

Liberals Think More Analytically (More “WEIRD”) than Conservatives

Thomas Talhelm<sup>1</sup>, Jonathan Haidt<sup>2</sup>, Shigehiro Oishi<sup>1</sup>, Xuemin Zhang<sup>3,4</sup>, Felicity F. Miao<sup>1</sup>, and  
Shimin Chen<sup>5</sup>

<sup>1</sup> Department of Psychology, University of Virginia

<sup>2</sup> Stern School of Business, New York University

<sup>3</sup> School of Psychology, Beijing Normal University;

<sup>4</sup>State Key Lab of Cognitive Neuroscience and Learning, Beijing Normal University

<sup>5</sup> Department of Social Work, China University of Mining and Technology

Author note

This research was supported by a National Science Foundation Graduate Student Fellowship and a National Science Foundation East Asian and Pacific Summer Institute Fellowship awarded to Thomas Talhelm.

Correspondence about this article should be addressed to Thomas Talhelm,  
Department of Psychology, University of Virginia, P.O. Box 400400, Charlottesville, VA  
22904-4400. [tat8dc@virginia.edu](mailto:tat8dc@virginia.edu)

### Abstract

Henrich and colleagues (2010) summarized cultural differences in psychology and argued that people from one particular culture are outliers: people from societies that are Western, educated, industrialized, rich, and democratic (WEIRD). This study shows that liberals think WEIRDer than conservatives. In five studies with more than 5,000 participants, we found that liberals think more analytically (an element of WEIRD thought) than moderates and conservatives. Study 3 replicates this finding in the very different political culture of China, although it held only for people in more modernized urban centers. These results suggest that liberals and conservatives in the same country think as if they were from different cultures. Studies 4-5 show that briefly training people to think analytically causes them to form more liberal opinions, whereas training them to think holistically causes shifts to more conservative opinions.

*Keywords:* politics, cognitive style, WEIRD, analytic, holistic, culture

### Liberals Think More Analytically (More “WEIRD”) than Conservatives

American political parties realigned and purified in the 1970s and 1980s. By the 1990s, the Republican Party had lost nearly all of its liberals, and the Democratic Party had lost nearly all of its conservatives (Levendusky, 2009). As the battle lines became more bitter, many observers started calling politics a “culture war” (Hunter, 1991).

This study tests whether liberals and conservatives actually think about the world as if they were from different cultures. Of course, partisans on both sides believe different facts, use different economic theories, and hold differing views of history. But might the differences run even deeper? Do liberals and conservatives process the same set of facts with different cultural thought styles? To answer this question, we test whether liberals and conservatives think differently on measures of cultural thought style, and then we test the provocative idea that temporarily changing people’s cultural thought styles changes their political opinions.

### **WEIRD Analytic Thought**

Henrich, Heine, and Norenzayan (2010) reviewed decades of cross-cultural research and concluded that Westerners are WEIRD. The 15% of people who live in Western, educated, industrialized, rich, and democratic (WEIRD) societies are frequent psychological outliers compared to the other 85% of humanity, even though WEIRD people are the vast majority of subjects in psychology studies and form the basis of our theories of human nature. In this study, we show that liberals are an even WEIRDer part of that 15%. Liberalism may be the sixth attribute of WEIRD cultures.

How are WEIRD people outliers? WEIRD people have different economic behavior, moral judgments, trust, and self-concepts (Henrich et al., 2010). But we focus on WEIRD thought.

WEIRD people are cognitive outliers because they score analytically on measures of thought and perception (Henrich et al., 2010). For example, analytic thinkers use logical rules

of non-contradiction such that X and “not X” cannot both be true. And analytic thinkers are more likely to use properties of objects to predict their behavior, such as using personality traits to predict behavior (e.g., predicting that impatient people will honk at slow drivers; Morris & Peng, 1994).

The non-WEIRD 85% of the world thinks more holistically or intuitively. They are more likely to think that X and “not X” can both be true. And they more often use situations to predict behavior (e.g., people will honk during rush hour).

The differences extend to non-verbal perception. Analytic thinkers see the world as made up of singular, distinct objects that can be separated from their context. For example, on memory tasks, Americans who see a picture of a wolf in a forest are good at later remembering having seen that wolf, even when it appears against a new background, such as a desert (Masuda & Nisbett, 2001). East Asians are more likely to tie focal objects to the background and report *not* having seen the wolf when it appears against the new desert background.

Some psychologists call the 85% way of processing the world “holistic” because it emphasizes seeing scenes as a whole and seeing people as a product of situations (Nisbett, Peng, Choi, & Norenzayan, 2001). They call the 15% thought style “analytic” because it emphasizes slicing up the world and analyzing objects individually, divorced from context—much like scientific analysis requires thinkers to separate complex phenomena into separate parts.

### **The Social Orientation Hypothesis**

The holistic-analytic distinction is not just a cross-national distinction. In its earliest stage (before the terms “holistic” and “analytic” were common), researchers found that analytic thought varies from person to person within Western nations and that it correlates with various measures of social behavior or social style. An early pioneer in this work, Witkin

measured people's perceptual style using the rod-and-frame task (Witkin & Goodenough, 1977). In that task, participants have to rotate a rod to stand at the true vertical, even though it sits in a rotated frame. The rotated frame slants people's sense of up and down, and some people end up aligning the rod more with the frame rather than the true vertical.

Witkin called the people who rotated the rod more in line with the slanted frame rather than the true vertical "field dependent." Witkin called people "field independent" if they relied on their body's internal cues and made the rod truly straight (despite the rotated box).

Witkin also discovered that people's perceptual style tracked their social style (Witkin & Goodenough, 1977). Witkin catalogued dozens of social differences: field-independents preferred solitary activities, played fewer group sports, and were less susceptible to social conformity on Asch's social suggestion task. Field-independent men had longer hair, and field-independent women showed up to the lab wearing shorter skirts—evidence that field-independents more readily bucked social norms (norms of the 1960s, at least).

Witkin was 30 years ahead of cultural psychologists who developed the social orientation hypothesis, which argues that social style causes cultural differences in cognitive style (Varnum, Grossman, Kitayama, & Nisbett, 2010). They argue that people think analytically when their culture endorses "self-direction, autonomy, and self-expression" and views the self as "bounded and separate from social others" (Varnum et al., 2010, p. 9). People think holistically when their culture endorses an interdependent, connected view of the self and emphasizes fitting in and harmony more than self-expression.

Although Witkin mostly studied Americans, his conception of field-independents fits with the idea that independent cultures tell people to pay more attention to internal cues (like their own attitudes and preferences) and interdependent cultures tell people to pay more attention to external cues (like social norms and the preferences of others). In fact, later research showed that collectivistic East Asians are more field-dependent (Nisbett et al., 2001).

Witkin's findings are correlational, so they cannot prove social style causes thought style. However, psychologists have tested the social orientation hypothesis experimentally. The most common method is to briefly make people more collectivistic and test whether they think more holistically afterwards. To make people more collectivistic, they have had participants circle first-person singular pronouns (*I*, *me*, and *mine*) or first-person plural pronouns (*we*, *us*, and *our*) on what they think is a linguistic test (Kuhnen & Oyserman, 2002); read stories with characters that make independent decisions or decisions that take other people into account (Trafimow, Triandis, & Goto, 1991; Study 2); and list ways that they are like or unlike other people (Trafimow et al., 1991; Study 1). All of these different interdependent primes make people think more holistically (and vice-versa), with an average effect size of  $d = 0.54$  (meta-analysis: Oyserman & Lee, 2008).<sup>1</sup>

### **Liberals May be More Individualistic**

We hypothesize that liberals think more analytically because liberal culture is more individualistic, with looser social bonds, more emphasis on self-expression, and a priority on individual identities over group identities (Haidt, 2012, Ch. 7). For example, liberalism is associated with cities, which are centers of self-expression and non-conformity (Kashima et al., 2004). Conservatism is often associated with rural areas, where people are enmeshed in tightknit communities and are more likely to know the people they see walking on the street. Conservatism is also associated with interconnected groups, such as churches, fraternities, and the military.

There is also evidence that liberal morality around the world is more individualistic than conservative morality. Across many different countries, conservatives score higher on the three “socially binding” moral foundations from Moral Foundations Theory: loyalty (people should be loyal to their groups), authority (leaders and social institutions are essential for creating social order and should be deferred to), and sanctity (some people, objects, and

ideas must be protected from desecration, particularly those that bind groups together, such as flags; Graham, Haidt, & Nosek, 2009; Haidt, 2012). For example, conservatives are more likely to endorse the statement “It is more important to be a team player than to express oneself” (Graham et al., 2009). In contrast, liberals put higher importance rankings on moral foundations that generally function to protect individuals, rather than groups: care (we should care for individuals who are suffering) and fairness (particularly a concern for fairness as equality; people should be protected from exploitation and cheating).

However, some psychologists object to calling liberals individualistic. For example, in her discussion of whether liberals or conservatives are more collectivistic, Janoff-Bulman (2009, p. 123) said that calling conservatives collectivistic ignores liberals’ support for “communal sharing.” The argument goes like this: American conservatives staunchly oppose welfare programs for the poor and raising federal taxes to support social programs. Doesn’t that mean conservatives are more individualistic?

We argue that this is a confusion of the common meaning of the word “collectivism” with the more precise meaning of “collectivism” in cultural psychology. Although sharing is a part of collectivism, collectivism is *not* generalized sharing with “other people.” Collectivism is a system of tight social ties and responsibilities, but *less* trust and *weaker* ties toward strangers—a stronger in-group/out-group distinction (Triandis, 1995). Conservatives care deeply about close others, but they may dislike welfare programs because those programs serve strangers or even people from outgroups, and conservatives may see individuals on welfare as weighing down the system. Thus, we argue that supporting national welfare programs is actually consistent with liberal individualism; distrusting national welfare is consistent with collectivism. However, research is needed to compare liberals and conservatives using measures that have been validated across cultures.

However, there is some evidence that US conservatives show some “Western” traits more strongly than US liberals. US conservatives are more likely to attribute other people’s behavior to internal causes (the fundamental attribution error), which is more common in Western cultures (Skitka, Mullen, Griffin, Hutchinson, & Chamberlin, 2002). In addition, a study of managers found that conservative US managers were more likely to defend more extreme internal attributions of behavior as a social control strategy—essentially holding individuals accountable even if external factors lessen their responsibility (Tetlock, 2000). Thus, it is not entirely clear whether we should expect conservatives to display more typically “Western” traits.

### **Prior Evidence that Liberals Think Analytically**

If liberals are really more individualistic, the social orientation hypothesis would predict that they think more analytically. Researchers have tested cognitive differences between liberals and conservatives for decades, but very few studies have used measures of cultural thought. It is unclear whether the measures that have been used with liberals and conservatives (such as the Need for Cognition scale) are measuring the same thing as cultural measures.

A meta-analysis of over 22,000 participants found that liberals scored higher on a number of measures of a preference for deep thought and a rejection of simple solutions (Jost, Glaser, Kruglanski, & Sulloway, 2003). Liberals are more tolerant of ambiguity ( $r = .34$ ) and uncertainty (.27), and they have less of a need for order, structure, and closure (-.26). Similarly, results from the large YourMorals.org database show that liberals score higher than moderates ( $d = 0.20$ ) on the Need for Cognition scale (Iyer, Koleva, Graham, Ditto, & Haidt, 2012). Conservatives score lower than moderates ( $d = -0.19$ ). Interestingly for our predictions about libertarians (explained below), libertarians also score higher ( $d = 0.34$ ) than moderates (all  $ds$  relative to moderates).



Most of this research uses self-report questionnaires that ask people to describe their own thought style, which could be measuring how people see themselves rather than how they actually think. Psychologists have also used behavioral measures, such as intelligence tests and systematic coding of people's written statements. A meta-analysis of behavioral measures of cognition found that liberals showed higher cognitive complexity (Van Hiel, Onraet, & De Pauw, 2010). For example, liberals had less cognitive rigidity ( $r = -.11$ ), more tolerance of ambiguity ( $r = .22$ ), and higher general cognitive ability and education ( $r = .26$ ). Although the findings of the behavioral meta-analysis echoed the self-report findings, the effect sizes were generally smaller.

The Van Hiel meta-analysis included studies of one cultural measure, field dependence, but the authors concluded that there were not enough studies to ensure that publication bias was not skewing the results (Van Hiel et al., 2010). There were fewer than half the number of studies on field-dependence ( $n = 10$ ) than studies of the other cognitive variables ( $ns = 20-50$ ). Therefore, whether there are cultural differences in cognition between liberals and conservatives is not fully resolved.

Another open question is whether "cognitive complexity" is the same as cultural analytic thought. On the surface, some of the terms used for cognitive complexity actually sound like holistic thought. For example, liberals' "tolerance of ambiguity and uncertainty" (Jost et al., 2003) sounds similar to East Asians' tolerance for X and "not X" both being true. If so, liberals should think more holistically.

Perhaps the biggest theoretical difference is that tests that have been used on liberals and conservatives often emphasize "depth of processing," whereas cultural psychologists do not use this term. However, some measures of cultural thought suggest that holistic thought has more depth. Measures of liberals' cognitive complexity stress the recognition of "multiple perspectives" (Van Hiel et al., 2010, p. 1771)—the exact phrase Nisbett and colleagues (2001,

p. 293) use to describe holistic thought. Similarly, Korean participants rated more factors as relevant to determining causal attribution than Americans, which could be interpreted as recognizing multiple perspectives (Choi, Dalal, Kim-Prieto, & Park, 2003). Therefore, reading prior studies on cultural and political thought could lead readers to hypothesize that *liberals* have more holistic thought.

### **The Libertarian Exception**

Despite our prediction that liberals think more analytically, cultural researchers have not reported relationships between political orientation and cultural thought. We argue that this is because overall political identity (e.g., liberal, conservative, socialist) reflects a messy mix of social and economic politics, whereas the social orientation hypothesis would predict that social politics should be the best predictor of thought style. Libertarians are a good example of why.

