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Bleeding-heart conservatives and hard-headed liberals: The dual processes of moral judgements

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ABSTRACT

Conservatives differ from liberals in a variety of domains, including exhibiting greater fear and disgust sensitivity. Additionally, experimental procedures to reduce reasoning ability lead to stronger endorsement of conservative views. We propose that dual-process models of moral judgements can account for these findings, with conservatives relying on System 1 (fast, emotional) and liberals relying on System 2 (slow, reasoned) processes. To test this theory, we had liberal and conservative participants respond to moral dilemmas under cognitive load or with no load. As predicted, liberals took longer to respond under cognitive load than under no load, indicating a reliance on controlled reasoning processes. Conservatives' response times were not affected by cognitive load. These differences cannot be accounted for by group differences in logical reasoning or working memory capacity. Instead, as predicted, logical reasoning ability positively predicted the time that liberals, but not conservatives, spent contemplating the dilemmas. These findings suggest that differential reliance on Systems 1 and 2 may be a fundamental aspect of left-right political orientation. They also challenge intuitionist models of morality and politics and suggest a dual-process theory of morality could account for some of the discrepancies in the political psychology literature.

Conservatives (right-wing) and liberals (left-wing) exhibit a series of cognitive, emotional, neural and physiological differences for which a unifying explanation remains elusive. In the current study we propose that a dual-process approach to moral judgements can parsimoniously account for many of these differences, with conservatives favouring System 1 (intuitive/emotional) and liberals favouring System 2 (logical/reasoned) responses.

Political orientation is linked to individual differences in personality, and physiological and neuroanatomical traits, associated with fear and threat. Conservatives (right-wing) show greater physiological responses to threatening stimuli than do (left-wing) liberals (Oxley et al., 2008), and exhibit greater disgust sensitivity (Helzer & Pizarro, 2011; Inbar, Pizarro, Iyer, & Haidt, 2012). They also perceive greater threat in ambiguous facial expressions (Vigil, 2010) and possess more white matter in the right amygdala, a brain area associated with threat and fear processing (Kanai, Feilden, Firth, & Rees, 2011). A meta-analysis of political ideology (Jost, Glaser, Kruglanski, & Sulloway, 2003) found that conservatives show greater needs for certainty and cognitive closure, and a greater aversion to ambiguity and complexity. Conservatives are also more conscientious, rule bound and orderly) whereas liberals exhibit greater openness to experience (reviewed by Jost (2009) and Carney, Jost, Gosling, & Potter (2008)).

The theory of motivated social cognition (Jost et al., 2003) postulates that divergent psychological motives to manage threat and uncertainty drive these differences: conservatives, unlike liberals, interpret change and uncertainty as threatening and are thus highly motivated to maintain the social status quo. Consistent with conceptualising conservatism as a cognitive defense against threat and uncertainty, recent life-threatening experiences can increase conservative attitudes (Bonanno & Jost, 2006), and liberals, more than conservatives, can better override habitual responses (Amodio, Jost, Master, & Yee, 2007). The theory of motivated social cognition, however, does not account for why other situational factors, such as alcohol intoxication, time pressure and cognitive load, all of which challenge reasoning processes by encouraging low-effort thought, increase endorsement of conservative attitudes (Eidelman, Crandall, Goodman, & Blanchar, 2012).

Dual-process theories of moral judgements (Greene, Morelli, Lowenberg, Nystrom, & Cohen, 2008; Greene, Nystrom, Engell, Darley, & Cohen, 2004; Paxton, Ungar, & Greene, 2012) could parsimoniously account for both the apparent conservative aversion to threat and uncertainty, and the relationship between inhibited reasoning capacity (via low-effort thought processes) and increased conservative attitudes. Dual-process theories explain moral judgements as resulting from an interaction between two systems: System 1 is fast, intuitive and emotionally driven, but can be subsequently overridden by reasoned judgements made by System 2, which is slow and effortful (Cushman, Young, & Hauser, 2006; Feinberg, Willer, Antonenko, & John, 2012; Greene et

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al., 2004, 2008). If liberals and conservatives differ in the extent to which they rely on Systems 1 and 2, this could account for the apparently fear-motivated behaviours of conservatives (System 1 dominance) and also for the observed increases in conservatism when reasoning abilities (System 2) are challenged.

