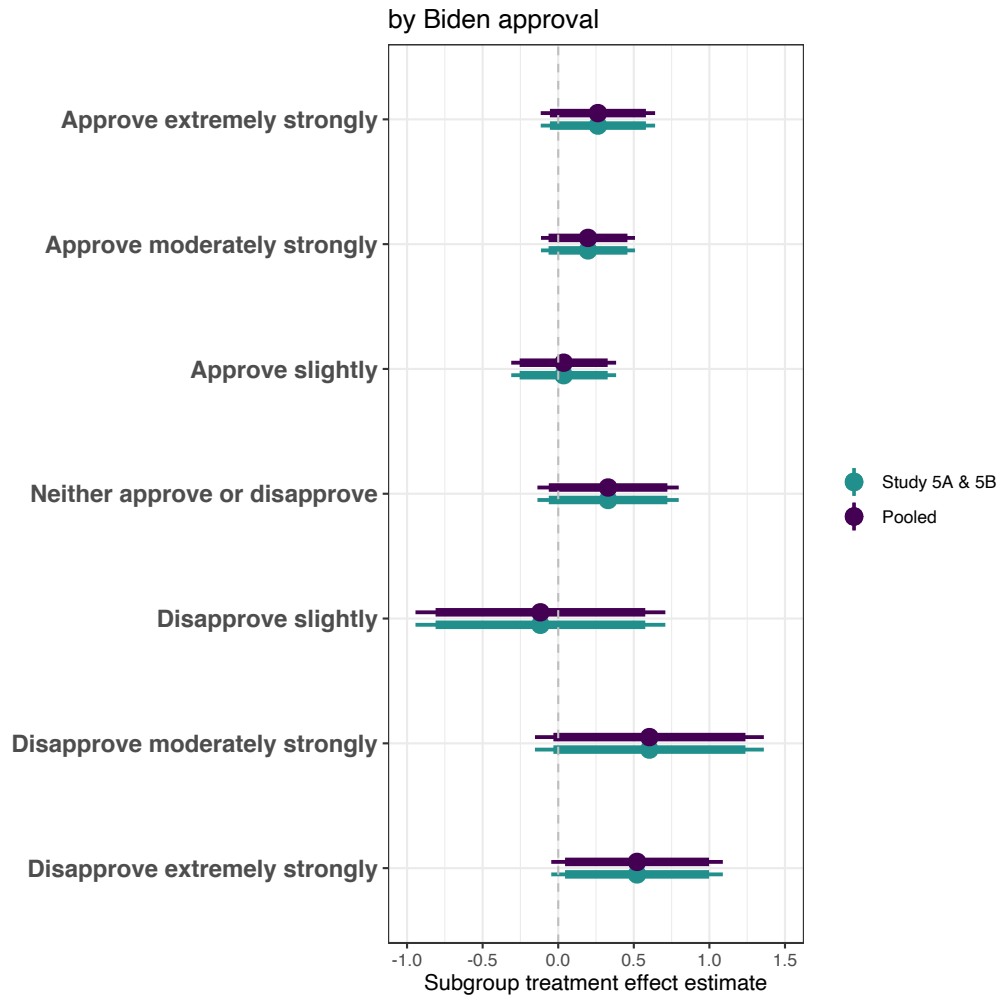

Figure I.30: Logistic regression estimated peer praise for empathy treatment effect on log likelihood of choosing empathy task, by Trump approval subgroup.

Figure I.31: Logistic regression estimated peer praise for empathy treatment effect on log likelihood of choosing empathy task, by Biden approval subgroup.