If we were to poll 1,000 people's politics and test their thought style, libertarians would be a stick in our theoretical mud. That is because conservatives are the most socially interdependent, but libertarians are the *least* interdependent, the least attached to groups, friends, and even family (Iyer et al., 2012). Libertarians often fiercely deny society's right to restrain individuals. But if we do not give them a libertarian response option—which often happens on short liberal-conservative scales—libertarians often self-identify as conservatives.<sup>2</sup>

That means the conservatives in many studies are actually a mix of social conservatives and libertarians. And because libertarians are so individualistic, they should be on the extreme analytic end of the spectrum. Indeed, libertarians score the highest of any political group on a measure of “systemizing” and the lowest on “empathizing” (Iyer et al., 2012). Mixing libertarian analytic thought with holistic social conservative thought weakens the liberal-conservative differences.

Psychology research has long mixed economic and social politics. “Since 1952 most academic surveys have asked the same party identification questions” (Burden & Klofstad, 2005, p. 871). A common wording is: “Generally speaking, do you usually think of yourself as a Republican, a Democrat, an Independent, or what?” on a seven-point scale from “strong democrat” to “strong republican.” Jost’s meta-analysis on political thought mostly used a single-item measure (Jost et al., 2003). Even in social psychology, most studies use a similar one-item political identification scale (e.g., Jost, Nosek, & Gosling, 2008).

To deal with this problem, we measure economic and social politics separately. This fits with Jost, Federico, and Napier’s (2009) conclusion that social and economic politics are correlated but distinct (p. 313). Social politics covers people’s opinions on personal freedom, such as marijuana legalization, abortion, and gay rights. Economic politics deals with how the government should regulate trade and taxes, questions like how much the government should tax and whether the government should regulate businesses.

All studies in this paper split political questions into an economic and a social question. The scale for those questions ranges from one (*very liberal*) to seven (*very conservative*), with four representing *moderate*. This lets libertarians separate themselves out from social conservatives, since libertarians often identify as social liberals but economic conservatives.

### **The Current Studies**

The studies we report bring together four features that create the most rigorous test yet of the hypothesis that politics is related to holistic-analytic thought: (1) We bring cultural thought measures into political psychology. (2) We distinguish social and economic politics.<sup>3</sup> (3) We measure thought style with cognitive tests, rather than self-report scales. (4) We test whether thought style *causes* political opinions by briefly changing people’s thought styles and then measuring their political opinions.

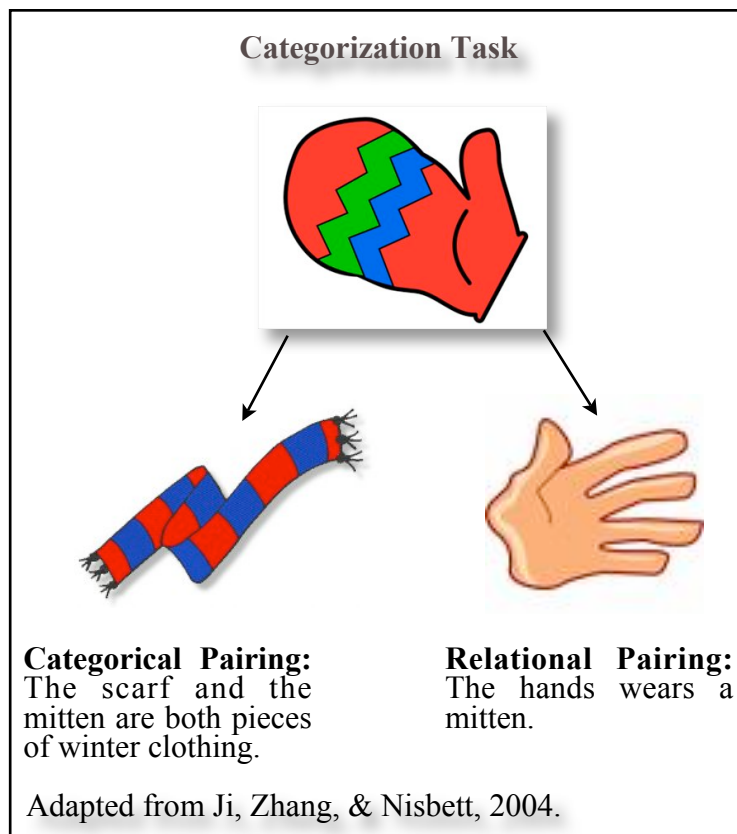
To make our tests more generalizable, we use three different samples: (1) US college subject pool samples, which naturally control for age and education (Studies 1 and 4), (2) much larger internet samples, which cover more diverse demographic groups and allow us to control for more demographic variables (Studies 2 and 5), and (3) a sample from China, which has a vastly different political climate (Study 3).

### Study 1

#### Triad Task

To measure cultural thought style, we used the triad task (Chiu, 1972; Ji, Zhang, & Nisbett, 2004). Participants see three items and “indicate which two of the three are most closely related.” For example, participants see the items *panda*, *banana*, and *monkey*. Two objects can be paired together because they belong to the same abstract category (e.g., panda and monkey are animals/mammals), and two can be paired together because they share a functional relationship (e.g., monkeys eat bananas; Figure 1). To hide the intention of the task, the 8 key items are dispersed within 12 distractor items.<sup>4</sup> Non-Westerners tend to choose more relational pairings (monkey and banana; Ji et al., 2004) than Westerners.

Because the triad task is essentially a series of binary choices (either categorical or relational), it is most accurately analyzed with a binomial model. We used a generalized linear model with a binomial link, rather than least-squares linear regression. To calculate effect sizes, we calculated Nagelkerke  $R^2$  (the  $R^2$  equivalent for GLMs). We then took the square root to calculate the correlation ( $r$ ), which gives effect sizes comparable to previous meta-analyses of politics and thought.



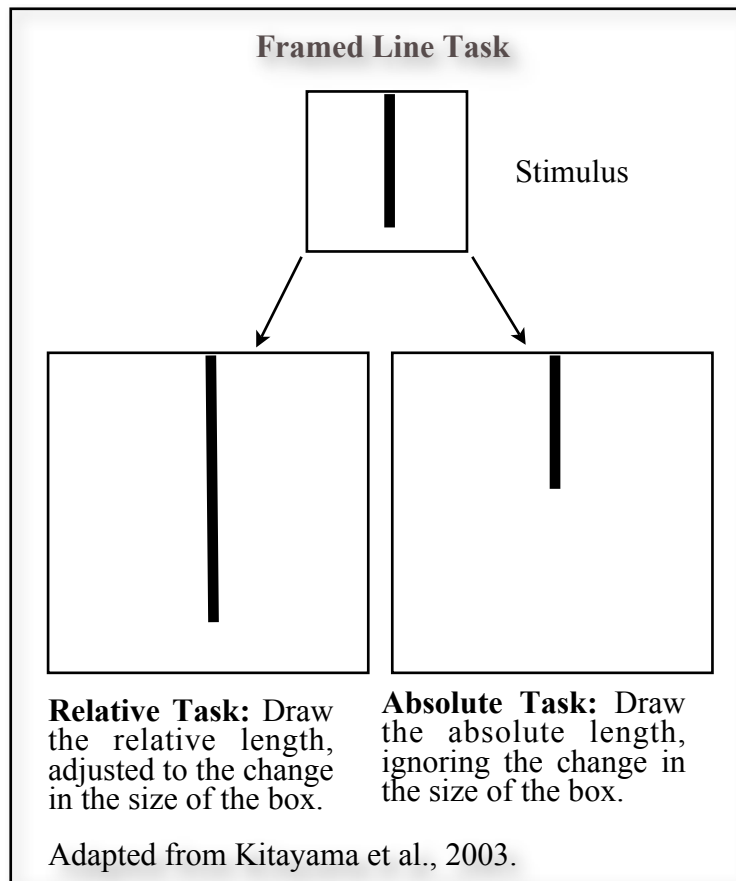
*Figure 1.* The triad task asks participants to choose the two objects that are most closely related. Each triad has two objects that can be paired because they share a functional relationship and two that can be paired because they belong to the same abstract category.

### **Framed-Line Task**

Participants also took the framed-line task (FLT: Kitayama, Duffy, Kawamura, & Larsen, 2003). Recent researchers created the FLT as a simpler way to measure field-dependence because Witkin's rod-and-frame task used bulky equipment.

In the FLT, participants see a line inside a box, and then they see a new box in which to redraw that line (see Figure 2 for explanation). Participants see the stimulus box and line for 4 seconds, after which the computer automatically advances to the empty box they have to draw the line in. Participants get as much time as needed to draw the line using the up and

down arrows. Participants complete three practice trials before each task to make sure they understand the task. Then they do six trials each of the absolute and relative task. The order of absolute and relative was counterbalanced between participants. Order did not affect the results, so we collapse across order.



*Figure 2.* In the relative task, participants have to redraw the line relative to the size of the box. In the absolute task, they have to ignore the changing size of the box. East Asian cultures tend to do better on the relative task, whereas Western cultures tend to do better on the absolute task.

Performance is calculated in terms of error, which is the absolute difference between the line that participants draw and the correct line. In the absolute task, error is simply the absolute value of (the length of the line participant draws) – (length of the original line). In the relative task, the correct length is indexed to the size of the box. If the original line is 2 cm in a 5 cm box, and the new box is 10 cm, the new line should be 4 cm.

Overall performance is calculated as error on the absolute task minus error on the relative task. This gives a final score where positive values mean participants did better on the relative task (relativity bias or field-dependent) and negative values mean the participants did better on the absolute task (absolute bias or field-independent). The classic finding is that Westerners have an absolute bias, and Easterners have a relative bias.

## Methods

In total, 218 University of Virginia undergraduates (148 female) completed Study 1 as a part of the departmental subject pool. Participants took the triad task and the framed-line task on a computer and reported demographics, including two political questions: “How would you describe your political outlook with regard to social [economic] issues?” The response scale was from one (*very liberal*) to seven (*very conservative*), with four representing *moderate*.

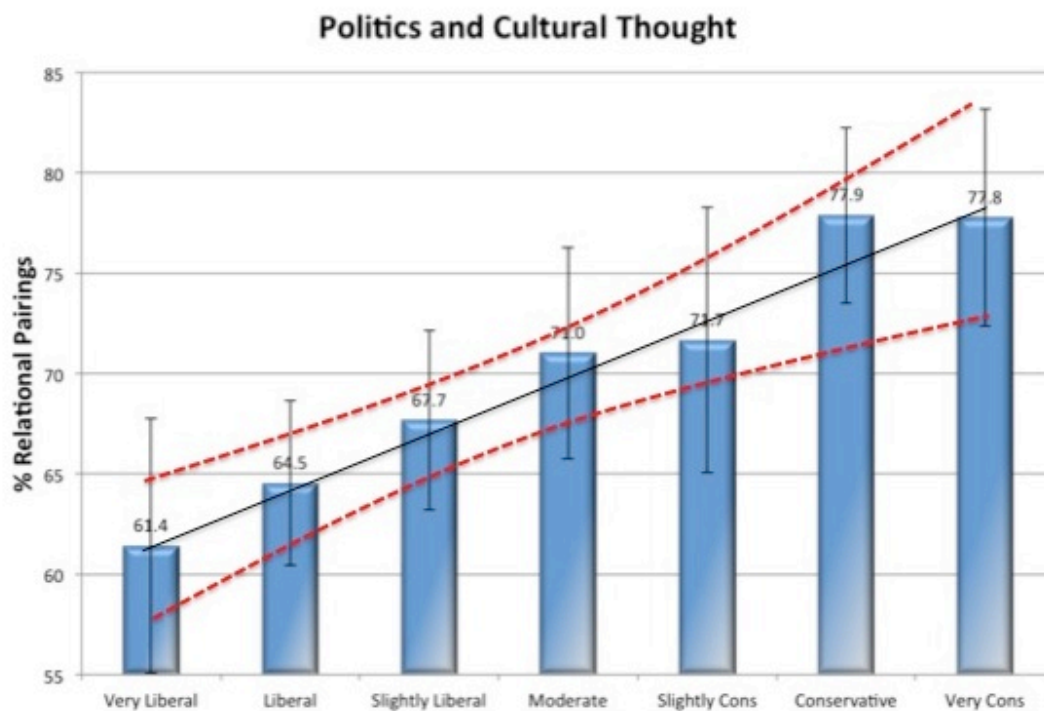
## Results and Discussion

**Political distribution.** On the social politics question, 127 (58.3%) identified as very liberal to slightly liberal, 39 (17.9%) as moderate, and 52 as slightly conservative to very conservative (23.9%). Social and economic politics were correlated but not identical,  $r(218) = .60, p < .001$ .

**Triad task.** Social liberals made more categorical pairings (similar to the dominant Western style), and conservatives made more relational pairings (more similar to the East

Asian style),  $B = 0.14$ ,  $p < .001$ , effect size  $r = .29$  (Figure 3; binomial-linked GLM).

