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Abstract

Empathy is defined as the ability to understand and share others emotions (Batson, 1991). It is key in social relationships. Empathic concerns increase if the perceiver and target share common membership in a social category (Horstein,1978). Past literature has shown that people value others' pain similar to how they value their own pain, to the extent that they empathize with the other person. The neural circuits activated in response to another's pain is in the self's ACC neural responses, an unconscious affect response, are weakened by race-defined intergroup relationships (Xu et al, 2009). In this study, we want to examine the effect of political belief bias on a person's empathy for pain towards political ingroup and outgroup members. If political belief bias is proven in a person's empathy for pain, the result will have significant social implications. Specifically, it can help us gain a better understanding of principal-agent relationships such as attorney and client, doctor and patient, donor and recipient.

Keywords

Empathy, Psychology, Neuroscience

Disciplines

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Abstract

Empathy is defined as the ability to understand and share others' emotions (Batson, 1991). It is key in social relationships. Empathic concerns increase if the perceiver and target share common membership in a social category (Horstein, 1978). Past literature has shown that people value others' pain similar to how they value their own pain, to the extent that they empathize with the other person. The neural circuits activated in response to another's pain is in the self's ACC neural responses, an unconscious affect response, are weakened by race-defined intergroup relationships (Xu et al, 2009). In this study, we want to examine the effect of political belief bias on a person's empathy for pain towards political ingroup and outgroup members. If political belief bias is proven in a person's empathy for pain, the result will have significant social implications. Specifically, it can help us gain a better understanding of principal-agent relationships such as attorney and client, doctor and patient, donor and recipient.

Prosocial Behavior and Empathy

Western philosophical and psychological thought has long debated the existence of altruism and egoism. Egoists argue that humans are ultimately concerned with self-benefit. Egoistic theory is reflected in the philosophical thought of prominent scholars such as Thomas Hobbes, whom in *Levinthian* argues that: "No man giveth but with intention of good to himself; because gift is voluntary; and of all voluntary acts the object to every man is his own pleasure". Furthermore, Adam Smith extended the argument of self-interest as a driver of the greater good by articulating that "it is not from the benevolence of the butcher, the brewer, or the baker, that we can expect our dinner, but from their regard to their own interest in the fundamental book of Classical Economic thought, the *Wealth of Nations*." In acknowledgement that humans are self-interested, altruists argue that under some circumstances humans are driven by motivation beyond self-interest. Specifically, some actions are motivated by the desire to benefit another person. Altruism is commonly defined as: "intrinsically motivated voluntary behavior intended to benefit another--acts motivated by concern for others or by internalized values, goals, and self-rewards rather than by expectations of concrete or social rewards or the avoidance of punishment" (Einsenberg, Fabes, and Spinard, 2006).

According to Batson's Empathy-Altruism hypothesis, altruistic motivations and actions are evoked by the emotion, empathy (Batson, 1991). The hypothesis that empathy provokes altruistic motivations is the basis for large body of research on human social behavior, specifically in understanding why people help others in some circumstances and abstain from helping others in

other circumstances. Thus, in order to understand altruistic and prosocial behavior, it is critical to examine empathy.

While definitions of empathy vary in different domains, in psychological research, empathy is defined as “the ability to understand and share others emotions, key in social behavior, and change people’s attitudes toward a target (Batson, 1991). Empathy is composed of two components. The first component of empathy is the affective component which involves actions such as emotional sharing. The second component of empathy is the cognitive component which involves actions such as perspective taking. It is also important to distinguish empathy from sympathy, “an affective response that frequently stems from empathy, but can derive directly from perspective taking or other cognitive processing” and personal distress, which “stems from exposure to another’s state or condition, but is a self focused, aversion emotional reaction to the vicarious experiencing of another’s emotion”(Eisenberg, 2010).

Preston and de Waal further contributed to the literature on empathy by introducing the Perception-Action Model. The Perception Action Model is developed on the basis that empathic responses don’t require conscious and effortful processing, but rather occur automatically (Preston et de Waal, 2002). Since Empathy is defined as a shared emotional experience, the model argues that when a subject is paying attention and cognitively aware of the object’s emotional state, the subject’s own neural mechanisms that are engaged in the processing of emotional states are activated (Preston et de Waal ,2002). Furthermore, past literature has shown that empathy increases with “past experience, similarity, and familiarity”. According to the Perception Action Model, the increase of empathy from greater commonality between the subject and object is the result of more readily access of representations of the experience of the object by the subject (Preston et de Waal ,2002). In understanding the neural mechanisms of empathy, it is important to remember that there is no distinct “empathy area” in the brain. Instead, the neural mechanisms activated in empathizing with another person are the areas recruited when the self is engaged in the relevant domain of the task.