There is converging evidence that conservatives may well rely heavily on emotional, System 1 processes. Conservatism is related to both chronic and temporary elevations in disgust sensitivity (Helzer & Pizarro, 2011), with these relationships persisting when accounting for education, religious affiliation and other personality factors (Inbar et al., 2012). Moreover, conservatives are more likely to condemn (harmless) taboo sexual acts as immoral and respond to them with negative affect, subsequently exhibiting "moral dumbfounding" – defined as "stubborn and puzzled maintenance of a moral judgement, without supporting reasons" (Haidt & Hersh, 2001, p. 194). This finding suggests that conservatives, more than liberals, tend to rely on emotional/intuitive processes (System 1) when making moral decisions, rendering them less able to articulate logical reasons for their choices (a System 2 process).

There is also evidence for more dominant System 2 function in liberals. Skitka, Mullen, Griffin, Hutchinson, and Chamberlin (2002) showed that although both liberals and conservatives initially blamed individuals for their own socio-economic misfortune, an intuitive System 1 response, only liberals' attitudes were subsequently moderated to take into account external factors (System 2). These findings suggest that, within the realm of moral judgements, at least, conservatives may exhibit more dominant System 1 processes, even in the absence of needs to manage threat and uncertainty (since individuals suffering socio-economic misfortune are not an obvious threat or source of uncertainty), whereas liberals may exhibit more dominant System 2 processes.

The current study directly tests the notion that liberals and conservatives differ in the relative extents to which they rely on System 1 and System 2 processes when making moral judgements. We applied a design inspired by Greene et al. (2008). Greene and colleagues who presented participants with a series of moral dilemmas in which the agent has the option of taking an action that will result in the death of a specified individual, but will also avert the death of several other people.

To detect whether logical reasoning processes (System 2) were involved in generating responses to the dilemmas, Greene et al. used a cognitive load manipulation requiring participants to attend to numbers scrolling along the bottom of the screen, responding whenever they a saw a '5' digit. Such manipulations only delay responding on other tasks when those other tasks are under the control of so-called "cognitive" processes: the logical reasoning (System 2) processes (Eidelman et al., 2012; Greene et al., 2008). Hence, our measure of the extent to which participants' responses to the dilemmas reflected logical/reasoned (System 2), rather than emotional/intuitive (System 1) processes, was the difference in response time to the dilemmas between the load and no load conditions.

We replicated Greene et al.'s (2008) basic design, recording response times to moral dilemmas under both cognitive load (using a similar cognitive load induction procedure) and no-load conditions. If liberals exhibit a greater propensity to rely on System 2 and conservatives a greater propensity to rely on System 1, the cognitive load induction should slow liberals' response times to the dilemmas (relative to the no load condition), with no difference in conservatives' response times between the load and no-load conditions. Note that, consistent with the reports of Greene et al. (2008), we do not predict that responses under System 1 control, should be generally faster than responses under System 2 control, and so we make no predictions about the overall tendency for liberals (or conservatives) to respond more slowly (or quickly) overall.

Since the differences we are proposing between liberals and conservatives are differences in the propensity to rely on System 1 (intuitive) versus System 2 (logically reasoned), not a difference in logical reasoning ability per se, it's important to account for individual differences in logical reasoning ability. Hence we included a logical reasoning task. We also included a working memory capacity task, as a proxy for intelligence (Conway, Kane, & Engle, 2003), given the complicated relationship between political orientation and intelligence: intelligence is positively associated with conservatism in people with low political interest, but negatively so in people with high political interest (Kemmelmeier, 2008), although Rindermann, Flores-Mendoza, and Woodley (2012) report a positive association between intelligence and political centrality.

If the cognitive load induction selectively increases liberals' response times, but not those of conservatives, then the differential effect of load should not be explicable by liberal/conservative differences in reasoning ability or intelligence. We also predicted that logical reasoning ability should correlate positively with response time for liberal, but not conservative, participants, as a result of liberals' reliance on System 2, and conservatives' reliance on System 1, processes.

