

Pain Sensitivity is Associated with Moral Judgment

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Abstract

Moral psychologists often identify harm perception as a core consideration in moral deliberation. Since pain tends to be a ubiquitous form of harm, pain experiences are likely to activate cognitive harm templates. We examined whether pain sensitivity was associated with individual differences in moral judgement. In Study 1, higher pain sensitivity was positively associated with greater perceived relevance of binding foundations and greater support of all moral foundations. Pain sensitivity predicted greater condemnation of moral transgressions involving binding foundations and greater approval of utilitarian behaviour on moral dilemmas. However, it was unclear whether this effect on moral dilemmas was driven by salience, utilitarian content, or goal-oriented language. Study 2 manipulated question wording in dilemmas without changing details of dilemmas themselves. Participants with higher pain sensitivity indicted higher approval of the behaviours described in moral dilemmas regardless of question wording, suggesting that salience, not utilitarian content, was driving these results.

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Introduction

Questions of how people recognize moral actions have a long history in the study of philosophy. Through the study of normative ethics, philosophers have been trying to determine which actions are right and which are wrong, as well as how people come to know what constitutes right or wrong. Two prominent theories of morality have since emerged in Western philosophy: Utilitarianism and Deontology. Utilitarianism contends that normative ethics can be reduced to an equation, wherein the best course of action in any situation is one that minimizes the amount of pain produced while maximizing the amount of pleasure (Mill, 1863). Deontology holds that morality is determined through a series of rules which stipulate whether specific kinds of actions themselves are right or wrong, regardless of the consequences of those actions (Kant, 1785). These two contrasting perspectives of morality set the foundation for much of the intellectual debate regarding the way people perceive the normative execution of moral action.

While moral philosophy typically focuses on the normative task of determining how people *ought to* conceptualize and rationalize moral actions, the study of moral psychology concerns itself with the descriptive task of determining how people *actually* conceptualize and rationalize moral actions. Two of the most prominent theories in moral psychology are the Moral Foundations Theory and the theory of Dyadic Morality. Moral Foundations Theory argues that morality is founded upon multiple fundamental values, namely Care/Harm, Fairness/Cheating, Loyalty/Betrayal, Authority/Subversion and Sanctity/Degradation (Graham, Haidt, Koleva, Motyl, Iyer, Wojcik, Ditto, 2012), which people differentially access when deducing the moral significance of an action. Dyadic Morality Theory argues that morality is based upon the single axiom of interpersonal harm. Even within Moral Foundations Theory's pluralistic framework, harm is still recognized as a prominent consideration in moral deliberation. Indeed, though

people do not universally endorse all the moral foundations, harm is consistently regarded as morally relevant, regardless of individual differences such as political orientation (Graham, Haidt, & Nosek, 2009). Since the most common and ubiquitous forms of harm tend to be pain, experiences of pain are likely to activate cognitive harm templates. However, very little research has been conducted examining the relationship between pain and moral judgements. In this paper, we examine whether pain sensitivity is associated with individual differences in moral judgement.

Moral Foundations Theory

The Moral Foundations Theory (MFT) argues that the human mind is organized in advance of actual experience to facilitate the learning of values, norms, and behaviours that are essential for solving adaptive social problems. MFT argues that these foundations are analogous to a “first draft” of morality within people’s minds, whereas culture and society are the editing process which refine adult moral cognition. Thus, innate moral foundations may transform or whither as a consequence of different cultural experiences, however, vestigial remnants of these systems can still be observed by inhibiting people’s ability to exert explicit deliberative reasoning when making moral judgements. This mélange of innate moral foundations and culturally acquired norms and values form the bases of people’s moral intuitions, inspiring sudden evaluative feelings about moral scenarios without any conscious search, evidence, or inference. According to MFT, cognitively taxing moral deliberation arose from the need to explain, justify and defend our moral intuitions. The large number of diverse recurrent social challenges that required adaptive solutions lead to a large number of moral foundations.

MFT identifies five such foundations, each of which arose to address a specific socially adaptive function. The Care/Harm foundation is proposed to have arose from the adaptive challenge of caring for vulnerable offspring, and is triggered by visual and auditory signs of suffering and distress. The Care/Harm foundation is often characterized by compassion towards victims of harm, and aggression towards those who perpetrate harm. The Fairness/Cheating foundation arose to facilitate social cooperation and minimize the risk of being exploited within cooperative situations, and is characterized by the values of justice and equality. The Loyalty/Betrayal foundation arose from the need to defend against intergroup competition, and is characterized by the values of patriotism and loyalty. The Authority/Subversion foundation arose from the need to navigate social dominance hierarchies, and is characterized by values of respect and obedience. Finally, the Sanctity/Degradation foundation arose from the need to avoid pathogens and parasites, and is characterized by the values of purity and chastity (Graham et al., 2011, 2012; Haidt & Graham, 2007). Moral Foundations Theory is flexible; it is able to account for a variety of patterns in moral deliberation and identify their adaptive significance and characteristics.

Dyadic Morality Theory

The Moral Dyad was presented as a counterpoint to the MFT in an attempt to create a more parsimonious account of moral cognition, by unifying moral judgement under the single foundation of the harm template. The theory of Dyadic Morality (Gray, Waytz & Young, 2012) states that people understand moral concepts through the use of conceptual “prototypes” of interpersonal harm. While there is a wealth of behaviour that people might identify as being

immoral, the most universally condemned acts, such as murder, theft or rape, are often composed of an intentional aggressor who perpetrates harm and a victim who is the recipient.

Indeed, people tend to perceive that there are victims for even ostensibly victimless crimes, such as bestiality and necrophilia (Gray, Schein, & Ward, 2014). Additionally, seemingly harmless wrongs still activate concepts of harm and increase perceptions of suffering, suggesting that even in scenarios where there is no clear victim, people are still activating a template of interpersonal harm to process the scenarios. Dyadic morality centers harm as the basis of moral cognition, and argues that differential accessibility of the harm template across normative contexts may account for individual differences in moral condemnation (Schein & Gray, 2015).

The Relationship Between Pain and Harm

If harm really does play such a fundamental role in moral processing, it is necessary to understand how harm is practically understood. Harm can be an abstract and nebulous concept; however, most people would agree that infidelity, within the context of a monogamous marriage, is morally wrong. Similarly, most people would agree that slapping someone during an argument is also morally wrong. In both of these cases, there is an intuitive sense that someone has caused harm, despite the fact that one scenario results in physical pain while the other only results in social pain.

There is a strongly intuitive relationship between physical pain and social pain. People tend to describe feelings of social rejection with phrases similar to those used to describe physically painful experiences. For example, after someone has said something cruel to us, we might describe ourselves as having “hurt feelings”, and leaving a relationship is often described as being “heartbreaking”. Additionally, research suggests the linguistic overlap between physical

pain and social pain is present across cultures (MacDonald & Leary, 2005). Several neuroimaging studies have shown that seeing pain in others activates similar areas as experiencing pain first hand. There is overlap between activation in the anterior insula (AI) and the anterior cingulate cortex (ACC) when viewing others in pain and when directly experiencing pain (Cui, Ma, & Luo, 2016; Lamm, Decety, & Singer, 2011). Research has also shown activation in the ACC when people make utilitarian moral decision, where harms are calculated in order to decide the best course of action (Greene, Nystrom, Engell, Darley, & Cohen, 2004). This research provides some support that concepts of pain and harm overlap in the brain, suggesting that physical pain, and pain sensitivity, may be able to activate templates of interpersonal harm.

The Current Study

We have so far highlighted the role that harm and pain play in moral cognition and judgements, going forward, our goal was to examine the potential effect of pain sensitivity on moral judgements. Pain is the first and most universal experience of harm people are likely to experience, therefore, pain is likely to activate the harm template described by Dyadic Morality. We posit that, since people with higher pain sensitivity have an increased likelihood of experiencing pain, their harm templates are more likely to become chronically accessible. Due to this increased accessibility of the harm template, people with higher pain sensitivity should display a greater condemnation of moral actions and behaviours that they consider harmful. The current study was designed to address this conceptual hypothesis.

We conducted a large online survey examining various moral behaviours and judgements while measuring individual measures of pain sensitivity. In order to determine the unique effects

of pain sensitivity, we controlled for various individual differences associated with moral judgements. While the “Individualizing” foundations of Care/Harm and Fairness/Cheating are typically endorsed universally, Liberals tend to rate these foundations higher than Conservatives. Political conservatism, on the other hand, is commonly associated with higher endorsement of the “Binding” foundations Loyalty/Betrayal, Authority/Subversion and Sanctity/Degradation (Graham et al., 2009; Haidt & Graham, 2007; Napier & Luguri, 2013), so a self-report measure of political orientation was included. Participants were recruited through Amazon’s Mechanical Turk, to ensure a more robust population of Conservatives compared to student populations, which tend to be majority Liberal. We also included measures of disgust sensitivity (Baron, Gürçay, & Luce, 2018; Inbar, Pizarro, Knobe, & Bloom, 2009; Jones & Fitness, 2008), negative affectivity (Vrabel, Zeigler-Hill, McCabe, & Baker, 2019; Zeigler-Hill, Besser, Cronin, & Vrabel, 2018), state-trait anxiety (Baron et al., 2018; Choe & Min, 2011; Perkins et al., 2013), state-trait anger (Baron et al., 2018; Hutcherson & Gross, 2011; Rozin, Lowery, Imada, & Haidt, 1999), empathy (Baron et al., 2018; Decety & Cowell, 2014), and gender (Fumagalli et al., 2010; Lifton, Carolina, & Hill, 1985; Rothbart, Hanley, & Albert, 1986), since each of these variables have been shown to be associated with moral judgement.

In Study 1, we had three main hypotheses. Hypothesis 1) Participants with higher pain sensitivity would report greater endorsement of moral judgements across foundation. Hypothesis 2) Participants with higher pain sensitivity would rate the option that involves less salient pain more favorably (i.e., rate the option that involves more salient pain less favorably) in each moral dilemma. Hypothesis 3) Hypotheses 1 and 2 should remain significant even after controlling for individual differences in disgust sensitivity, negative affectivity, state and trait anxiety, state and trait anger, empathy, political orientation, and gender.

A power analysis was performed using preliminary data from a pilot study. The pilot study found that there was a correlational effect of $f^2 = .0079$ between responses on the Pain Sensitivity inventory and the Harm or Authority foundation (there was an identical correlational effect for these two foundations) in Part 2 of the Moral Foundations Questionnaires. We chose these foundations rather than the other three because they were the foundations in Part 2 of the Moral Foundations Questionnaire that showed the weakest correlation with Pain Sensitivity. A power analysis indicated that with an effect size of $f^2 = .0079$, $\alpha = .05$, $\text{power} = .80$, we need a sample size of 996. Expecting a 10% attrition rate due to inattention or incomplete questionnaires, we recruited 1107 participants. The study design and plan for analysis was preregistered on Open Science Framework (OSF) prior to data collection (<https://osf.io/fbew7>).

Study 1

Method

Participants. A sample of 1090 American residents was collected using Amazon's Mechanical Turk (MTurk). Participants were compensated \$2.00 for their participation. Of our sample, 583 identified themselves as men (53%), 494 identified themselves as women (45%), 3 identified themselves as "something else", 3 indicated they "prefer not to say" and 7 participants failed to indicate their gender. The average age among participants was 36.02 years ($SD = 10.67$). Political Orientation was assessed using a 9-point scale sliding scale (1 = Liberal, 5 = Centrist, 9 = Conservative; $M = 4.81$, $SD = 2.62$). Forty-three percent of the sample indicated that they were Liberal ($N = 465$), forty-one percent indicated that they were Conservative ($N =$

445), thirteen percent indicated they were Centrists ($N = 145$) and thirty-four participants failed to indicate their Political Orientation.

Procedure. Participants were recruited from MTurk to take a roughly 30-minute survey ostensibly about attitudes and beliefs. Upon giving their consent, participants completed a questionnaire measuring three different moral judgements (moral vignettes, dilemmas and moral foundations), a pain sensitivity questionnaire, followed by several individual differences measures, including disgust sensitivity, negative affect reactivity, state and trait anger, state and trait anxiety, cognitive and affective empathy, and political orientation, all of which have previously been shown to be related to moral judgments, and finally their demographics.

Moral Foundations Questionnaire. Participants completed the Moral Foundations Questionnaire (MFQ; Graham et al., 2012). The MFQ was divided into two parts. In Part 1, participants rated the extent to which each statement was relevant to morality (e.g., Whether or not someone suffered emotionally) on a 6-point scale (0 = Not at all relevant; 5 = Extremely relevant). In Part 2, participants rated the extent to which they agreed with each statement (e.g., Compassion for those who are suffering is the most crucial virtue) on a 6-point scale (0 = Strongly disagree; 5 = Strongly agree; see Appendix 1).

Moral Vignettes. Participants rated 25 moral vignettes (e.g., “You see a teenage boy chuckling at an amputee he passes by while on the subway”), tapping into different moral foundations according to Clifford et al. (2015), on a 5-point scale (1 = not at all wrong, 5 = extremely wrong). The vignettes used were chosen based on the degree to which they a) corresponded to the foundation that they belonged to and b) loaded cleanly on the expected factors in Clifford et al. (2015). We chose up to four vignettes per foundation with a minimum correspondence of 60% and a minimum factor loading of .40. In addition to the foundations

identified by Graham et al. (2012), the moral vignettes divide the Care/Harm foundation into three additional subsets: emotional harm, physical harm to animals and physical harm to humans (see Appendix 2).

Moral Dilemmas. There were three types of dilemmas. The first type was low-conflict moral scenarios, meant to encourage participants to use the extremes of the scale, the second type was high-conflict moral scenarios, detailing trolley-type problems meant to force participants to decide how appropriate or inappropriate it might be to harm one person in order to help several others, and the third type which was non-moral control scenarios, where participants were tasked with judging how appropriate or inappropriate they considered an everyday choice scenario to be. Participants rated fourteen dilemmas adapted from Greene (2001; 2004) on the extent to which the actions taken in the scenarios was appropriate or inappropriate on a 6-point scale (1 = extremely inappropriate, 6 = extremely appropriate; see Appendix 3).

Pain Sensitivity. Pain sensitivity was measured using the scale devised by Ruscheweyh, Marziniak, Stumpfenhorst, Reinholz, and Knecht (2009), and was scored as according to them. Participants responded to questions about various painful experiences (e.g., You bump your shin badly on a hard edge, for example, on the edge of a glass coffee table) and answered on an 11-point scale (0 = not at all painful; 10 = most severe pain imaginable; see Appendix 4).

Covariates. The Questionnaire of Cognitive and Affective Empathy was used to measure empathy (Reniers, Corcoran, Drake, Shryane, & Völlm, 2011). It was divided into two subcategories: Cognitive and Affective, scored according to Reniers et al. (2011). The Cognitive subscale refers to items that pertain to the more cognitive side of empathy, such as perspective taking (i.e., trying to view events through the eyes of another) and online simulation (i.e., future intentions for empathic behaviour). The Affective subscale refers to the emotional side of

empathy, such as emotional contagion (i.e., the automatic mirroring of the feelings of others), proximal responsivity (i.e., the affective response when witnessing the moods of others in a close social context) and peripheral responsivity (i.e., the affective response when witnessing the moods of others in a more detached context). Participants responded to items on a 6-point Likert scale (1 = Strongly disagree; 6 = Strongly agree).

Disgust sensitivity was assessed according to Haidt, McCauley, and Rozin (1994) and Deacon, Connolly, Cisler, Olatunji, and Lohr (2006). The Disgust Sensitivity Scale was divided into two parts. In Part 1 participants read statements (e.g., I might be willing to try eating monkey meat, under some circumstances) and reported on a 2-point scale (Agree vs. Disagree). In Part 2, participants read statements (e.g., If you see someone put ketchup on vanilla ice cream and eat it) and reported on a 3-point scale (1 = Not Disgusting; 2 = Slightly Disgusting; 3 = Disgusting). Two questions were excluded from the analysis due to their explicitly moral nature: “I think homosexual activities are immoral” and “I think it is immoral for someone to seek sexual pleasure from animals”. These two questions bore too much overlap with our dependent variables, since they explicitly invoke morality and share similar content with the two moral vignettes “You see a homosexual in a gay bar offering sex to anyone who buys him a drink” and “You see a man in a bar using his phone to watch people having sex with animals”. Thus, these questions were not included in our analysis of Disgust sensitivity.

Negative Affectivity was assessed according to Watson and Clark (1984). Participants read statements (e.g., I tend to get very emotional very easily) and responded on a 4-point scale (1 = Not at all like me; 4 = Completely like me).

State-Trait Anxiety and Anger were also assessed according to research by Spielberger (Spielberger, Sydeman, 1994; Vagg & Spielberger, 1999). In the State-Trait Anxiety Inventory,

participants were asked to respond to statements (e.g., I feel that difficulties are piling up so that I cannot overcome them) on a 4-point scale (1 = Almost never; 4 = Almost always). Similarly, on the State-Trait Anger Inventory participants were asked to respond to statements (e.g., I get annoyed when I am singled out for correction) on a 4-point scale (1 = Almost never; 4 = Almost always).

Results

Pain Sensitivity and Covariates. Table 1 displays the correlations between pain sensitivity and individual differences variables. Higher pain sensitivity was associated with more conservative political orientation, $r(1090) = .319, p < .001$, higher disgust sensitivity, $r(1090) = .345, p < .001$, and higher negative affectivity, $r(1090) = .508, p < .001$. Higher pain sensitivity was also associated with higher state-trait anxiety, $r(1090) = .289, p < .001$, higher state-trait anger, $r(1090) = .578, p < .001$, higher empathy, $r(1090) = .146, p < .001$, but was not significantly associated with gender, $F(1, 1090) = 2.81, p = .09$.

Moral Foundations. On Part 1 of the Moral Foundations Questionnaire, we predicted that participants with higher pain sensitivity would rate statements as being more relevant across foundations. Pain sensitivity predicted higher perceived relevance of Loyalty/Betrayal ($B = 0.27, SE = 0.03, t = 8.01, p < .001$), Authority/Subversion ($B = 0.27, SE = 0.03, t = 8.02, p < .001$), and Sanctity/Degradation ($B = 0.24, SE = 0.03, t = 7.27, p < .001$) foundations, but not Care/Harm ($B = -0.03, SE = 0.04, t = -0.18, p = .86$) or Fairness/Cheating ($B = 0.02, SE = 0.04, t = 0.54, p = .59$) foundations. This is of particular interest, since Loyalty/Betrayal, Authority/Subversion, and Sanctity/Degradation corresponds to Binding foundations, characteristically endorsed more

strongly by Conservatives, whereas Care/Harm and Fairness/Cheating foundations correspond to individualizing foundations (Graham et al., 2011).

The coefficients for the correlation between pain sensitivity and the Loyalty/Betrayal ($r = .48$), Authority/Subversion ($r = .47$), and Sanctity/Degradation ($r = .46$) foundations indicated a medium effect size (Cohen, 1988). Using semi-partial correlations to control for individual differences variables, the unique effect of pain sensitivity on Loyalty/Betrayal ($r = .20$), Authority/Subversion ($r = .20$) and Sanctity/Degradation ($r = .17$) foundations was small (Cohen, 1988).

On Part 2, we predicted that participants with higher pain sensitivity would report more support of statements across moral foundations. Pain sensitivity predicted higher support of all moral foundations, even after controlling for individual difference variables (see Table 3.1). The coefficients for the correlation between pain sensitivity and the Care/Harm ($r = .19$) and Fairness/Cheating ($r = .24$) foundations indicated a small effect size. The coefficients for the correlation between pain sensitivity and the Loyalty/Betrayal ($r = .52$) foundation indicated a large effect size, while Authority/Subversion ($r = .38$) and Sanctity/Degradation ($r = .44$) foundations indicated a medium effect size (Cohen, 1988). Using semi-partial correlations to control for individual differences variables, the unique effect of pain sensitivity on Care/Harm ($r = .17$), Fairness/Cheating ($r = .17$), Loyalty/Betrayal ($r = .28$), Authority/Subversion ($r = .15$) and Sanctity/Degradation ($r = .16$) foundations was small (Cohen, 1988).

Moral Vignettes. We predicted that participants with higher pain sensitivity would rate the vignettes across foundations as more immoral, even after controlling for individual difference variables. Table 2.2 displays the results of the linear regression. Pain sensitivity predicted higher immoral ratings for Care/Harm subscales emotional harm ($B = 0.08$, $SE = 0.03$, $t = 2.80$, p

= .005) and lower immoral ratings for physical harm to animal ($B = -0.172$, $SE = 0.03$, $t = -5.75$, $p < .001$) but physical harm to humans was not significant ($B = 0.04$, $SE = 0.03$, $t = 1.34$, $p = .18$). We also analysed the Care/Harm foundation as a composite of its subscales for parity with the MFQ, and found that it was not significant ($B = -0.03$, $SE = 0.03$, $t = -0.24$, $p = .35$). Pain sensitivity was also not a significant predictor of perceived immorality of vignettes in the Fairness/Cheating foundation, either ($B = -0.01$, $SE = .03$, $t = -0.24$, $p = .81$).

Pain sensitivity did significantly predict higher perceived immorality of Loyalty/Betrayal vignettes ($B = 0.41$, $SE = 0.03$, $t = 14.74$, $p < .001$), Authority/Subversion vignettes ($B = 0.45$, $SE = 0.03$, $t = 16.58$, $p < .001$) and Sanctity/Degradation vignettes ($B = 0.13$, $SE = 0.03$, $t = 4.21$, $p < .001$). However, after controlling for individual differences variables, Sanctity/Degradation vignettes did not retain significance ($B = 0.02$, $SE = 0.04$, $t = 0.42$, $p = .67$). While pain sensitivity did not predict higher ratings of immorality across foundations, our directional prediction was supported for Loyalty/Betrayal and Authority/Subversion foundations. Just like on Part 1 of the MFQ, pain sensitivity was associated with higher perceptions of “wrongness” on Binding, but not individualizing, moral foundations.

The coefficients for the correlation between pain sensitivity and Loyalty/Betrayal and pain sensitivity and Authority/Subversion vignettes were $r = .41$ and $r = .45$ respectively, indicating a medium effect size (Cohen, 1988). In order to determine the extent of the specific effect of pain sensitivity after controlling for individual difference variables, we computed the semi-partial correlations for each foundation (see Table 2.1). The effect of pain sensitivity on Loyalty/Betrayal and Authority/Subversion vignettes after controlling for individual difference variables were both $r = .21$, indicating a small effect size (Cohen, 1988).

Dilemmas. We predicted that participants with higher pain sensitivity would rate dilemma options that involved less salient pain more favourably in each of the moral dilemmas. Since we had specific predictions for each of the high-conflict dilemmas, depending on their wordings, each dilemma was analysed individually. Contrary to this prediction, pain sensitivity was positively associated with the tendency to consider the behaviour described in the high-conflict moral as “appropriate” for all dilemmas even after controlling for individual difference variables (see Table 2).

Surprisingly, pain sensitivity was also positively associated with approval of the behaviour described in three of the five non-moral dilemmas after controlling for individual differences variables ($B_{D11} = 0.19$, $SE = 0.04$, $t = 4.75$, $p < .001$; $B_{D13} = 0.10$, $SE = 0.04$, $t = 2.39$, $p = .02$; $B_{D14} = 0.12$, $SE = 0.04$, $t = 2.89$, $p = .0039$). This finding is explored further in our discussion.