In this study, we specifically examine empathy for pain. Consistent with Preston and de Waal’s Perception-Action Model, past literature in social neurosciences has shown that observing others in pain engages similar brain networks in response to one’s own pain, a neural demonstration of empathy (Crockett et al, 2014). The magnitude of the neural response directly correlated with self-reported empathy (Crockett et al, 2014). Thus, the greater people empathize with the other person, the greater they will value the pain of the other person.

As mentioned earlier in the paper, self-interest is not the sole driver of human behavior. Instead, certain behaviors are driven by altruistic motives. While Smith argued that self-interest increased the welfare of society, he also posited that: “For one man...unjustly to promote his own advantage by loss or disadvantage of another, is more contrary to nature, than death, than

poverty, than pain, than all misfortunes which can affect him” in the Theory of Moral Sentiments (Smith, 1759). Specifically, Moral Sentiments Theory proscribes that: “harming others lead some people to evaluate cost of others’ pain as higher than own in environment where they feel degree of responsibility for that pain” (Crockett et al, 2014). The key factor to note for the increase in empathy is the environment in where they feel a degree of responsibility. In Crockett’s study on the neuroscience of moral decision making, the results not only confirmed that people do indeed behave altruistically, but also noted the importance of reciprocity and partner choice, hence social norms in empathetic responses and prosocial behavior as a whole (Crockett et al, 2014). The effect of the social environment and norms on how individuals behave is further demonstrated with neural evidence that in the context of a game show, people’s neural regions involved in vicarious reward(vACC activity) increases when they view a socially desirable contestant win, even though they themselves are not directly receiving any benefit(Mobbs, 2009) Furthermore, the experience of reward by the participant increases when the participant views the contestant as similar to oneself in values and attitudes(Mobbs, 2009)

Not only does social norms modulate empathy, but past literature has shown that empathy is enhanced by greater commonality between the subject and object, specifically ingroup membership. Since people infer others’ mental states based on their own knowledge about their self, empathy increases when there are similarities between the self and other (Mitchell, 2006). This is demonstrated by evidence in social cognition that people mentalize in different ways when the other is perceived to be similar versus dissimilar from oneself(Mitchell, 2006). In the subregions of the mPFC, there is a “division of labor” between the ventral and dorsal regions. The ventral mPFC contributes to mental state inferences of similar others, while the dorsal mPFC contributes to mentalizing about dissimilar others (Mitchell, 2006). Thus, in regards to social group membership, there is evidence of different social cognitive processes involved when people evaluate a person in one’s ingroup vs outgroup as when thinking about outgroup members, people may not employ the same self referential basis they do to make judgements about ingroup members (Mitchell, 2006). While ingroup/outgroup membership has been a deeply studied topic in social psychology, the use of neuroscience, specifically fMRI techniques, have provided supplementary evidence beyond the scope of self report. In social psychology, . There is neural evidence that ingroup members are processed in greater depth than outgroup members in the brain(Van Bavel, Packer, and Cunningham, 2008). Specifically, there is greater activation in fusiform gyri, amygdala, OFC, and dorsal striatum when people viewed faces of ingroup members compared to outgroup members (Van Bavel, Packer, and Cunningham, 2008).

While mere categorization with a group can create greater ingroup bias(ie. Assigning participants to novel groups with equal prior exposure to ingroup members and outgroup members), it is important to note that not any in-group membership results increase of empathy. The defining ingroup membership must be a salient category in order to increase empathetic responses.

For instance, university group status(shared vs unshared) does not have an impact on empathetic induction(Batson, 1997). The salient social category depends on the social context as it may alter their perceptual and affective processes(Turner et al, 1987). For instance, people categorize others according to race when it is the salient social category, but according to team membership(ignore race) when team membership is salient(Kurzban et al, 2011). Thus, in our study, we seek to make political party affiliation is the salient ingroup variable that we seek to examine. Specifically the effect of political affiliation on empathic responses both on a behavior and neural level.