1. Method

1.1. Participants

This study was approved by the Charles Sturt University HREC (under approval number 113/2013/08) and was conducted in accordance with the provisions of the World Medical Association Declaration of Helsinki. One hundred and twenty-four participants completed the online study. Five were subsequently removed due to long response times (see Results) leaving a sample of 119 participants (41 males) aged from 18 to 70 years ($M = 34.2$, $SD = 12.8$), of which 108 identified as Australian. Participants were either first year psychology students ($n = 58$, 41 liberals), who participated in return for course credit, or members of the general public ($n = 61$, 44 liberals). Eighty-five participants (29 males) aged from 18 to 59 years ($M = 32.7$, $SD = 11.4$) self-reported as liberal, and 34 (13 males) aged from 18 to 70 years ($M = 37.2$, $SD = 15.6$) self-reported as conservative.

1.2. Stimuli and procedure

The experiment was conducted online, with presentation controlled by Inquisit Software (Millisecond Corp.). Participants first responded to a series of moral dilemmas, half under cognitive load, and were then given a working memory capacity test, a logical reasoning test and, lastly, provided their political orientation.

1.2.1. Moral dilemmas

The set of moral dilemmas was the "personal moral dilemmas" of Koenigs et al. (2007). This set of dilemmas is used frequently in studies of moral judgements (e.g., Greene et al., 2004, 2008; Feinberg et al., 2012; Koenigs et al., 2007) and involve an agent weighing up whether to harm one person for the benefit of several other people. As in Greene et al.'s (2008) experiment, a utilitarian answer (deciding to harm one to save many) is always in the affirmative. For example, in the submarine dilemma, participants are told they are on a submarine and an onboard explosion has injured a crew-member and left the rest of the crew with insufficient oxygen. The participant is then asked whether it is morally permissible to kill the injured crew-member, who would not otherwise survive anyway, to preserve oxygen for the remaining crew. Participants were first provided with the body of the dilemma and given unlimited reading time. Once the question was revealed (at the participant's indication), they had 30 s to respond, after which on-screen instructions indicated their time was up and that they had to answer now.

We used 19 dilemmas, 10 arbitrarily allocated to set-A and 9 to set-B. Half of the participants completed set-A under load and set-B under no-load (blocked and counter-balanced for order and reversed for the other

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half of the participants). In the cognitive load condition load was induced (during both the unlimited reading time provided to read the body of the dilemma and the subsequent 30-second time period given to respond) by asking participants to attend to single digits (changing randomly at a rate of 1 per second) in the bottom-right corner of the screen, and to press a button every time a "5" appeared. In the no-load condition participants were simply presented with the dilemmas (unlimited reading time followed by 30 s to respond) with no other concurrent task.

1.2.2. Working memory capacity

Participants were presented with digit-strings (each digit on the screen for 700 ms) of increasing lengths from 4 to 10. After each string participants were asked to type in the digit sequence just shown. Participants' score for this task was the length of the longest digit string they recalled correctly, or 3, if they did not recall any of the strings correctly.

1.2.3. Logical reasoning

Participants completed 6 deductive reasoning multiple-choice questions, including 3 syllogisms and 3 other questions, for example:

"What is the missing letter in this series: g? d i j d k l d.

Is it f, e, c, h, or d?"

Responses were not time-limited and each participant was given an overall score out of 6, reflecting their number of correct responses. Scores ranged from 0 to 6 with the measure exhibiting good discriminability between participants (no >31 of the 118 participants who completed the test achieved the same score).

1.2.4. Political orientation and other demographic information

Participants indicated their political orientation on a sliding scale that ranged from 0 (labeled 'extremely liberal') to 100 ('extremely conservative'), with labels indicating 'centre left' and 'centre-right', at the 25 and 75 mark, respectively (numbers were not visible). The slider was initially positioned at 50. A sliding scale was used so that participants could indicate a political orientation, which we could classify as liberal (<50) or conservative (>50), without the participant having to necessarily identify with one of those labels. The mean score reported by those classified as conservative was 24.68 (SD = 14.30), and for liberals, 68.24 (SD = 9.67). After indicating their political orientation, participants provided their age, sex and nationality.