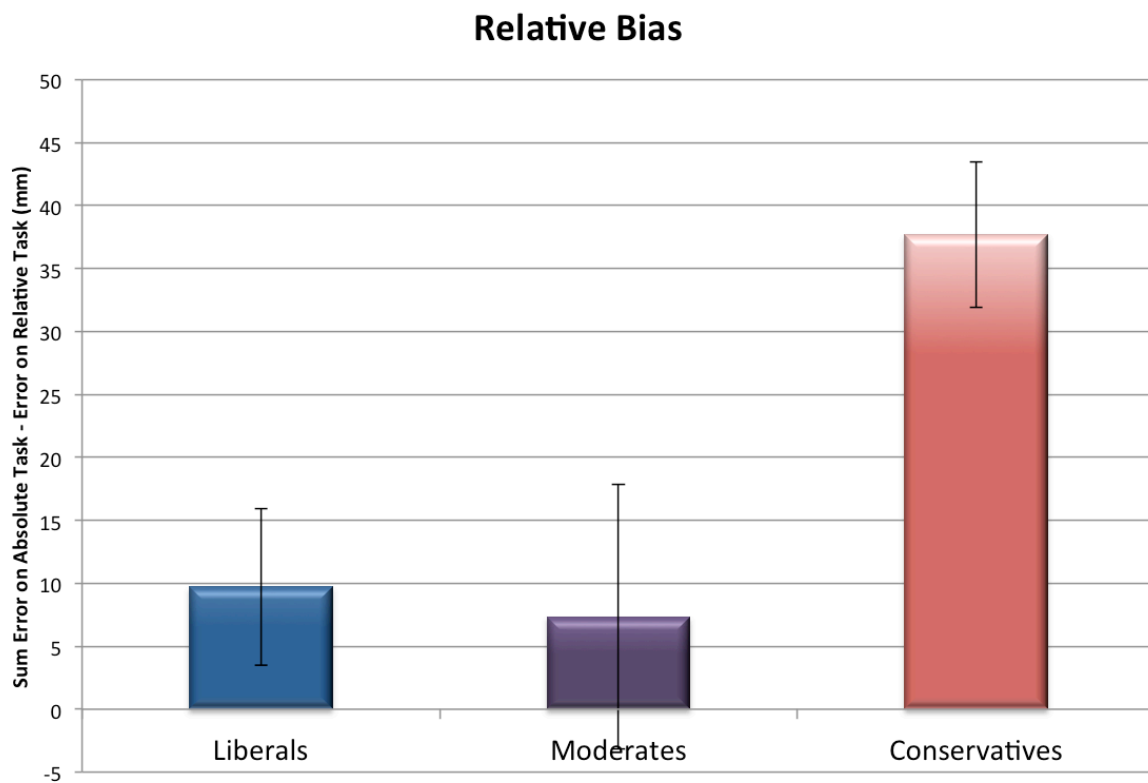
Economic politics was not related to thought style  $B = 0.02$ ,  $p = .59$ ,  $r = .04$ .



*Figure 3.* Social conservatives chose a higher percentage of relational pairings (Study 1). People from East Asian cultures are more likely to choose relational pairings. People from Western cultures choose fewer relational pairings. Error bars = 1 SEM. The black line is a regression line. Dashed lines represent 95% CIs. The SE bars are wider than the CI because the SEs are calculated for each group separately, whereas the CI is calculated across all participants.



**FLT.** Social politics predicted differences in cultural perception style, although it bordered significance  $B = 4.62$ ,  $p = .077$ ,  $\beta = .12$  (Figure 4). Conservatives did much better on the relative task than the absolute task—a strong relative bias. Liberals had a small relative bias. Like the triad task, the FLT results were not related to economic politics,  $B = 2.00$ ,  $p = .47$ ,  $\beta = .05$ .



*Figure 4.* Perceptual bias on the framed-line task by social politics. Social conservatives show a pattern more similar to Japanese participants, with more error on the absolute perception task than the relative task. Error bars = 1 SEM.

**Controlling for gender.** One potential problem with the data could be that men and women are not equally distributed across the political spectrum. That could be a problem because men sometimes score more analytically. However, men also tend to identify as more conservative, which would work against our hypothesis (e.g., Kaufmann & Petrocik, 1999; men identified as more conservative in all of the studies here, although the difference was small and only occasionally significant).

On the FLT, there were no gender differences ( $p = .72$ ). On the triad task, women chose more relational pairings than men,  $B = 0.43$ ,  $p < .001$ ,  $r = .27$ . However, social politics remained significant after controlling for gender,  $B = 0.14$ ,  $p < .001$ ,  $r = .29$ .

**Controlling for ethnicity.** We also controlled for ethnicity. The effect of social politics remained after including ethnicity  $B = 0.14$ ,  $p < .001$ ,  $r = .29$  (ethnicity coded as white = 1; others = 0) and among the non-white participants alone  $n = 84$ ,  $B = 0.19$ ,  $p = .001$ ,  $r = .36$ .

In sum, social liberals had more analytic (more “Western”) cognitive and perceptual style than their conservative American classmates. Socially conservative students had a more relational (more “East Asian”) cognitive and perceptual style. These tests are designed to measure differences between people on opposite ends of the Earth, but this study adds to the evidence that there are cultural differences in cognition between people in the same nation (e.g., Na et al., 2010).

## Study 2

Although Study 1 found that social liberals have different thought styles from social conservatives, the sample was relatively homogenous and from a single university. Therefore, we ran a second study with a broader sample, using the internet to collect data from participants across the US of different ages, education, and locations.

## Methods

Participants came from YourMorals.org, a site designed to test moral and political attitudes. Participants generally find the website on their own or through news articles on the web. After reporting demographic information, visitors are free to take as many tests as they want. Participants are not paid for participating, but they get instant results and debriefings after the experiments, which is what attracts most visitors.

A total of 3,174 participants (45% female) took the full 20-item triad task over 2 years. Most participants (75%) came from the US and Canada; 6% came from the UK and Australia. No more than 1% came from any other single country. The webpage randomly ordered the 20 questions and the three objects within each question. Participants ranged from 17 to 90 years old (mean = 34.7, SD = 14.4). The economic and social politics subtype questions are optional, so some participants (126-215 depending on the question) did not report one or more of the subtypes.

The social and economic politics questions were identical to Study 1: “How would you describe your political outlook with regard to social [economic] issues?” The response scale was from one (*very liberal*) to seven (*very conservative*), with four representing *moderate*. The only difference is that YourMorals also allows participants to choose “Don’t know/not political,” “Can’t pick one label,” and “Other.” We removed people who chose these options (4.2%).

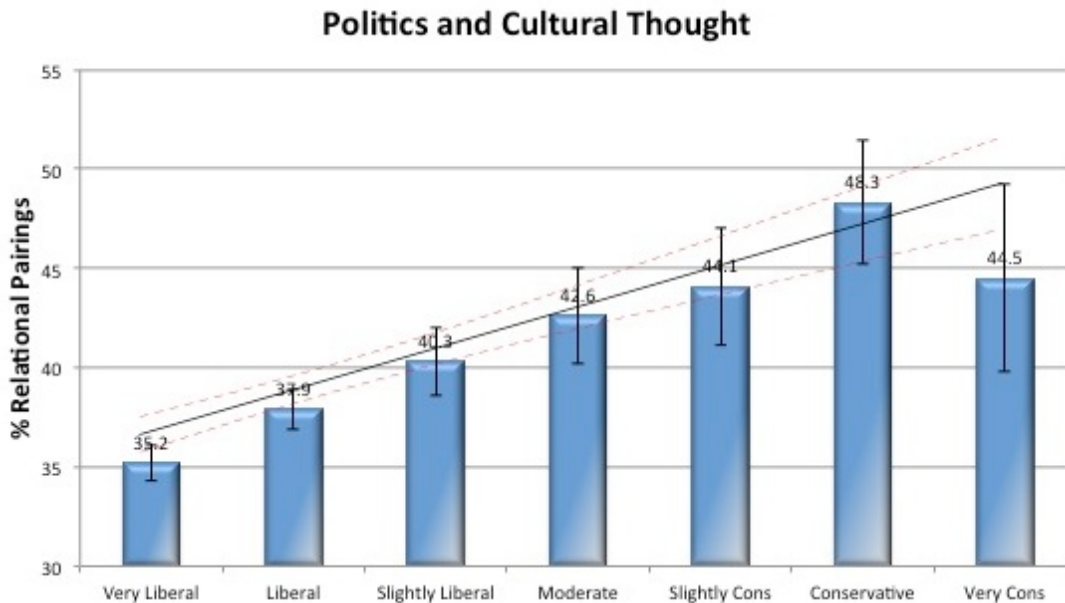
YourMorals also included an overall political identity question (i.e., not referring to social or economic politics). The scale was also from one (*very liberal*) to seven (*very conservative*). However, it also included a “Libertarian” option. The YourMorals sample brought many libertarians ( $n = 445$ ), allowing us to more rigorously test the theory that it is social politics that predicts cultural thought, rather than economic politics.

## **Results and Discussion**

**Political distribution.** On the social politics question, 2,659 (83.8%) identified as very liberal to slightly liberal, 205 as moderate (6.5%), and 310 (9.8%) as slightly to very conservative. Economics and social politics were correlated, but less than in the university sample  $r(2996) = .43, p < .001$ . As expected, social and economic politics were less correlated among libertarians  $r(338) = .22, p < .001$

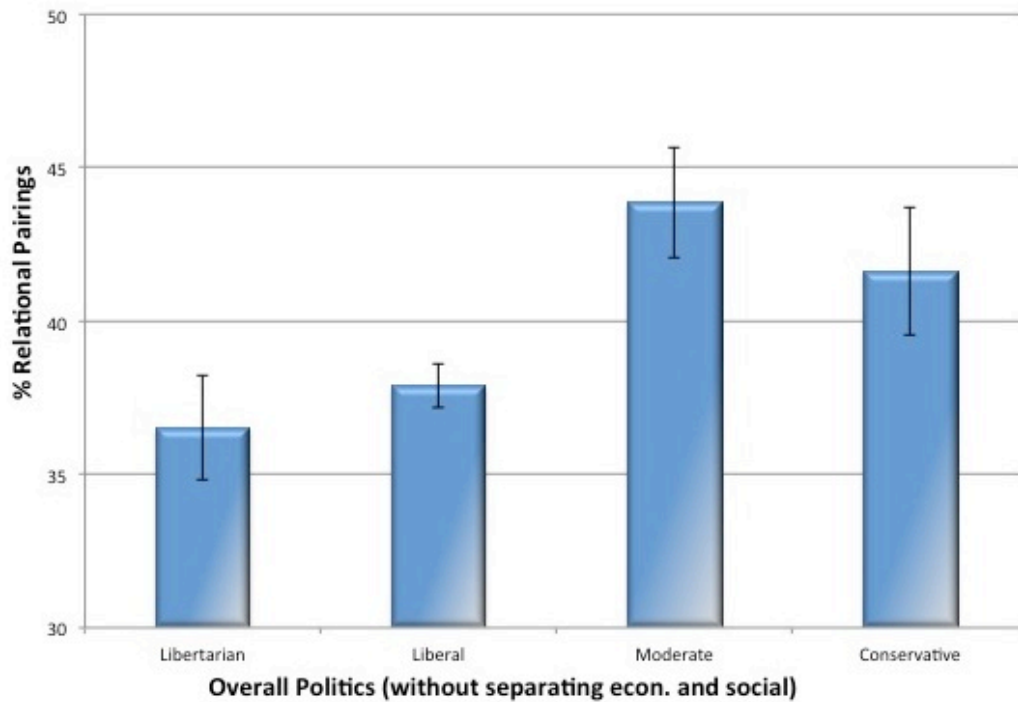
The YourMorals respondents scored more analytically than the university samples. YourMorals participants' mean score (39% relational) was a little more than half of the mean of the university sample (67%), meaning the YourMorals participants were a highly analytic group.<sup>5</sup> Perhaps it is not surprising that people who choose to come to research websites and learn more about themselves through psychological tests are more analytic than the average college student. In any case, showing that there are significant differences between political groups even among this highly analytic group may be a more conservative test of the theory.

**Politics.** As in the first study, social conservatives thought more holistically,  $B = 0.09, p < .001, r = .19$  (Figure 5). The relationship also held when we analyzed only non-US participants  $B = 0.08, p < .001, r = .17$ . Economic politics was significant, but had a very small effect size  $B = 0.02, p = .03, r = .04$ . The regression coefficient was significantly smaller for economic politics than social politics ( $p < .001$ ; compared by converting the coefficients to  $z$  values). Excluding libertarians, overall political identity tracked thought style  $B = 0.07, p < .001, r = .14$ , but the regression coefficient was significantly smaller than for social politics ( $p < .001$ ).



*Figure 5.* Social politics strongly predicted holistic vs. analytic thought style in the much larger YourMorals.org sample ( $n = 2,705$ ). Higher values represent more holistic thought. Error bars = 1 SEM. The black line is a regression line. Dashed lines are 95% CIs. The SE bars are wider than the CI because the SEs are calculated for each group separately, whereas the CI is calculated across all participants.

**Libertarians.** As the social orientation hypothesis predicts, libertarians scored very analytically (Figure 6). Libertarians scored slightly more analytic than liberals (combining *very liberal* to *slightly liberal*),  $B = -0.08$ ,  $p = .03$ ,  $r = -.04$ . Libertarians thought more analytically than both moderates  $B = -0.36$ ,  $p < .001$ ,  $r = -.24$  and conservatives  $B = -0.27$ ,  $p < .001$ ,  $r = -.19$  (combining *slightly conservative* to *very conservative*). Consistent with their creed that people should stick to their own business and not interfere with the lives of others, libertarians thought more like individualistic Westerners than collectivistic Easterners.



*Figure 6.* Libertarians thought more analytically than moderates and conservatives. This is consistent with the social orientation hypothesis, which predicts that libertarians should think more analytically because they are individualistic. Error bars = 1 SEM.

**Controlling for gender.** Women thought more holistically than men  $B = 0.28, p < .001, r = .19$ . Social politics was still significant after including gender in the GLM  $B = 0.10, p < .001, r = .20$ .

**Controlling for age.** Younger participants thought more holistically than older participants,  $B = 0.01, p < .001, r = .22$ . However, social politics still predicted thought styles while controlling for age,  $B = 0.10, p < .001, r = .20$ .