Examining empathy for pain provides a measurable basis for empathy beyond the behavioral level. As mentioned prior in the literature review that people mentalize, there is specific evidence that people value others pain like themselves: perceptions of others in pain activates neural circuits that mediates first person pain experience. In the brain there are two competing motivational systems: empathy based motivation(activation in AI when witnessing a persons suffering and increases our propensity to help) and motivation counteracting empathy(activation in NAcc, letting the other person suffer). When a person views another person in pain, the ACC and Anterior Insula, self-regions for pain, are activated.

A study which found evidence on both a behavioral and neural level on the existence of racial bias in empathy for pain seeks us to examine the existence of political belief bias on empathy for pain(Xu et al, 2009). As mentioned earlier in the literature review, there is both an affective and cognitive component to empathy, the results of the study on racial group membership showed a decrease in ACC empathic responses to perception of others in pain when participants viewed faces of racial ingroup members, a demonstration of the affective component of empathy(Xu et al, 2009). It is important to note that the own race bias in empathy related ACC activity reflected an unconscious affective response as while there was a neural empathic bias toward racial ingroup members, there was no difference in subjective ratings of others' pain intensity and induced self unpleasantness as measured by subjective ratings(Singer, 2004). We know that empathic neural responses are weakened by race-defined intergroup relationships, but are the same empathic neural responses also weakened by political defined intergroup relationships? Since the empathic neural response is unconscious, we seek to examine if there is an unconscious, affective neural response in a person's empathetic response influenced by political affiliation.

Political Affiliation and Identity

This study combines the literature in psychology, neuroscience, and political science to examine the effect of political belief bias on a person's empathy for pain. Since the study involves both a behavioral and neural component, we have hypotheses' for both components. In the behavior component, we hypothesize that people will report more empathy for political ingroup than

outgroup members. Since the strength of a person's identification with a particular ingroup affects the influence of the group (in our case political party) attitude on the individual's attitudes and behavior, we hypothesize that the greater one's political affiliation, the greater one's self-reported empathy for a member in the political ingroup. Moreover, the influence of political ingroup/outgroup affiliation will also result in less sharing for political outgroup members than ingroup members in the context of a dictator game. Past neuroscience and psychological findings as well as our study on brand empathy lead us to hypothesize that an empathetic neural response will manifest in a participant's brain in response to a political ingroup member's pain. The empathetic neural response is defined as the activation of neural circuits that mediate first person pain experience, specifically the ACC and Insula) since we are investigating a person's empathy for pain. Moreover, we hypothesize that party-defined intergroup relationships will weaken a person's empathetic neural response. Similar to the behavior hypothesis that the stronger political belief will result in greater self-reported empathy, we also hypothesize that the strength of political affiliation of a participant is correlated to the strength of neural activation.

We are interested in understanding political party affiliation given the importance of party identification in understanding political behavior and human behavior as a whole. Party identification is not only one of the most consequential voter characteristics (Theodoridis, 2017) in the United States, but is also shown to both guide and constrain attitudes and behavior in realms beyond voting (Jost, 2006). In fact, today, more than ever before political orientation appears to "pervade almost every aspect of our public and private lives" (Abramowitz and Saunders, 2008).

Beyond electoral behavior, party identification provides a measure of social identity. The social identity approach to understanding party identification prompts us to investigate the existence of political belief bias in empathy given the ability of party affiliation to create ingroup and outgroup attitudes and behaviors.

According to social identity theory, "individuals derive their self concept from knowledge of their membership in a group and that they place value and emotional significance on that group membership" (Greene, 1999). In the context of the political partisanship in the United States, social identity theory can be used to better understand both party identification and the bipartisan relationship between political parties in the U.S. Past research has shown that social identity, which is based on the perceived relations of groups affect inter party perceptions (Kelly, 1990). In fact, "members of a political party were significantly more likely to perceive their own group as relatively diverse and the opposition party as relatively homogeneous and extreme" (Kelly, 1990). Moreover, the role of social identity extends to one's own attitudes as a person's attitude toward a social policy is heavily dependent on the political party's stated position (Cohen, 2003). While a person may have individual values, these values are largely shaped by the attitudes of the person's primary social groups (Bettencourt and Hume, 1998). Specifically with regard to

political social groups, the definition of a policy as liberal or conservative overrides the influence of the objective and factual components of the policy content in its persuasiveness (Cohen, 2003). In fact, under the availability of reference group information about a policy, people show minimal concern for the policy content, and instead uphold the collectivist values to be their individual value (Cohen, 2003). Therefore, group affiliation and social identity is of significant importance to understanding political behavior as people base their attitudes on social meaning.