2. Results

All analyses were conducted using SPSS v20 for Mac, and all stimulus, data and syntax files will be indexed through Research Data Australia (researchdata.ands.org.au), linked to the profile of the corresponding author. Five participants (2 conservative and 3 liberal) had extreme mean response times (>3 standard deviations above the mean), so their data were removed. Of the remaining 119 participants, only 101 (74 liberals and 27 conservatives) provided at least one utilitarian response (agreeing to harm one person for the benefit of many) in both load conditions, whereas all participants provided at least one non-utilitarian response in both load conditions. To avoid removing participants who did not provide both types of responses, these two response types were analysed separately. Additionally, six participants failed to respond to the working memory capacity task and one participant failed to respond to the reasoning task. These participants were retained in the dataset, but were not included in analyses involving those respective tests.

2.1. Logical reasoning and working memory capacity

An independent samples *t*-test revealed no significant difference ($t(110) = 0.193$, $p = 0.85$, $\eta_p^2 = 0.002$) in working memory scores between liberals (M = 6.42, SD = 1.24) and conservatives (M = 6.29, SD = 1.44). Logical reasoning scores also showed no significant differences ($t(116) = 0.471$, $p = 0.638$, $\eta_p^2 = 0.007$) between liberals (M = 2.93, SD = 1.39) and conservatives (M = 2.68, SD = 1.32).

Table 1
Correlations between working memory capacity scores and moral dilemma response time for liberal and conservative participants.

Condition (response type)	Working memory capacity					
	Liberal			Conservative		
	Pearson *r*	*p*	N	Pearson *r*	*p*	N
Load (utilitarian)	0.074	0.529	75	0.119	0.490	27
No load (utilitarian)	0.029	0.811	72	0.010	0.686	25
Load (non-utilitarian)	0.146	0.193	81	0.040	0.078	31
No load (non-utilitarian)	−0.037	0.740	81	−0.185	0.125	31

Pearson correlations revealed no significant relationships between working memory capacity and response times, for either liberals or conservatives under either load condition (see Table 1). Logical reasoning scores, however, correlated positively with response time for liberal participants under both load conditions, but not for conservative participants (see Table 2).

2.2. Number of utilitarian responses

A GLM repeated-measures ANOVA with cognitive load as a within-subjects variable and political orientation as a between subjects-variable revealed no difference between liberals and conservatives on the number of utilitarian responses (agreeing to harm one person for greater of good of many) given ($F(1, 117) = 1.167$, $p = 0.282$, $\eta_p^2 = 0.010$). Number of utilitarian responses was also not affected by cognitive load ($F(1117) = 0.982$, $p = 0.324$, $\eta_p^2 = 0.008$), nor was there a significant interaction between load and orientation ($F(1, 117) = 1.522$, $p = 0.220$, $\eta_p^2 = 0.013$).

2.3. Utilitarian response time

Mean response times to provide a utilitarian answer were analysed using a GLM repeated-measures ANOVA with cognitive load as a within-subjects variable and political orientation as a between-subjects variable. As predicted, there was a significant interaction between cognitive load and political orientation ($F(1, 99) = 4.253$, $p = 0.042$, $\eta_p^2 = 0.041$) as liberals took significantly longer to respond under cognitive load, compared to the no-load condition ($p = 0.002$, $\eta_p^2 = 0.093$) whereas cognitive load had no effect on conservatives' response times ($p = 0.626$, $\eta_p^2 = 0.002$, see Fig. 1A). The main effects of load and political orientation were not significant (both $p > 0.144$).

2.4. Non-utilitarian response time

The same analyses as above were applied to non-utilitarian response times, again revealing a significant interaction between cognitive load and political orientation ($F(1, 117) = 5.218$, $p = 0.024$, $\eta_p^2 = 0.043$) with liberals responding more slowly under load ($p < 0.001$, $\eta_p^2 = 0.109$) and load not affecting conservatives' response times ($p = 0.753$, $\eta_p^2 = 0.001$, see Fig. 1B). There was also a significant main effect

Table 2
Correlations between reasoning scores and moral dilemma response time for liberal and conservative participants.