Pain Sensitivity, Political Orientation and Moral Variables. Finally, we ran a series of analyses to determine whether there were any interaction effects between pain sensitivity and our moral measures. Our exploratory hypothesis was that participants with higher pain sensitivity would show greater endorsement of moral foundations that are more relevant to their political orientation than of moral foundations that are less relevant to their political orientation. Political orientation was analyzed as a continuous variable, however for clarity, participants who identified their Political orientation as being Centrist (i.e., chose 5 on the 9 point-scale) were not included on the graphs.

Moral Foundations Questionnaire. On Part 1 of the MFQ, the interaction between pain sensitivity and political orientation was significant for all five foundations (see Table 4.1). For those who reported being more liberal, higher pain sensitivity predicted lower perceived

relevance of Care/Harm and Fairness/Cheating foundations. Conversely, for those who reported being more conservative, higher pain sensitivity predicted higher perceived relevance of Care/Harm ($B = 0.10$, $SE = 0.03$, $t = 3.06$, $p = .002$) and Fairness/Cheating foundations ($B = 0.11$, $SE = 0.03$, $t = 3.63$, $p < .001$; see Figures 1.1-1.2). However, for both Liberals and Conservatives, higher pain sensitivity predicted higher perceived relevance of Loyalty/Subversion ($B = -0.08$, $SE = 0.03$, $t = -3.20$, $p = .001$), Authority/Subversion ($B = -0.11$, $SE = 0.03$, $t = -4.02$, $p < .001$) and Sanctity/Degradation ($B = -0.16$, $SE = 0.03$, $t = -6.09$, $p < .001$) foundations, but the effect was greater in more liberal participants (see Figure 1.3-1.5).

On Part 2 of the MFQ, the interaction between pain sensitivity and political orientation was significant for all foundations except Care/Harm ($B = 0.05$, $SE = 0.03$, $t = 1.83$, $p = .07$). For both Liberals and Conservatives, higher pain sensitivity predicted higher perceived relevance of the Fairness/Cheating ($B = 0.18$, $SE = 0.03$, $t = 6.42$, $p < .001$) foundation, but the effect was stronger in more conservative participants (see Figure 2.1-2.2). For both Liberals and Conservatives, higher pain sensitivity predicted higher perceived relevance of Loyalty/Subversion ($B = -0.13$, $SE = 0.02$, $t = -5.28$, $p < .001$), Authority/Subversion ($B = -0.20$, $SE = 0.03$, $t = -7.49$, $p < .001$) and Sanctity/Degradation ($B = -0.21$, $SE = 0.03$, $t = -8.21$, $p < .001$) foundations, but the effect was greater in more liberal participants (see Figure 2.3-2.5).

On both Part 1 and Part 2 of the MFQ, higher pain sensitivity among Liberals seemed to bring their endorsement of Binding foundations up to the same strength as Conservatives.

Conservatives with high pain sensitivity also seemed to report similarly to Liberals on Individualizing foundations, though the Care/Harm foundation was not consistently significant.

Moral Vignettes. We found significant interactions between pain sensitivity and political orientation on all foundations except the Care/Harm subscale physical harm to animals ($B = 0.03$,

$SE = 0.03, t = 0.96, p = .34$) and the Care/Harm composite ($B = -0.001, SE = 0.03, t = -0.03, p = .98$; see Table 4.2). For both Liberals and Conservatives, higher pain sensitivity predicted higher perceived relevance of the emotional harm subscale of the Care/Harm foundation ($B = -0.08, SE = 0.03, t = -2.53, p = .01$), as well as the Fairness/Cheating ($B = -0.10, SE = 0.03, t = -3.22, p = .001$), Loyalty/Subversion ($B = -0.14, SE = 0.03, t = -4.70, p < .001$), Authority/Subversion ($B = -0.11, SE = 0.03, t = -3.73, p < .001$) and Sanctity/Degradation ($B = -0.21, SE = 0.03, t = -6.72, p < .001$) foundations, but the effect was stronger in more liberal participants. For both Liberals and Conservatives, higher pain sensitivity predicted higher perceived relevance of the “physical harm to humans” subscale of the Care/Harm foundation ($B = 0.08, SE = 0.03, t = 2.69, p = .007$), but the effect was stronger in more conservative participants. Highly pain sensitive Liberals consistently reported similar condemnation of Binding foundations as Conservatives.

Moral Dilemmas. We found significant interactions between pain sensitivity and political orientation on all moral dilemmas and on two of the five non-moral dilemmas. For both Liberals and Conservatives, higher pain sensitivity predicted higher approval of the utilitarian behaviours described in the high-conflict moral dilemmas, but the effect was stronger in more conservative participants (see Table 4.3, Figures 3.1-3.14).

Discussion

We found that participants with higher pain sensitivity made stronger moral judgements, particularly on Binding moral foundations. We also found that pain sensitivity was positively associated with more approval of the behaviours presented in the high-conflict moral dilemmas. However, this was also the case for non-moral control dilemmas.

Greene (2001, 2004) posited that approval of high-conflict dilemmas, which require participants to report on whether it is appropriate or inappropriate to cause harm to a single person in order to save multiple others, represented the use of utilitarian algebra as opposed to deontological reasoning. But non-moral dilemmas do not pose the same utilitarian vs. deontological trade-off. Thus, our finding that higher pain sensitivity was associated with higher approval of both utilitarian moral choices and inefficient but harmless non-moral choices may indicate that participants with higher pain sensitivity are simply more approving of more salient choices, rather than specifically utilitarian options. Additionally, both moral and non-moral dilemmas were presented in goal-oriented language (e.g., How appropriate or inappropriate is it for you to bring one of your children to the laboratory *in order to* avoid having them both die?) which might have contributed to the observed results. To tease apart these possibilities, we conducted a second, exploratory study where we manipulated the question wording in the dilemmas without changing the details of the dilemmas themselves.

Study 2

Rationale

We ran another online study to further explore the results of Study 1. Once again, we decided to recruit from MTurk, matching our previous sample. Expecting two possible small interaction effects of $f^2 = .02$, we ran a power analysis for a linear multiple regression model examining the R^2 increase. The power analysis found that with an effect size of $f^2 = .02$, $\alpha = .05$ and power = .8, we would need a sample size of 476. Expecting a 10% attrition rate due to inattention or incomplete questionnaires, we recruited 534 participants.

Method

Participants. A sample of 533 American residents was collected using MTurk. Participants were compensated \$1.00 for their participation. Of our sample, 306 identified themselves as men (57%), 222 identified themselves as women (42%), 1 identified themselves as “something else” and 5 participants failed to indicate their gender. The average age among participants was 36.15 years ($SD = 10.88$). Political Orientation was assessed using a 9-point scale sliding scale (1 = Liberal, 5 = Centrist, 9 = Conservative; $M = 4.54$, $SD = 2.66$). Forty-seven percent of the sample indicated that they were Liberal ($N = 253$), thirty-six indicated that they were Conservative ($N = 190$), fifteen percent indicated that they were Centrist ($N = 79$) and eleven participants failed to indicate their Political Orientation.

Procedure. Upon reading the consent form, participants were randomly assigned to one of three conditions. In condition 1, participants completed the original version of the dilemmas, where the utilitarian option (in moral dilemmas) or inefficient option (in non-moral dilemmas) was the salient option and presented in an explicitly goal-oriented way (e.g. High-Conflict: How appropriate or inappropriate is it for you to bring one of your children to the laboratory in order to avoid having them both die?; Non-Moral: How appropriate or inappropriate is it for you to take the history class during the fall term in order to help you fulfill your graduation requirements?). In condition 2, participants completed a different version of the dilemmas, where the utilitarian option (in moral dilemmas) or inefficient option (in non-moral dilemmas) was still the salient option but not presented in an explicitly goal-oriented way (e.g. High-Conflict: How appropriate or inappropriate is it for you to bring one of your children to the laboratory, which would avoid having them both die?; Non-Moral: How appropriate or inappropriate is it for you to

take the history class during the fall term, which would mean that you do not fulfill your graduation requirements?). In condition 3, participants completed yet another version of the dilemmas, where the deontological option (in moral dilemmas) or efficient option (in non-moral dilemmas) is the salient option and not presented in any explicitly goal-oriented way (e.g. High-Conflict: How appropriate or inappropriate is it for you to not bring either of your children to the laboratory, which would mean having them both die?; Non-Moral: How appropriate or inappropriate is it for you to take the science class during the fall term, which would mean that you fulfill your graduation requirements?). Appendix 5 shows the moral dilemmas the wording used in each condition. Participants then completed the Pain Sensitivity Questionnaire (Ruscheweyh et al., 2009), followed by demographic questions and debriefing.

Results

Replicating Study 1. First, we ran a linear regression to establish whether the effect of pain sensitivity on moral judgements from Study 1 would replicate. We found that higher pain sensitivity predicted higher approval of behaviours describing the original, unedited goal-oriented options (see Table 6). However, with the smaller sample size, pain sensitivity not significantly associated with the approval of behaviour described in the original goal-oriented non-moral dilemmas except one ($B_{D10} = 0.23$, $SE = 0.07$, $t = 3.08$, $p = .0024$). This may suggest that the significant effects we found on the non-moral dilemmas in Study 1 were artificially inflated by our large sample size.

Exploratory Hypotheses. Based on our findings in Study 1, our exploratory hypothesis was that participants with higher pain sensitivity would report more approval for utilitarian

behaviours (ie. Conditions 1 and 2), and would report lower approval for deontological behaviours (ie. Condition 3). We found that pain sensitivity was positively associated with approval of the behaviours described in high-conflict moral dilemmas, regardless of condition ($B_{D3} = 0.15$, $SE = 0.07$, $t = 2.08$, $p = .0381$; $B_{D4} = 0.31$, $SE = 0.07$, $t = 4.24$, $p < .001$; $B_{D5} = 0.17$, $SE = 0.07$, $t = 2.30$, $p = .021$; $B_{D6} = 0.34$, $SE = 0.07$, $t = 4.71$, $p < .001$; $B_{D7} = 0.23$, $SE = 0.07$, $t = 3.08$, $p = .00218$; $B_{D8} = 0.35$, $SE = 0.07$, $t = 4.90$, $p < .001$), except for Dilemma 9 ($B_{D9} = 0.091$, $SE = 0.07$, $t = 1.24$, $p = .22$). This suggests that participants with high pain sensitivity were driven by option salience when responding to high-conflict moral dilemmas, rather than utilitarian or deontological content.

In Study 1, we were surprised to find that pain sensitivity was positively associated with greater approval of behaviours on even the non-moral dilemmas. However, this was not the case for non-moral dilemmas in Study 2. Pain sensitivity was only significantly positively associated with one non-moral dilemma ($B_{D10} = 0.24$, $SE = 0.07$, $t = 3.46$, $p < .001$), all others failed to reach significance ($B_{D11} = 0.08$, $SE = 0.06$, $t = 1.31$, $p = .19$; $B_{D12} = -0.01$, $SE = 0.07$, $t = -2.01$, $p = .044$; $B_{D13} = 0.05$, $SE = 0.07$, $t = 0.74$, $p = .459$; $B_{D14} = -0.03$, $SE = 0.07$, $t = -0.48$, $p = .63$). This seems to affirm that there is likely something unique about the relationship between pain sensitivity and high-conflict dilemmas, rather than simply a positive scale bias.

Discussion

We had three exploratory hypotheses. Hypothesis 1) If salience was the driving factor, participants with higher pain sensitivity should report higher approval of the behaviours described in conditions 1, 2 and 3, regardless of utilitarian or deontological content for both moral and non-moral dilemmas. Hypothesis 2) If pain sensitivity is substantively linked to

utilitarianism, participants with higher pain sensitivity should report higher approval of the behaviour described on high-conflict moral dilemmas in conditions 1 (goal-orientation) and 2 (utilitarian-salient), but rate behaviours described in condition 3 (deontological-salient) as being less appropriate. Pain sensitivity, however, would not be systematically associated with approval of either option in non-moral dilemmas in conditions 1, 2, and 3. Hypothesis 3) If goal-oriented focus is the driving factor, then pain sensitivity should be more positively associated with approval of an option when it is explicitly goal-oriented (i.e., condition 1) than when it is not explicitly goal-oriented (in conditions 2 and 3) for both high-conflict moral and non-moral dilemmas.

We found that pain sensitivity was not systematically associated with higher approval of behaviour described in the non-moral dilemmas, suggesting that the significant effects we observed in Study 1 might not be robust. However, pain sensitivity was still positively associated more approval of behaviours described in the moral dilemmas, regardless of utilitarian or deontological question wording. One interpretation of this is that higher pain sensitivity is associated with an increased tendency to approve of whatever option is most salient. However, the fact that non-moral dilemmas do not show the same pattern makes this explanation more dubious. If people with higher pain tolerance are simply more approving of the most salient behaviour, it should follow that they would similarly respond more favorably on non-moral items.

An alternative explanation is that participants with higher pain sensitivity are activating the harm template for both Utilitarian- (i.e., condition 1 and 2) and Deontological-salient (i.e., condition 3) wordings, however the “victims” are being differentially interpreted. According to the theory of Dyadic Morality, harm prototypes include one agent and one patient who comprise

the victim and the perpetrator. In all moral dilemmas, the participant is placed in the role of perpetrator, however, there are two possible victims in high-conflict dilemmas: the person being sacrificed and the people who will be saved due to that sacrifice. Empathizing with the victim is thought to increase condemnation of actions that cause the victim harm (Pizarro, 2000). It is possible that differentially identifying the victim might affect decisions on moral dilemmas. Therefore, in the Deontological-salient condition, it is possible that participants are identifying the victim as the person being sacrificed in the moral dilemmas, and are more approving of behaviour which avoids harming them. Conversely, in the Utilitarian-salient conditions, participants are identifying the people who will be saved due to the sacrifice as the victim, making them more approving of behaviour which saves them.

General Discussion

Pain Sensitivity and Moral Judgements. Propensity for experiencing pain, as measured by the pain sensitivity scale was associated with making stronger moral judgements. Specifically, pain sensitivity was consistently associated with greater endorsement of Loyalty/Betrayal, Authority/Subversion, and Sanctity/Degradation foundations, but not Care/Harm or Fairness/Cheating foundations. Since pain is both theoretically and neurologically associated with harm, we predicted that those with higher pain sensitivity should show higher endorsement of moral behaviour within the Care/Harm foundation. However, this was not the case. One potential explanation for this may have been that effects of pain sensitivity on vignettes and the MFQ Part 1 may have been obscured by ceiling effects. For the moral vignettes, the means of both the Care/Harm composite ($M = 3.85$, $SD = 0.7$) and Fairness/Cheating ($M = 3.8$, $SD = 0.77$) foundations were within the top 25% of the scale, while

Loyalty/Betrayal ($M = 3.13$, $SD = 0.82$), Authority/Subversion ($M = 3.08$, $SD = 0.8$), and Sanctity/Degradation ($M = 3.64$, $SD = 0.86$) foundations were not. For the MFQ Part 2, the mean of the Care/Harm ($M = 4.52$, $SD = 0.98$) foundation was also within the top 25% of the scale, while Fairness/Cheating ($M = 4.38$, $SD = 0.95$), Loyalty/Betrayal ($M = 3.13$, $SD = 1.17$), Authority/Subversion ($M = 4.09$, $SD = 1.15$), and Sanctity/Degradation ($M = 3.8$, $SD = 1.39$) foundations were not.

Pain Sensitivity and Political Orientation. A pervasive stereotype of people with left-wing ideology is that of the “bleeding heart liberal”, someone who is overly generous and caring towards those who may not deserve it (Farwell & Weiner, 2000). As such, it seems intuitive that liberals should have a higher pain sensitivity. The term “bleeding heart” itself suggest an association between feelings of pain and the tendency to care injudiciously. If liberals were more sensitive to pain, it might suggest that their seemingly indiscriminate generosity stems from a heightened empathy, borne of many past painful experiences. However, we found that pain sensitivity was actually positively associated with conservative political orientation.

Previous research has shown that disgust sensitivity predicts political conservatism (Inbar, Pizarro, Iyer, & Haidt, 2012; Terrizzi, Shook, & McDaniel, 2013), and it has been suggested that disgust sensitivity might underlie differences between Conservatives’ and Liberals’ use of moral foundations (Rozin et al., 1999). In this sample, we found that pain sensitivity ($r = .32$) was twice as predictive of political orientation as disgust sensitivity ($r = .16$). Indeed, pain sensitivity was the strongest predictor of political orientation of all the individual differences variables we measured (see Table 1).

One possible explanation for this may be that pain sensitivity increases the severity of moral judgements through the harm template, thus increasing endorsement of all foundations,

including binding foundations. Since binding foundations are associated with more conservative political ideology (Graham et al., 2009; Haidt & Graham, 2007), increased endorsement of these foundations may lead people with higher pain sensitivity to identify more with conservative ideology. Additionally, our data suggests that Liberals and Conservatives are differentially affected by pain sensitivity. When responding to the MFQ, pain sensitivity more strongly predicted Liberal's endorsements of moral judgements. Despite the fact that Liberals typically do not endorse binding foundations, Liberals with higher pain sensitivity endorsed Loyalty/Betrayal, Authority/Subversion and Sanctity/Degradation foundations just as much as Conservatives did. However, on the moral dilemmas, Conservatives with higher pain sensitivity were more approving of utilitarian behaviours compared to Liberals. In fact, Conservatives seemed to be driving the main effect of pain sensitivity on approval of moral dilemmas.

Moral Dilemmas and Salience. Higher pain sensitivity predicted greater approval of the behaviour described in high-conflict moral dilemmas. However, it was unclear in Study 1 whether this is driven by wording salience or whether wording affects how harm attributions are made. In Study 2, it seemed that greater approval of high-conflict dilemmas was driven more by how salient the option was, and not the specific utilitarian or deontological content of the question.

Limitations. Though our study sample was relatively large, one limitation is that participants were recruited to participate through MTurk, remotely, thus we were not able to ensure that participants were responding attentively. The MTurk sample was also predominantly white, educated, and liberal, thus our sample is not very diverse.

Additionally, as mentioned above, our findings are correlational, and as such we are unable to make any definitive judgements about the causal relationship between pain sensitivity and moral

judgements. More research is necessary to determine the causal relationship between pain sensitivity, moral judgements and political orientation.

Future Directions and Conclusion

Future directions for this research will focus on determining the causal relationship between pain and moral judgement. We mean to examine this by running a repeated-measures study examining whether inducing pain will affect participants' responses to the same moral questionnaires used in Study 1. Participants will respond to the moral questions in two blocks. In one block, participants will answer the first half of the moral variables while experiencing painful pressure to one of their fingers. The second block will act as a control, and participants will answer the second half of moral variables without experiencing pain. We also plan to examine whether it is possible to inhibit the harm pathway by blocking pain experiences. We hope to test this by observing whether participants who receive over-the-counter painkillers, that theoretically block their harm template, might display more leniency when making moral judgements.

In this paper, we argue that pain sensitivity is positively associated with moral judgements. To test this, we measured four different types of moral dependent variables: moral vignettes, moral relevance, moral support and moral dilemmas. We found that higher pain sensitivity predicted greater endorsement of binding foundations on moral vignettes and moral relevance questions. Higher pain sensitivity was also associated with higher endorsement of all foundation on moral support questions. Additionally, pain sensitivity was more predictive of conservative political orientation than other individual measures such as disgust sensitivity. Pain sensitivity was associated with higher approval of the behaviour described in moral dilemmas,

regardless of whether utilitarian options or deontological options were made salient. This research suggests there is a link between pain sensitivity and moral judgements, though more research is required to determine the exact nature of that relationship.

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Appendix: Study 1

Table 1

Table of Correlations for Covariates

	1	2	3	4	5	6	7	8
1. Pain Sensitivity	--							
2. Political Orientation	.319***	--						
3. Disgust Sensitivity	.345***	.159***	--					
4. Negative Affectivity	.508***	.172***	.270***	--				
5. State-Trait Anxiety	.289***	.103***	.092**	.616***	--			
6. State-Trait Anger	0.578***	.290***	.167***	.753***	.584***	--		
7. Empathy	0.146***	-.055	.190***	.157***	-.009	-.009	--	
8. Gender	-.059	0.079**	.139***	.095**	.044	-.066	.126***	--

Note: * $p < .05$, ** $p < .01$, *** $p < .001$, two-tailed. $N = 1090$. For gender, 1 = man, 2 = woman, 3 = something else, 4 = prefer not to say.

Table 2.1

Regression Analysis Summary for Pain Sensitivity Predicting Moral Foundations Questionnaire

Variable	B	St. error	t	P-value	r
<i>Moral Foundations, Part 1</i>					
Care/Harm	0.00	0.03	-0.06	.96	.00
Fairness/Cheating	-0.02	0.03	-0.72	.47	-.02
Loyalty/Betrayal	0.48	0.03	17.91	< .001***	.48
Authority/Subversion	0.47	0.03	17.71	< .001***	.47
Sanctity/Degradation	0.46	0.03	17.05	< .001***	.46
<i>Moral Foundations, Part 2</i>					
Care/Harm	0.19	0.03	6.52	< .001***	.19
Fairness/Cheating	0.24	0.03	8.26	< .001***	.24
Loyalty/Betrayal	0.52	0.03	20.12	< .001***	.52
Authority/Subversion	0.38	0.03	13.49	< .001***	.38
Sanctity/Degradation	0.44	0.03	16.00	< .001***	.44

*Note: * $p < .05$, ** $p < .01$, *** $p < .001$. DF of 1 and 1087.*

Table 2.2

Regression Analysis Summary for Pain Sensitivity Predicting Moral Vignettes

Variable	B	St. error	t	P-value	r
Care/Harm	-0.03	0.03	-0.93	0.35	-.03
Emotional	0.08	0.03	2.80	.005**	.08
Animals/Physical	-0.17	0.03	-5.75	< .001***	-.17
Humans/Physical	0.04	0.03	1.34	0.18	.04
Fairness/Cheating	-0.01	0.03	-0.24	0.81	-.01
Loyalty/Betrayal	0.41	0.03	14.74	< .001***	.41
Authority/Subversion	0.45	0.03	16.58	< .001***	.45
Sanctity/Degradation	0.13	0.03	4.21	< .001***	.13

*Note: * $p < .05$, ** $p < .01$, *** $p < .001$. DF of 1 and 1087.*

Table 2.3

Regression Analysis Summary for Pain Sensitivity Predicting Moral Dilemmas

Variable	B	St. error	t	P-value	r
<i>Low-conflict, moral</i>					
1. Donate	-0.04	0.03	-1.42	.16	-.04
2. Taxes	0.51	0.03	19.66	< .001***	.51
<i>High-conflict, moral</i>					
3. Sophie	0.36	0.03	12.81	< .001***	.36
4. Sacrifice	0.31	0.03	10.81	< .001***	.31
5. Life Boat	0.22	0.03	7.60	< .001***	.22
6. Vitamins	0.37	0.03	12.92	< .001***	.37
7. Crying Baby	0.27	0.03	9.24	< .001***	.27
8. Plane Crash	0.04	0.03	14.20	< .001***	.40
9. Euthanasia	0.19	0.03	6.25	< .001***	.19
<i>Non-moral</i>					
10. VCR	0.20	0.03	6.59	< .001***	.20
11. Class	0.19	0.03	6.35	< .001***	.19
12. Jog	0.05	0.03	1.69	.09	.05
13. Food	0.12	0.03	4.14	< .001***	.12
14. Errands	0.09	0.03	2.86	.004**	.09

Note: * $p < .05$, ** $p < .01$, *** $p < .001$. DF of 1 and 1087.