**Controlling for SES.** A large-scale study found that high-SES Americans think more analytically than low-SES Americans (Na et al., 2010). Therefore, we controlled for SES with the 865 participants who completed the MacArthur Scale of Subjective Social Status (Adler, Epel, Castellazzo, & Ickovics, 2000). The scale asks people to rank their SES on a ladder from 1 to 10 compared to people in their own country.

Consistent with prior research, low-SES people thought more holistically than high-SES people  $B = 0.04$ ,  $p = .005$ ,  $r = .09$ . Controlling for SES, social politics still predicted thought style  $B = 0.12$ ,  $p < .001$ ,  $r = .25$ .

**Controlling for education.** We analyzed education as a continuous variable from “completed high school” to “completed graduate/professional degree.” (See appendix for the full breakdown.) Less educated people thought more holistically  $B = 0.16$ ,  $p < .001$ ,  $r = .32$ . However, controlling for education still left a significant relationship between thought and social politics  $B = 0.07$ ,  $p < .001$ ,  $r = .13$ .

**Controlling for personality.** A total of 1,176 participants had taken the 44-item Big-Five Inventory (John & Srivastava, 1999). Only extraversion and openness correlated with thought style. Extraverts thought more holistically  $B = 0.01$ ,  $p = .004$ ,  $r = .08$ . People low on openness thought more holistically  $B = 0.02$ ,  $p < .001$ ,  $r = .13$ . This fits with the fact that liberals tend to be higher on openness (Jost, 2006). Finally, social politics was still associated with thought style after including all of the Big Five  $B = 0.09$ ,  $p < .001$ ,  $r = .23$ .

**Controlling for intelligence.** One alternative theory is that the differences that we are calling “cultural” are actually differences in intelligence. YourMorals included the three-item Cognitive Reflection Test, which correlates moderately with IQ as measured by the Wonderlic Test ( $r = .43$ ; Frederick, 2005). Participants who scored higher on the Cognitive Reflection Test also thought more analytically  $B = 0.37$ ,  $p < .001$ ,  $r = .46$ . However, social politics still predicted analytic thought after controlling for scores on the Cognitive Reflection Test  $B = 0.25$ ,  $p < .01$ ,  $r = .54$ , as well as the interaction between the Cognitive Reflection Test and social politics  $B = -0.08$ ,  $p < .04$ ,  $r = -.14$ . In the interaction, the relationship between politics and cultural thought was stronger among people who scored lower on the Cognitive Reflection Test.

In sum, Study 2 replicated the main finding from Study 1 with a larger, more diverse sample. The Study 2 sample had more variation in age, education, and geographic location, which allowed us to control for more potential confounds. Social politics predicted thought style above and beyond differences in education, SES, personality, and intelligence.

### Study 3

Up to this point, we have argued that social politics is linked to cultural thought style as if it were an abstract truth, true for everyone in the world. However, Studies 1 and 2 only tested this with American participants, and study after study has shown Westerners think more analytically than people from most other cultures (Henrich et al., 2010). Furthermore, political identity in the US may be structurally different from other cultures and other political systems.

Thus we repeated the study with a large Mainland Chinese sample. China is a much tougher test of the theory because Chinese samples already score on the holistic end of the spectrum, running the risk of a ceiling effect. More importantly, politics is sensitive in China, and personal expression of politics is lower than the West. Because Chinese citizens do not directly elect their national leaders, they have less of a need to form their own political identities.

That said, Western visitors to China may be surprised to see how vocal social issues can be in the Chinese media. Mainstream media discuss what Americans would call social issues: Does studying abroad give Chinese students loose morals or is it a mind-broadening experience? Should society support migrant workers or are they drains on urban welfare systems? Chinese people can also join political parties and vote in National People's Congress elections. Certain issues are sensitive, but it would be wrong to say that Chinese society has *no* discussion of politics.

### Methods



As a part of a project on cultural differences between northern and southern China, 1,209 students (69% female) from six sites took the triad task and reported social and economic politics (for more details on the sample, see: Talhelm et al., 2014).<sup>6</sup>

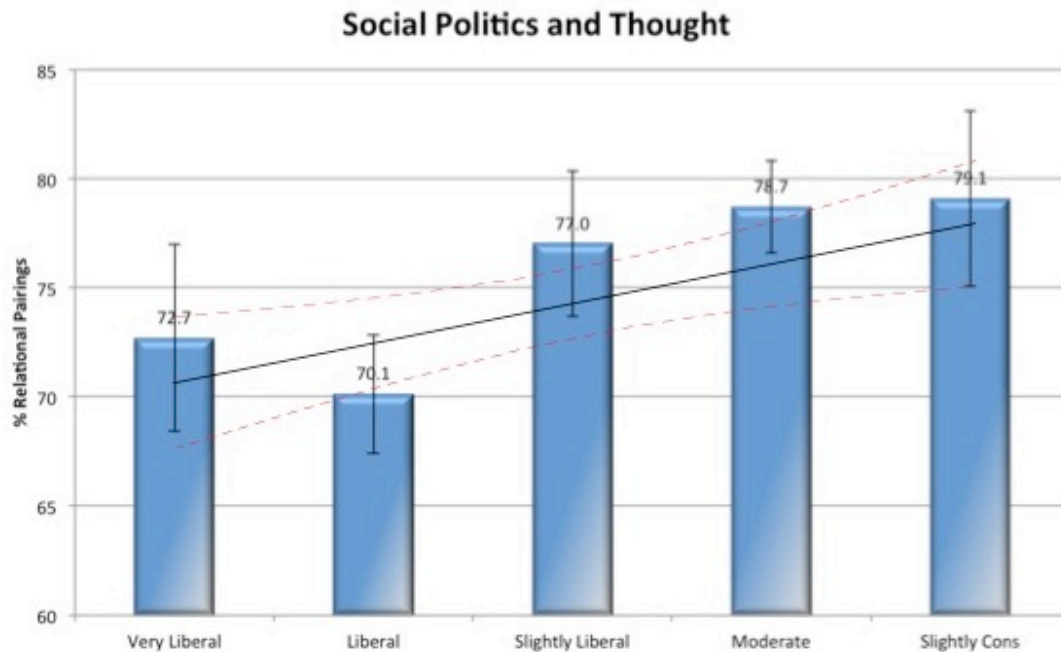
We translated the two political items directly into Chinese, using *baoshou* (保守) for *conservative* and *kaiming* (开明, which translates to *progressive, enlightened, liberal-minded*) for *liberal*. *Conservative* is easy to translate into Chinese, but *liberal* is more difficult. Although Chinese participants are familiar with the term *kaiming*, it is not used as commonly as *liberal* is in the West.<sup>7</sup>

We also tested whether the differences are limited to people who grew up in more developed areas. We classified areas as urban if they were provincial capitals, which tend to be the largest and most developed cities in each province. Results were similar when we expanded the definition of urban to provincial capitals and any other of the 50 largest cities.

## Results and Discussion

**Political distribution.** A majority of students (59%) identified as very socially liberal to slightly socially liberal; 32% as moderates; and 10% as slightly conservative to very conservative. As in the American samples, social and economic politics correlated strongly, but were not identical  $r(1208) = .64, p < .001$ .

**Politics and thought style.** We found a significant interaction between politics and whether people grew up in an urban or rural area,  $B = -0.18, p = .003$ . Among participants who grew up in rural areas, there was no relationship between social politics and thought style  $B = -0.01, p = .58, r = -.01$ . But among participants who had grown up in urban areas, the relationship between social politics and thought style was as strong as in the US,  $B = 0.17, p < .001, r = .25$ , Figure 7 (US Study 2  $r = .19$ ).



*Figure 7.* Social conservatives in China also thought more relationally (holistically). Error bars = 1 SEM. The black line is a regression line. Dashed lines are 95% CIs. The “conservative” and “very conservative” categories could not be accurately estimated because only 1.2% identified as conservative and 0.3% as very conservative. The SE bars are wider than the CI because the SEs are calculated for each group separately, whereas the CI is calculated across all participants.

This may be because participants from urban areas are more familiar with politics and have more articulated political attitudes. This may also be a snapshot of a culture in a unique point in history. China has undergone massive change, modernizing much more quickly than the US, with millions of people migrating to cities.

Economic politics did not interact with urban/rural  $B = .05, p = .32$ . Among people from urban areas, economic politics was marginally related to holistic thought  $B = 0.07, p = .09, r = .11$ . Among people from urban areas, the effect of social politics remained after

controlling for gender, site effects, and rice/wheat cultures  $B = 0.17, p < .001, r = .25$  (more details on control variables in Talhelm et al., 2014).

In sum, Study 3 replicates the US findings in a very different political culture. However, the relationship between social politics and thought only emerged among people from more developed areas. Replicating the findings in China is important because Chinese culture has a more holistic baseline thought style. Finding that liberals think more analytically even in this more holistic culture gives one piece of evidence that the relationship between politics and thought style is not just an American phenomenon.

#### Study 4

The first three studies showed that liberals and conservatives think differently, but these studies were correlational. Thus they leave open the intriguing question of whether thought style *causes* people to be liberal or conservative. Does thinking analytically lead people to reach liberal conclusions, perhaps because it pushes people to see issues abstractly or in terms of individuals? Does thinking holistically lead people to conservative conclusions, perhaps because it pushes people to see issues intuitively or in terms of groups and relations? We tested this possibility in Study 4 by asking people to think analytically or holistically (or control) and then giving them a political issue to think about.

#### Methods

Participants in Study 4 reported their political identity weeks *before* the study on the psychology department pre-screening questionnaire. This let us control for prior political identity. Excluding 9 participants who did not have pre-screen data, 87 students (65 female) at the University of Virginia participated in Study 4.

**Training cultural thought.** Participants were randomly assigned to either the control, categorical, or relational condition. The control group took the triad task as before, without

any special instructions. The categorical group was instructed to choose the categorical pairings:

Your task is to categorize the following objects based on their abstract categories.

You'll see groups of items. For example:

Janitor, Mop

Jackhammer, Janitor

Jackhammer, Mop

In every group, one pairing will be because one uses the other. For example, janitors use mops. But you should pair mop with jackhammer because both belong to the category tools.

Participants in the relational condition read similar instructions, except that they were asked to choose the items that “share a relationship or because one of them uses the other.”

All of the distractor items were removed because they could not fit either categorical or relational groupings, leaving the 8 original triad items. We treated the first question as a practice question. Participants were excluded from analysis if they got any questions wrong after the practice ( $n = 9$ ).

**Political opinions.** Following the triad task, participants read two fabricated news articles. One article described opposing welfare programs (Cohen, 2003), and one described opposing policies for mainstreaming special education students (Hawkins & Nosek, 2012). The welfare article was designed to tap into a partisan issue; in the US, liberals tend to favor more generous welfare programs.

In contrast, the mainstreaming article was specifically designed to be about a topic that does not fit clearly with partisan positions. A prior study showed that the effect of political party identity on people's opinion to the mainstreaming article was less than half the effect on the welfare article (Hawkins & Nosek, 2012, Study 2). Thus, if popular partisan positions reflect cultural thought style, the weaker liberal-conservative split on mainstreaming may mean that thought style manipulation will not alter opinions toward mainstreaming.

Each article had democrats supporting one plan (generous welfare, mainstreaming) and republicans supporting the other (stricter welfare, special classrooms). Participants "voted" for a plan on a scale from one (*Strongly support plan A*) to seven (*Strongly support plan B*), with four meaning they equally like both plans. There were three comprehension questions after the articles asking which party proposed which plan and what the plans did. We excluded participants who got any of these comprehension questions wrong (welfare  $n = 4$ ; mainstreaming  $n = 5$ ; leaving welfare  $n = 73$ , mainstreaming  $n = 72$ ).

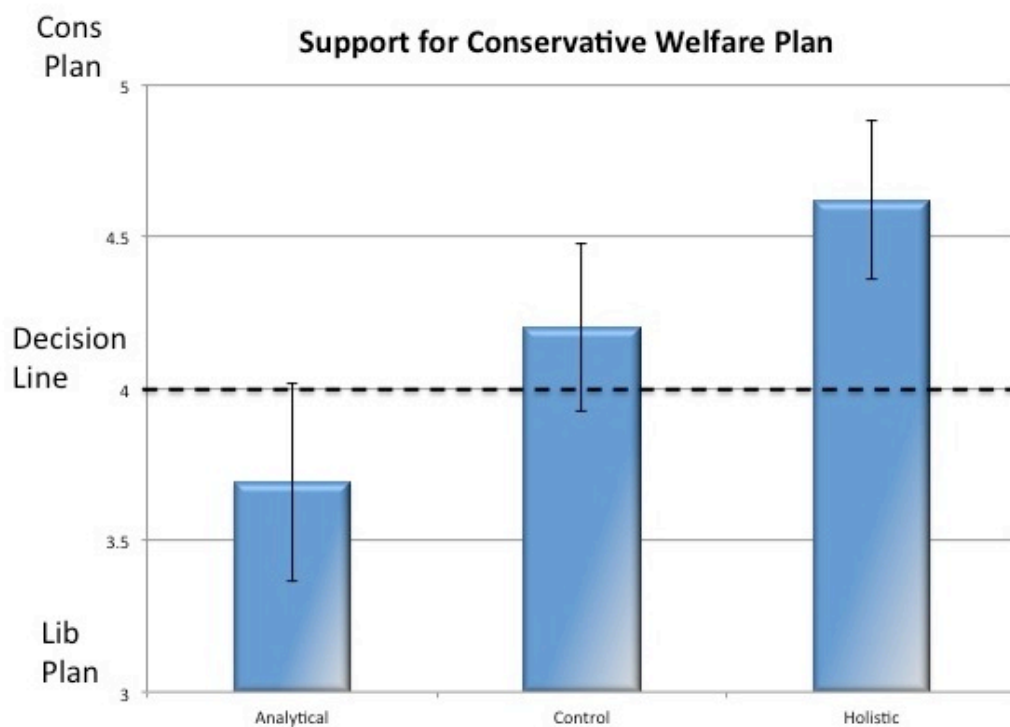
After the articles, participants took an 8-item version of the Anson-Motyl Political Orientation Scale (AMPOS: Anson, Motyl, & Coolidge, under review), which asks for opinions on common political issues. For example, one item reads "Flag burning should be illegal."