Condition (response type)	Logical reasoning					
	Liberal			Conservative		
	Pearson *r*	*p*	N	Pearson *r*	*p*	N
Load (utilitarian)	0.247	0.030	78	0.081	0.672	30
No load (utilitarian)	0.331	0.004	74	0.152	0.441	28
Load (non-utilitarian)	0.297	0.006	84	0.081	0.650	34
No load (non-utilitarian)	0.167	0.129	84	−0.030	0.867	34

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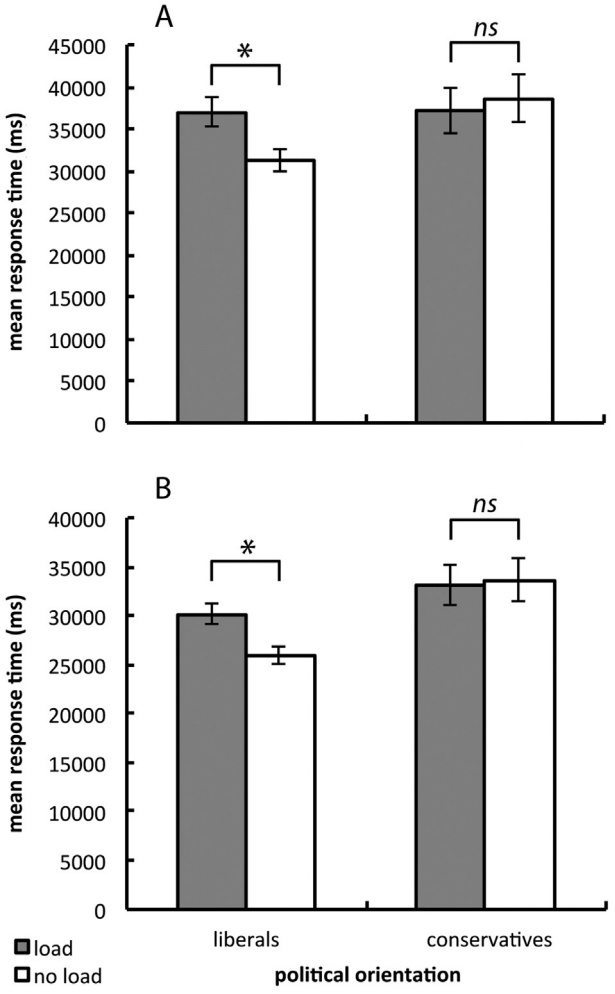

Fig. 1. Shows the mean (±1 se) response time for liberals and conservatives to provide utilitarian (A) and non-utilitarian (B) responses to moral dilemmas under cognitive load (grey bars) and no load (white bars). For both types of responses, cognitive load increased the response time of liberal participants but had no effect on the response times of conservative participants.

of political orientation ($F(1, 117) = 5.218$, $p = 0.024$, $\eta_p^2 = 0.043$), with liberals responding faster than conservatives: significantly so under no load ($p < 0.001$, $\eta_p^2 = 0.110$), but not under load ($p = 0.171$, $\eta_p^2 = 0.016$).

3. Discussion

Consistent with the hypothesis that liberals rely more on controlled cognitive (System 2) processes than conservatives, the cognitive load induction selectively interfered with the time taken by liberal, but not conservative, participants to make moral judgements. There was no evidence that these differences resulted from disparities in logical reasoning or general intelligence, or as a result of the liberals and conservatives being differentially predisposed to make utilitarian or non-utilitarian decisions. Logical reasoning ability did, however, predict how long liberal, but not conservative, participants spent considering their answer. These findings suggest that political orientation is associated with the degree to which a person relies on either emotional/intuitive or logically reasoned processes when making moral judgements. It is also worth emphasizing here that there was no difference between liberals and conservatives in their tendency to endorse (or not) the utilitarian response to the dilemmas, meaning that the two groups were largely in agreement with respect to the actions they deemed to be morally permissible. Thus, it does not follow from these data that either System 1 or System 2 (or liberal or conservative participants) are necessarily more adept at, or better suited to, arriving at accurate or appropriate moral judgements.

Contrary to Greene et al.'s (2008) findings, we did not find that System 1 processes were only deployed for utilitarian decisions, since cognitive load increased liberals' response times for both utilitarian and non-utilitarian answers. We did find, however, that utilitarian decisions took more time to reach than non-utilitarian decisions overall. Additionally, within liberal participants, the only decision type that did not correlate significantly with logical reasoning was non-utilitarian decisions made under no load, suggesting a relatively greater System 1 contribution for these decisions than for others. These findings suggest that although System 2 processes are not restricted to utilitarian decisions in these paradigms, as Greene and colleagues suggested, they are less likely to be involved when participants arrive at non-utilitarian decisions. The fact that System 2 appears to be involved in at least some non-utilitarian decisions (made by liberal participants) suggests that participants may have been considering consequences other than the fate of the other characters in the dilemmas. Since the utilitarian action is often quite harsh or violent, participants may have been considering the legal or social ramifications for themselves of their hypothetical decisions, leading to a System 2 driven, non-utilitarian response.