by Race Race subgroups presented are Black or African American ("Black"), White, and a combined grouping of Asian, Hispanic, Latinx, Native Hawaiian, Pacific Islander and Other ("Other") given the small sample sizes of the race subgroups. Figure I.32 presents subgroup analyses by race.
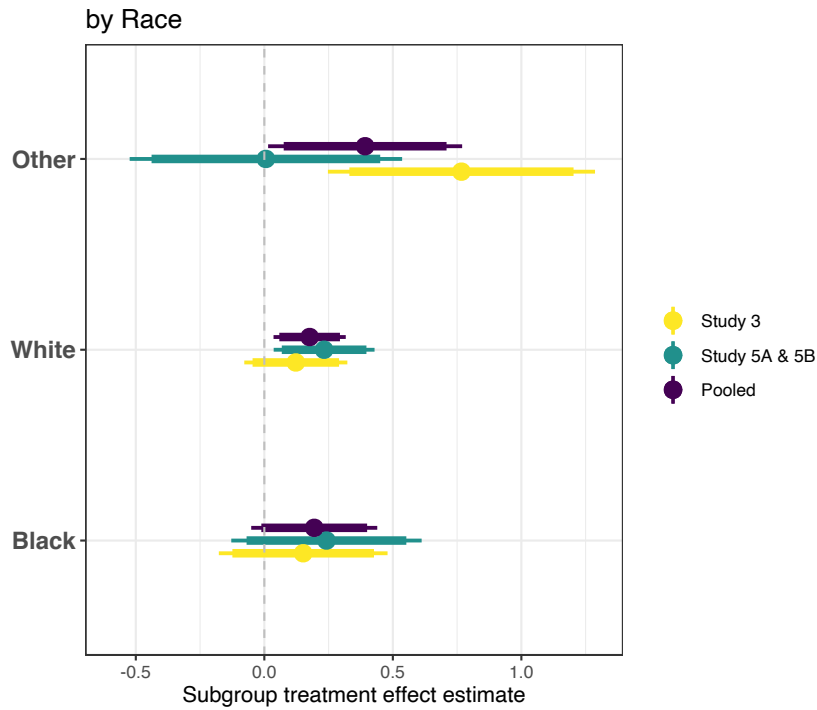
by Race

Figure I.32: Logistic regression estimated peer praise for empathy treatment effect on log likelihood of choosing empathy task, by race subgroup.

by Education   Our most disaggregated coding for education level has too few observations for some categories for within-subgroup estimation of treatment effects, so we aggregate to three general categories, bundling "Some high school, but did not graduate" and "High school or equivalent (GED)" to "HS", combining "Some college, but did not complete a degree" and "Bachelor's degree (BA/BS)" and "Associate degree" to "College", and "Master's degree (MA/MS/MBA)" and "Medical (MD), law (JD) or other doctoral degree (PhD)" combined to "Postgrad". In Study 5B we had an extra category for "no schooling completed" but since this was a single respondent we drop this category throughout. Figure I.33 presents subgroup analyses by aggregated education level.
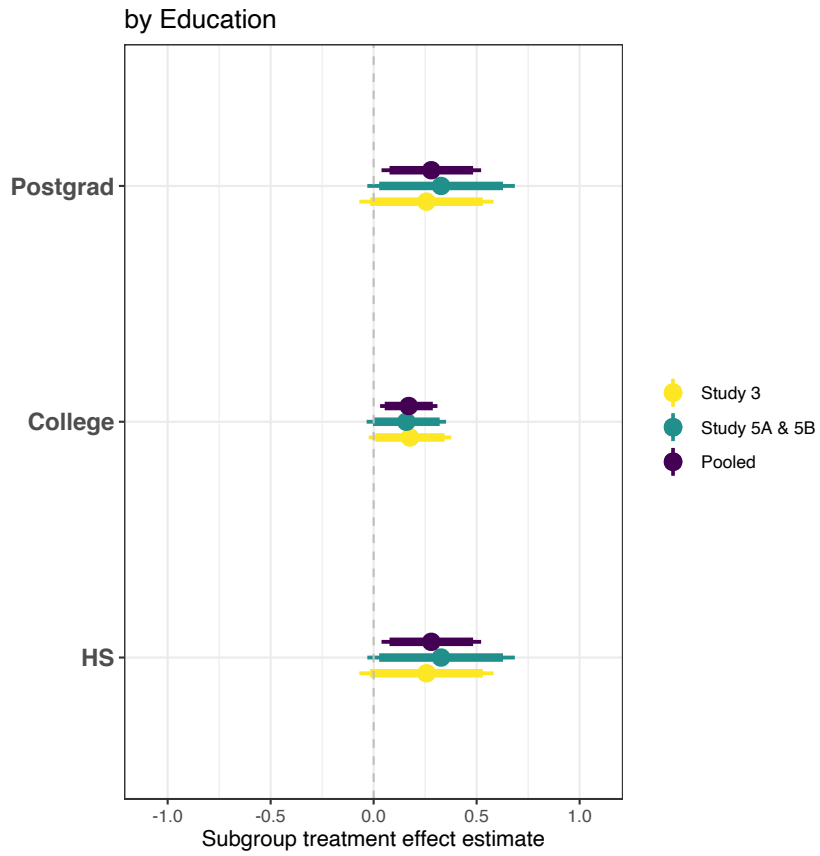
Figure I.33: Logistic regression estimated peer praise for empathy treatment effect on log likelihood of choosing empathy task, by education subgroup.