There is an important distinction between the AMPOS and the articles. The AMPOS simply asks people to pull up their stable political attitudes, whereas the articles give participants the chance to process the different arguments in the article and form a more contextualized opinion—an opinion to a particular policy, rather than a general attitude of agreement. If the cognitive style manipulation changes the way people process information, we could hypothesize that it will only change opinions that people are actively processing. If so, it would not affect people's responses to more stable attitudes like "I'm socially liberal" or

“Flag burning should be illegal.” Thus we expected that the manipulation might affect answers to the articles but not the AMPOS.

### Results and Discussion

**Political articles.** In a regression controlling for prior politics, the thought training condition significantly predicted responses to the welfare plan  $\beta = .24, p = .02$  (Table 1). People in the analytic condition supported the liberal welfare plan more than people in the relational condition (Figure 8).



*Figure 8.* Support for opposing liberal and conservative welfare plans after brief thought training, Study 4. Values above the dotted line side with the conservative plan, and values below the line side with the liberal plan. Error bars = 1 SEM.

Table 1  
*Effects of Thought Training on Political Attitudes for Studies 4 and 5*

<b>Study 4: Cons. Welfare Plan</b>	$\beta$	B	SE	<i>t</i>	<i>p</i>
Prior-Reported Politics	.37	.40	.11	3.56	.001
Thought Training	.24	.52	.22	2.34	.02
<b>Study 4: Special Education Mainstreaming</b>	$\beta$	B	SE	<i>t</i>	<i>p</i>
Prior-Reported Politics	-.40	-.52	.13	-4.00	< .001
Thought Training	.11	.27	.23	1.14	.26
<b>Study 5: Drug Offenders to College</b>	$\beta$	B	SE	<i>t</i>	<i>p</i>
Prior-Reported Politics	-.38	-.40	.07	-6.14	< .001
Thought Training	-.13	-.29	.13	-2.17	.03
<b>Study 5: Free Trade Support</b>	$\beta$	B	SE	<i>t</i>	<i>p</i>
Prior-Reported Politics	.003	.003	.067	.04	.97
Thought Training	-.038	-.072	.127	-.56	.57

Note: Thought training coded as analytic = -1; control = 0; holistic = 1. Prior-reported politics ranges from 1 (*very liberal*) to 7 (*very conservative*). For the dependent variables, higher values represent support for: conservative welfare plan (less money for welfare); mainstreaming special education students; sending drug offenders to college for free; and expanding free trade.

In line with the fact that the mainstreaming article was designed to be less partisan, the thought manipulation did not affect people's opinions about mainstreaming  $p = .26$ . To test whether the effect of the thought training differed between the two articles, we calculated a difference score representing support for liberal policy. Thought training predicted this difference  $B = 1.08$ ,  $\beta = .34$ ,  $p = .004$ . This suggests that the effect of thought training differed between the two articles.

Comparing just the categorical and relational conditions, the effect size of the manipulation on welfare support was quite large: a partial correlation of .40 (controlling for politics). The effect size of the manipulation was comparable to the effect of the most obvious predictor: political identity, which had a partial correlation of .41. If this were a vote, the liberal plan would have won after we had people think analytically (64% support) and lost after we had people think holistically (38%).

Furthermore, the thought training was effective across the political spectrum, as evidenced by the lack of an interaction between politics and condition ( $p = .92$ ). This suggests that the thought training affects both liberals and conservatives. As in Studies 1-3, the effect held ( $p = .02$ ) after adding gender to the model. Gender did not predict welfare attitudes ( $p = .88$ ).

**Quadratic contrasts.** In the regressions, we coded the thought training coded as analytic = -1, control = 0, holistic = 1 because we predicted that the analytic thought training would push people to form more liberal opinions, the control would be in the middle, and the holistic training would push people to form conservative opinions. However, we report an additional regression that includes an orthogonal quadratic term (analytic = -1; control = 2; holistic = -1) to test whether the results diverge from the linear pattern. This would happen if the control condition were to fall significantly above or below the expected linear condition order. The quadratic was not significant for welfare or education, while the original linear term remained significant for welfare and non-significant for education (Table 2).

**Long-term attitudes.** The manipulation did not significantly change people's social political identity  $t(75) = 0.79, p = .43$  (controlling for prior politics) or people's political attitudes on the AMPOS. A regression predicting sum AMPOS conservatism from experimental condition was not significant  $t(75) = -0.01, p = .99$ .



In sum, Study 4 provides the first evidence that cultural thought style can *cause* attitudes toward a political opinion presented in a long-form article (but not political attitudes in response to short, general statements). The effect of thought style training in this Study 4 is surprising because it may be hard to change attitudes on a controversial issue like welfare. However, because the effect is new and only appeared for a single outcome measure, replication is needed.

### Study 5

One drawback of Study 4 was that *post hoc* power was low ( $\beta = .29$ , power = 67%). Therefore, we collected data in the lab and through YourMorals.org for higher power. Importantly, both sources had prior-reported political identity (from the department participant pool pre-screen and registration information at YourMorals.org).

Another drawback of Study 4 was that thought style only affected one outcome measure. Therefore we created two new articles for Study 5. We created an article about a law that would send convicted drug criminals to college for free instead of sending them to prison. The drug offender article was designed specifically to appeal to liberals and violate conservative notions of proportionality and punishment. The article quoted supporters of the law who argued that the program (1) was cheaper than sending criminals to jail and (2) reduced repeat offense rates more than jail.

We also created an article about a law that would expand free trade with more countries. Because Studies 1 and 2 showed that cultural thought style was more strongly related to social politics than economic politics, this article tested whether cultural thought style would affect economic attitudes. Similar to the mainstreaming article in Study 4, free trade has unclear partisan positions. Pure liberalism emphasizes individual liberty, and complete individual liberty would mean that people can trade with people from other nations without government interference. However, US democrats often oppose free trade on the

grounds that it benefits large corporations that rely on sweatshop labor and pollute the environment. Some US republicans oppose free trade on the grounds that it hurts American workers. In short, both republicans and democrats have groups that support and oppose free trade.

## Methods

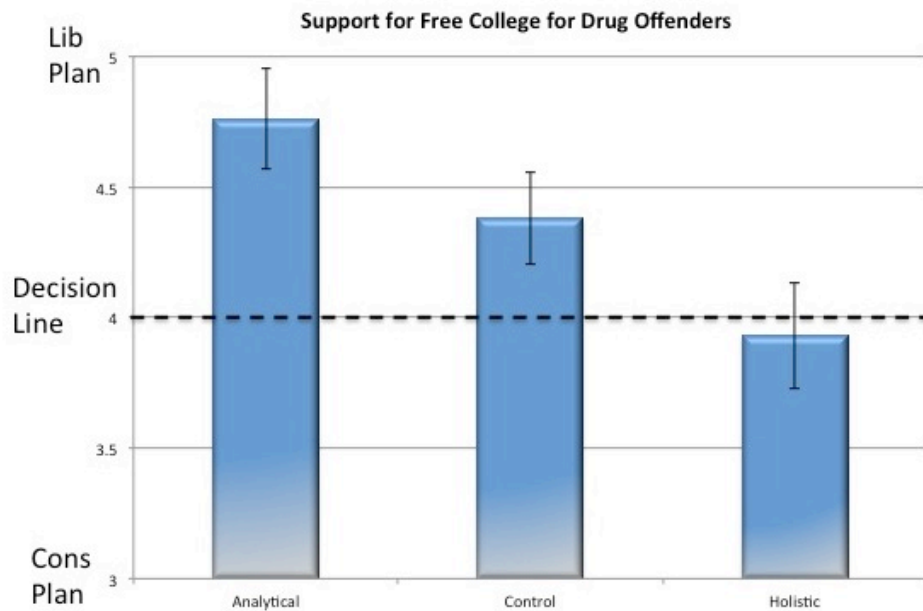
Participants were 290 (186 female) students at the University of Virginia and 279 (108 female) visitors to YourMorals.org. Participants completed the triad task, read one of two articles, and reported demographics.

Because YourMorals allows more flexibility in coding, we were able to prevent participants from progressing if they answered incorrectly. Therefore, we did not exclude participants for answering triad-training questions incorrectly. However, we excluded participants who answered the article comprehension questions incorrectly (drug offender article  $n = 27$ ; free trade  $n = 20$ ). Prior political identity was unavailable for 84 participants. We controlled for prior-reported political identity in all regressions.

## Results and Discussion

**Drug-offender law.** We combined the YourMorals and the university sample because: (1) a dummy variable representing the sample source was not significant ( $p = .20$ ), (2) the effect of the thought training was still significant ( $p = .03$ ) after controlling for sample, and (3) there was no interaction between thought training and sample ( $p = .84$ ). The thought training significantly affected opinions to the drug offender law  $\beta = -.13$ ,  $p = .03$  (Table 1; condition coded as analytic -1; control 0; holistic 1). People in the analytic condition had higher support for sending drug offenders to college for free; people in the holistic condition supported it less (Figure 9). If the response were a vote, the thought training would have increased support from 52% (holistic condition) to 70% (analytic condition).

As in Study 4, the thought training was effective for liberals and conservatives, as suggested by the non-significant interaction between politics and thought condition ( $p = .95$ ). Gender was not significant ( $p = .75$ ), and the effect of thought training remained significant ( $p = .037$ ) after adding gender to the model.



*Figure 9.* Support for plan to send convicted drug offenders to college for free instead of prison after brief thought training. Values above the dotted line side with the liberal plan, and values below the line side with the conservative plan. Error bars = 1 SEM.

**Free-trade law.** The triad training had no effect on the free-trade article  $\beta = -.04$ ,  $p = .57$  (Table 1). Next we meta-analytically compared the effect sizes of thought training on the free-trade law versus the drug-offender law to test whether thought training affected the social issue more strongly. We converted the regression coefficients to  $z$  scores representing the extent of liberal opinion. However, there is ambiguity in how to code the direction of the effect for free trade because wings in both the Republican and Democratic parties support and oppose free trade. We coded support for free trade as conservative because prior-reported

conservatives were slightly more likely to support it (Table 1). The effect sizes were significantly different for the free-trade and drug-offender articles ( $z = 1.99, p = .02$ ).<sup>8</sup> This suggests that the thought training had different effects on the social versus economic issue.

The results suggest that the thought training does not affect opinions toward economic policies, which would fit with the findings of Studies 1 and 2 that cultural thought style is more strongly related to social politics. It could also reflect the fact that free trade is not as clearly divided along partisan lines in the US. Data from the control condition supported this idea: Overall political identity correlated with drug-offender opinions  $r(79) = -.39, p < .001$ , but not free trade,  $r(78) = .01, p = .91$ .

**Quadratic contrasts.** Similar to Study 4, we added orthogonal quadratic contrasts for the thought training to test for departures from our predicted linear pattern from analytic to control to holistic conditions. The linear coding remained significant for the drug-offender article and non-significant for the free-trade article, whereas the quadratic was non-significant for both articles (Table 2). This suggests that the results do not seriously diverge from a linear pattern.

In sum, Study 5 replicated the results of Study 4 (1) with a larger sample size and (2) with a different outcome measure (drug-offender policy). Study 5 also replicates the findings with a YourMorals sample that includes older people (mean age = 35.2; SD = 15.2), who may have more stable political attitudes than college undergraduates.

### General Discussion

Across five studies, thousands of participants, and two different cultures, social liberals consistently thought more analytically—more prototypically Western or “WEIRD” (Henrich et al., 2010)—than social conservatives. We found that training people to think more analytically caused them to reach more liberal conclusions on political issues and that training

them to think more holistically caused them to form more conservative opinions. This was true even after controlling for political identity reported weeks before the experiment.

These findings seem to contradict the similarities between “holistic thought” and “cognitive complexity.” Previous studies have found that liberals have a preference for complex thought (Jost et al., 2003), but some descriptions of holistic thought make it sound more complex, including attention to more objects and tolerance of multiple perspectives. At least on the surface, descriptions of holistic thought as tolerance for X and “not X” both being true (Nisbett et al., 2001, p. 293) sounds like liberals’ tolerance of ambiguity and uncertainty (Jost et al., 2003, p. 346).

Our results suggest that the similarity between complex thought and holistic thought is only superficial. As one small example, analytic thought can be highly complex, as it is in math theorems and philosophical treatises. More work needs to be done to reconcile these two conceptions.

Our findings extend Moral Foundations Theory’s portrait of liberals and conservatives. Haidt (2012) argued that the American culture war is mostly a battle over the three socially “binding” foundations: loyalty, authority, and sanctity. Social conservatives generally endorse these foundations, liberals much less so.

If liberals have an analytic style that focuses on individual agents, their moral thinking could emphasize the protection of those individuals by emphasizing the care and fairness foundations (which often function to protect individuals, sometimes at the expense of social order). In contrast, social conservatives have a holistic thought style, which could emphasize the connections between people—including their role-based duties to each other and their groups. This may explain why they find more value in the binding foundations.

In each study, social politics predicted cultural thought styles more strongly than economic politics. The fact that previous cultural studies did not differentiate between social

and economic politics could explain why cultural psychologists have not reported differences based on politics. And if social politics tracks people's social styles more closely than economic politics, our results fit with the social orientation hypothesis—the theory that people's social orientation helps determine their cultural thought style (Varnum et al., 2010). Thus, the results contribute to the evidence that social style is connected to cultural thought.

### **Mechanism**

Studies 4-5 showed that analytic training made people support more liberal programs. However, one limitation of this study is that we did not explicitly test mediating variables to explain *why* thought style has this effect. For example, if the analytic training encourages people to think more abstractly/universally, the training should affect people's scores on universalism scales. Follow-up studies can test mediating variables explicitly.