Although liberal and conservative participants did not differ in their reasoning or working memory capacity scores, liberals did respond more quickly than conservatives when providing non-utilitarian responses under no load. This is unlikely to reflect a general intelligence difference between liberals and conservatives (reflected in reading speed, for example) however, as the same difference was not observed when utilitarian responses were provided. In any case, we are positing that liberals and conservatives tended to arrive at their answers via different means, with conservatives relying more on System 1 and liberals more on System 2, so direct comparisons of absolute response times between the groups are not necessarily meaningful and could reflect any of the many dispositional and behavioural differences between liberals and conservatives previously identified (reviewed by Jost, 2009).

Although the faster (non-utilitarian under no load) response times of liberals, compared to conservatives, might seem inconsistent with liberals' greater reliance on System 2, this finding is similar to one reported by Greene et al. (2008). In both cases, participants whose load induction suggested they were relying on System 2 (in our case liberals, and in Greene's case, people providing utilitarian responses), actually responded more quickly than the relevant comparison group (in our case conservatives, and in Greene's case, people providing non-utilitarian judgements) who were apparently relying on the supposedly faster System 1.

Saltzstein and Kasachkoff (2004) point out that some judgements may be developed based on reasoning, but subsequently re-deployed in a more automatic fashion. Given the repetitive nature of the dilemmas (a decision that harms one to preserve many), liberal participants may not have needed to reason anew for each dilemma, applying previous thought processes to subsequent scenarios. Admittedly, it remains unclear why this potential short-cut would only benefit non-utilitarian responses in our study.

Moral psychology is largely divided between intuitionist (Haidt, 2012) and dual-process theories of moral decision-making (Feinberg et al., 2012; Greene et al., 2004, 2008). Intuitionist theories deny that *ex-ante* (prior to the decision) reasoning plays a significant role in moral decisions, arguing that any rationale provided by a person to explain a moral decision (with few exceptions, Haidt, 2001) is simply a post hoc rationalisation. Dual process theories, on the other hand, recognise the role of intuition (via System 1), but also claim a more prominent role for *ex-ante* reasoning (via System 2). The current study provides support for dual-process theory, but may also help resolve apparent inconsistencies in the literature. Since we provide evidence that moral decisions can be more intuitive in conservatives, but more likely to be based on *ex-ante* reasoning in liberals, the predominant political

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orientation of any given sample could have a large effect on whether a particular study appears to support an intuitionist or dual-process theory of morality.

These results also have broader implications for the prevailing intuitionist view of political attitudes (Graham, Haidt, & Nosek, 2009; Haidt & Hersh, 2001; Haidt, 2012). If disparate moral intuitions are responsible for left-right differences in political attitudes, as this theory asserts, then we would not have predicted the differential use of *ex-ante* reasoning between liberals and conservatives seen in the present study. Rather than looking within either System 1 or System 2 for the root cause of the moral differences between liberals and conservatives, perhaps the answer lies within the extent to which System 2 processes are able to override System 1, and in what circumstances this is likely to occur.

Future research should now examine the resilience and stability of people's moral and political beliefs, especially in the face of evidence that contradicts their views. A number of researchers have shown that affect-driven attitudes are difficult to change, and are not responsive to arguments based on reason (Edwards, 1990; Haidt & Hersh, 2001; Shavitt, 1990). Since the present results indicate a greater System 2 response on the part of liberals, it could be useful to examine whether liberals and conservatives differ in their responses to logic- and affective-based arguments. One would expect that, if conservatives rely more on intuitive processes (System 1), their attitudes will be less amenable to change in response to logic-based arguments. These possibilities are supported by observations that liberals are better able than conservatives to differentiate between strong and weak arguments and that conservatives tend to be more persuaded than liberals to change their view to match that of someone they perceive to be similar to themselves (Miller, Krochik, & Jost, 2010). We would also expect to see similar relationships between reliance on intuitive processes and responses to reasoned arguments when examined at the level of individuals within the broad categories of liberal and conservative.

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