Table 3.1

Regression Analysis Summary for Pain Sensitivity Predicting Moral Foundations Questionnaire

Variable	B	St. error	t	P-value	r	Semi-partial r
<i>Moral Foundations, Part 1</i>						
Care/Harm	-0.01	0.04	-0.18	0.86	.47	.01
Fairness/Cheating	0.02	0.04	0.54	0.59	.42	.01
Loyalty/Betrayal	0.27	0.03	8.01	< .001***	.57	.20
Authority/Subversion	0.27	0.03	8.02	< .001***	.58	.20
Sanctity/Degradation	0.24	0.03	7.27	< .001***	.63	.17
<i>Moral Foundations, Part 2</i>						
Care/Harm	0.22	0.04	6.15	< .001***	.47	.17
Fairness/Cheating	0.23	0.04	6.13	< .001***	.47	.17
Loyalty/Betrayal	0.37	0.03	11.80	< .001***	.65	.28
Authority/Subversion	0.21	0.03	6.07	< .001***	.58	.15
Sanctity/Degradation	0.21	0.03	6.61	< .001***	.64	.16

Note: * $p < .05$, ** $p < .01$, *** $p < .001$. DF of 8 and 1041. Individual differences variables are political orientation, disgust sensitivity, negative affectivity, state-trait anxiety, state-trait anger, empathy and gender.

Table 3.2

Multiple Regression Analysis Summary for Pain Sensitivity Predicting Moral Vignettes Controlling for Individual Differences

Variable	B	St. error	t	P-value	r	Semi-partial r
Care/Harm	-0.04	0.04	-1.12	.26	.47	.00
Emotional	0.03	0.04	0.91	.37	.44	.00
Animals/Physical	-0.15	0.04	4.02	< .001***	.43	.01
Humans/Physical	0.05	0.04	1.22	.22	.35	.00
Fairness/Cheating	0.00	0.04	0.09	.93	.35	.00
Loyalty/Betrayal	0.28	0.04	7.73	< .001***	.48	.21
Authority/Subversion	0.28	0.04	8.04	< .001***	.52	.21
Sanctity/Degradation	0.02	0.04	0.42	.67	.46	.01

*Note: * $p < .05$, ** $p < .01$, *** $p < .001$. DF of 8 and 1041. Individual differences variables are political orientation, disgust sensitivity, negative affectivity, state-trait anxiety, state-trait anger, empathy and gender.*

Table 3.3

Multiple Regression Analysis Summary for Pain Sensitivity Predicting Moral Dilemmas Controlling for Individual Differences

Variable	B	St. error	t	P-value	r	Semi-partial r
<i>Low-conflict, moral</i>						
1. Donate	-0.03	0.04	-0.68	.50	.02	.00
2. Taxes	0.36	0.03	10.62	< .001***	.27	.07
<i>High-conflict, moral</i>						
3. Sophie	0.29	0.04	7.67	< .001***	.22	.05
4. Sacrifice	0.21	0.04	5.55	< .001***	.15	.02
5. Life Boat	0.13	0.04	3.43	< .001***	.10	.01
6. Vitamins	0.24	0.04	6.54	< .001***	.18	.03
7. Crying Baby	0.21	0.04	5.54	< .001***	.16	.02
8. Plane Crash	0.29	0.04	8.12	< .001***	.22	.05
9. Euthanasia	0.10	0.04	2.46	.014*	.07	.01
<i>Non-moral</i>						
10. VCR	0.17	0.04	4.11	< .001***	.12	.02
11. Class	0.19	0.04	4.75	< .001***	.14	.02
12. Jog	0.07	0.04	1.60	.11	.05	.00
13. Food	0.10	0.04	2.39	.0169*	.07	.01
14. Errands	0.12	0.04	2.89	.00394**	.09	.01

*Note: * p < .05, ** p < .01, *** p < .001. DF of 8 and 1035. Individual differences variables are political orientation, disgust sensitivity, negative affectivity, state-trait anxiety, state-trait anger, empathy and gender.*

Table 4.1

Interaction Between Pain Sensitivity and Political Orientation on Moral Foundations Questionnaire

Variable	<i>B</i>	<i>St. error</i>	<i>t</i>	<i>P-value</i>
<i>Moral Foundations, Part 1</i>				
Care/Harm	0.10	0.03	3.06	.002**
Fairness/Cheating	0.11	0.03	3.64	< .001***
Loyalty/Betrayal	-0.09	0.03	-3.20	.001**
Authority/Subversion	-0.11	0.03	-4.02	< .001***
Sanctity/Degradation	-0.16	0.03	-6.09	< .001***
<i>Moral Foundations, Part 2</i>				
Care/Harm	0.06	0.03	1.83	.07
Fairness/Cheating	0.19	0.03	6.42	< .001***
Loyalty/Betrayal	-0.13	0.02	-5.28	< .001***
Authority/Subversion	-0.20	0.03	-7.49	< .001***
Sanctity/Degradation	-0.21	0.03	-8.21	< .001***

*Note: * p < .05, ** p < .01, *** p < .001. DF of 3 and 1051.*

Table 4.2

Interaction Between Pain Sensitivity and Political Orientation on Moral Vignettes

Variable	<i>B</i>	<i>St. error</i>	<i>t</i>	<i>P-value</i>
Care/Harm	0.00	0.03	-0.03	.98
Emotional	-0.08	0.03	-2.53	.01*
Animals/Physical	0.03	0.03	0.96	.34
Humans/Physical	0.08	0.03	2.70	.007**
Fairness/Cheating	-0.10	0.03	-3.22	.0013**
Loyalty/Betrayal	-0.14	0.03	-4.70	< .001***
Authority/Subversion	-0.11	0.03	-3.73	< .001***
Sanctity/Degradation				

Note: * $p < .05$, ** $p < .01$, *** $p < .001$. *DF* of 3 and 1043.

Table 4.3

Interaction Between Pain Sensitivity and Political Orientation on Moral Dilemmas

Variable	<i>B</i>	<i>St. error</i>	<i>t</i>	<i>P-value</i>
<i>Low-conflict, moral</i>				
1. Donate	0.10	0.03	3.08	.002**
2. Taxes	0.10	0.03	3.77	< .001***
<i>High-conflict, moral</i>				
3. Sophie	0.12	0.03	4.13	< .001***
4. Sacrifice	0.19	0.03	6.52	< .001***
5. Life Boat	0.15	0.03	4.98	< .001***
6. Vitamines	0.14	0.03	4.78	< .001***
7. Crying Baby	0.22	0.03	7.38	< .001***
8. Plane Crash	0.22	0.03	7.76	< .001***
9. Euthanasia	0.16	0.03	5.12	< .001***
<i>Non-moral</i>				
10. VCR	0.09	0.03	2.84	.004**
11. Class	0.01	0.03	0.27	.79
12. Jog	0.04	0.03	1.11	.27
13. Food	0.08	0.03	2.55	.01*
14. Errands	0.06	0.03	1.74	.08

Note: * $p < .05$, ** $p < .01$, *** $p < .001$. *DF* of 3 and 1051 *df*.

Table 5.1

Interaction Between Pain Sensitivity and Political Orientation on Moral Foundations Questionnaire

Variable	<i>B</i>	<i>P-value</i>
<i>Moral Foundations, Part 1</i>		
Care/Harm	-0.01	0.86
Political Orientation	-0.16	< .001***
Disgust Sensitivity	0.11	< .001***
Negative Affectivity	-0.14	.002**
State-Trait Anxiety	0.02	.55
State-Trait Anger	0.04	.35
Empathy	0.42	< .001***
Gender	0.07	.16
Fairness/Cheating	0.02	0.59
Political Orientation	-0.18	< .001***
Disgust Sensitivity	0.06	.039*
Negative Affectivity	-0.24	< .001***
State-Trait Anxiety	0.07	.08
State-Trait Anger	0.05	.27
Empathy	0.37	< .001***
Gender	-0.04	.49
Loyalty/Betrayal	0.37	< .001***
Political Orientation	0.26	< .001***
Disgust Sensitivity	0.17	< .001***
Negative Affectivity	0.07	.11
State-Trait Anxiety	-0.02	.58
State-Trait Anger	0.03	.48
Empathy	0.09	< .001***
Gender	-0.09	.06
Authority/Subversion	0.21	< .001***
Political Orientation	0.28	< .001***
Disgust Sensitivity	0.18	< .001***
Negative Affectivity	0.04	.38

State-Trait Anxiety	-0.05	.13
State-Trait Anger	0.05	.23
Empathy	0.10	< .001***
Gender	-0.06	.21
Sanctity/Degradation	0.21	< .001***
Political Orientation	0.33	< .001***
Disgust Sensitivity	0.28	< .001***
Negative Affectivity	0.08	.07
State-Trait Anxiety	-0.05	.16
State-Trait Anger	-0.02	.67
Empathy	0.08	0.002**
Gender	-0.04	.37

Moral Foundations, Part 2

Care/Harm	0.22	< .001***
Political Orientation	-0.17	< .001***
Disgust Sensitivity	0.16	< .001***
Negative Affectivity	0.04	.35
State-Trait Anxiety	-0.06	.12
State-Trait Anger	-0.13	.008**
Empathy	0.28	< .001***
Gender	0.16	0.002**
Fairness/Cheating	0.23	< .001***
Political Orientation	-0.27	< .001***
Disgust Sensitivity	0.09	.002**
Negative Affectivity	-0.01	.90
State-Trait Anxiety	-0.07	.05
State-Trait Anger	0.08	.09
Empathy	0.29	< .001***
Gender	-0.07	.15
Loyalty/Betrayal	0.37	< .001***
Political Orientation	0.38	< .001***
Disgust Sensitivity	0.13	< .001***
Negative Affectivity	0.12	.004**
State-Trait Anxiety	-0.08	.015*
State-Trait Anger	-0.10	.013*

Empathy	0.03	.17
Gender	0.18	< .001***
Authority/Subversion	0.21	< .001***
Political Orientation	0.40	< .001***
Disgust Sensitivity	0.19	< .001***
Negative Affectivity	0.06	.19
State-Trait Anxiety	-0.12	< .001***
State-Trait Anger	-0.04	.36
Empathy	0.07	.014*
Gender	-0.09	.06
Sanctity/Degradation	0.21	< .001***
Political Orientation	0.36	< .001***
Disgust Sensitivity	0.32	< .001***
Negative Affectivity	0.04	.30
State-Trait Anxiety	-0.06	.07
State-Trait Anger	-0.03	.44
Empathy	0.06	.018*
Gender	-0.07	.12

*Note: * $p < .05$, ** $p < .01$, *** $p < .001$. DF of 8 and 1041. Individual differences variables are political orientation, disgust sensitivity, negative affectivity, state-trait anxiety, state-trait anger, empathy and gender.*

Table 5.2

Interaction Between Pain Sensitivity and Political Orientation on Moral Vignettes

Variable	<i>B</i>	<i>P-value</i>
Care/Harm	-0.04	.26
Political Orientation	-0.19	< .001***
Disgust Sensitivity	0.28	< .001***
Negative Affectivity	-0.08	.09
State-Trait Anxiety	-0.07	.06
State-Trait Anger	0.00	.99
Empathy	0.23	< .001***
Gender	0.26	< .001***
Emotional	0.03	.37
Political Orientation	-0.10	< .001***
Disgust Sensitivity	0.32	< .001***
Negative Affectivity	-0.05	.30
State-Trait Anxiety	-0.07	.06
State-Trait Anger	-0.02	.72
Empathy	0.22	< .001***
Gender	0.14	.009**
Animals/Physical	-0.15	< .001***
Political Orientation	-0.18	< .001***
Disgust Sensitivity	0.22	< .001***
Negative Affectivity	-0.11	.019*
State-Trait Anxiety	-0.03	.37
State-Trait Anger	0.00	.92
Empathy	0.20	< .001***
Gender	0.23	< .001***
Humans/Physical	0.05	.22
Political Orientation	-0.21	< .001***
Disgust Sensitivity	0.11	< .001***
Negative Affectivity	-0.01	.80
State-Trait Anxiety	-0.07	.06
State-Trait Anger	0.04	.42
Empathy	0.14	< .001***
Gender	0.32	< .001***

Fairness/Cheating	0.00	.93
Political Orientation	-0.03	.33
Disgust Sensitivity	0.25	< .001***
Negative Affectivity	-0.14	.004**
State-Trait Anxiety	-0.04	.31
State-Trait Anger	-0.05	.31
Empathy	0.19	< .001***
Gender	0.03	.56
Loyalty/Betrayal	0.28	< .001***
Political Orientation	0.12	< .001***
Disgust Sensitivity	0.23	< .001***
Negative Affectivity	-0.03	.46
State-Trait Anxiety	-0.05	.15
State-Trait Anger	0.07	.16
Empathy	0.03	.27
Gender	-0.01	.80
Authority/Subversion	0.28	< .001***
Political Orientation	0.11	< .001***
Disgust Sensitivity	0.24	< .001***
Negative Affectivity	-0.03	.56
State-Trait Anxiety	-0.06	.08
State-Trait Anger	0.12	.014*
Empathy	0.04	.16
Gender	0.03	.60
Sanctity/Degradation	0.02	.67
Political Orientation	0.12	< .001***
Disgust Sensitivity	0.41	< .001***
Negative Affectivity	-0.07	.12
State-Trait Anxiety	-0.05	.14
State-Trait Anger	-0.05	.30
Empathy	0.10	< .001***
Gender	0.08	.12

*Note: * p < .05, ** p < .01, *** p < .001. DF of 8 and 1041 df. Individual differences variables are political orientation, disgust sensitivity, negative affectivity, state-trait anxiety, state-trait anger, empathy and gender.*

Table 5.3

Interaction Between Pain Sensitivity and Political Orientation on Moral Dilemmas

Variable	<i>B</i>	<i>P-value</i>
<i>Low-conflict, moral</i>		
1. Donate	-0.03	.50
Political Orientation	0.02	.60
Disgust Sensitivity	-0.10	.002**
Negative Affectivity	-0.13	.014*
State-Trait Anxiety	0.05	.19
State-Trait Anger	0.08	.16
Empathy	0.16	< .001***
Gender	-0.02	.77
2. Taxes	0.36	< .001***
Political Orientation	0.10	< .001***
Disgust Sensitivity	-0.13	< .001***
Negative Affectivity	0.14	.0014**
State-Trait Anxiety	-0.02	.54
State-Trait Anger	0.16	< .001***
Empathy	-0.02	.39
Gender	-0.12	.011*
<i>High-conflict, moral</i>		
3. Sophie	0.29	< .001***
Political Orientation	0.06	.07
Disgust Sensitivity	-0.13	< .001***
Negative Affectivity	0.00	1.00
State-Trait Anxiety	0.04	.30
State-Trait Anger	0.14	0.004**
Empathy	0.01	.77
Gender	-0.14	0.009**
4. Sacrifice	0.21	< .001***
Political Orientation	0.026422	.38
Disgust Sensitivity	-0.17	< .001***
Negative Affectivity	-0.05	.28
State-Trait Anxiety	0.07	.045*

State-Trait Anger	0.27	< .001***
Empathy	0.00	.95
Gender	-0.14	.0079**
5. Life Boat	0.13	< .001***
Political Orientation	0.04	.20
Disgust Sensitivity	-0.09	.006**
Negative Affectivity	-0.12	.018*
State-Trait Anxiety	-0.01	.89
State-Trait Anger	0.29	< .001***
Empathy	0.03	.38
Gender	-0.21	< .001***
6. Vitamines	0.24	< .001***
Political Orientation	0.06	.04*
Disgust Sensitivity	-0.10	.001**
Negative Affectivity	0.06	.24
State-Trait Anxiety	0.03	.35
State-Trait Anger	0.15	.002**
Empathy	0.03	.29
Gender	-0.14	.007**
7. Crying Baby	0.21	< .001***
Political Orientation	0.02	.62
Disgust Sensitivity	-0.23	< .001***
Negative Affectivity	-0.03	.60
State-Trait Anxiety	0.02	.54
State-Trait Anger	0.25	< .001***
Empathy	-0.03	.28
Gender	-0.14	.0096**
8. Plane Crash	0.29	< .001***
Political Orientation	0.02	.59
Disgust Sensitivity	-0.16	< .001***
Negative Affectivity	0.01	.86
State-Trait Anxiety	0.01	.87
State-Trait Anger	0.26	< .001***
Empathy	-0.06	.041*
Gender	-0.10	0.04*

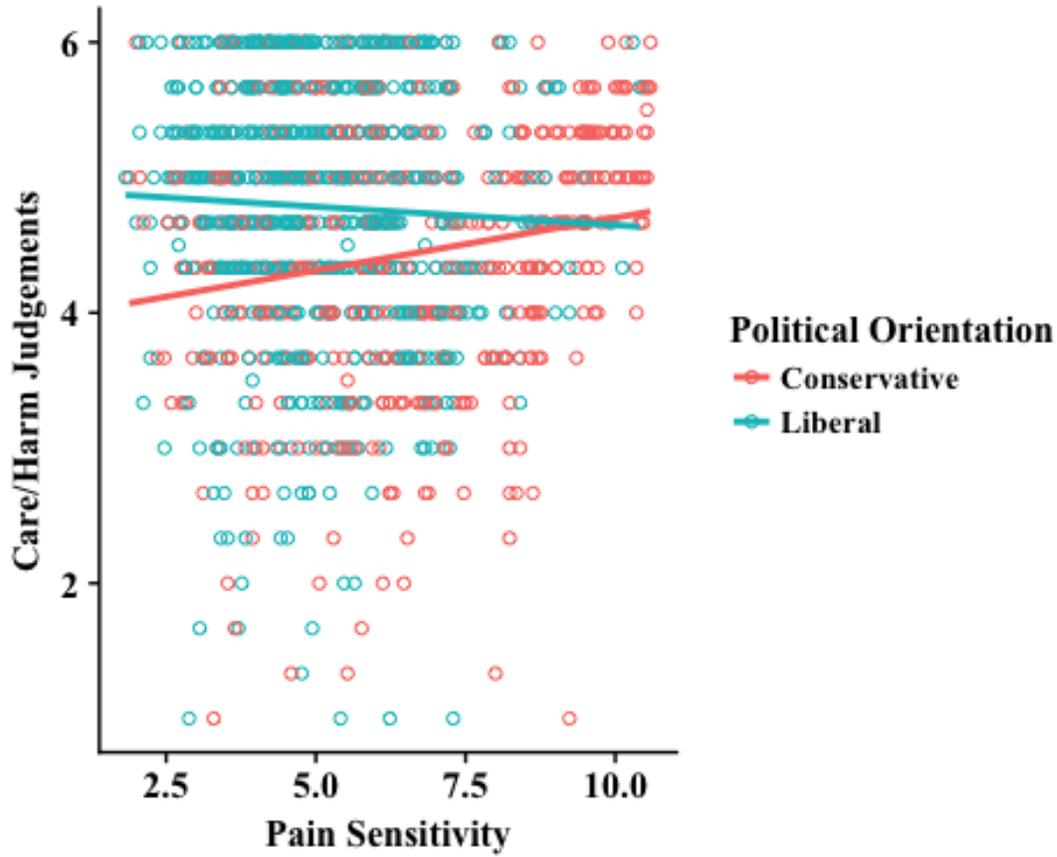
9. Euthanasia	0.10	.014*
Political Orientation	0.02	.59
Disgust Sensitivity	-0.14	< .001***
Negative Affectivity	0.00	.94
State-Trait Anxiety	0.00	.95
State-Trait Anger	0.21	< .001***
Empathy	0.09	.004**
Gender	-0.03	.64
<i>Non-moral</i>		
10. VCR	0.17	< .001***
Political Orientation	0.06	.07
Disgust Sensitivity	-0.08	.02*
Negative Affectivity	-0.04	.46
State-Trait Anxiety	0.14	< .001***
State-Trait Anger	0.00	.96
Empathy	0.10	.0015**
Gender	-0.09	.10
11. Class	0.19	< .001***
Political Orientation	0.06	.08
Disgust Sensitivity	0.02	.50
Negative Affectivity	-0.05	.32
State-Trait Anxiety	0.04	.39
State-Trait Anger	-0.05	.33
Empathy	0.11	< .001***
Gender	-0.14	.015*
12. Jog	0.07	.11
Political Orientation	0.04	.19
Disgust Sensitivity	0.01	.83
Negative Affectivity	-0.13	0.017*
State-Trait Anxiety	0.02	.68
State-Trait Anger	0.00	.94
Empathy	0.15	< .001***
Gender	-0.15	.008**
13. Food	0.10	.0169*
Political Orientation	0.02	.64
Disgust Sensitivity	-0.02	.60

Negative Affectivity	-0.01	.88
State-Trait Anxiety	0.03	.41
State-Trait Anger	0.01	.84
Empathy	0.07	.035*
Gender	-0.13	.027*
14. Errands	0.12	.00394**
Political Orientation	-0.01	.81
Disgust Sensitivity	0.05	.11
Negative Affectivity	-0.12	.022*
State-Trait Anxiety	0.07	.07
State-Trait Anger	0.06	.26
Empathy	0.14	< .001***
Gender	-0.12	0.04*

*Note: * $p < .05$, ** $p < .01$, *** $p < .001$. DF of 8 and 1035. Individual differences variables are political orientation, disgust sensitivity, negative affectivity, state-trait anxiety, state-trait anger, empathy and gender.*

Figure 1.1.1

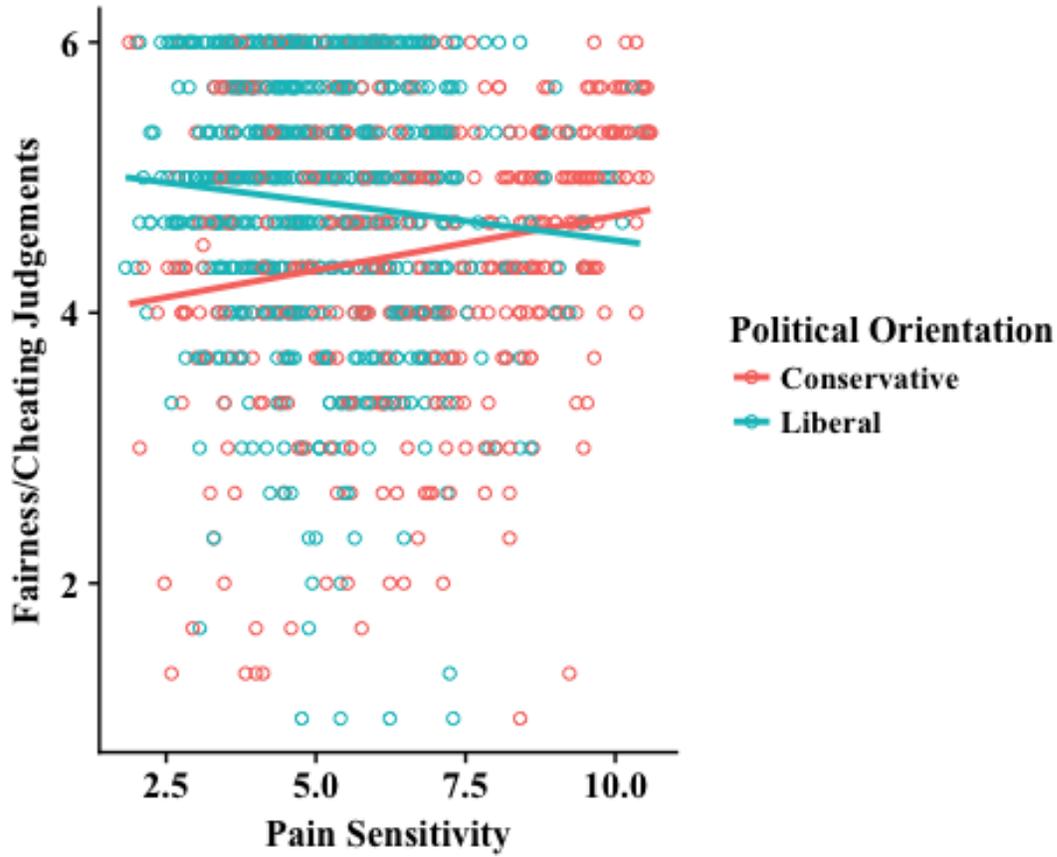
Interaction Between Pain Sensitivity and Political Orientation on the Care/Harm Foundation on the Moral Foundation Questionnaire Part 1