Another question is whether the causal arrow runs both ways. In Studies 4 and 5, we tested one possible causal direction (thought to politics), but causality could also run the other way (politics to thought). Perhaps convincing people of liberal policies (or asking them to pretend) makes them think more analytically.

### **Causality**

Are liberals liberal *because* they think analytically? To understand what this study says about causality, it is important to understand the can-versus-do distinction. Studies 4-5 showed that thought styles *can* cause political attitudes, but that is different from showing that thought styles *do* cause most people's real-world political attitudes.

In life, there are many variables that cause people to hold different political beliefs: genes, personality predispositions, and family socialization to name a few. Any one of those variables could cause *both* political beliefs and thought styles. For example, maybe professorial parents teach their kids to think analytically *and* give them liberal attitudes. In

that case, thought styles would not cause the kids' political beliefs; they would just help people reinforce their political beliefs.

### **Universality**

By testing student samples, general US samples, and a Chinese sample, we offer some evidence that the relationship between politics and thought is not limited to one culture. However, it is an open question whether this relationship would hold in cultures with different conceptions of politics or in US culture over time.

There are examples that may be hard for our theory to fit. For example, politics and thought style were not related among rural Chinese participants. This could mean that politics is unrelated to thought among less-developed societies.

There is also evidence that these cognitive styles can change over time. One study found that liberal senators' writings became less complex when Congress was majority conservative (Tetlock, Hannum, & Micheletti, 1984). Similarly, it is not clear how our theory would fit with economic liberalizers in the Soviet Union, who were to the right of hardline Communists on economic questions, but left on individual liberties (Tetlock & Boettger, 1989).

Finally, there is the question of how these results fit with previous studies that suggest conservatives show more "American" thought. Previous research has found that conservatives are more likely to give internal attributions for other people's behavior, which in cultural psychology is considered a Western tendency (Morris & Peng, 1994; Tetlock, 2000). Perhaps it is a mistake to include internal attributions under the umbrella of analytic thought. Or perhaps this is unique to American conservatism. More research is needed to explain this paradox.

### **Conclusion**

Understanding how liberals and conservatives perceive the world can help us understand how they can read about the same event and see it completely differently. For example, prior studies have explained liberal-conservative differences by showing that conservatives think more “rigidly.” The findings of this study suggest that basic cultural thought styles may help explain why liberals and conservatives see political issues differently.

This study demonstrates that tools and constructs from cultural psychology are useful for intracultural research, even within the WEIRDest populations. Political differences and divisions are partly cultural divisions, and they can be studied—and perhaps bridged—as such. In fact, our findings suggest an extension to Henrich, Heine, and Norenzayan’s (2010) construct of WEIRDness: Perhaps we should add an “L,” for Liberal. We could speak of WEIRDL cultures—or perhaps WILDER cultures.

Given that the great majority of social scientists are politically liberal (Gross, 2012), perhaps adding the L will make it easier for researchers to consider the cognitive starting point of those with different political viewpoints. Some call American politics a “culture war.” This study shows that the two sides in that conflict think about the world as if they really came from different cultures.



## References

- Adler, N. E., Epel, E. S., Castellazzo, G., & Ickovics, J. R. (2000). Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy White women. *Health Psychology, 19*, 586–592.
- Anson, J. M., Motyl, M., & Coolidge, F. L. (under review). The AMPOS: A four-factor scale predicting political orientation, party affiliation, and voting behavior.
- Burden, B. C., & Kloffstad, C. A. (2005). Affect and cognition in party identification. *Political Psychology, 26*(6), 869-886.
- Chiu, L.-H. (1972). A cross-cultural comparison of cognitive styles in Chinese and American children. *International Journal of Psychology, 7*, 235-242.
- Choi, I., Dalal, R., Kim-Prieto, C., & Park, H. (2003). Culture and judgement of causal relevance. *Journal of Personality and Social Psychology, 84*(1), 46-59.
- Cohen, G. L. (2003). Party over policy: The dominating impact of group influence on political beliefs. *Journal of Personality and Social Psychology, 85*(5), 808-822.
- Frederick, S. (2005). Cognitive reflection and decision making. *Journal of Economic Perspectives, 19*, 25-42.
- Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Journal of Personality and Social Psychology, 96*(5), 1029-1046.
- Gross, N. (2013). *Why are professors liberal and why do conservatives care?* Cambridge, MA: Harvard University Press.
- Haidt, J. (2012). *The righteous mind: Why good people are divided by politics and religion.* New York, NY: Pantheon Books.
- Hawkins, C. B., & Nosek, B. A. (2012). Motivated independence? Implicit party identity predicts political judgment among self-proclaimed independents. *Personality*

*and Social Psychology Bulletin*, 38(11), 1437-1452.

Hawkins, C. B., & Nosek, B. A. (2012). Libertarian response options. Unpublished raw data.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world?

*Behavioral and Brain Sciences*, 33, 61-135.

Hunter, J. D. (1991). *Culture wars: The struggle to define America*. New York, NY: Basic Books.

Iyer, R., Koleva, S., Graham, J., Ditto, P. H., & Haidt, J. (2012). Understanding libertarian morality: The psychological dispositions of self-identified libertarians. *PLoS One*, 7(8), e42366.

Janoff-Bulman, R. (2009). To provide or protect: Motivational bases of political liberalism and conservatism. *Psychological Inquiry*, 20, 120-128.

Ji, L. J., Zhang, Z., & Nisbett, R. E. (2004). Is it culture or is it language? Examination of language effects in cross-cultural research on categorization. *Journal of Personality and Social Psychology*, 87(1), 57-65.

John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality theory and research* (pp. 102–138). New York, NY: Guilford Press.

Jost, J. T. (2006). The end of the end of ideology. *American Psychologist*, 61, 651-670.

Jost, J. T., Federico, C. M., & Napier, J. L. (2009). Political ideology: Its structure, functions, and elective affinities. *Annual Review of Psychology*, 60, 307-333.

Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. (2003). Exceptions that prove the rule: Using a theory of motivated social cognition to account for ideological incongruities and political anomalies. *Psychological Bulletin*, 129, 383–393.

Jost, J. T., Nosek, B. A., & Gosling, S. D. (2008). Ideology: Its resurgence in social, personality, and political psychology. *Perspectives on Psychological Science*, 3, 126-

136.

Kashima, Y., Kokubo, T., Kashima, E. S., Boxall, D., Yamaguchi, S., & Macrae, K. (2004).

Culture and self: Are there within-culture differences in self between metropolitan areas and regional cities. *Personality and Social Psychology Bulletin*, *30*, 816-823.

Kaufmann, K. M., & Petrocik, J. R. (1999). The changing politics of American men:

Understanding the sources of the gender gap. *American Journal of Political Science*, *43*(3), 864-887.

Kitayama, S., Duffy, S., Kawamura, T., & Larsen, J. T. (2003). Perceiving an object and its

context in different cultures: A cultural look at New Look. *Psychological Science*, *14*(3), 201-206.

Kuhnen, U., & Oyserman, D. (2002). Thinking about the self influences thinking in general:

Cognitive consequences of salient self-concept. *Journal of Experimental Social Psychology*, *38*, 492-499.

Levendusky, M. (2009). The partisan sort: How liberals became Democrats and conservatives

became Republicans. Chicago, IL: University of Chicago.

Masuda, T., & Nisbett, R. E. (2001). Attending holistically versus analytically: Comparing the

context sensitivity of Japanese and Americans. *Journal of Personality and Social Psychology*, *81*(5), 922-934.

Morris, M. W., & Peng, K. (1994). Culture and cause: American and Chinese attributions for

social and physical events. *Journal of Personality and Social Psychology*, *67*, 949-971.

Na, J., Grossmann, I., Varnum, M. E. W., Kitayama, S., Gonzalez, R., & Nisbett, R. E.

(2010). Cultural differences are not always reducible to individual differences.

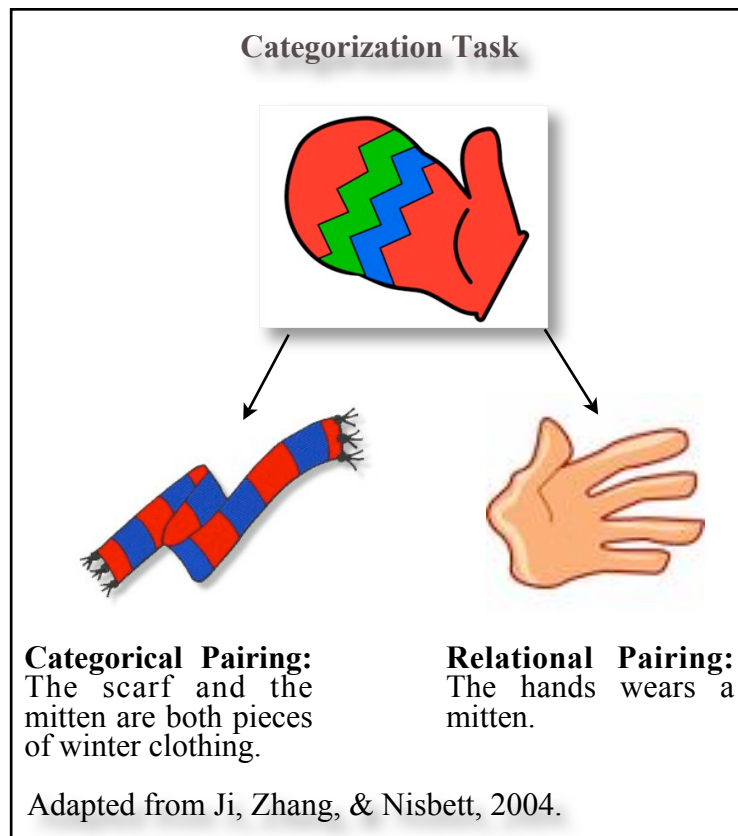
*Proceedings of the National Academy of Sciences of the United States of America*, *107*(14), 6192-6197.

- Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A. (2001). Culture and systems of thought: Holistic versus analytic cognition. *Psychological Review*, 108(2), 291-310.
- Oyserman, D., & Lee, S. (2008). Does culture influence what and how we think? Effects of priming individualism and collectivism. *Psychological Bulletin*, 134, 311-342.
- Sidanius, J. (1984). Political interest, political information search, and ideological homogeneity as a function of sociopolitical ideology: A tale of three theories. *Human Relations*, 37, 811-828.
- Skitka, L. J., Mullen, E., Griffin, T., Hutchinson, S., & Chamberlin, B. (2002). Dispositions, scripts, or motivated correction? Understanding ideological differences in explanations for social problems. *Journal of Personality and Social Psychology*, 83(2), 470-487.
- Talhelm, T., Zhang, X., Oishi, S., Chen, S., Duan, D., Lan, X., & Kitayama, S. (2014). Discovery of large-scale psychological differences within China explained by rice vs. wheat agriculture. *Science*, 344(6184), 603-608.
- Tetlock, P. E. (2000). Cognitive biases and organizational correctives: Do both disease and cure depend on the politics of the beholder? *Administrative Science Quarterly*, 45(2), 293-326.
- Tetlock, P. E., & Boettger, R. (1989). Cognitive and rhetorical styles of traditionalist and reformist Soviet politicians: A content analysis study. *Political Psychology*, 10(2), 209-232.
- Tetlock, P. E., Hannum, K. A., & Micheletti, P. M. (1984). Stability and change in the complexity of senatorial debate: Testing the cognitive versus rhetorical style hypotheses. *Journal of Personality and Social Psychology*, 46(5), 979-990.
- Trafimow, D., Triandis, H., & Goto, S. (1991). Some tests of the distinction between the private self and the collective self. *Journal of Personality and Social Psychology*, 60, 649-655.

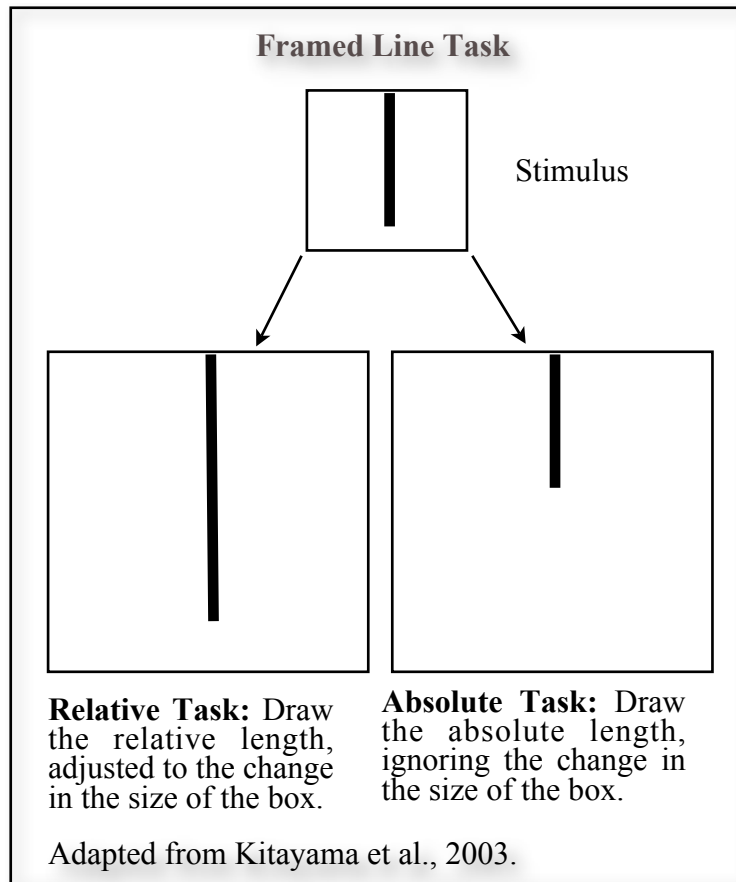
- Triandis, H. C. (1995). *Individualism and collectivism*. Boulder, CO: Westview Press.
- Van Hiel, A., Onraet, E., & De Pauw, S. (2010). The relationship between social-cultural attitudes and behavioral measures of cognitive style: A meta-analytic integration of studies. *Journal of Personality, 78*(6), 1765-1799.
- Varnum, M. E. W., Grossman, I., Kitayama, S., & Nisbett, R. E. (2010). The origin of cultural differences in cognition: The social orientation hypothesis. *Current Directions in Psychological Science, 19*(1), 9-13.
- Witkin, H. A., & Goodenough, D. R. (1977). Field dependence and interpersonal behavior. *Psychological Bulletin, 84*, 661-689.