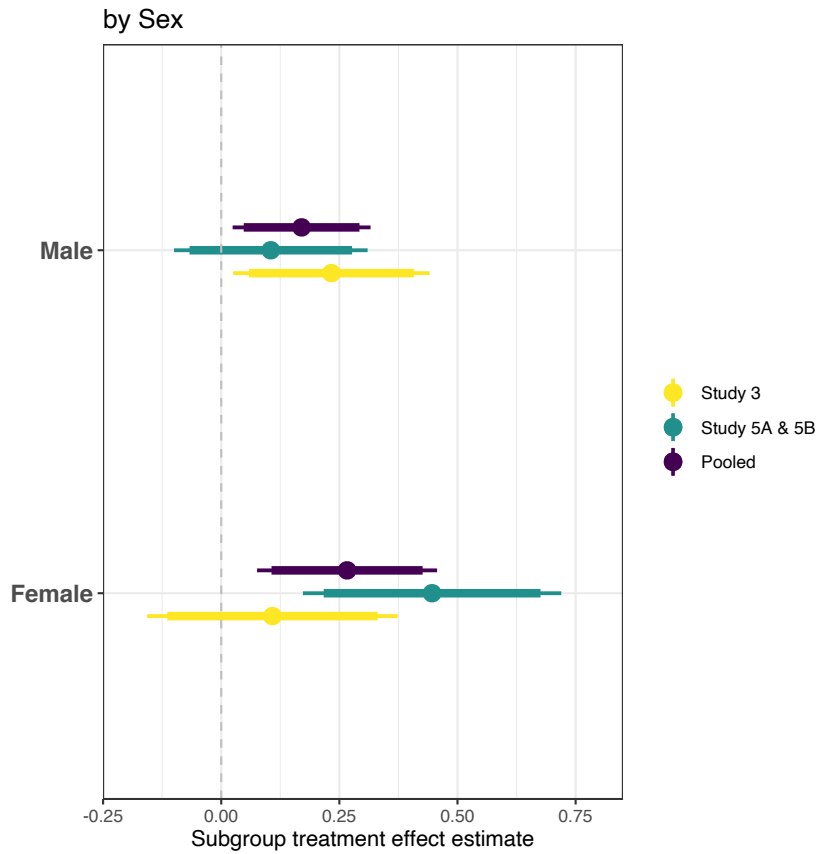**by Sex** Figure I.34 presents subgroup analyses by respondent sex.