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 1.1.2

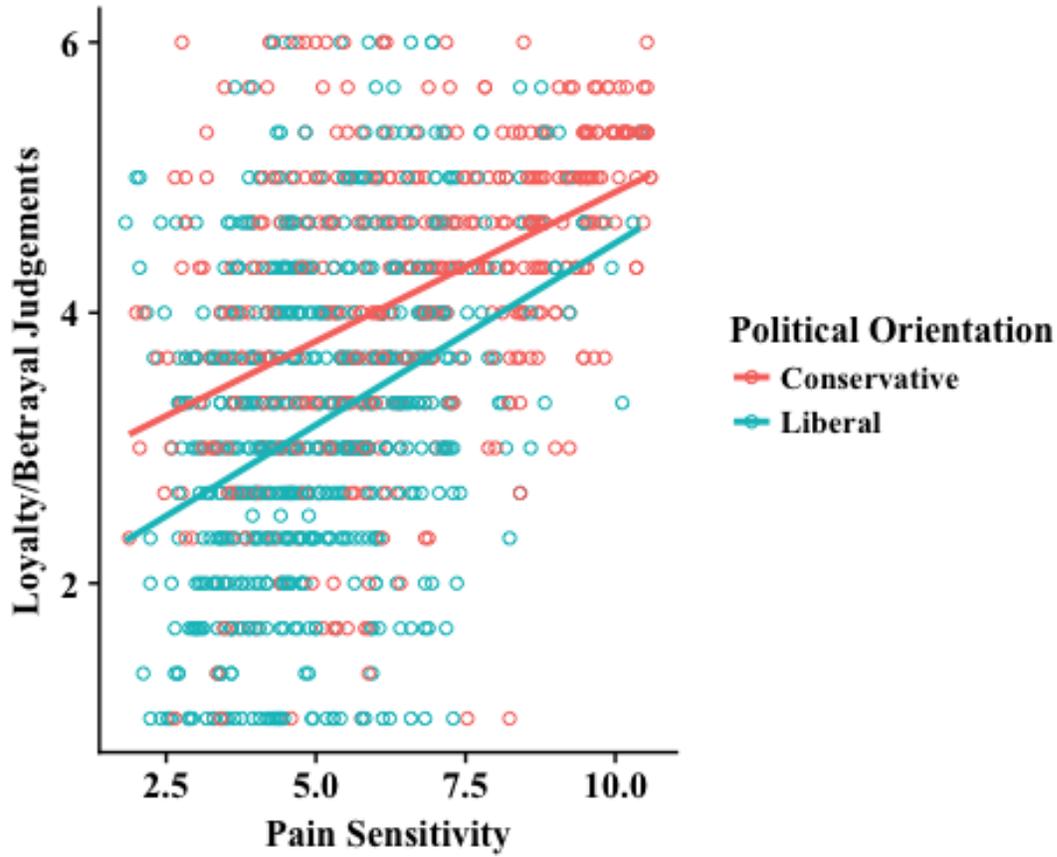
Interaction Between Pain Sensitivity and Political Orientation on the Fairness/Cheating on the Foundation Moral Foundation Questionnaire Part 1



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 1.1.3

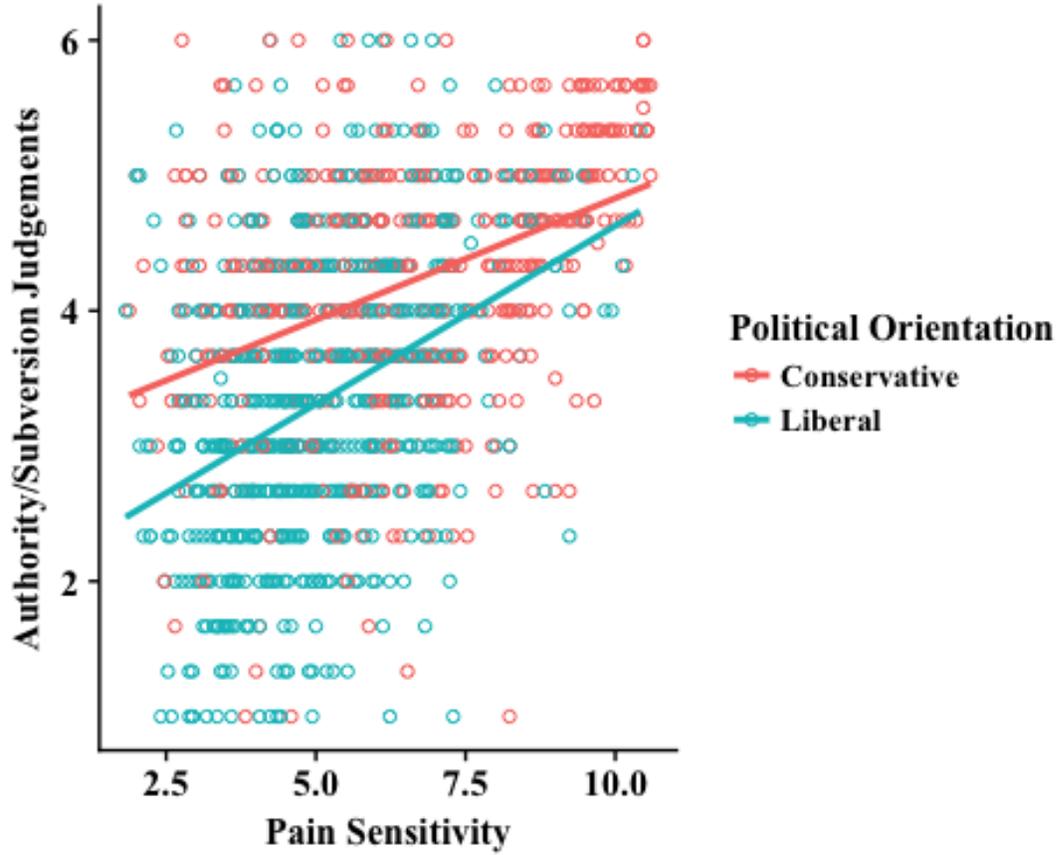
Interaction Between Pain Sensitivity and Political Orientation on the Loyalty/Betrayal on the Foundation Moral Foundation Questionnaire Part 1



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 1.1.4

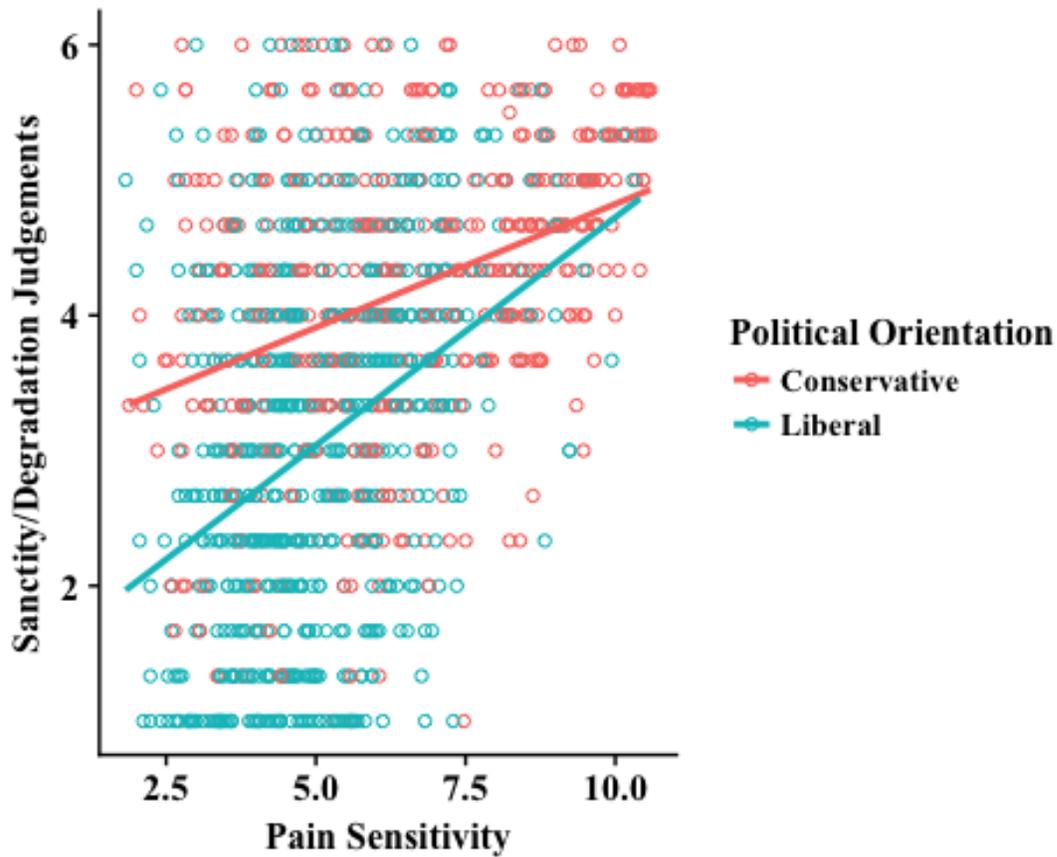
Interaction Between Pain Sensitivity and Political Orientation on the Authority/Subversion on the Foundation Moral Foundation Questionnaire Part 1



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 1.1.5

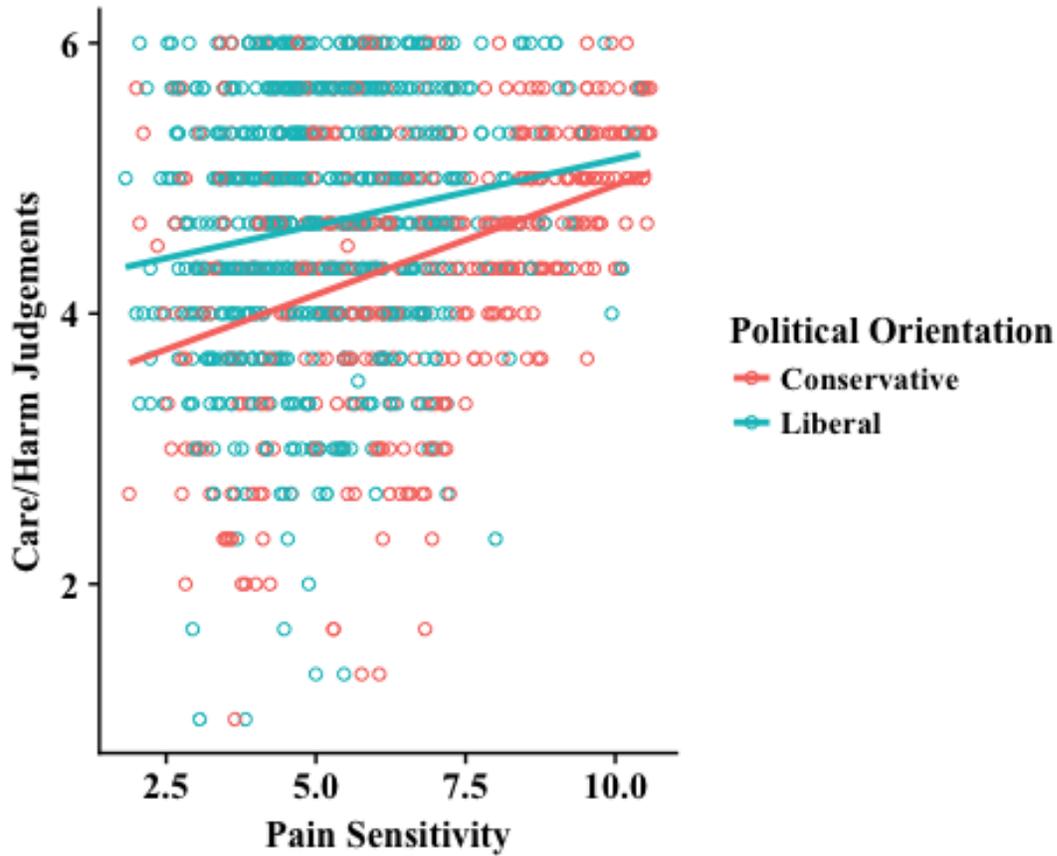
Interaction Between Pain Sensitivity and Political Orientation on the Sanctity/Degradation Foundation on the Moral Foundation Questionnaire Part 1



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 1.2.1

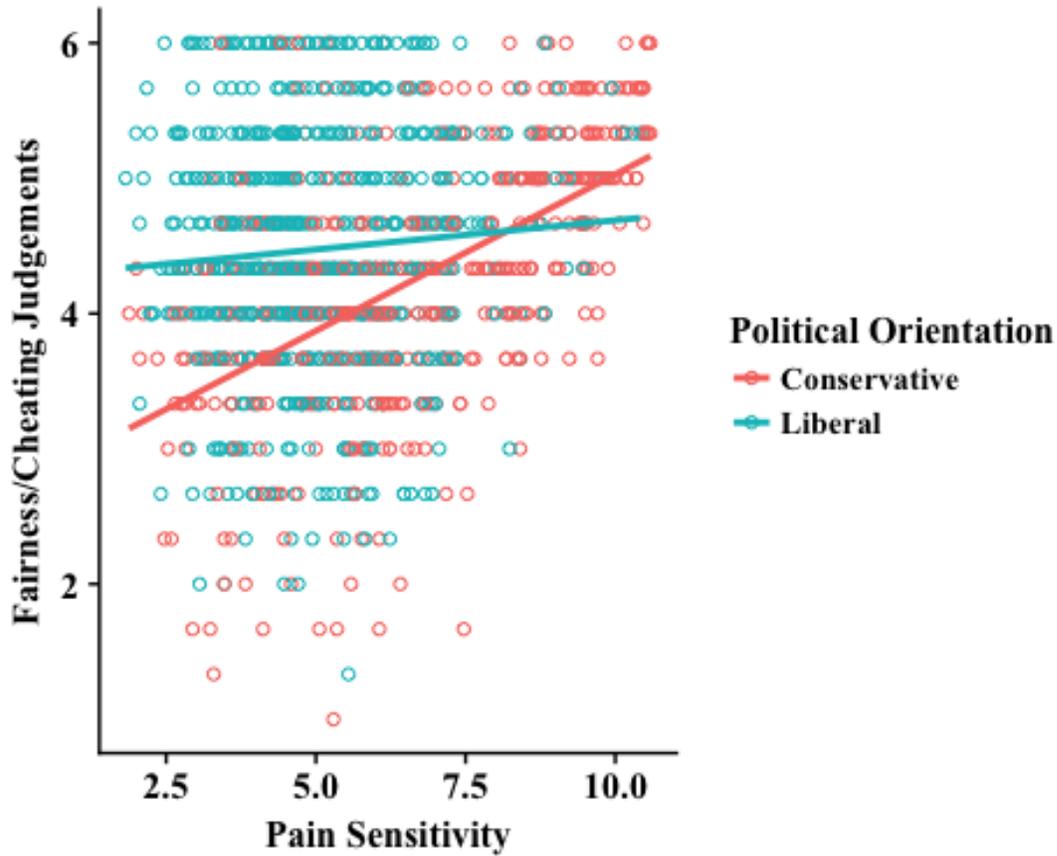
Interaction Between Pain Sensitivity and Political Orientation on the Care/Harm Foundation on the Moral Foundation Questionnaire Part 2



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 1.2.2

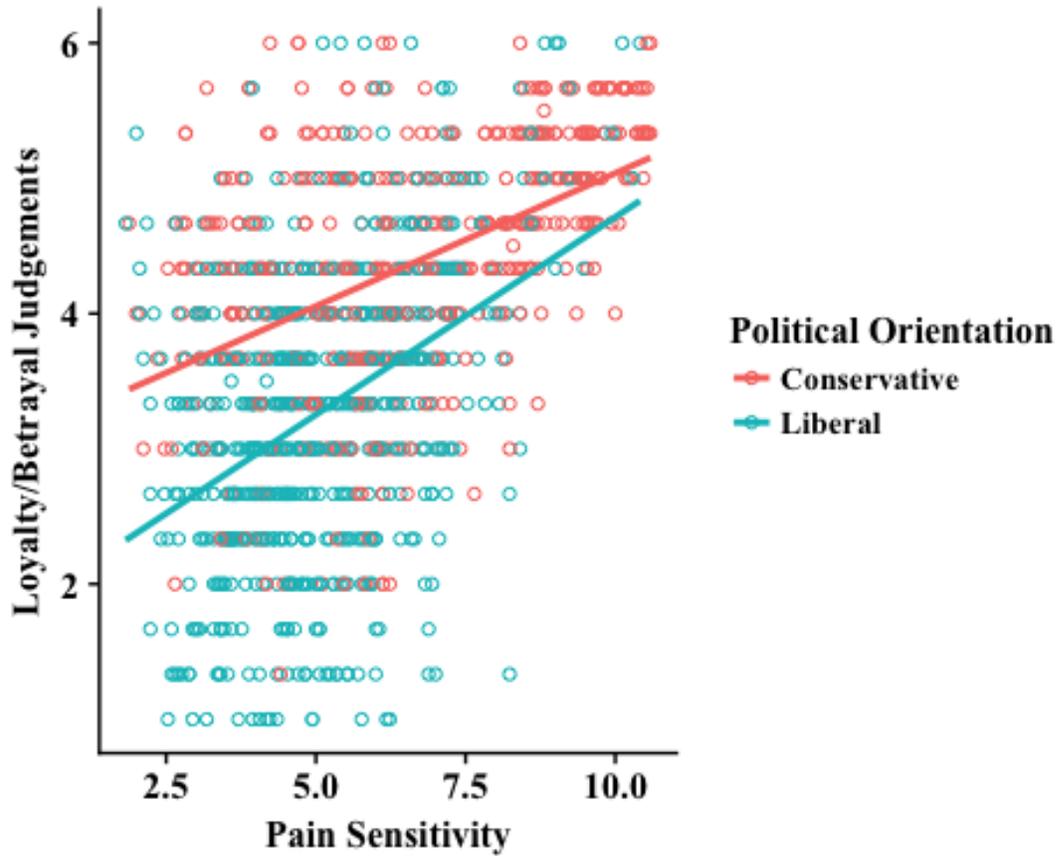
Interaction Between Pain Sensitivity and Political Orientation on the Fairness/Cheating Foundation on the Moral Foundation Questionnaire Part 2



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 1.2.3

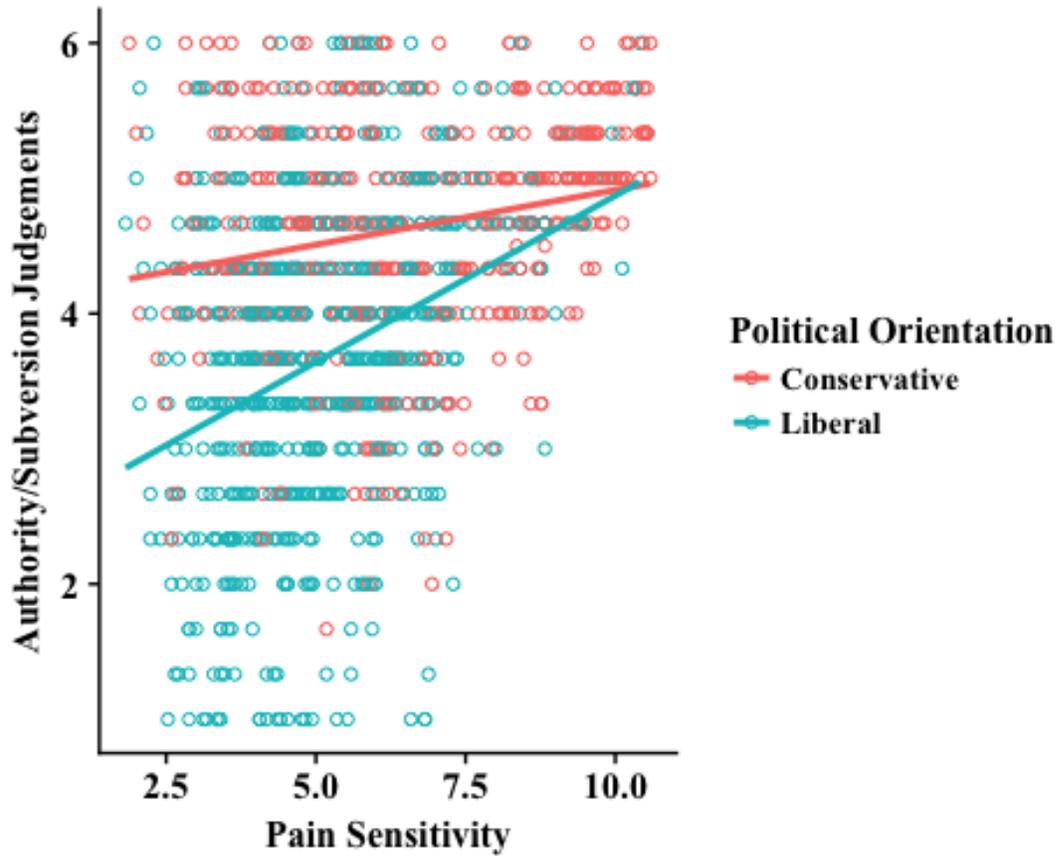
Interaction Between Pain Sensitivity and Political Orientation on the Loyalty/Betrayal Foundation on the Moral Foundation Questionnaire Part 2



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 1.2.4

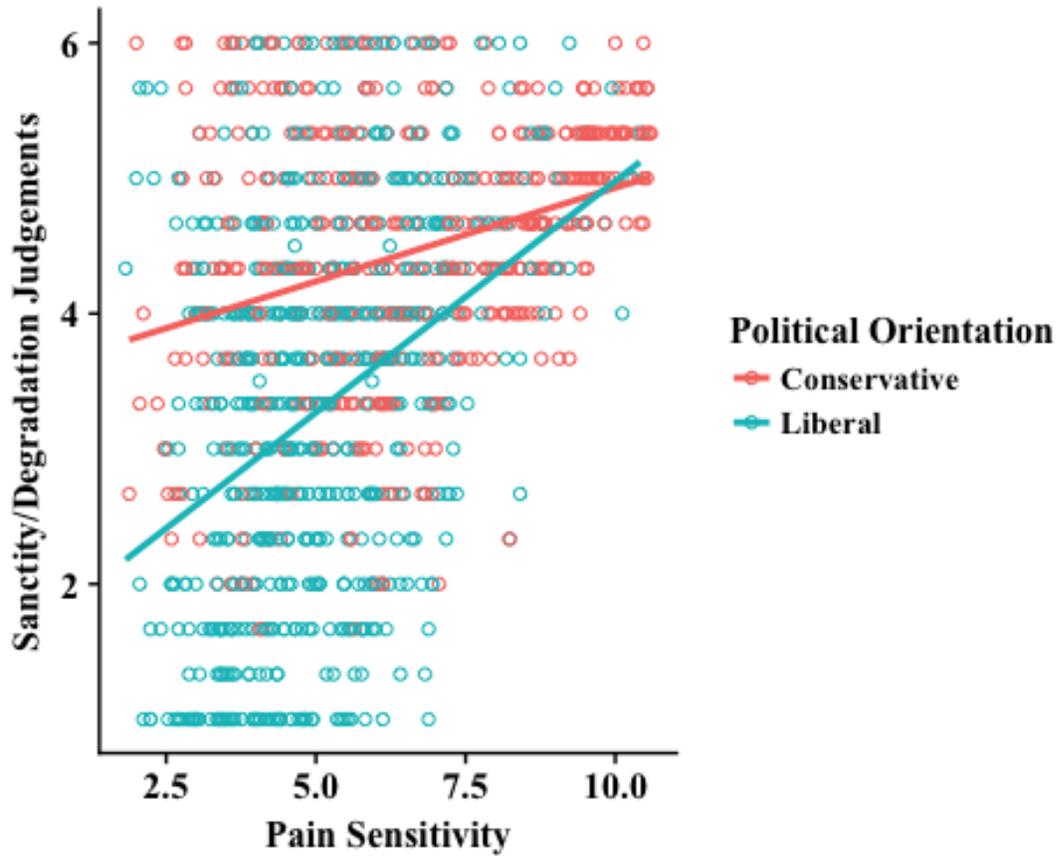
Interaction Between Pain Sensitivity and Political Orientation on the Authority/Subversion Foundation on the Moral Foundation Questionnaire Part 2