### Acknowledgements

We thank Zhao Xia and Niu Qingqyun for help collecting data in Beijing; Adam Putnam, Michael Varnum, Casey Eggleston, Felicity Miao, Minha Lee, and Anita Chu for comments on earlier drafts; Michael Kellagher and Yuxin Wang for collecting data in the US; Michael Kubovy for guidance in analyzing the binomial triad data; Carlee Hawkins and Brian Nosek for providing data on how libertarians identify politically when they don't have a libertarian option; and David Dobolyi for designing a web-friendly version of the triad task.

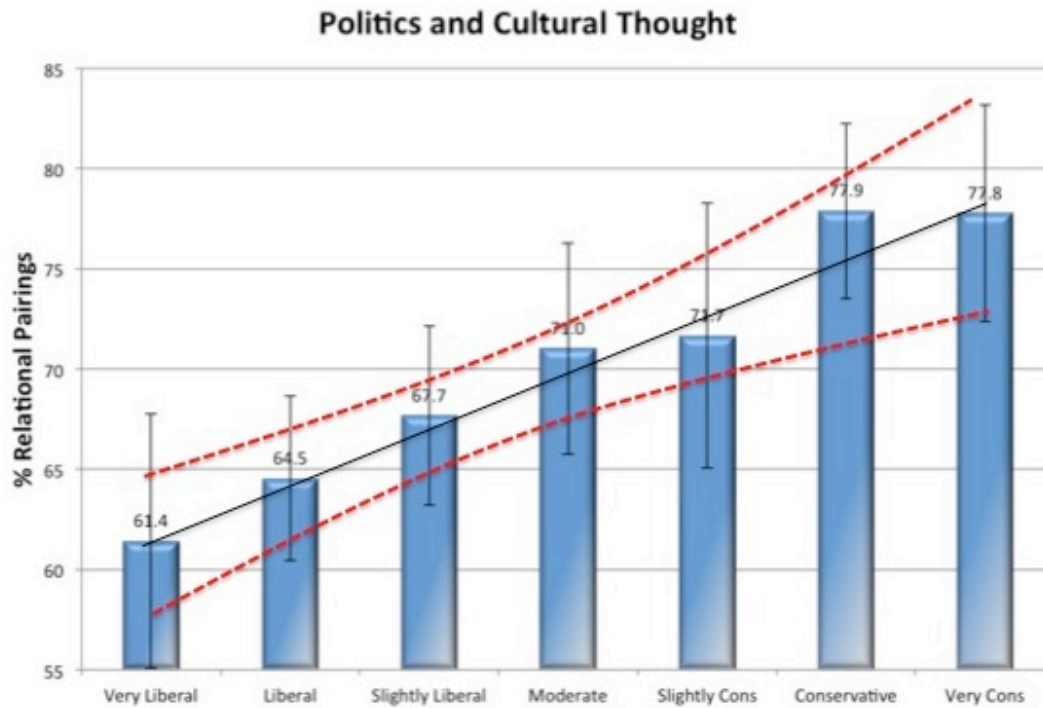


*Figure 1.* The triad task asks participants to choose the two objects that are most closely related. Each triad has two objects that can be paired because they share a functional relationship and two that can be paired because they belong to the same abstract category.



*Figure 2.* In the relative task, participants have to redraw the line relative to the size of the box. In the absolute task, they have to ignore the changing size of the box. East Asian cultures tend to do better on the relative task, whereas Western cultures tend to do better on the absolute task.





*Figure 3.* Social conservatives chose a higher percentage of relational pairings (Study 1).

People from East Asian cultures are more likely to choose relational pairings. People from Western cultures choose fewer relational pairings. Error bars = 1 SEM. The black line is a regression line. Dashed lines represent 95% CIs. The SE bars are wider than the CI because the SEs are calculated for each group separately, whereas the CI is calculated across all participants.

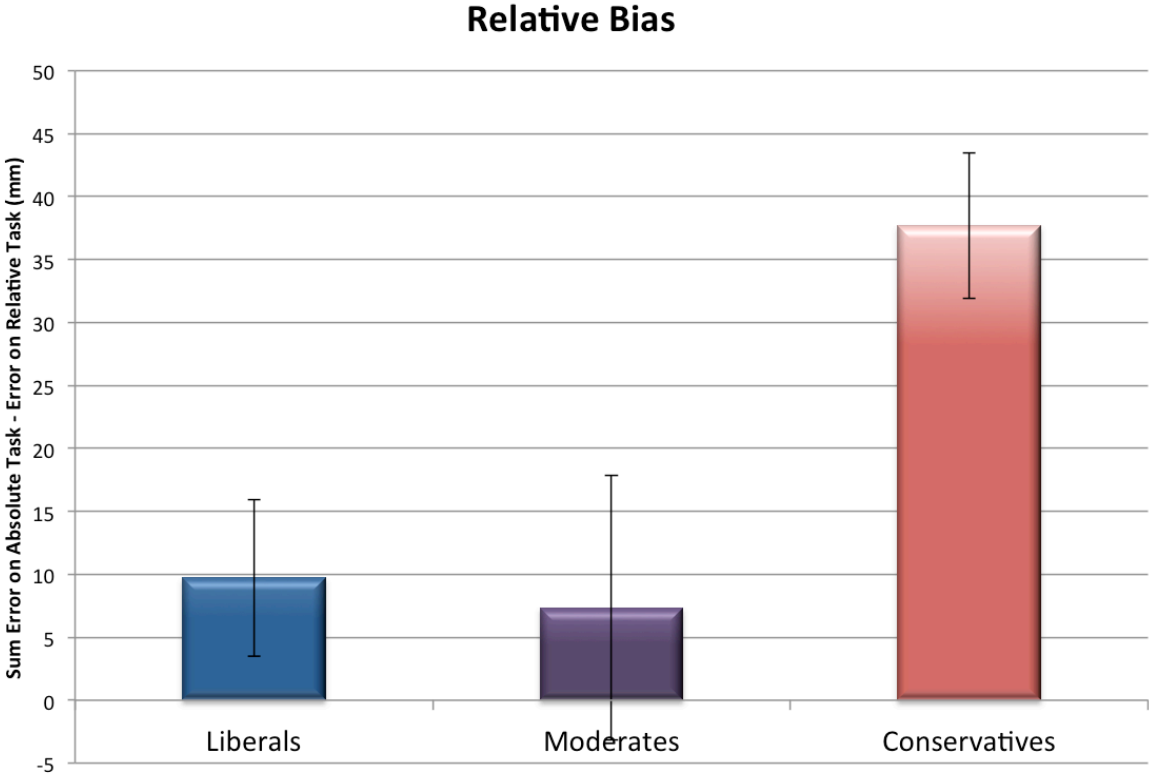
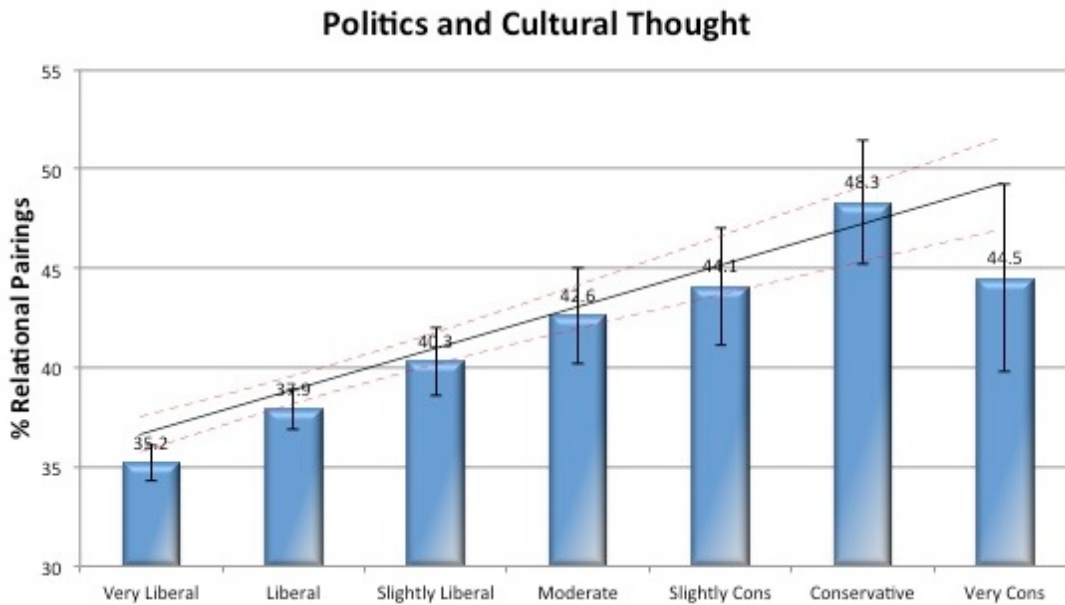


Figure 4. Perceptual bias on the framed-line task by social politics. Social conservatives show a pattern more similar to Japanese participants, with more error on the absolute perception task than the relative task. Error bars = 1 SEM.



*Figure 5.* Social politics strongly predicted holistic vs. analytic thought style in the much larger YourMorals.org sample ( $n = 2,705$ ). Higher values represent more holistic thought. Error bars = 1 SEM. The black line is a regression line. Dashed lines are 95% CIs. The SE bars are wider than the CI because the SEs are calculated for each group separately, whereas the CI is calculated across all participants.

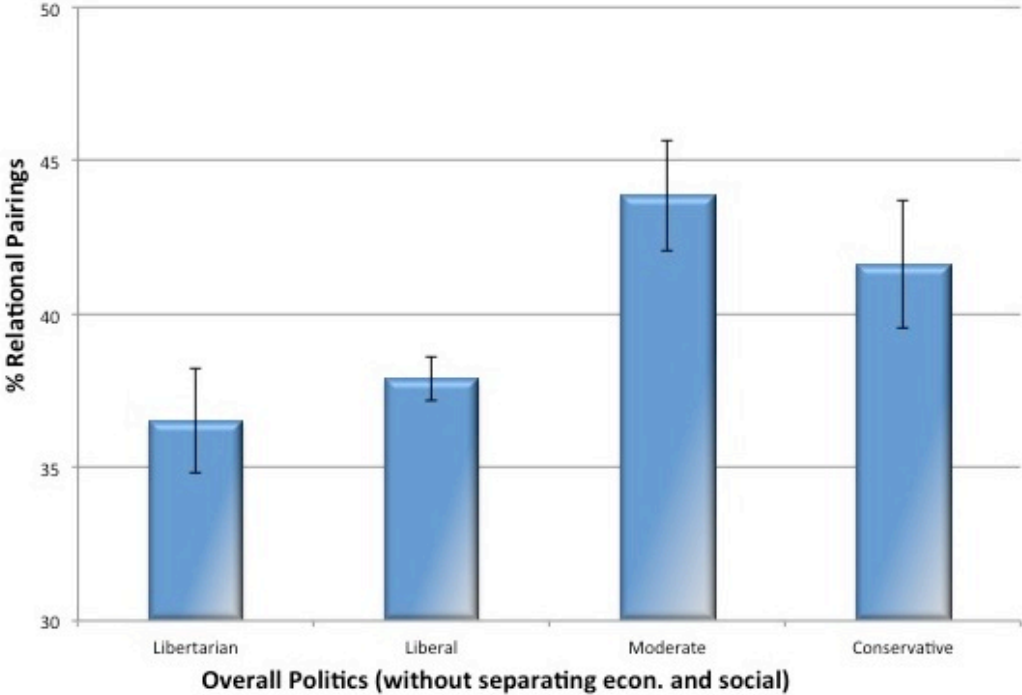
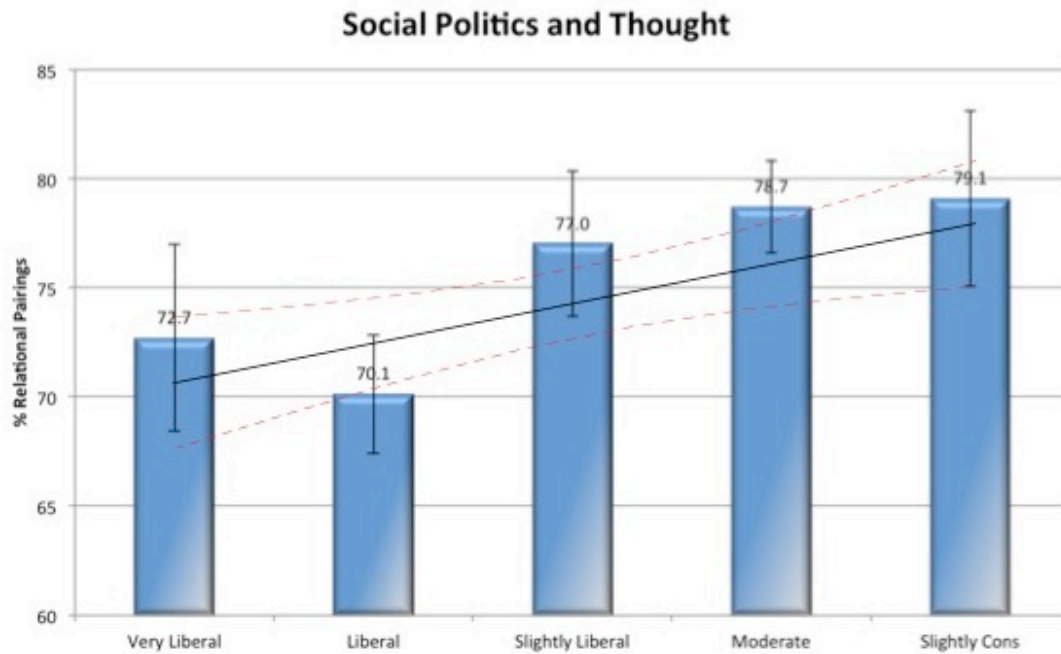
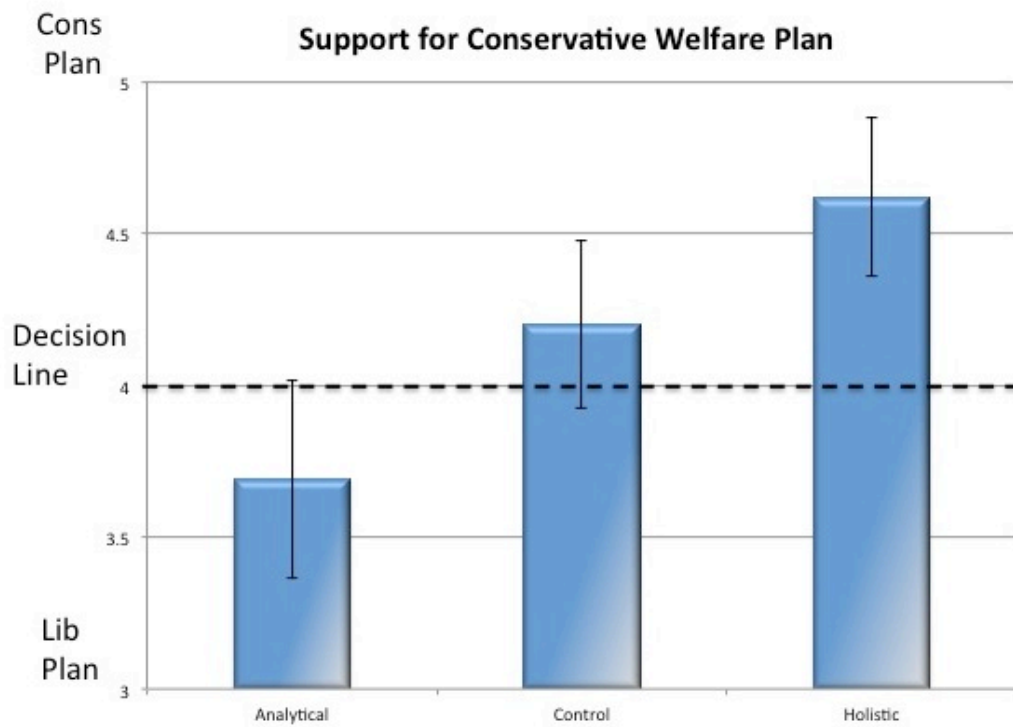