Figure I.34: Logistic regression estimated peer praise for empathy treatment effect on log likelihood of choosing empathy task, by respondent sex subgroup.

by baseline empathy Estimates of correlations between treatment and outcome by baseline empathy battery terciles (low, medium and high) presented in Figure I.35.
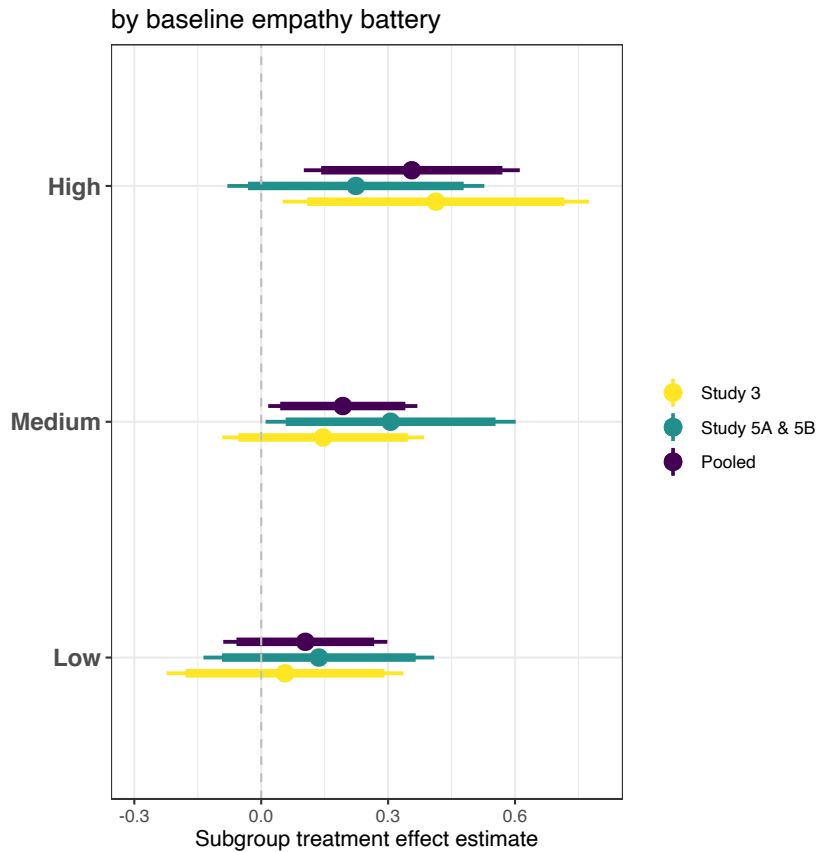
by baseline empathy battery

Figure I.35: Logistic regression estimated peer praise for empathy treatment effect on log likelihood of choosing empathy task, by respondent base empathy battery tercile.

by Attentiveness We look at subgroup effects by respondent attentiveness in Studies 5A and 5B (where the peer praise and task choice outcome are both measured for respondents over several trials) and look at attentive (respondents who pass the multiple choice `attentionMC` and grid `attentionG` attention checks), somewhat attentive (pass only `attentionMC` or `attentionG` but not both) and inattentive respondents (pass neither check). See Appendix Section B.4 for details. Figure I.36 presents estimated treatment effects of peer praise for empathy on choosing the empathy task within each of these subgroups.
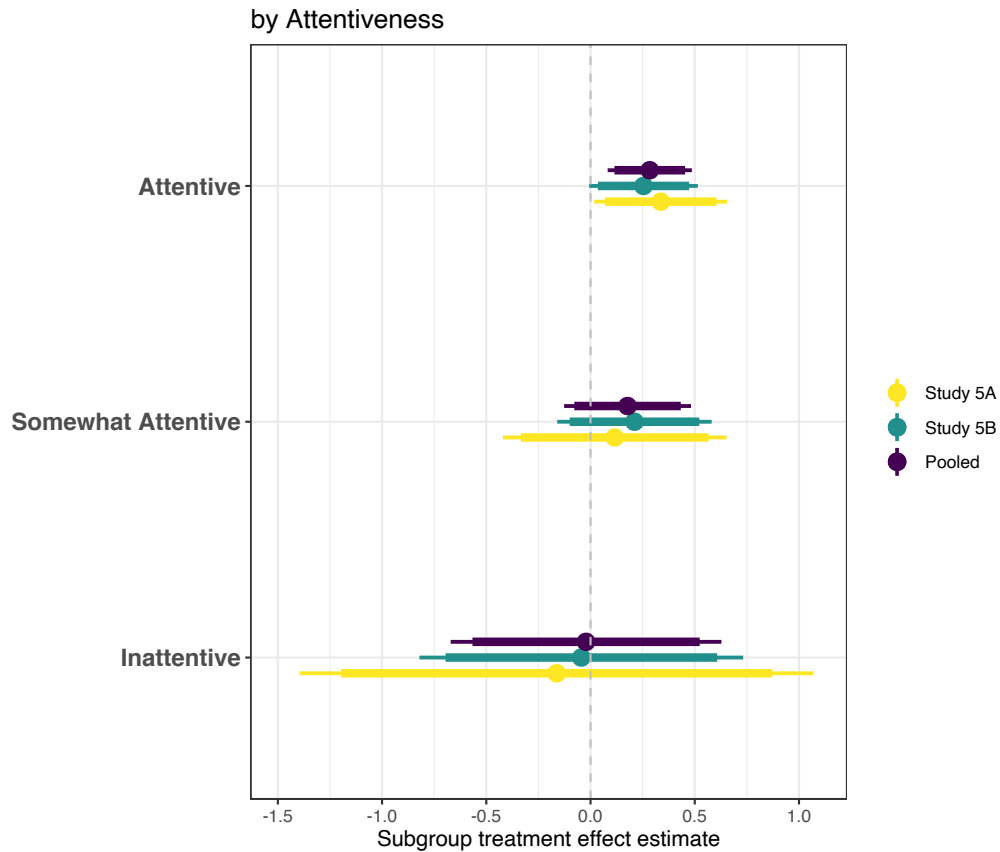
Figure I.36: Logistic regression estimated peer praise for empathy treatment effect on log likelihood of choosing empathy task, by respondent attentiveness.