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 1.2.5

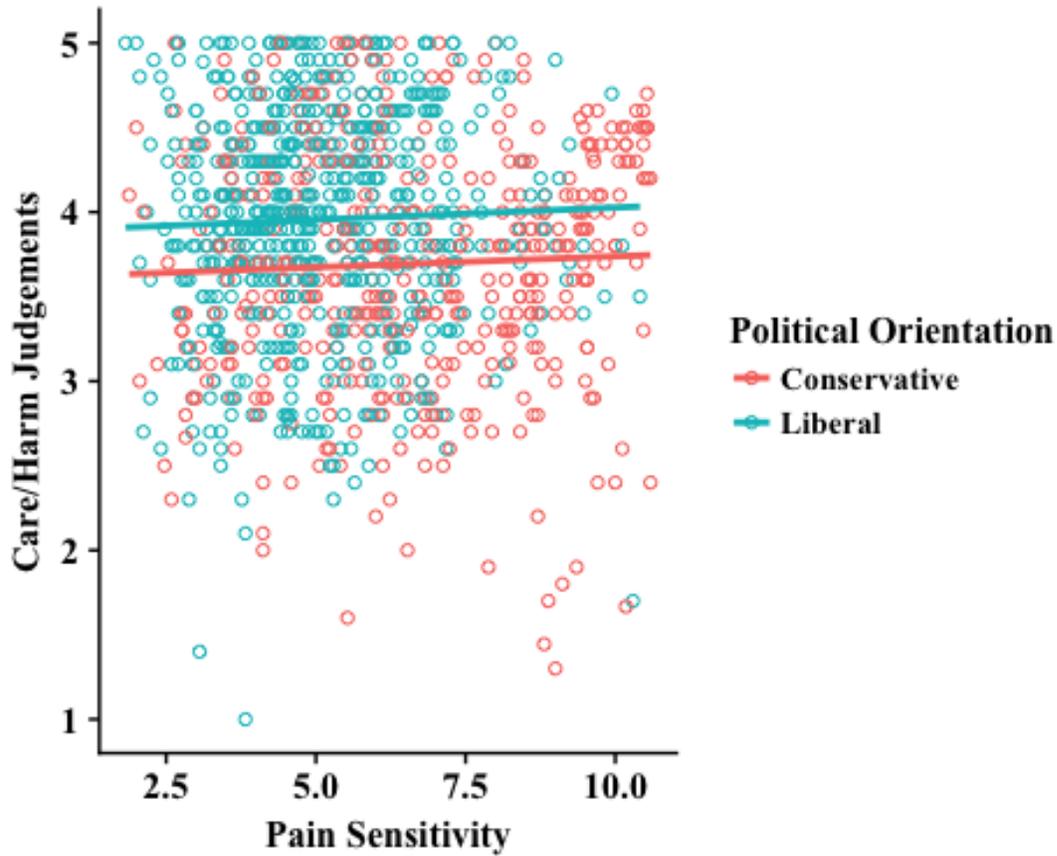
Interaction Between Pain Sensitivity and Political Orientation on the Sanctity/Degradation Foundation on the Moral Foundation Questionnaire Part 2



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 2.1

Interaction Between Pain Sensitivity and Political Orientation on the Care/Harm Foundation on the Moral Vignettes



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 2.1.1

Interaction Between Pain Sensitivity and Political Orientation on the Emotional Harm subscale of the Care/Harm Foundation on the Moral Vignettes

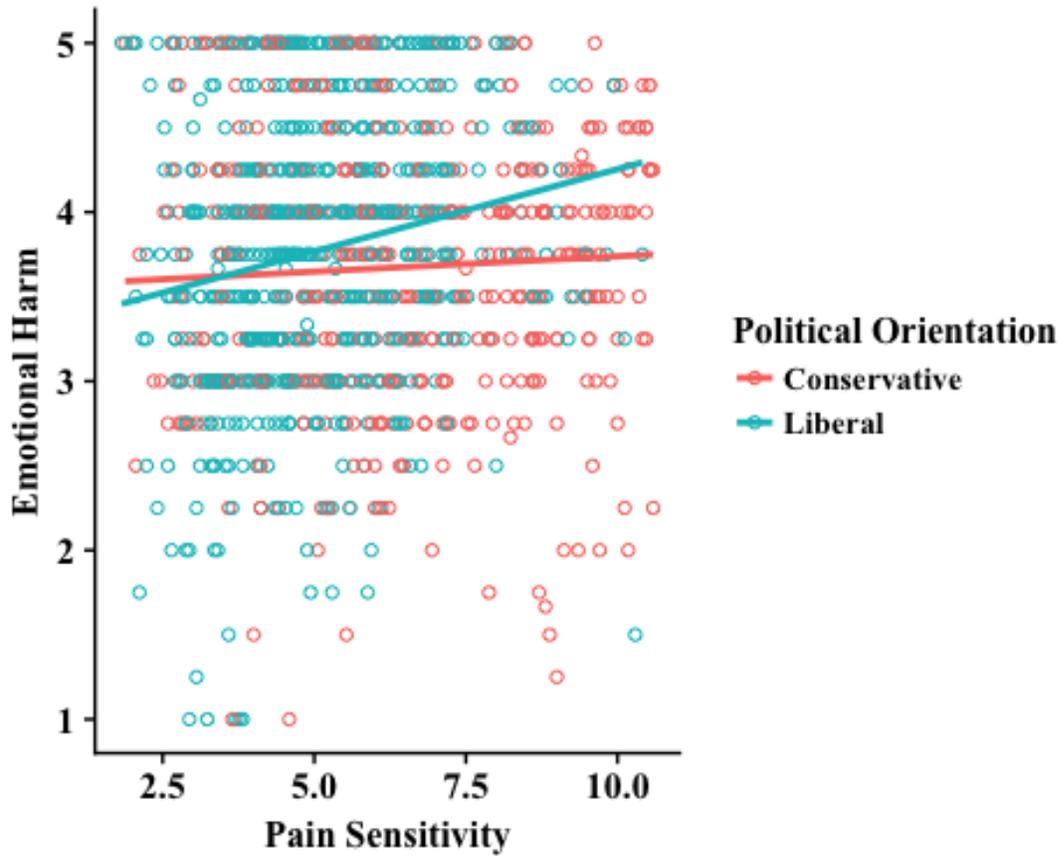
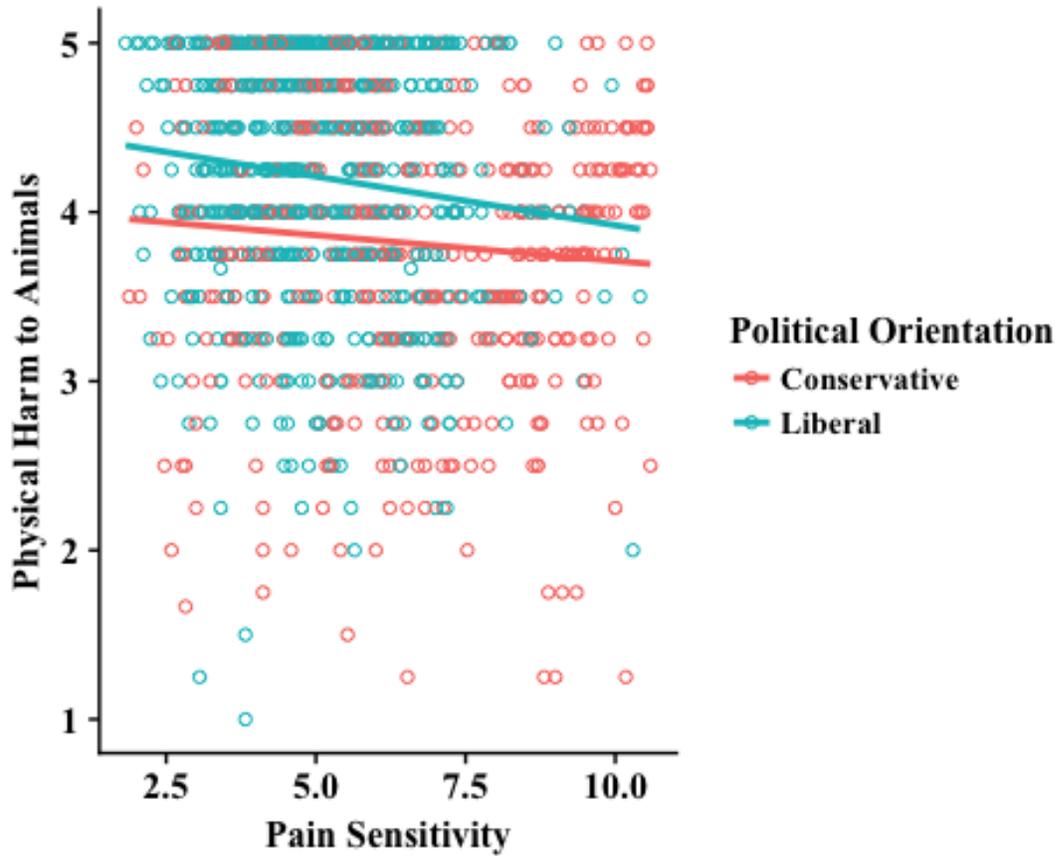


Figure 2.1.2

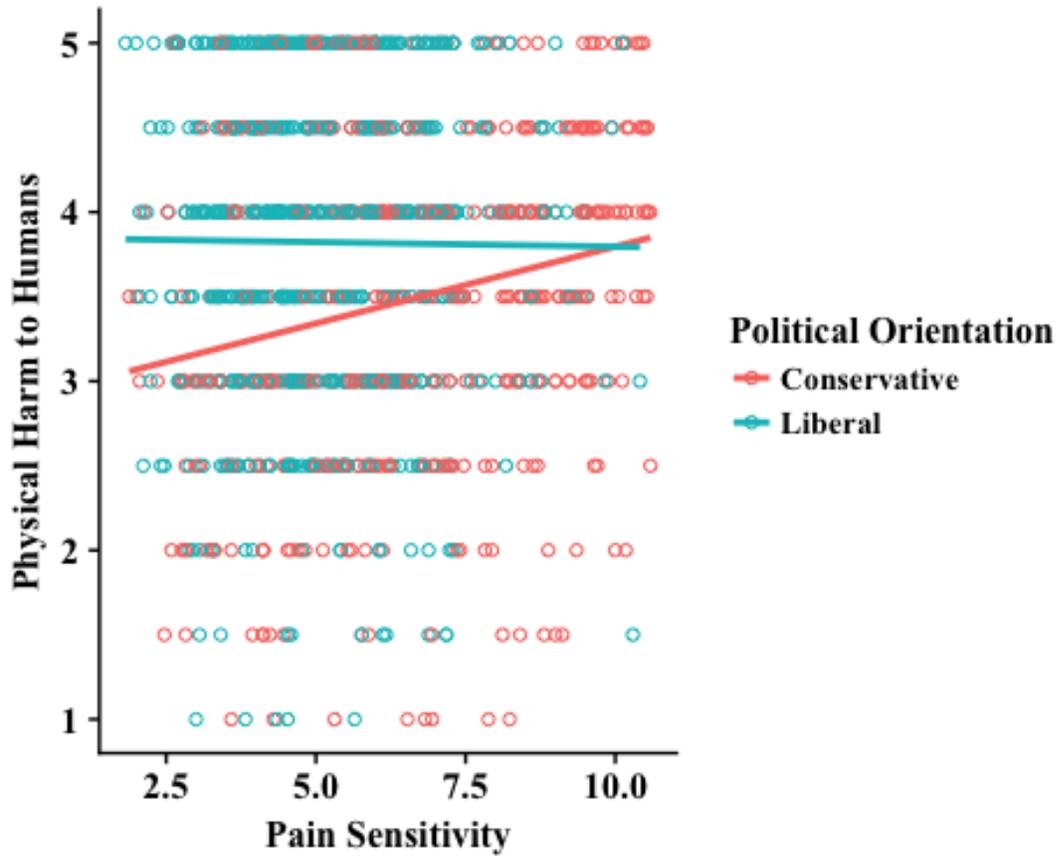
Interaction Between Pain Sensitivity and Political Orientation on the Physical Harm to Animals subscale of the Care/Harm Foundation on the Moral Vignettes



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 2.1.3

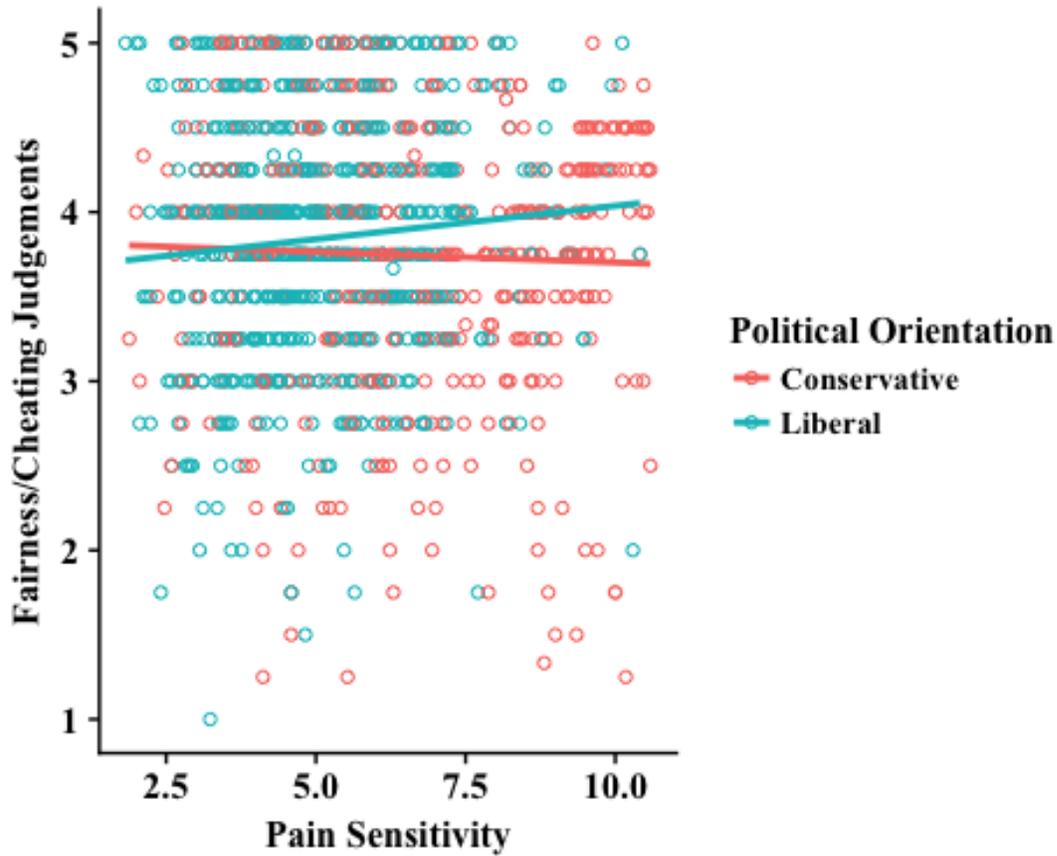
Interaction Between Pain Sensitivity and Political Orientation on the Physical Harm to Humans subscale of the Care/Harm Foundation on the Moral Vignettes



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 2.2

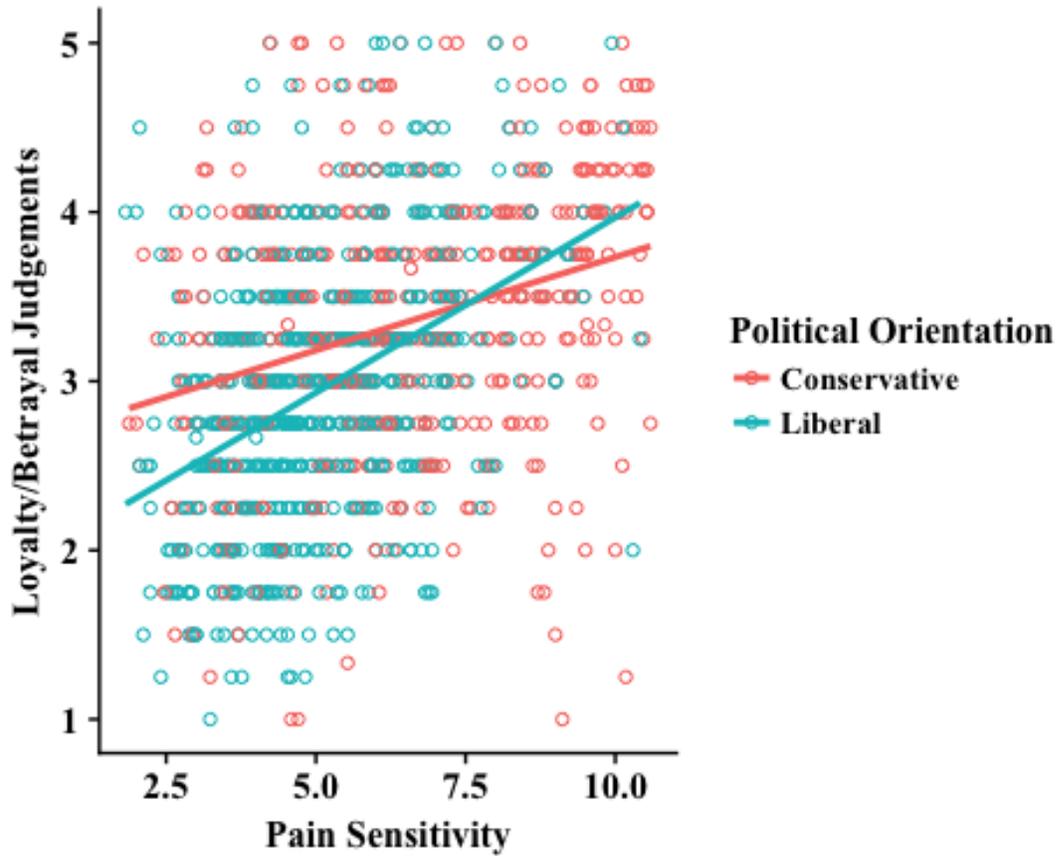
Interaction Between Pain Sensitivity and Political Orientation on the Fairness/Cheating Foundation on the Moral Vignettes



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 2.3

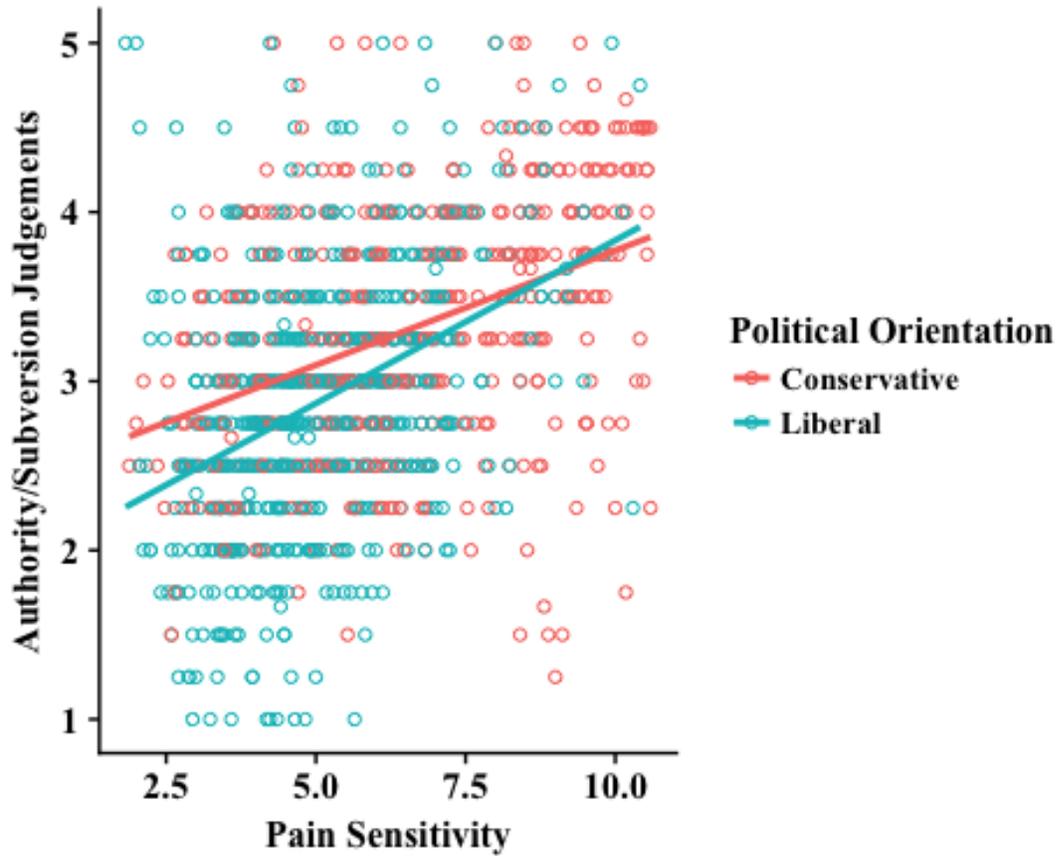
Interaction Between Pain Sensitivity and Political Orientation on the Loyalty/Betrayal Foundation on the Moral Vignettes