The influence of political affiliation on individual behavior even extends to the experience of Schadenfreude, pleasure derived from another person's misfortune. In the political realm, Schadenfreude is exhibited by an ingroup member experiencing joy in response to a setback or failure of the outgroup. In fact, a study that showed individual news articles that were either heavily pro-Democrat or pro-Republican and asked for emotional reactions showed that party affiliation and the strength of party identification can predict the amount of schadenfreude felt by participants (Combs, 2009). More significantly, the study showed that even if the outcome of the outgroup is negative not only for the outgroup, but all involved (ie. The nation and the individual), the individual still felt joy in the negative outcome (Combs, 2009). This shows the dominating influence of group identification, specifically political party association, in individual behavior to the extent that they are willing to experience a negative outcome themselves in order to witness the outgroup member experience misfortune.

Past literature also shows the influence of political ideology extends beyond voting behavior, social identity to personality factors. The literature on basic personality differences between the left and right may contribute to greater group loyalty and stronger ingroup bias in political affiliation as members of the same political party not only share the same beliefs, but hold similar personality dimensions formed by their "psychological needs, motives, and orientations toward the world" (Carney, 2008). A study on the Big Five Personality Dimensions found significant differences between liberals and conservatives on openness and conscientiousness (Carney, 2008). Specifically, "Liberals are more open minded in pursuit of creativity, novelty, and diversity, whereas conservatives lead lives that are more orderly, conventional, and better organized" (Carney, 2008). The rift in personality dimensions in political affiliation further contributes to the ease of using political affiliation to segment social groups and investigate the impact of ingroup and outgroup attitudes in empathy for pain.

The bipartisan nature of the U.S political system provides defined social groups to examine the existence of political belief bias and differential attitudes and behaviors toward ingroup and outgroup members. Notably, the deep ideological polarization in American politics creates distinct social groups with distinct values (Abramowitz, 2005). Moreover, given the timing of the midterm elections in November, the current political climate is also ideal given that political sentiments are higher during election season.

Political Affiliation Measurement

As mentioned, this study involves both a behavioral and neural component. A key measure for both components is the political affiliation of the participant. Since our experiment is investigating the existence of political belief bias, participants of the study must pass a threshold for the extent of their political affiliation. For instance, independent voters who do not identify with a party do not satisfy the criteria and would invalidate the results. Moreover, participants who have a weak political affiliation must be screened out as well since they do not hold strong ties to their political group. Thus, in order to obtain valid results, a screening measure for political affiliation must be implemented prior to the experiment. The political affiliation measurement will be comprised of an explicit and implicit measure. The explicit measure is conducted in two branches: categorical and ideological. The categorical measure seeks to screen for the party affiliation of the participant while the ideological measure. A combination of the categorical and ideological measure aggregates as the explicit measure for political affiliation in our experiment. The categorical measurement is composed of two scales. The Michigan scale asks: "Generally speaking, do you usually think of yourself as a Republican, a Democrat, an Independent, or Other?" explicitly. The seven point scale consists the choices: Strong Republican, Weak Republican, Independent Republican, Independent Independent, Independent Democrat, Weak Democrat, Strong Democrat. Since our experiment requires participants with a strong political affiliation (Democrat or Republican), only participants will indicate Strong Republican or Strong Democrat will qualify. The second categorical scale asks "to what extent do you identify with the following political groups: Democrat, Republican, Independent"(Gromet, 2013). This is also a seven point scale with 1 indicating "not at all" and 7 representing "very much". Participants who indicate a rating of 5 or above fulfills this criteria of the categorical measurement. The categorical measurement is especially prevalent in the context of U.S politics given the bipartisan nature. However, while party identification is a critical component of the overall experiment as it is the social category being investigated, we must also measure the ideological beliefs of participants as a complement to the categorical measurement. While it is conventional for a party member's ideological beliefs to align with the party's ideological beliefs, we can not generalize that the individual upholds all values of the party. Thus, we must account for diversions in individual and collectivist values. As an ideological measurement, participants are asked to indicate their political ideological view on social and economic issues. Taken from Gromet's study on the impact of political ideology on energy-efficiency attitudes and choices, participants are asked to indicate their belief on trade and immigration. Specifically "Government should have fewer free trade agreements(1) to Government should have more free trade agreements(7)" and "Return illegal immigrants to their native countries(1) to Create a pathway to citizenship for illegal immigrants(7)" (Gromet, 2013).