Study 5 was composed of two days' worth of survey experiments, which we refer to throughout as 5A and 5B. 5A included 20 trials of the main task for all respondents, while 5B included 3. We additionally

I.2 Fading effects of peer praise

Figure I.37 presents estimated average causal marginal effects (ACME) and total effects (TE) or peer praise for empathy (through happiness) over successive main task trials.
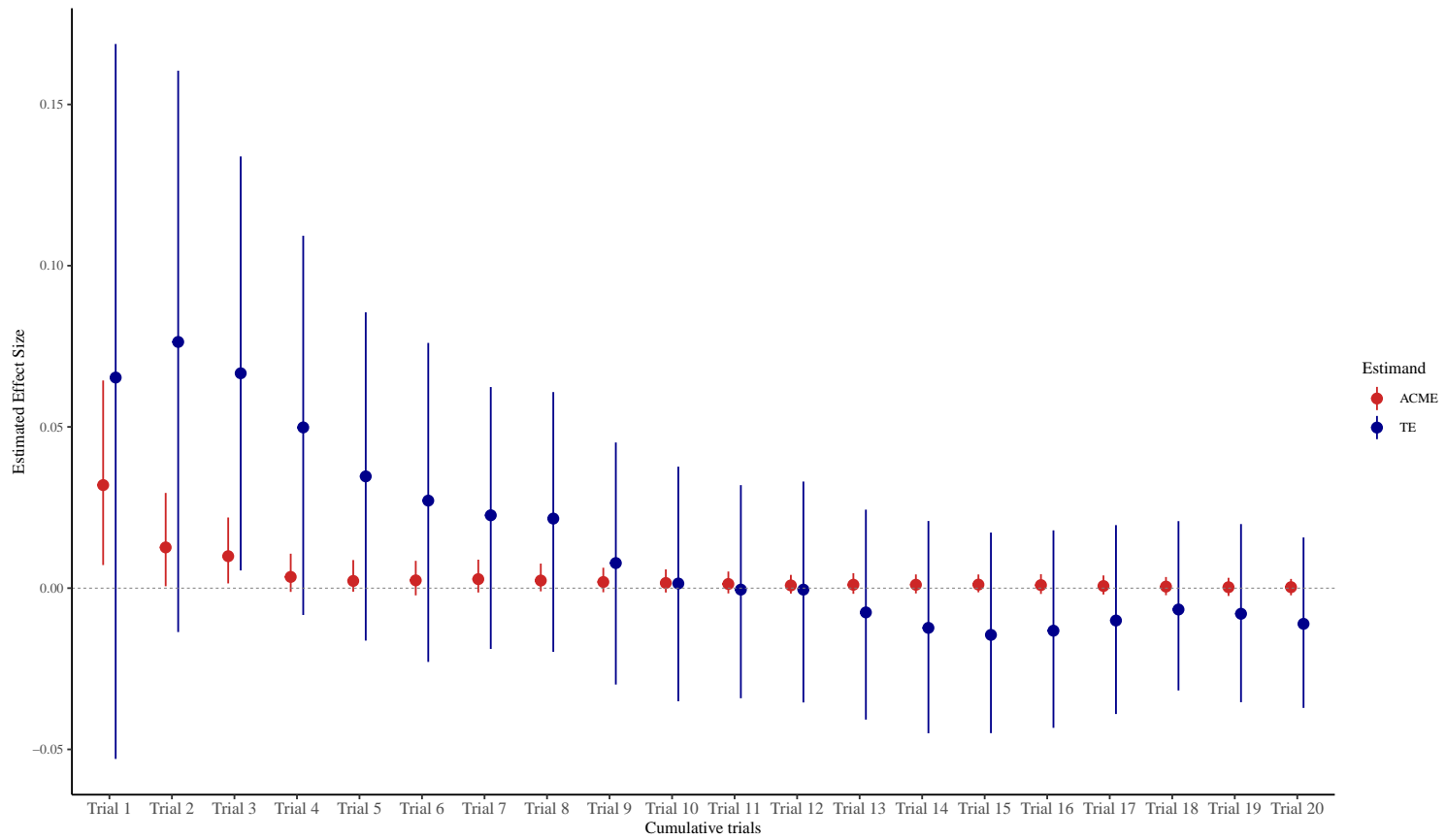
Figure I.37: **ACME and TE effects of peer praise (through happiness) over successive trials.**