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 2.4

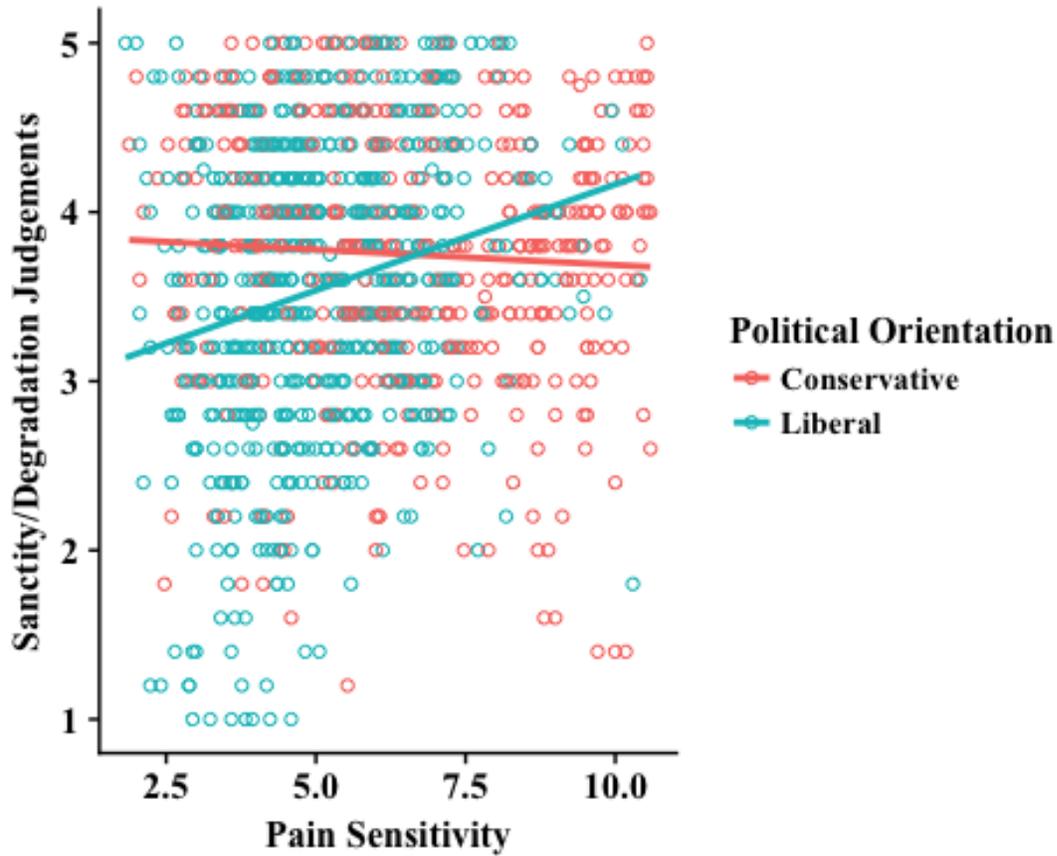
Interaction Between Pain Sensitivity and Political Orientation on the Authority/Subversion Foundation on the Moral Vignettes



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 2.5

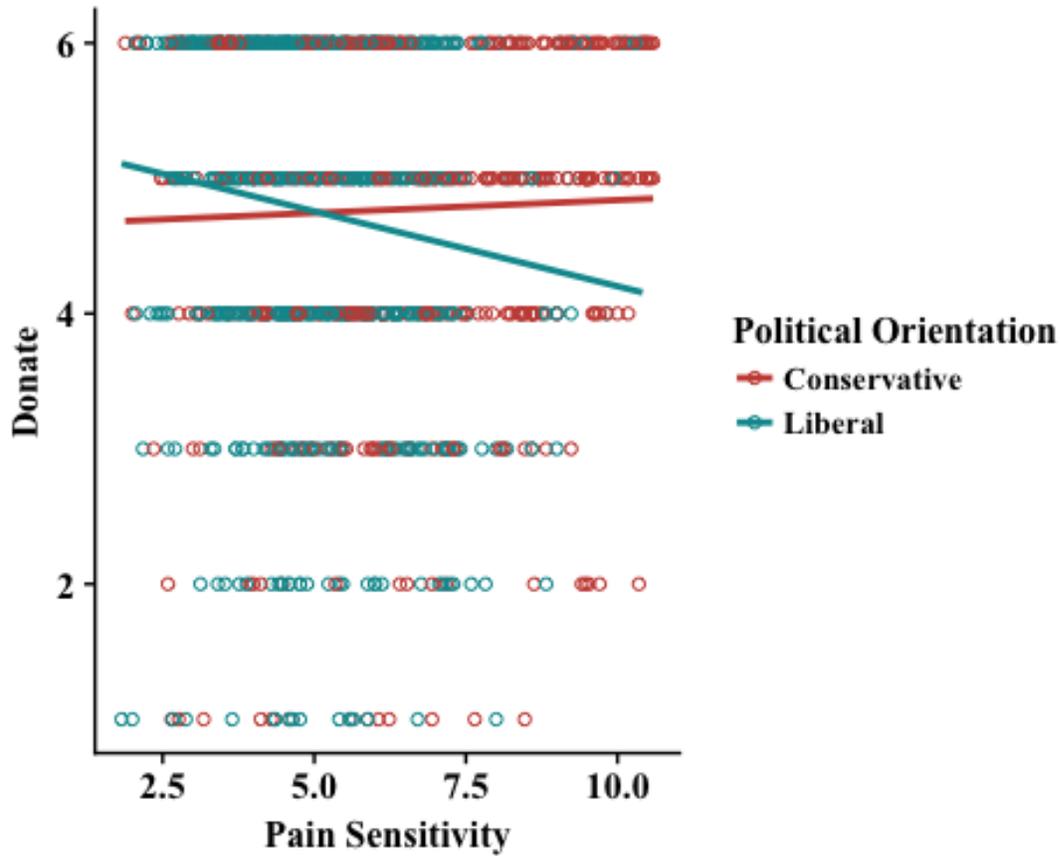
Interaction Between Pain Sensitivity and Political Orientation on the Sanctity/Degradation Foundation on the Moral Vignettes



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 3.1

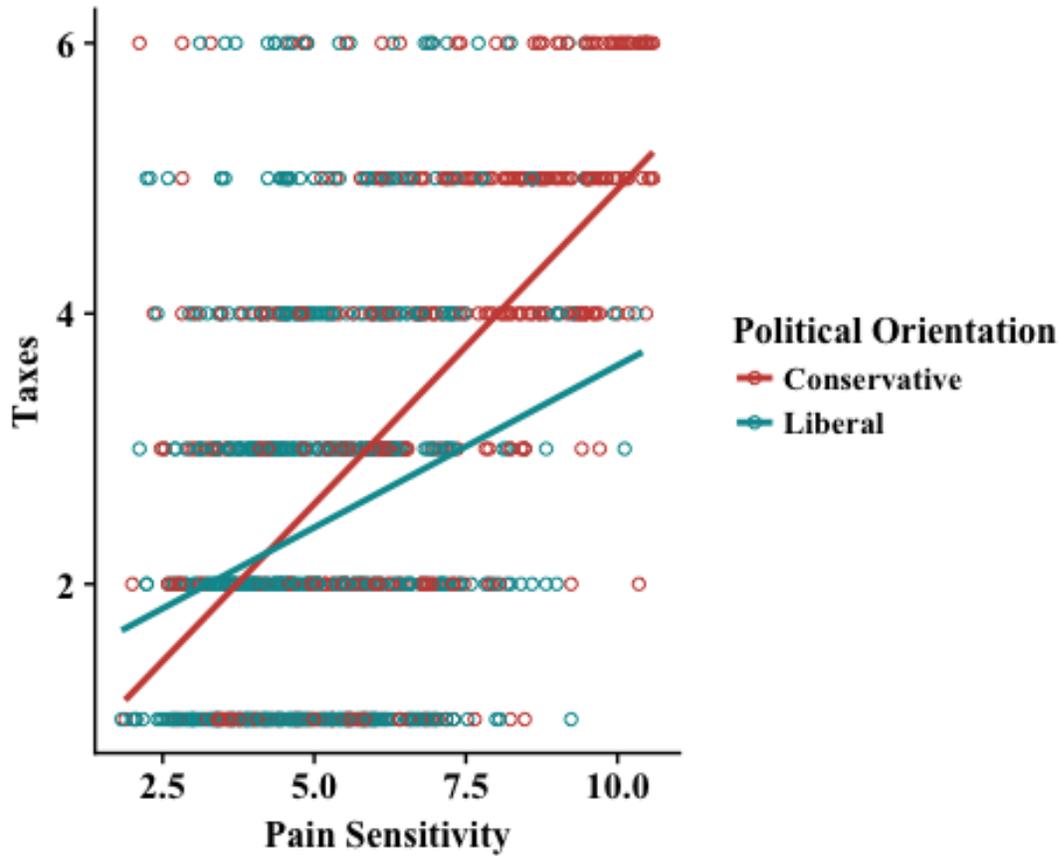
Interaction Between Pain Sensitivity and Political Orientation on the Low-Conflict “Donate” Moral Dilemma



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 3.2

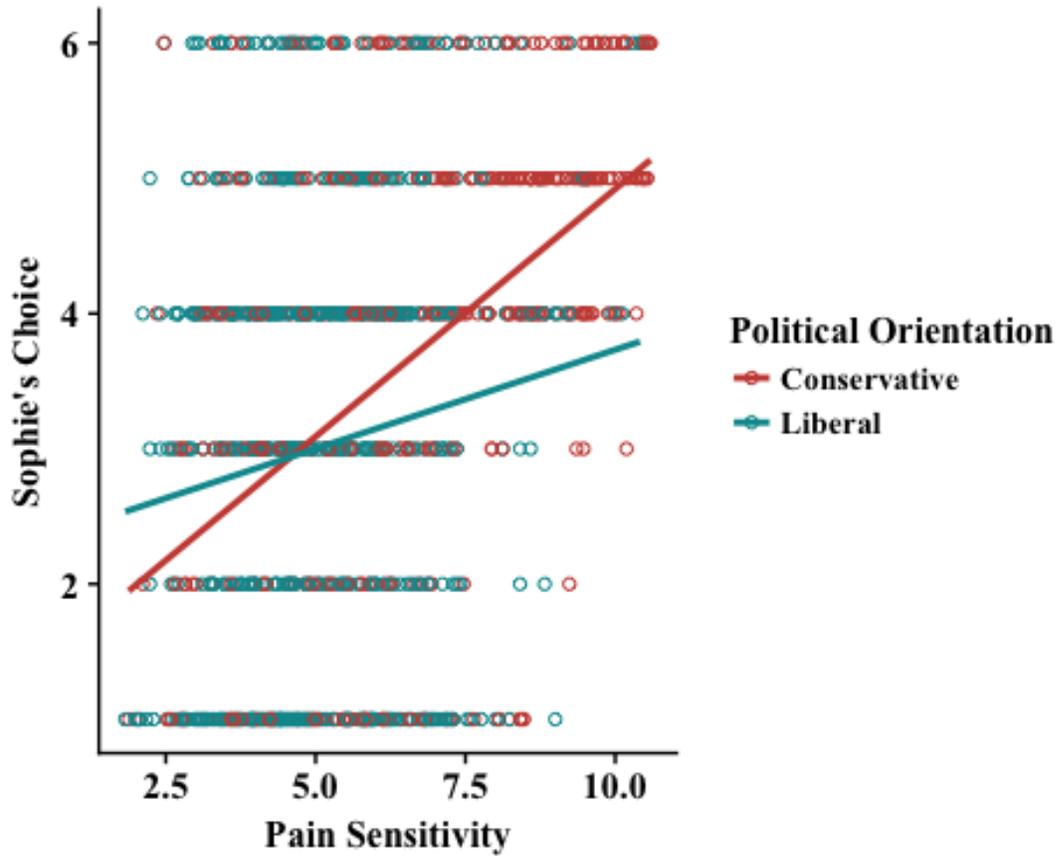
Interaction Between Pain Sensitivity and Political Orientation on the Low-Conflict “Taxes” Moral Dilemma



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 3.3

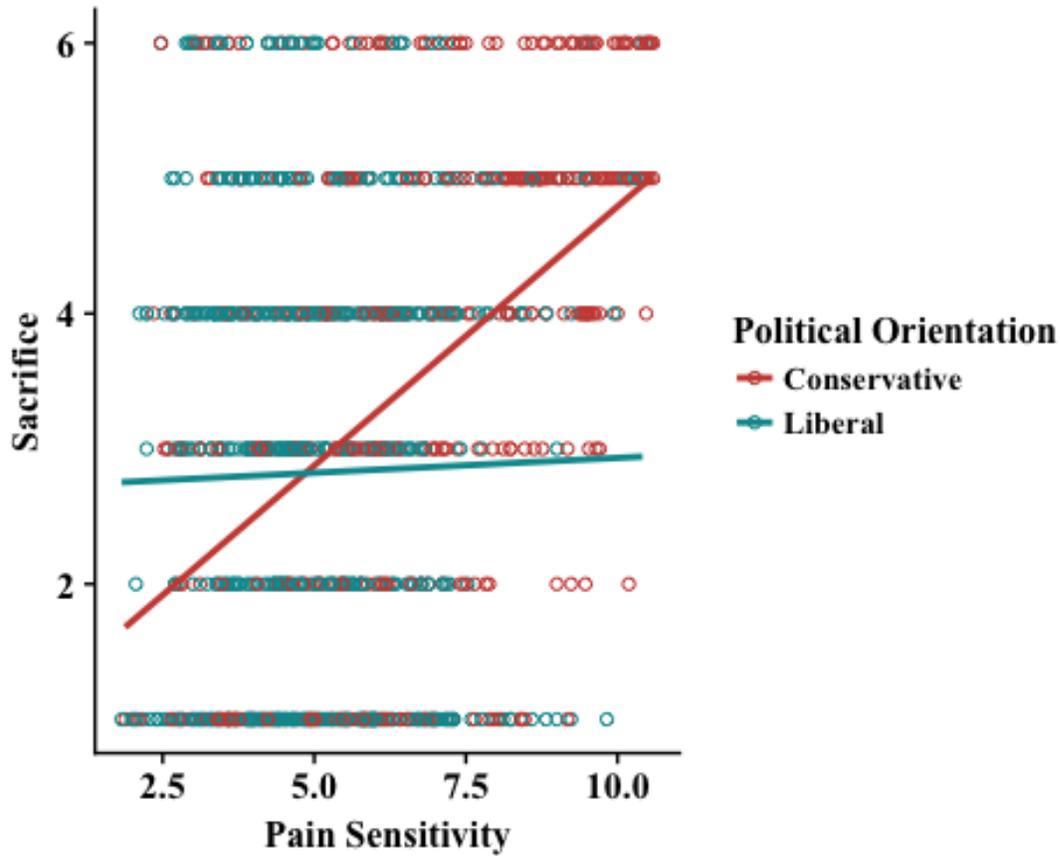
Interaction Between Pain Sensitivity and Political Orientation on the High-Conflict “Sophie’s Choice” Moral Dilemma



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 3.4

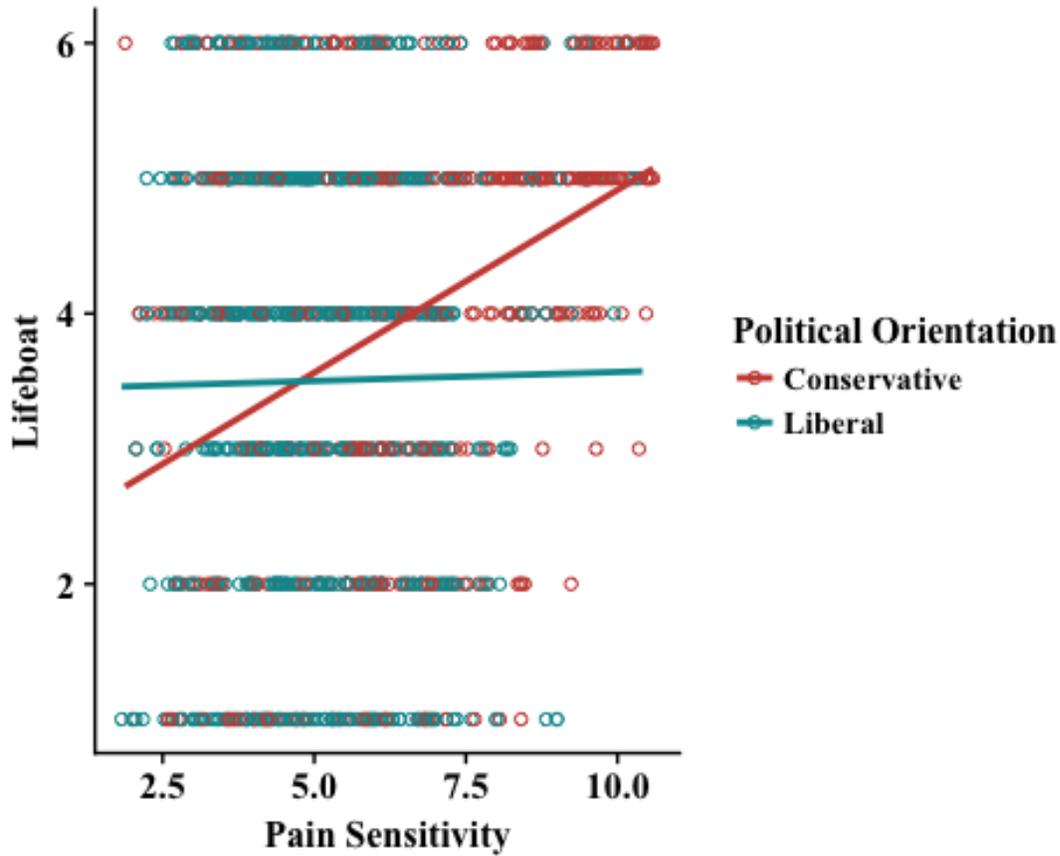
Interaction Between Pain Sensitivity and Political Orientation on the High-Conflict “Sacrifice” Moral Dilemma



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 3.5

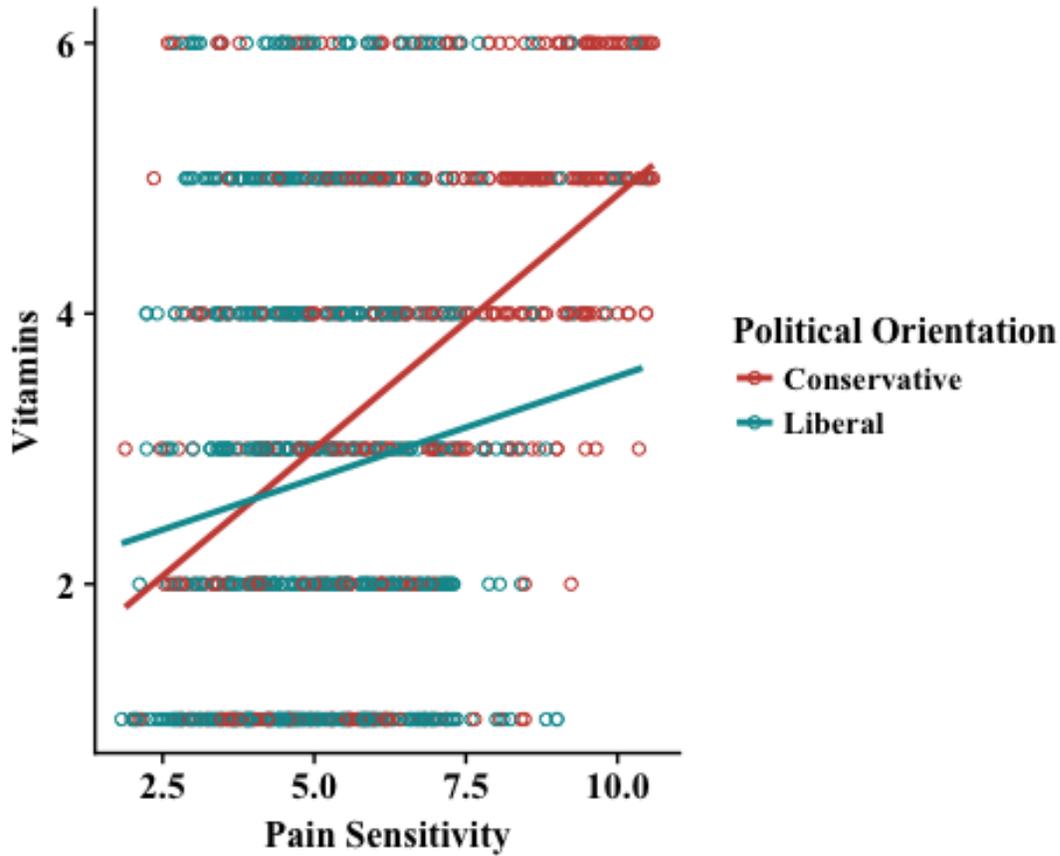
Interaction Between Pain Sensitivity and Political Orientation on the High-Conflict “Lifeboat” Moral Dilemma



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 3.6

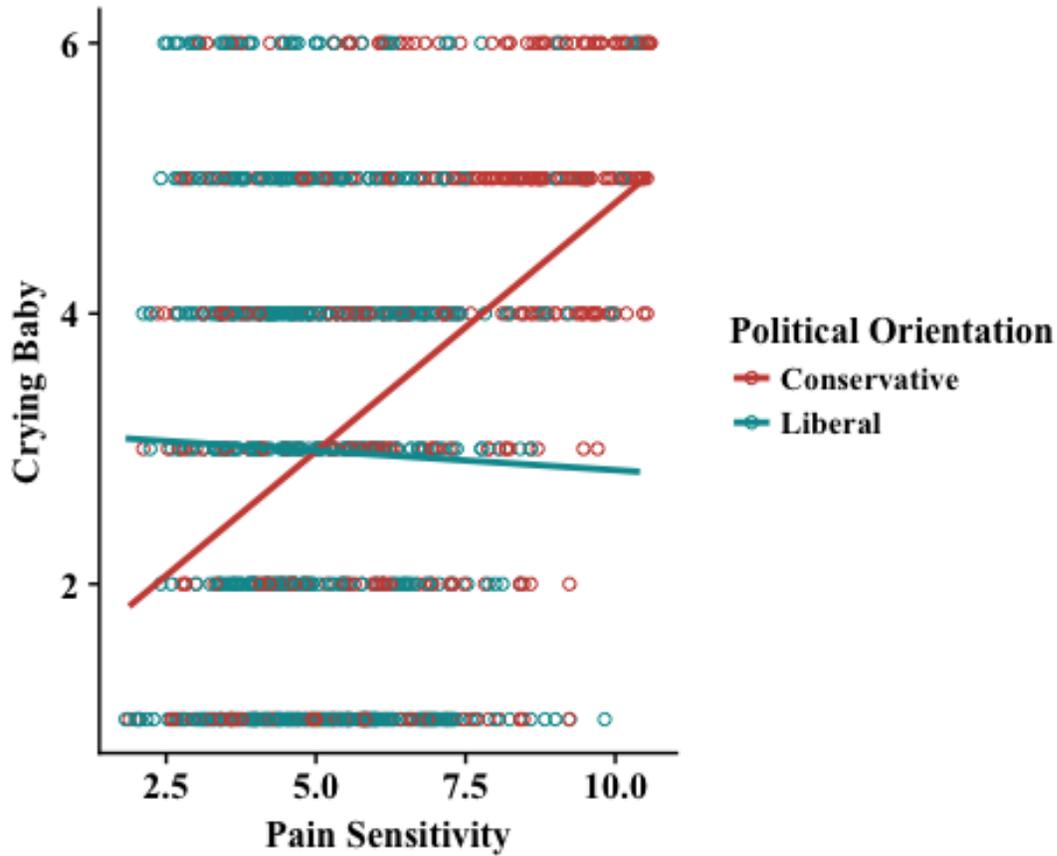
Interaction Between Pain Sensitivity and Political Orientation on the High-Conflict “Vitamins” Moral Dilemma