Figure 6. Libertarians thought more analytically than moderates and conservatives. This is consistent with the social orientation hypothesis, which predicts that libertarians should think more analytically because they are individualistic. Error bars = 1 SEM.



*Figure 7.* Social conservatives in China also thought more relationally (holistically). Error bars = 1 SEM. The black line is a regression line. Dashed lines are 95% CIs. The “conservative” and “very conservative” categories could not be accurately estimated because only 1.2% identified as conservative and 0.3% as very conservative. The SE bars are wider than the CI because the SEs are calculated for each group separately, whereas the CI is calculated across all participants.



*Figure 8.* Support for opposing liberal and conservative welfare plans after brief thought training, Study 4. Values above the dotted line side with the conservative plan, and values below the line side with the liberal plan. Error bars = 1 SEM.

Table 1  
*Effects of Thought Training on Political Attitudes for Studies 4 and 5*

<b>Study 4: Cons. Welfare Plan</b>	$\beta$	B	SE	<i>t</i>	<i>p</i>
Prior-Reported Politics	.37	.40	.11	3.56	.001
Thought Training	.24	.52	.22	2.34	.02
<b>Study 4: Special Education Mainstreaming</b>	$\beta$	B	SE	<i>t</i>	<i>p</i>
Prior-Reported Politics	-.40	-.52	.13	-4.00	< .001
Thought Training	.11	.27	.23	1.14	.26
<b>Study 5: Drug Offenders to College</b>	$\beta$	B	SE	<i>t</i>	<i>p</i>
Prior-Reported Politics	-.38	-.40	.07	-6.14	< .001
Thought Training	-.13	-.29	.13	-2.17	.03
<b>Study 5: Free Trade Support</b>	$\beta$	B	SE	<i>t</i>	<i>p</i>
Prior-Reported Politics	.003	.003	.067	.04	.97
Thought Training	-.038	-.072	.127	-.56	.57

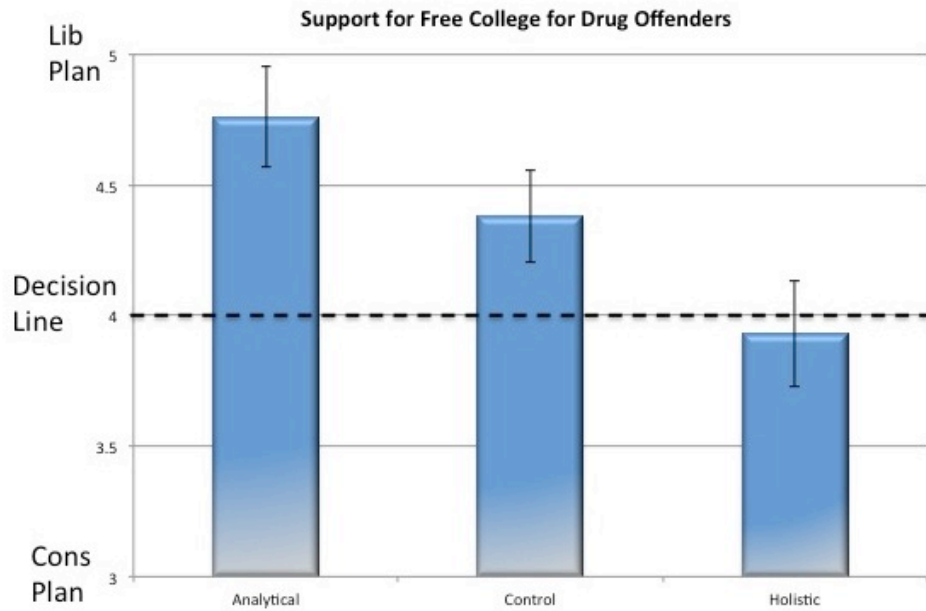
Note: Thought training coded as analytic = -1; control = 0; holistic = 1. Prior-reported politics ranges from 1 (*very liberal*) to 7 (*very conservative*). For the dependent variables, higher values represent support for: conservative welfare plan (less money for welfare); mainstreaming special education students; sending drug offenders to college for free; and expanding free trade.

Table 2  
*Quadratic Contrasts for Studies 4 and 5*

<b>Study 4: Cons. Welfare Plan</b>	$\beta$	B	SE	<i>t</i>	<i>p</i>
Prior-Reported Politics	.37	.40	.11	3.55	.001
Thought Training: Linear	.24	.52	.22	2.32	.02
Thought Training: Quadratic	.04	.04	.11	0.37	.71
<b>Study 4: Special Education Mainstreaming</b>	$\beta$	B	SE	<i>t</i>	<i>p</i>
Prior-Reported Politics	-.42	-.54	.13	-4.16	< .001
Thought Training: Linear	.11	.26	.23	1.13	.26
Thought Training: Quadratic	-.15	-.18	.12	-1.51	.14
<b>Study 5: Drug Offenders to College</b>	$\beta$	B	SE	<i>t</i>	<i>p</i>
Prior-Reported Politics	-.38	-.40	.07	-6.13	< .001
Thought Training: Linear	-.13	-.28	.13	-2.16	.03
Thought Training: Quadratic	-.006	-.007	.08	-0.09	.93
<b>Study 5: Free Trade Support</b>	$\beta$	B	SE	<i>t</i>	<i>p</i>
Prior-Reported Politics	.005	.005	.067	0.08	.94
Thought Training: Linear	-.04	-.07	.13	-0.54	.59
Thought Training: Quadratic	.08	.09	.07	1.19	.23

Note: Linear contrast: analytic = -1; control = 0; holistic = 1. Quadratic: analytic = -1; control = 2; holistic = -1. The quadratic term tests whether there is a divergence from the linear pattern.





*Figure 9.* Support for plan to send convicted drug offenders to college for free instead of prison after brief thought training. Values above the dotted line side with the liberal plan, and values below the line side with the conservative plan. Error bars = 1 SEM.

## Supplemental Materials

**Holistic-Analytic Thought Tasks in the Oyserman and Lee Meta-analysis**

Oyserman and Lee (2008) included several measures of cognition that are not obviously a part of the holistic-analytic framework, such as the judgment of differences between self and other. When we looked at only the studies with tasks we judged as directly related to the holistic-analytic framework, the effect size was similar ( $d = 0.6$ ) to the one reported based on their broader category ( $d = .54$ ). The most relevant tasks in their meta-analysis are internal vs. external attributions, the Embedded Figures Test, and memory for *where* objects appeared (contextual memory) vs. *whether* they appeared at all (non-contextual).

**Education Categories**

Because many participants were currently in college or graduate school, sorting people into categories of educational attainment was difficult. For example, it is arbitrary to sort the quarter of the participants who were currently in college apart from the people currently in graduate school, since a significant portion of those college students may soon be in graduate school. Therefore, we followed the US Census's standard and measured educational attainment only for people 25 years or older. We removed the participants who chose not to report education (3%) and those who were still in high school (0.2%).

To make education a continuous variable, we put people who had completed some college before people who were still in college—and those before people who had completed college. We followed the same format for graduate and professional degrees. That resulted in the following categories:

- 1 = Completed high school
- 2 = Some college/university
- 3 = Currently in college/university

4 = Completed college/university

5 = Some graduate/professional school

6 = Currently in graduate/professional school

7 = Completed graduate/professional school

### Triad Task Items

The triad task includes two items that we view as structurally different from the eight key items. The eight key items can weed out non-serious responses, but the two extra items cannot. For example, in the key item of *panda, banana, and monkey*, “panda” and “banana” is not a very logical pairing because they are known for eating bamboo, not fruits. In contrast, the two extra items always are designed so that no matter how the participant responds, the result is a logical response because any two objects can be paired together logically, as in the case of *letter, stamp, postcard*. We have a slight preference for excluding these items because they cannot weed out non-serious responses. However, results are highly similar if the two extra items are included.

---

<sup>1</sup> See supplemental materials for details which cultural tasks are included in the meta-analysis.

<sup>2</sup> For example, five studies on the research website Project Implicit asked which party participants identified with, including a libertarian option (*Republican, Democrat, Libertarian, Independent, Green, Other, and Don't Know*; Hawkins & Nosek, 2012). The registration page that they filled out earlier asked for their overall political identity without separating economic and social politics and without a libertarian response option (*strongly liberal to strongly conservative*). On average, the 237 libertarian visitors identified on the conservative side (mean = 4.46, SD = 1.57 where 4 is moderate). In percentages, 48%

---

identified as conservative, 27% as “neutral (moderate),” and 25% as liberal. In other words, libertarians were about twice as likely to identify as conservative than liberal.

<sup>3</sup> Although most research has only tested overall politics, a study by Sidanius (1984) did look at economic and social politics separately. Consistent with our prediction, Sidanius found that social liberals showed more cognitively complexity than social conservatives, but he found no relationship between economic politics and cognitive complexity. So there is at least one instance of support for the hypothesis that social politics is a better predictor of thought style than economic politics.

<sup>4</sup> The original task includes two other items that we argue are structurally different. See supplemental materials.

<sup>5</sup> Savvy readers might suspect the YourMorals group was more analytic because they were more liberal than Virginia students, but the difference still held when we compared very liberals from YourMorals to very liberals in Virginia (and so on). Comparing students and YourMorals respondents in the same political category, the YourMorals respondents had 25-30% fewer analytic pairings across the spectrum.

<sup>6</sup> This sample includes 149 non-Han participants from different cultures within China (e.g., Tibetans and Uyghur Muslims). Other cultures within China may have different cultural thought styles and political beliefs. Therefore, we must be careful to ensure that we are not confounding differences *between* cultures and individual-level differences.

For example, even though the 149 non-Han participants in this study were spread across 20 ethnicities, the small non-Han groups still had different political views and thought styles. For example, Uyghur Muslims were more analytic than Han Chinese (Uyghur mean = 67% holistic choices; Han = 76%). At the same time, Uyghurs identified as more politically conservative than Han Chinese, which may not be surprising given Islam’s association with social conservatism (Uyghur = 3.83; Han = 3.04). *Inter-cultural* differences like these could confound the individual-level, within-culture relationship between politics and thought style.

It would be interesting to replicate findings *within* each culture. However, that would require large samples from each culture. Our largest sample from a single minority culture had only 22 people, which is far too small to analyze for individual differences.

<sup>7</sup> The next best alternative is probably *kaifang*, which translates to “open” (as in, open to new ideas, reflecting things like openness to marrying non-Chinese and living together before marriage). We decided not to use *kaifang* because it is less political than *kaiming*, but we have collected data in another study that suggests *kaifang* similarly predicts thought style.

<sup>8</sup> If support for free trade is coded as liberal, the comparison of the effect sizes becomes a non-significant trend  $z = 1.20, p = .23$ .