While explicit measurements have been the standard measurement of political affiliation in academia as well as polling for elections, new evidence of the existence of "implicit party

identity” demonstrate the need to complement an explicit measure with an implicit measure of party identity (Theodoridis, 2017). An implicit measure addresses the limitations of the explicit measure given the influence of social desirability bias in self report measures. For instance, there may be partisans who, when asked, claim to be independent given the social environment and pressure they face (Klar and Kurpnikov, 2016). Theodoridis’ use of eight years of national survey data and a new implicit association test provide direct evidence of voter association with a party at a visceral level. Furthermore, comparison to measures of affect, differential evaluation, and motivated processing show that implicit party identity is able to capture variation in political cognition that explicit measures do not account for (Theodoridis, 2017).

. Moreover, an implicit measure, is especially applicable for our study given the bipartisan political climate in the U.S. There is evidence that “partisan attachments in the US are so ingrained in voter cognition than they appreciably impact reaction time when completing a simple classification task” (Theodoridis, 2017). In the implicit measure of party identity, the “self” and “other” used as attribute concepts and social category (Democrat or Republican) is used as the target concept(Theodoridis, 2017).

A combination of explicit measures (categorical and ideological) and implicit measures(implicit association test) will provide us with an accurate measure to screen the political affiliation of participants to ensure accurate results.

Methodology

The study is comprised of a two by two matrix design: Target Political Affiliation(Democrat/Republican) x Pain/No Pain. Participants, who themselves are either Democrat or Republican) will view members(target) in both their political ingroup and outgroup receive either pain or no pain. There are four conditions: Democrat receives pain, Democrat no pain, Republican receives pain, and Republican receives no pain. Using the procedure of Xu’s study on racial empathy for pain, we will stimulate pain by injecting fake syringe needles into the target’s cheek and counterbalance it by using a q-tip for no pain (see photos below). The political affiliation of the target is made salient to the participant through a badge on the chest of the target indicating whether he/she is a Democrat/ Republican. The political identification of the participant does not change the number nor type of video they view as we want to examine the difference. Thus, all participants will view all videos (both Democrats and Republicans receiving pain and no pain).

In the fMRI machine, a total a six functional scans will be taken. Each video(stimulus) durates 3s and the fixation(a central cross) will be a 9s interstimulus interval. Participants will be asked the press a button in response to his/her feeling in the machine to ensure focus and attention on the task at hand. Each scan is comprised of 16 video clips: 6 Democrat and 6 Republican faces, half with painful and half with non painful stimulations. The videos are shown in random order.

After the scanning procedure, participants are asked to complete a post scan survey. The behavior data will be used to cross validate the neural data from the fMRI scan. In addition to indicating how they felt in response to viewing videos of a Democrat/Republican receiving pain vs no pain in the fMRI scanner, participants will be asked to self report the intensity of the pain they felt and the extent of their empathy post-scan. To measure empathy, Batson's empathic concern scale will be provided. Specifically, participants are asked to answer: "How sympathetic, softhearted, warm, compassionate, tender, moved did you feel when you saw the person receiving highly painful shocks?" in response to all videos. In addition, to measure the intensity of first person pain in response to viewing the target receive pain, participants are asked to complete a pain intensity rating and unpleasantness rating scale in response to all the videos. Specifically "How painful do you think the model feels?" (Likert scale: 0=no effect, 10=maximal effect) and "How unpleasant do you feel when observing the video clip" (Likert scale: 0=no effect, 10=maximal effect) (Xu, 2009).

In addition, identity is an important measure to evaluate as well. As indicated in the pre-scan survey that the extent of endorsement of individual vs party values can provide insight into the results and provide a measurement for the hypothesis that the stronger the political affiliation, the greater the empathy reported by the participant. An implicit association test asking "How strongly do you associate your "self" with the liberal/conservative target?" will be conducted. In addition, participants will be asked to participate in a Dictator Game where subjects are given a small amount of money (ie. 10 dollars) and asked to choose to allocate a portion of the money to the other player. The identity of the recipient in the game will vary from unidentified anonymous, registered Republican, and registered Democrat. This will not only provide a measure of the participant's ingroup (Democrat Party or Republican Party) association.

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