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 3.7

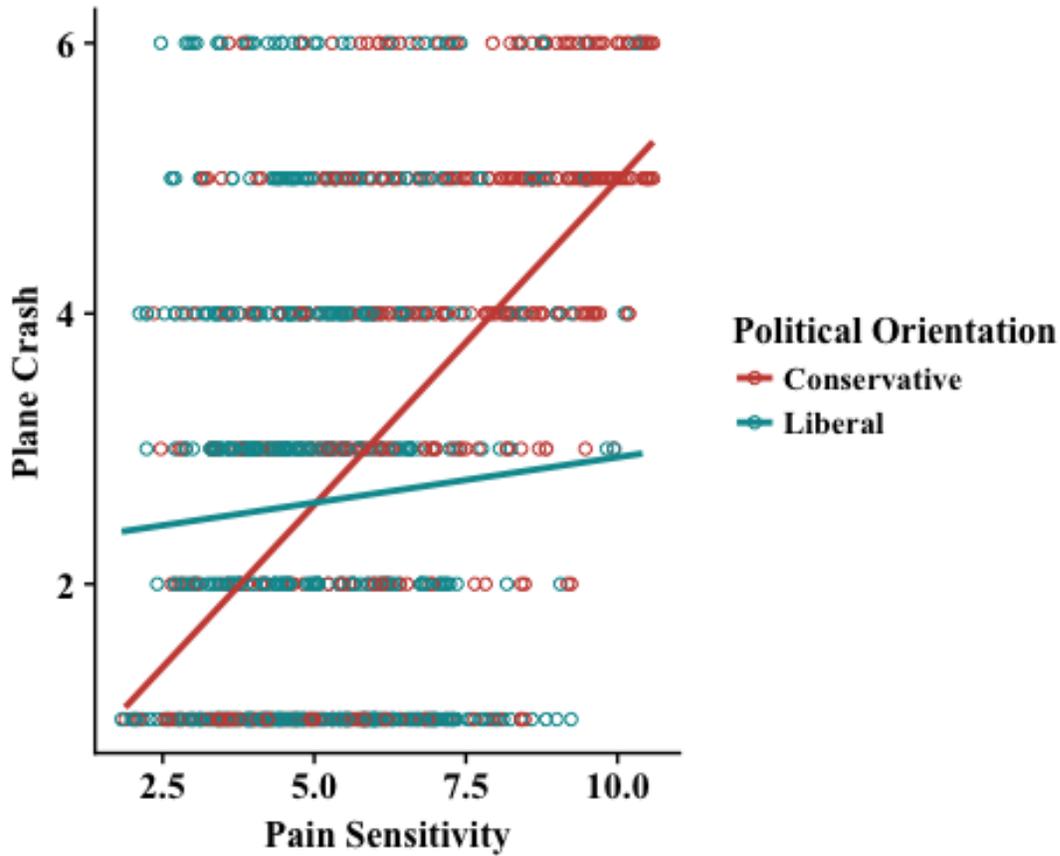
Interaction Between Pain Sensitivity and Political Orientation on the High-Conflict “Crying Baby” Moral Dilemma



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 3.8

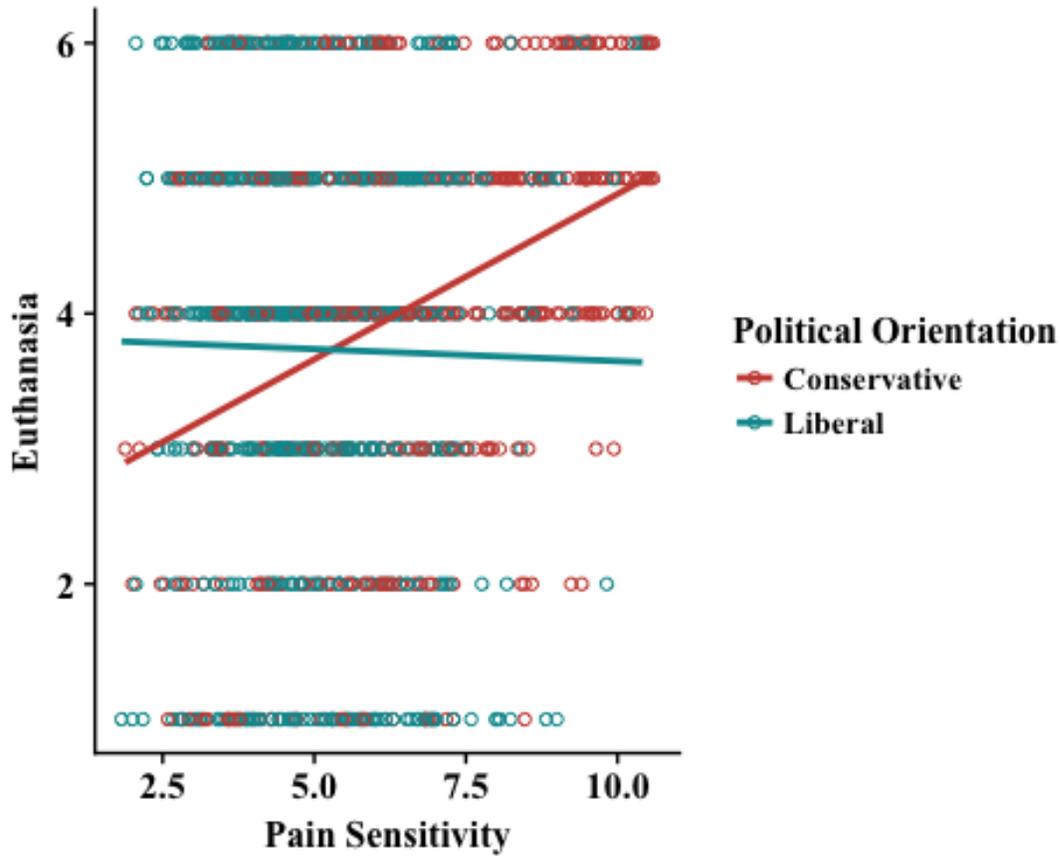
Interaction Between Pain Sensitivity and Political Orientation on the High-Conflict “Plane Crash” Moral Dilemma



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 3.9

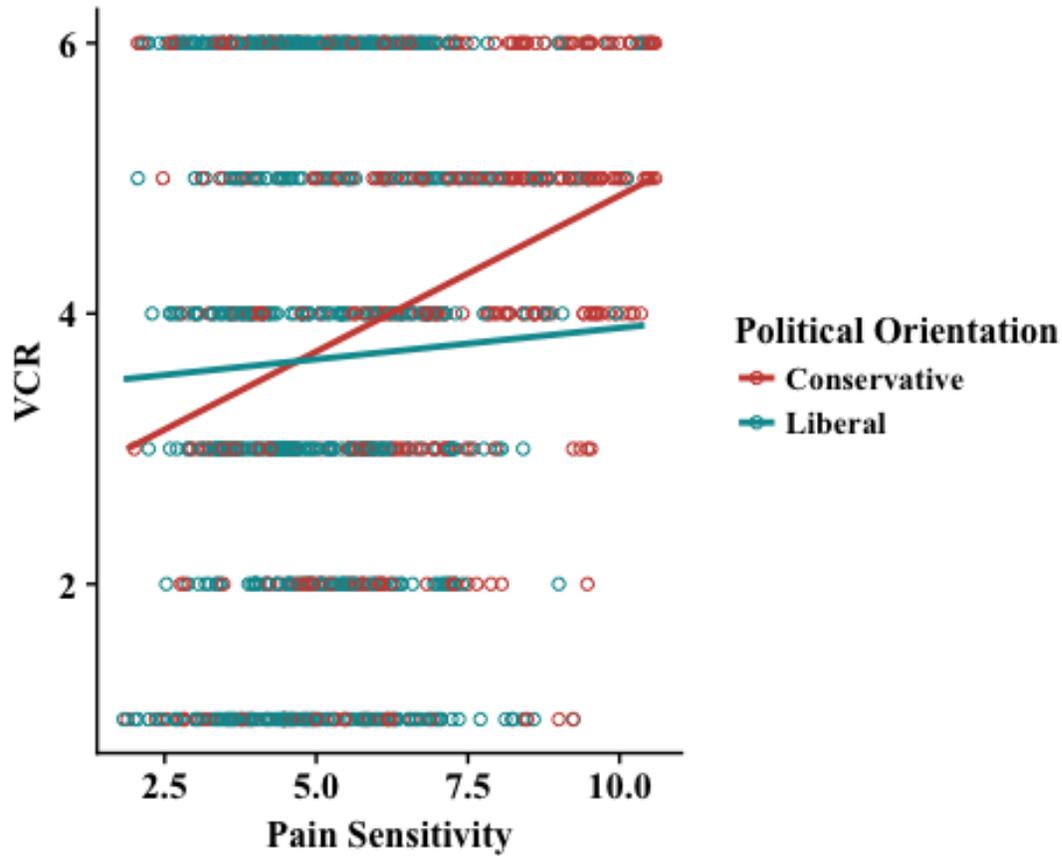
Interaction Between Pain Sensitivity and Political Orientation on the High-Conflict “Euthanasia” Moral Dilemma



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 3.10

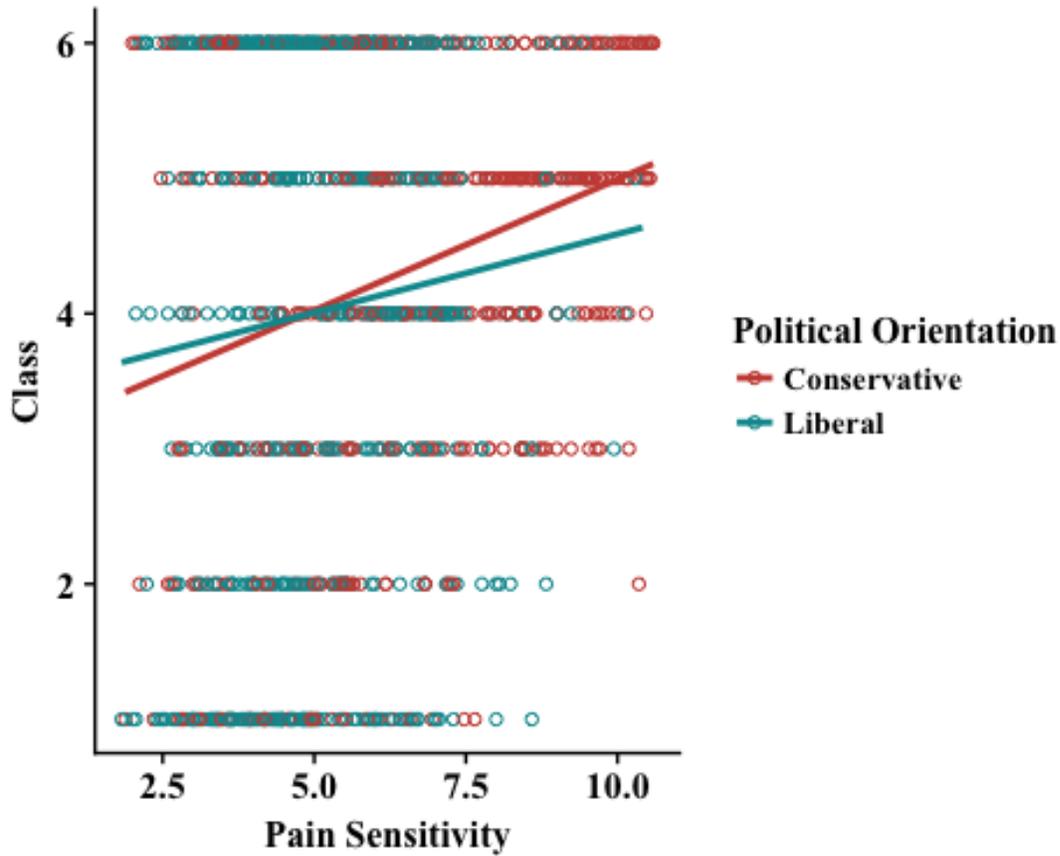
Interaction Between Pain Sensitivity and Political Orientation on the “VCR” Non-Moral Dilemma



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 3.11

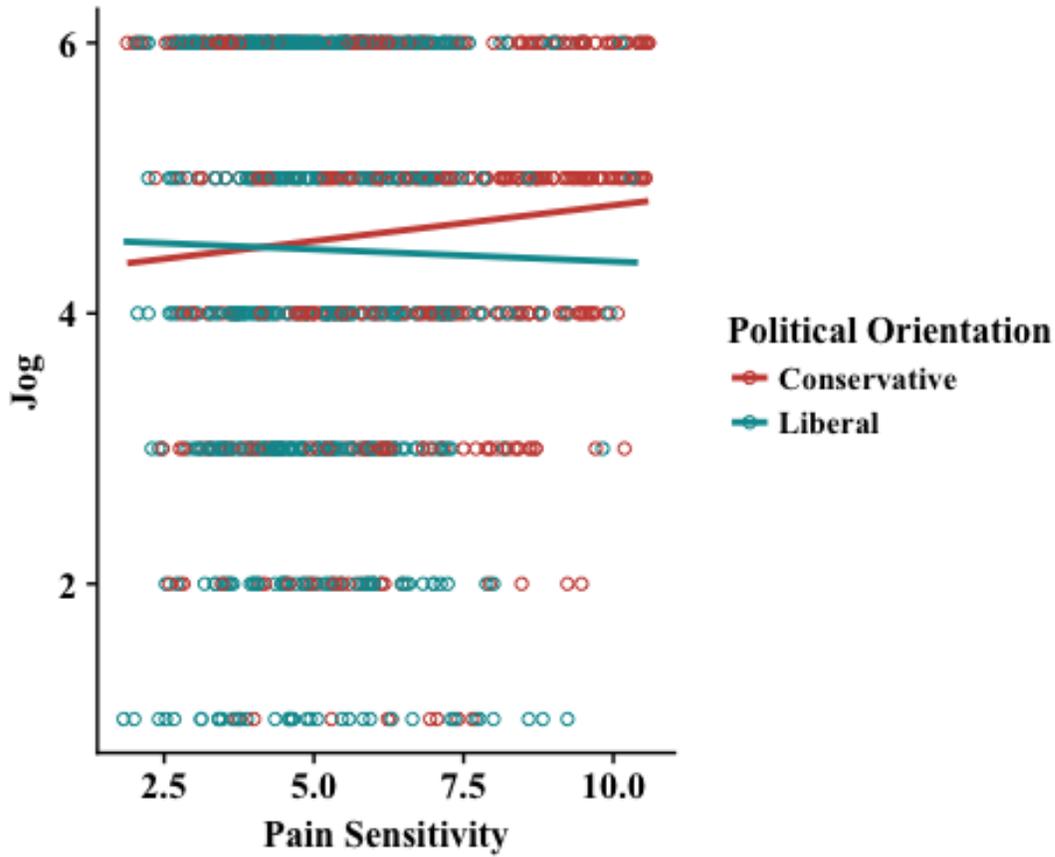
Interaction Between Pain Sensitivity and Political Orientation on the “Class” Non-Moral Dilemma



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 3.12

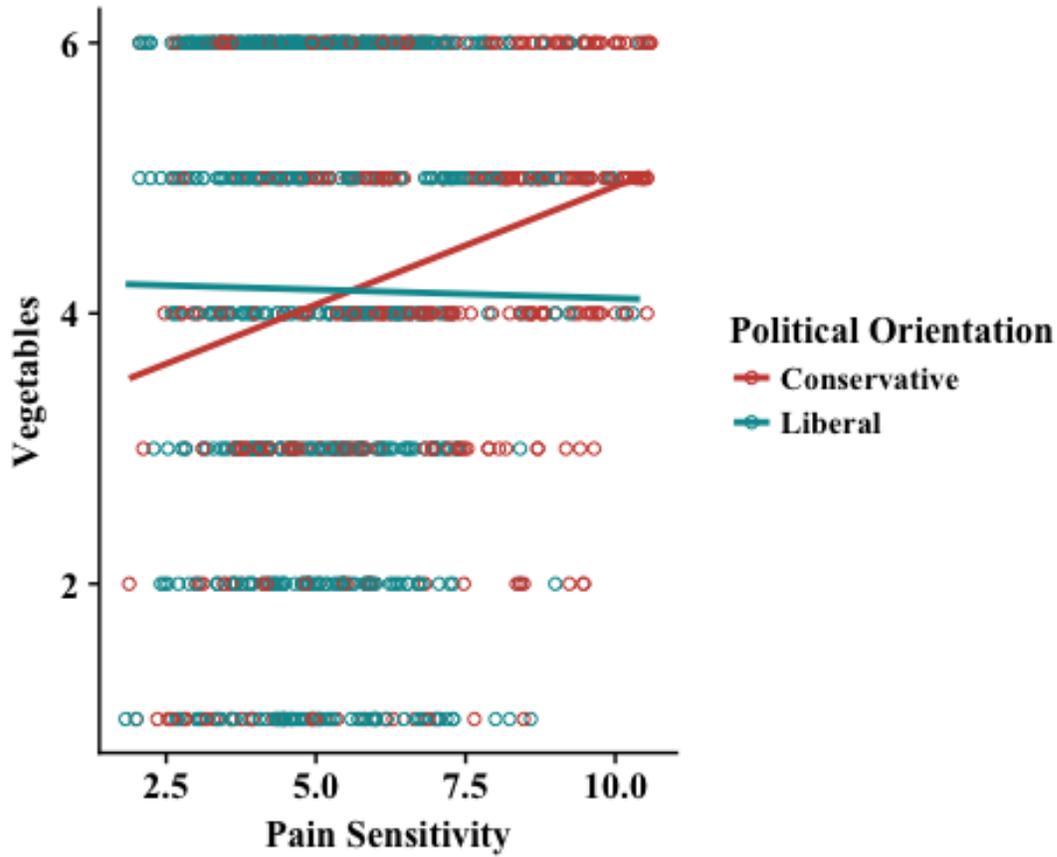
Interaction Between Pain Sensitivity and Political Orientation on the “Jog” Non-Moral Dilemma



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 3.13

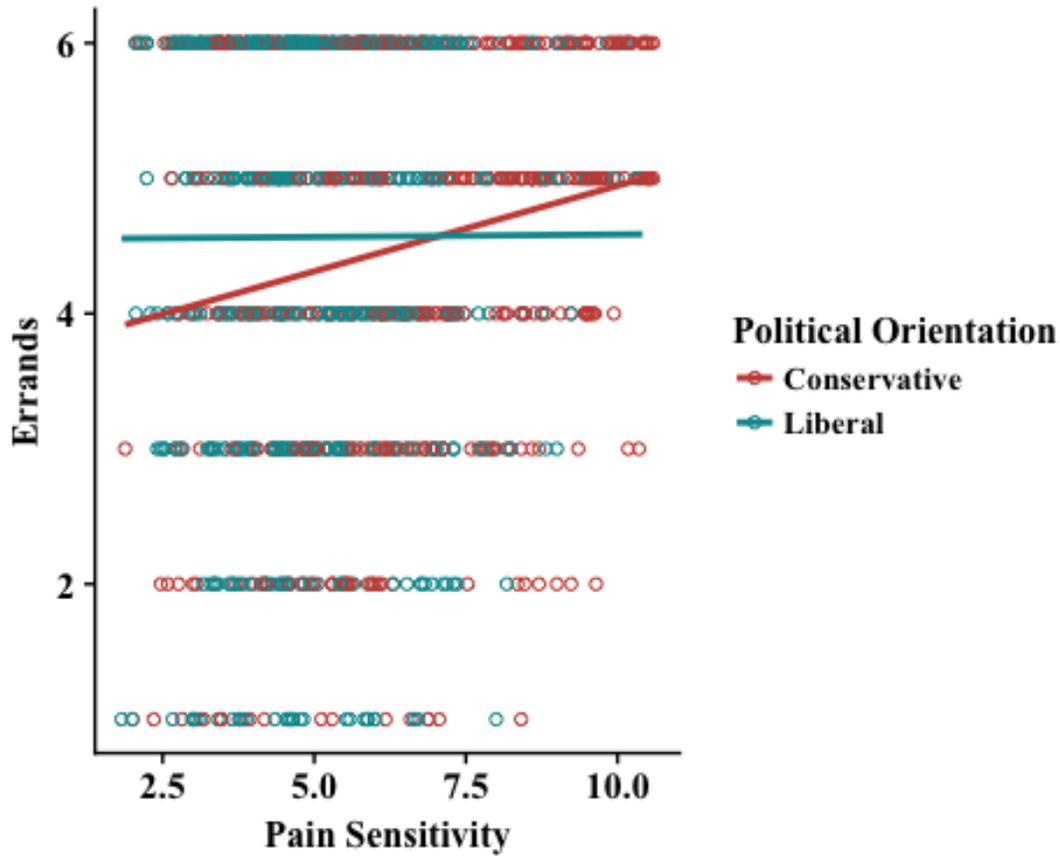
Interaction Between Pain Sensitivity and Political Orientation on the “Vegetables” Non-Moral Dilemma



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Figure 3.14

Interaction Between Pain Sensitivity and Political Orientation on the “Errands” Non-Moral Dilemma



Note: Those who identified themselves as “Centrist” were excluded from the graph, but not the analysis

Appendix 1

Moral Foundations Questionnaire Part 1: Relevance

- _____ Whether or not someone suffered emotionally
- _____ Whether or not some people were treated differently than others
- _____ Whether or not someone's action showed love for his or her country
- _____ Whether or not someone showed a lack of respect for authority
- _____ Whether or not someone violated standards of purity and decency
- _____ Whether or not someone was good at math
- _____ Whether or not someone cared for someone weak or vulnerable
- _____ Whether or not someone acted unfairly
- _____ Whether or not someone did something to betray his or her group
- _____ Whether or not someone conformed to the traditions of society
- _____ Whether or not someone did something disgusting
- _____ Whether or not someone was cruel
- _____ Whether or not someone was denied his or her rights
- _____ Whether or not someone showed a lack of loyalty
- _____ Whether or not an action caused chaos or disorder
- _____ Whether or not someone acted in a way that God would approve of

Appendix 1.2

Moral Foundations Questionnaire Part 2: Support

_____ *Compassion for those who are suffering is the most crucial virtue.*

_____ *When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.*

_____ *I am proud of my country's history.*

_____ *Respect for authority is something all children need to learn.*

_____ *People should not do things that are disgusting, even if no one is harmed.*

_____ *It is better to do good than to do bad.*

_____ *One of the worst things a person could do is hurt a defenseless animal.*

_____ *Justice is the most important requirement for a society.*

_____ *People should be loyal to their family members, even when they have done something wrong.*

_____ *Men and women each have different roles to play in society.*

_____ *I would call some acts wrong on the grounds that they are unnatural.*

_____ *It can never be right to kill a human being.*

_____ *I think it's morally wrong that rich children inherit a lot of money while poor children inherit nothing.*

_____ *It is more important to be a team player than to express oneself.*

_____ *If I were a soldier and disagreed with my commanding officer's orders, I would obey anyway because that is my duty.*

_____ *Chastity is an important and valuable virtue.*

*Appendix 2**Moral Vignettes*

Care/Harm, Emotional

You see a teenage boy chuckling at an amputee he passes by while on the subway.
You see a woman commenting out loud about how fat another woman looks in her jeans.
You see a girl saying that another girl is too ugly to be a varsity cheerleader.
You see a boy telling a woman that she looks just like her overweight bulldog.

Care/Harm, Physical/Animals

You see a woman throwing her cat across the room for scratching the furniture.
You see a boy throwing rocks at cows that are grazing in the local pasture.
You see a man lashing his pony with a whip for breaking loose from its pen.
You see a zoo trainer jabbing a dolphin to get it to entertain his customers.

Care/Harm, Physical/Humans

You see a teacher hitting a student's hand with a ruler for falling asleep in class.
You see a woman spanking her child with a spatula for getting bad grades in school.