J Ethical considerations

All of the studies conducted in this project received IRB approval and exemption through the University of Wisconsin Madison Educational and Social/Behavioral Science IRB (# 2020-0843-CP002).

Fair wage In establishing pay scales for each study, we conducted pilots to establish average times for pre-treatment, task and post task portions of each study design and paid based on the state with the highest minimum wage in mid 2020 (Washington, at $13.50 per hour). Our intention was to offer fair wages especially in the context of work showing the median wage of MTurk workers is ˜$2/hour (Hara et al., 2018).

Negative treatments and distress In our studies we intentionally avoided negative affect in interactions as much as possible, by not providing negative peer feedback or emphasizing negative emotions when exploring mediators.

No deception Our studies incorporated a strict no-deception of respondents rule throughout, which in part motivated and necessitated Study 2 – garnering real peer praise and validating its authenticity.

References

Berinsky, Adam J, Michele F Margolis, Michael W Sances and Christopher Warshaw. 2019. "Using screeners to measure respondent attention on self-administered surveys: Which items and how many?" *Political Science Research and Methods* 9(2):1–8.

Hara, Kotaro, Abigail Adams, Kristy Milland, Saiph Savage, Chris Callison-Burch and Jeffrey P. Bigham. 2018. A Data-Driven Analysis of Workers' Earnings on Amazon Mechanical Turk. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. CHI '18 Montreal QC, Canada: Association for Computing Machinery pp. 1–14.
URL: *https://doi.org/10.1145/3173574.3174023*

Harmon-Jones, Cindy, Brock Bastian and Eddie Harmon-Jones. 2016. "The discrete emotions questionnaire: A new tool for measuring state self-reported emotions." *PloS one* 11(8):e0159915.

Imai, Kosuke, Luke Keele and Teppei Yamamoto. 2010. "Identification, Inference and Sensitivity Analysis for Causal Mediation Effects." *Statistical Science* 25(1):51–71.
URL: *https://www.jstor.org/stable/41058997*