Fairness/Cheating

You see a student copying a classmate's answer sheet on a makeup final exam.
You see a referee intentionally making bad calls that help his favoured team win.
You see someone cheating in a card game while playing with a group of strangers.
You see a runner taking a shortcut on the course during the marathon in order to win.

Loyalty/Betrayal

You see an employee joking with competitors about how bad his company did last year.
You see a coach celebrating with the opposing team's players who just won the game.
You see a former US General saying publicly he would never buy any American product.
You see the coach's wife sponsoring a bake sale for her husband's rival team.

Authority/Subversion

You see a girl repeatedly interrupting her teacher as he explains a new concept.
You see an intern disobeying an order to dress professionally and comb his hair.
You see a girl ignoring her father's orders by taking the car after her curfew.
You see a teenage girl coming home late and ignoring her parents' strict curfew.

Sanctity/Degradation

You see a man having sex with a frozen chicken before cooking it for dinner.
You see a man in a bar using his phone to watch people having sex with animals.
You see a homosexual in a gay bar offering sex to anyone who buys him a drink.
You see a drunk elderly man offering to have oral sex with anyone in the bar.

Appendix 3

Moral Dilemmas

Low-Conflict:

1. Donate

You are at home one day when the mail arrives. You receive a letter from a reputable international aid organization. The letter asks you to make a donation of two hundred dollars to their organization.

The letter explains that a two hundred-dollar donation will allow this organization to provide needed medical attention to some poor people in another part of the world.

How appropriate or inappropriate is it for you to not make a donation to this organization in order to save money?

2. Taxes

You are the owner of a small business trying to make ends meet. It occurs to you that you could lower your taxes by pretending that some of your personal expenses are business expenses.

For example, you could pretend that the stereo in your bedroom is being used in the lounge at the office, or that your dinners out with your wife are dinners with clients.

How appropriate or inappropriate is it for you to pretend that certain personal expenses are business expenses in order to lower your taxes?

High-Conflict:

3. Sophie's Choice

It is wartime and you and your two children, ages eight and five, are living in a territory that has been occupied by the enemy. At the enemy's headquarters is a doctor who performs painful experiments on humans that inevitably lead to death.

He intends to perform experiments on one of your children, but he will allow you to choose which of your children will be experimented upon. You have twenty-four hours to bring one of your children to his laboratory. If you refuse to bring one of your children to his laboratory he will find them both and experiment on both of them.

C1: How appropriate or inappropriate is it for you to bring one of your children to the laboratory in order to avoid having them both die?

C2: How appropriate or inappropriate is it for you to bring one of your children to the laboratory, which would avoid having them both die?

C3: How appropriate or inappropriate is it for you to not bring either of your children to the laboratory, which would mean having them both die?

4. Sacrifice

You, your spouse, and your four children are crossing a mountain range on your return journey to your homeland. You have inadvertently set up camp on a local clan's sacred burial ground.

The leader of the clan says that according to the local laws, you and your family must be put to death. However, he will let yourself, your spouse, and your three other children live if you yourself will kill your oldest son.

How appropriate or inappropriate is it for you to kill your oldest son in order to save your spouse and your other three children?

5. Lifeboat

You are on a cruise ship when there is a fire on board, and the ship has to be abandoned. The lifeboats are carrying many more people than they were designed to carry. The lifeboat you're in is sitting dangerously low in the water—a few inches lower and it will sink.

The seas start to get rough, and the boat begins to fill with water. If nothing is done it will sink before the rescue boats arrive and everyone on board will die. However, there is an injured person who will not survive in any case. If you throw that person overboard the boat will stay afloat and the remaining passengers will be saved.

How appropriate or inappropriate is it for you to throw this person overboard in order to save the lives of the remaining passengers?

6. Vitamins

You are the leader of a mountaineering expedition that is stranded in the wilderness. Your expedition includes a family of six that has a genetically caused vitamin deficiency. A few people's kidneys contain large amounts of this vitamin.

There is one such person in your party. The only way to save the lives of the six members of this family is to remove one of this man's kidneys so that the necessary vitamins may be extracted from it. The man will not die if you do this, but his health will be compromised. The man is opposed to this plan, but you have the power to do as you see fit.

C1: How appropriate or inappropriate is it for you to forcibly remove this man's kidney in order to save the lives of the six vitamin-deficient people?

C2: How appropriate or inappropriate is it for you to forcibly remove this man's kidney, which would avoid having the six vitamin-deficient people die?

C3: How appropriate or inappropriate is it for you to not forcibly remove this man's kidney, which would mean having the six vitamin-deficient people die?

7. Crying Baby

Enemy soldiers have taken over your village. They have orders to kill all remaining civilians. You and some of your townspeople have sought refuge in the cellar of a large house. Outside you hear the voices of soldiers who have come to search the house for valuables.

Your baby begins to cry loudly. You cover his mouth to block the sound. If you remove your hand from his mouth his crying will summon the attention of the soldiers who will kill you, your child, and the others hiding out in the cellar. To save yourself and the others you must smother your child to death.

How appropriate or inappropriate is it for you to smother your child in order to save yourself and the other townspeople?

8. Plane Crash

Your plane has crashed in the Himalayas. The only survivors are yourself, another man, and a young boy. The three of you travel for days, battling extreme cold and wind. Your only chance at

survival is to find your way to small a village on the other side of the mountain, several days away.

The boy has a broken leg and cannot move very quickly. His chances of surviving the journey are essentially zero. Without food, you and the other man will probably die as well. The other man suggests that you sacrifice the boy and eat his remains over the next few days.

How appropriate or inappropriate is it to kill this boy so that you and the other man may survive your journey to safety?

9. Euthanasia

You are the leader of a small group of soldiers. You are on your way back from a completed mission deep in enemy territory when one of your men has stepped in trap that has been set by the enemy and is badly injured. The trap is connected to a radio device that by now has alerted the enemy to your presence. They will soon be on their way.

If the enemy finds your injured man they will torture him and kill him. He begs you not to leave him behind, but if you try to take him with you your entire group will be captured. The only way to prevent this injured soldier from being tortured is to shoot him yourself.

How appropriate or inappropriate is it for you to shoot this soldier in order to prevent him from being tortured by the enemy?

Non-Moral:

10. VCR

You have brought your broken VCR to the local repair shop. The woman working at the shop tells you that it will cost you about \$100 to have it fixed.

You noticed in the paper that morning that the electronics shop next door is having a sale on VCRs and that a certain new VCR which is slightly better than your old one is on sale for \$100.

How appropriate or inappropriate is it for you have your old VCR fixed in order to avoid spending money on a new one?

11. College Class

You are beginning your senior year of college. In order to fulfill your graduation requirements, you need to take a history class and a science class by the end of the year.

During the fall term, the history class you want to take is scheduled at the same time as the science class you want to take. During the spring term, the same history class is offered, but the science class is not.

How appropriate or inappropriate is it for you to take the history class during the fall term in order to help you fulfill your graduation requirements?

12. Jog

You intend to accomplish two things this afternoon: going for a jog and doing some paperwork. In general you prefer to get your work done before you exercise.

The weather is nice at the moment, but the weather forecast says that in a couple of hours it will start to rain. You very much dislike jogging in the rain, but you don't care what the weather is like while you do paperwork.

How appropriate or inappropriate is it for you to do your paperwork now with the intention of jogging in a couple of hours in order to get your work done before you exercise?

13. Vegetables

You are preparing pasta with fresh vegetables, and you are deciding on the order in which you will do the various things you need to do. You are in a big hurry.

At the moment you have a slight urge to cut vegetables. If you first start the water boiling and then cut the vegetables you will be done in twenty minutes. If you cut the vegetables and then start the water boiling you will be done in forty minutes.

How appropriate or inappropriate is it for you to cut the vegetables first and then start the water boiling in order to satisfy your slight urge to cut vegetables?

14. Errands

You need to go to the bakery in the morning and the furniture store in the afternoon. You also need to go to the camera shop at some point. You prefer to do most of your errands in the morning, but you very much dislike doing unnecessary driving.

The camera shop is near the furniture store and far from the bakery. As a result, you will have to do less driving if you go to the camera shop in the afternoon when you go to the furniture store.

How appropriate or inappropriate is it for you to go to the camera shop in the morning in order to do most of your errands in the morning?

Appendix 4

Pain Sensitivity

You bump your shin badly on a hard edge, for example, on the edge of a glass coffee table.

You burn your tongue on a very hot drink.

Your muscles are slightly sore as the result of physical activity.

You trap your finger in a drawer.

You take a shower with lukewarm water.

You have mild sunburn on your shoulders.

You grazed your knee falling off your bicycle.

You accidentally bite your tongue or cheek badly while eating.

You are walking across a cool tiled floor with bare feet.

You have a minor cut on your finger and inadvertently get lemon juice in the wound.

You prick your fingertip on the thorn of a rose.

You stick your bare hands in the snow for a couple of minutes or bring your hands in contact with snow for some time, for example, while making snowballs.

You shake hands with someone who has a normal grip.

You shake hands with someone who has a very strong grip.

You pick up a hot pot by inadvertently grabbing its equally hot handles.

You are wearing sandals and someone with heavy boots steps on your foot.

You bump your elbow on the edge of a table (“funny bone”).

Appendix: Study 2

Table 6

Regression Analysis Summary for Pain Sensitivity Predicting Moral Dilemmas

Variable	B	St. error	t	P-value
<i>Low-conflict, moral</i>				
1. Donate				
Pain Sensitivity	-0.18	0.08	-2.33	.02*
Condition 2	-0.09	0.11	-0.90	.37
Condition 3	-0.16	0.11	-1.51	.13
PS x C2	0.22	0.11	1.99	.047*
PS x C3	0.28	0.10	2.74	.006**
2. Taxes				
Pain Sensitivity	0.41	0.07	6.20	< .001***
Condition 2	-0.05	0.09	-0.51	.61
Condition 3	0.77	0.09	8.26	< .001***
PS x C2	-0.03	0.10	-0.35	.72
PS x C3	-0.34	0.09	-3.73	< .001***
<i>High-conflict, moral</i>				
3. Sophie				
Pain Sensitivity	0.15	0.07	2.08	.038*
Condition 2	-0.22	0.10	-2.18	.03*
Condition 3	0.18	0.10	1.77	.08
PS x C2	0.07	0.11	0.68	.50
PS x C3	0.13	0.10	1.25	.21
4. Sacrifice				
Pain Sensitivity	0.31	0.07	4.24	< .001***
Condition 2	-0.21	0.10	-2.02	.045*
Condition 3	0.24	0.10	2.35	.019*
PS x C2	-0.17	0.11	-1.62	.11
PS x C3	-0.03	0.10	-0.28	.78
5. Life Boat				
Pain Sensitivity	0.17	0.07	2.30	.0216*
Condition 2	-0.21	0.10	-2.02	.044*

Condition 3	0.24	0.10	2.35	.019*
PS x C2	-0.17	0.11	-1.62	.11
PS x C3	-0.03	0.10	-0.28	.78
6. Vitamines				
Pain Sensitivity	0.34	0.07	4.71	< .001***
Condition 2	-0.03	0.10	-0.33	.74
Condition 3	0.20	0.10	1.94	.05
PS x C2	-0.03	0.10	-0.32	.75
PS x C3	-0.06	0.10	-0.65	.51
7. Crying Baby				
Pain Sensitivity	0.23	0.07	3.08	.002**
Condition 2	-0.12	0.10	-1.16	.25
Condition 3	0.11	0.10	1.06	.29
PS x C2	-0.06	0.11	-0.53	.59
PS x C3	-0.05	0.10	-0.51	.61
8. Plane Crash				
Pain Sensitivity	0.35	0.07	4.90	< .001***
Condition 2	-0.15	0.10	-1.51	.13
Condition 3	0.44	0.10	4.39	< .001***
PS x C2	-0.09	0.10	-0.91	.36
PS x C3	-0.27	0.10	-2.73	.007**
9. Euthanasia				
Pain Sensitivity	0.09	0.07	1.24	0.22
Condition 2	0.01	0.10	0.07	.95
Condition 3	-0.12	0.10	-1.16	.25
PS x C2	0.01	0.11	0.12	.91
PS x C3	0.28	0.10	2.81	.005**
<i>Non-moral</i>				
10. VCR				
Pain Sensitivity	0.24	0.07	3.46	< .001***
Condition 2	-0.03	0.10	-0.36	.72
Condition 3	0.81	0.10	8.42	< .001***
PS x C2	-0.09	0.10	-0.87	.38
PS x C3	-0.38	0.09	-4.08	< .001***
11. Class				
Pain Sensitivity	0.08	0.06	1.31	1.31
Condition 2	-0.62	0.09	-6.93	< .001***
Condition 3	0.67	0.09	7.63	< .001***
PS x C2	0.25	0.09	2.72	.007**
PS x C3	-0.18	0.09	-2.13	.034*

12. Jog				
Pain Sensitivity	-0.01	0.07	-0.20	.84
Condition 2	0.06	0.10	0.59	.55
Condition 3	0.57	0.10	5.59	< .001***
PS x C2	0.08	0.11	0.74	.46
PS x C3	-0.14	0.10	-1.38	.17
13. Food				
Pain Sensitivity	0.05	0.07	0.74	0.46
Condition 2	-0.02	0.10	-0.20	.85
Condition 3	0.83	0.10	8.61	< .001***
PS x C2	0.10	0.10	1.01	.31
PS x C3	-0.22	0.09	-2.33	.02*
14. Errands				
Pain Sensitivity	-0.03	0.07	-0.48	.63
Condition 2	0.03	0.10	0.31	.75
Condition 3	0.54	0.10	5.25	< .001***
PS x C2	-0.02	0.11	-0.20	.84
PS x C3	-0.17	0.10	-1.65	.10

*Note: * $p < .05$, ** $p < .01$, *** $p < .001$. DF of 5 and 527.*

Appendix 5

Moral Dilemma Conditions

Low-Conflict:

1. Donate

You are at home one day when the mail arrives. You receive a letter from a reputable international aid organization. The letter asks you to make a donation of two hundred dollars to their organization.

The letter explains that a two hundred-dollar donation will allow this organization to provide needed medical attention to some poor people in another part of the world.

C1: How appropriate or inappropriate is it for you to not make a donation to this organization in order to save money?

C2: How appropriate or inappropriate is it for you to not make a donation to this organization, which would mean saving money?

C3: How appropriate or inappropriate is it for you to make a donation to this organization, which would mean not saving money?

2. Taxes

You are the owner of a small business trying to make ends meet. It occurs to you that you could lower your taxes by pretending that some of your personal expenses are business expenses.

For example, you could pretend that the stereo in your bedroom is being used in the lounge at the office, or that your dinners out with your wife are dinners with clients.

C1: How appropriate or inappropriate is it for you to pretend that certain personal expenses are business expenses in order to lower your taxes?

C2: How appropriate or inappropriate is it for you to pretend that certain personal expenses are business expenses, which would mean lowering your taxes?

C3: How appropriate or inappropriate is it for you to not pretend that certain personal expenses are business expenses, which would mean paying all your taxes?

High-Conflict:

3. Sophie's Choice

It is wartime and you and your two children, ages eight and five, are living in a territory that has been occupied by the enemy. At the enemy's headquarters is a doctor who performs painful experiments on humans that inevitably lead to death.

He intends to perform experiments on one of your children, but he will allow you to choose which of your children will be experimented upon. You have twenty-four hours to bring one of your children to his laboratory. If you refuse to bring one of your children to his laboratory he will find them both and experiment on both of them.

C1: How appropriate or inappropriate is it for you to bring one of your children to the laboratory in order to avoid having them both die?

C2: How appropriate or inappropriate is it for you to bring one of your children to the laboratory, which would avoid having them both die?

C3: How appropriate or inappropriate is it for you to not bring either of your children to the laboratory, which would mean having them both die?

4. Sacrifice

You, your spouse, and your four children are crossing a mountain range on your return journey to your homeland. You have inadvertently set up camp on a local clan's sacred burial ground. The leader of the clan says that according to the local laws, you and your family must be put to death. However, he will let yourself, your spouse, and your three other children live if you yourself will kill your oldest son.

C1: How appropriate or inappropriate is it for you to kill your oldest son in order to save your spouse and your other three children?

C2: How appropriate or inappropriate is it for you to kill your oldest son, which would avoid having your spouse and your other three children killed?

C3: How appropriate or inappropriate is it for you to not kill your oldest son, which would mean having your spouse and your other three children killed?

5. Lifeboat

You are on a cruise ship when there is a fire on board, and the ship has to be abandoned. The lifeboats are carrying many more people than they were designed to carry. The lifeboat you're in is sitting dangerously low in the water—a few inches lower and it will sink.

The seas start to get rough, and the boat begins to fill with water. If nothing is done it will sink before the rescue boats arrive and everyone on board will die. However, there is an injured person who will not survive in any case. If you throw that person overboard the boat will stay afloat and the remaining passengers will be saved.

C1: How appropriate or inappropriate is it for you to throw this person overboard in order to save the lives of the remaining passengers?

C2: How appropriate or inappropriate is it for you to throw this person overboard, which would avoid having the remaining passengers die?

C3: How appropriate or inappropriate is it for you to not throw this person overboard, which would mean having the remaining passengers die?

6. Vitamins

You are the leader of a mountaineering expedition that is stranded in the wilderness. Your expedition includes a family of six that has a genetically caused vitamin deficiency. A few people's kidneys contain large amounts of this vitamin.

There is one such person in your party. The only way to save the lives of the six members of this family is to remove one of this man's kidneys so that the necessary vitamins may be extracted from it. The man will not die if you do this, but his health will be compromised. The man is opposed to this plan, but you have the power to do as you see fit.

C1: How appropriate or inappropriate is it for you to forcibly remove this man's kidney in order to save the lives of the six vitamin-deficient people?

C2: How appropriate or inappropriate is it for you to forcibly remove this man's kidney, which would avoid having the six vitamin-deficient people die?

C3: How appropriate or inappropriate is it for you to not forcibly remove this man's kidney, which would mean having the six vitamin-deficient people die?

7. Crying Baby

Enemy soldiers have taken over your village. They have orders to kill all remaining civilians. You and some of your townspeople have sought refuge in the cellar of a large house. Outside you hear the voices of soldiers who have come to search the house for valuables.

Your baby begins to cry loudly. You cover his mouth to block the sound. If you remove your hand from his mouth his crying will summon the attention of the soldiers who will kill you, your child, and the others hiding out in the cellar. To save yourself and the others you must smother your child to death.

C1: How appropriate or inappropriate is it for you to smother your child in order to save yourself and the other townspeople?

C2: How appropriate or inappropriate is it for you to smother your child, which would mean saving yourself and the other townspeople from being killed?

C3: How appropriate or inappropriate is it for you to not smother your child, which would mean having yourself and the other townspeople killed?

8. Plane Crash

Your plane has crashed in the Himalayas. The only survivors are yourself, another man, and a young boy. The three of you travel for days, battling extreme cold and wind. Your only chance at survival is to find your way to small a village on the other side of the mountain, several days away.

The boy has a broken leg and cannot move very quickly. His chances of surviving the journey are essentially zero. Without food, you and the other man will probably die as well. The other man suggests that you sacrifice the boy and eat his remains over the next few days.

C1: How appropriate or inappropriate is it to kill this boy so that you and the other man may survive your journey to safety?

C2: How appropriate or inappropriate is it to kill this boy, which would mean that you and the other man may survive your journey to safety?

C3: How appropriate or inappropriate is it to not kill this boy, which would mean that you and the other man may not survive your journey to safety?

9. Euthanasia

You are the leader of a small group of soldiers. You are on your way back from a completed mission deep in enemy territory when one of your men has stepped in trap that has been set by the enemy and is badly injured. The trap is connected to a radio device that by now has alerted the enemy to your presence. They will soon be on their way.

If the enemy finds your injured man they will torture him and kill him. He begs you not to leave him behind, but if you try to take him with you your entire group will be captured. The only way to prevent this injured soldier from being tortured is to shoot him yourself.

C1: How appropriate or inappropriate is it for you to shoot this soldier in order to prevent him from being tortured by the enemy?

C2: How appropriate or inappropriate is it for you to shoot this soldier, which would prevent him from being tortured by the enemy?

C3: How appropriate or inappropriate is it for you to not shoot this soldier, which would lead him to being tortured by the enemy?

Non-Moral:

10. VCR

You have brought your broken VCR to the local repair shop. The woman working at the shop tells you that it will cost you about \$100 to have it fixed.

You noticed in the paper that morning that the electronics shop next door is having a sale on VCRs and that a certain new VCR which is slightly better than your old one is on sale for \$100.

C1: How appropriate or inappropriate is it for you have your old VCR fixed in order to avoid spending money on a new one?

C2: How appropriate or inappropriate is it for you to have your old VCR fixed, which would avoid spending money on a new one?

C3: How appropriate or inappropriate is it for you to not have your old VCR fixed, which would mean spending money on a new one?

11. College Class

You are beginning your senior year of college. In order to fulfill your graduation requirements, you need to take a history class and a science class by the end of the year.

During the fall term, the history class you want to take is scheduled at the same time as the science class you want to take. During the spring term, the same history class is offered, but the science class is not.

C1: How appropriate or inappropriate is it for you to take the history class during the fall term in order to help you fulfill your graduation requirements?

C2: How appropriate or inappropriate is it for you to take the history class during the fall term, which would mean that you do not fulfill your graduation requirements?

C3: How appropriate or inappropriate is it for you to take the science class during the fall term, which would mean that you fulfill your graduation requirements?

12. Jog

You intend to accomplish two things this afternoon: going for a jog and doing some paperwork. In general you prefer to get your work done before you exercise.

The weather is nice at the moment, but the weather forecast says that in a couple of hours it will start to rain. You very much dislike jogging in the rain, but you don't care what the weather is like while you do paperwork.

C1: How appropriate or inappropriate is it for you to do your paperwork now with the intention of jogging in a couple of hours in order to get your work done before you exercise?

C2: How appropriate or inappropriate is it for you to do your paperwork now with the intention of jogging in a couple of hours, which would mean getting your work done before you exercise?

C3: How appropriate or inappropriate is it for you to jog now with the intention of doing your paperwork in a couple of hours, which would mean getting your exercise done before you work?

13. Vegetables

You are preparing pasta with fresh vegetables, and you are deciding on the order in which you will do the various things you need to do. You are in a big hurry.

At the moment you have a slight urge to cut vegetables. If you first start the water boiling and then cut the vegetables you will be done in twenty minutes. If you cut the vegetables and then start the water boiling you will be done in forty minutes.

C1: How appropriate or inappropriate is it for you to cut the vegetables first and then start the water boiling in order to satisfy your slight urge to cut vegetables?

C2: How appropriate or inappropriate is it for you to cut the vegetables first and then start the water boiling, which would satisfy your slight urge to cut vegetables?

C3: How appropriate or inappropriate is it for you to start the water boiling first and then cut the vegetables, which would save you twenty minutes of time?

14. Errands

You need to go to the bakery in the morning and the furniture store in the afternoon. You also need to go to the camera shop at some point. You prefer to do most of your errands in the morning, but you very much dislike doing unnecessary driving.

The camera shop is near the furniture store and far from the bakery. As a result, you will have to do less driving if you go to the camera shop in the afternoon when you go to the furniture store.

C1: How appropriate or inappropriate is it for you to go to the camera shop in the morning in order to do most of your errands in the morning?

C2: How appropriate or inappropriate is it for you to go to the camera shop in the morning, which would mean doing most of your errands in the morning?

C3: How appropriate or inappropriate is it for you to go to the camera shop in the afternoon, which would mean doing less driving?