

Ineffective Attribution Testing: An exploration of individual differences in cognition between Liberals and Conservatives

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Abstract

Previous literature has suggested that there are underlying differences in cognitive processes between liberals and conservatives. Conservatives are said to have more structured cognitive patterns compared to liberals in addition to being less able to inhibit their responses on behavioral inhibition tasks (Amodio et al. 2007). These differences may manifest in implicit data collected by using the Implicit Association Test (IAT) and may prove to have both methodological and substantive implications. This paper hypothesizes that conservatives have less variability in their behavioral response times to IAT tasks, as well as longer response times and higher error rates compared to liberals. Using existing non-political IAT experiment data, this paper investigates the idea that conservatives exhibit these characteristics only after establishing a baseline behavioral pattern on the first block of the experiment. The results suggest that conservatives are not in fact slower overall or after the first block. The same is true for the variability and error rate hypotheses. Underlying individual differences in cognitive processing between conservatives and liberals do not have either methodological or substantive implications. IAT studies are not likely to falsely attribute substantive findings to conservatives and there is no evidence to suggest that studies need to include a control for political ideology.

Keywords: Implicit Association Test (IAT), cognition, individual differences

1 Introduction

Past research has shown that differences exist in cognitive processes between liberals and conservatives. However, it is unclear if these differences manifest in implicit measures in a way that would affect the conclusions drawn from studies using these types of measures. Therefore, this paper seeks to answer the question, “Do individual differences in cognitive processing present validity issues for the substantive conclusions drawn from IAT experiments?”

Previous research has primarily investigated individual differences in brain structures and neural activity (Amodio et al. 2007; Kanai et al. 2011) as well as in relation to personality measures and moral foundations (Jost et al. 2003, 2006; Block and Block 2006; Graham, Haidt, and Nosek 2009). Studies wishing to assess the prevalence of implicit biases use measures such as the Go / No-Go association task, BeanFest, the Flanker Task, and the Implicit Association Test (IAT). However, previous research has left open the possibility of individual differences in cognitive processing potentially impacting the substantive conclusions of studies using these types of implicit measures when ideology is not accounted for.

Following from implications of previous research, I argue that the structured cognitive style of conservatives will make them more consistent and thus have mean IAT response times that are less variable compared to liberals. Additionally, I argue that mean response times for conservatives over all of the blocks in an IAT should be slower than the average mean response time for liberals and that conservatives will also make significantly more errors. Furthermore, I argue that conservatives are inherently slower at implicit tasks that require changes in the required behavioral response after a pattern of responses has been established. Thus, on average, mean response times for conservatives over all blocks after the first one in an IAT should be slower than the average mean response time for liberals in

the last three blocks. In addition, after the first block in an IAT when conservatives have established a pattern, they will have less variable response times but make more errors than liberals over the last three blocks.

To test these conjectures, I use a combination of existing IAT experiment data from Project Implicit and the 2008-2009 ANES IAT pilot. Since the hypotheses suggest that there should be individual differences in the way that conservatives and liberals respond to implicit tasks themselves, the ideal test is using non-political IATs. Non-political IATs are ones that have no logical correlation with ideological divisions, such as Coffee/Tea vs. Good/Bad or Summer/Winter vs. Good/Bad. Therefore, existing data was supplemented with unpublished IAT data on 95 topics collected by Nosek and Hussey (2017), 21 of which feature non-political topics.

The results presented do not supply enough evidence to suggest that conservatives are slower overall or after the first block of an IAT. In addition, despite their proposed cognitive rigidity, conservatives do not show higher consistency in response times than liberals either overall or over the last three blocks of IATs. Finally, there is also not enough evidence to suggest that conservatives make significantly more errors overall or over the last three blocks of IATs.

If this study had found individual differences between conservatives and liberals in terms of their performance on IATs, there would have been methodological and substantive implications of using these measures to collect data on implicit processes. However, because conservatives are not significantly slower, more consistent, or more error prone than liberals, there is no reason to think that there are methodological implications for implicit measures. The typical outcome of interest for IATs is the “D” score which is calculated by subtracting block-level response times within respondents. This study does not provide significant evidence to suggest the need to control for ideology even when using non-political topics in IAT studies.

2 Underlying Cognitive Differences Between Conservatives and Liberals

Previous studies have investigated the idea that there are underlying individual differences in cognitive processing between conservatives and liberals. Early research focused on the differences in psychological measures between the two groups. Conservatives were found to have more structured and persistent cognitive processes, as well as have higher scores on measures of structure, cognitive closure, and order (Jost et al. 2003). In addition, conservatives are said to be more rigid in their ways (Block and Block 2006). In contrast, common personality traits of liberals include open-mindedness, curiousness, and creativeness (Carney et al. 2008).

In terms of decision-making, liberals and conservatives use different sets of moral foundations on which to base their decisions (Graham, Haidt, and Nosek 2009). Liberals rely more on individualizing foundations such as harm/caring and fairness/reciprocity, while conservatives endorse more group-focused morals (Graham, Haidt, and Nosek 2009; Graham, Nosek, and Haidt 2012). More interestingly, however, when asked to rate the morality of their in-group and out-group, liberals are less accurate in their estimations (Graham, Nosek, and Haidt 2012).

In terms of attention, conservatives spend more time focusing on aversive images, while liberals are more prone to direct their attention to pleasing stimuli (Dodd et al. 2012). This may be one explanation for why conservatives are more sensitive to angry faces (McLean et al. 2014). Liberals are also more susceptible to gaze-cuing effects (Dodd, Hibbing, and Smith 2011).

Political orientation also affects how information is processed. Brain (neural) activity when viewing political faces differs based on political ideology (Kaplan, Freedman, and Iacoboni 2007; Knutson et al. 2006). Conservatives display a general fear of uncertainty,

and therefore, prefer simpler and less abstract art (Wilson, Ausman, and Mathews 1973). Additionally, conservative senators have been found to make less complex arguments (Tetlock 1983). Because of their need for order, intolerance of ambiguity, and perceptions of a dangerous world, conservatives are generally threat and uncertainty avoidant (Jost et al. 2007). This avoidant behavior leads to learning asymmetries, where conservatives expose themselves to different information and at different rates than liberals (Shook and Fazio 2009).

A variety of implicit measure methodology has been used to investigate these differences in cognitive processing. Eye tracking and skin conductance levels have been used to assess differences in directed attention (Dodd et al. 2012). Other studies have used the Flanker Task, which presents two images on either side of a target to assess the characteristics of attentional gaze (McClean et al. 2014) or the Go / No-Go Task (Amodio et al. 2007). Bean-Fest has been used to investigate underlying differences in avoidance and learning between conservatives and liberals (Shook and Fazio 2009). In terms of brain regions and neural activity, studies have used fMRI to assess the underlying cognitive differences between liberals and conservatives (Kaplan, Freedman, and Iacoboni 2007; Kanai et al. 2011; Knutson et al. 2006). The strength of these measurement tools is the fact that they measure implicit attitudes and are very difficult, if not impossible, for participants to manipulate consciously.

However, few studies have investigated the implications of these studies on the underlying cognitive processing differences between liberals and conservatives. In addition to substantive implications, individual differences in cognitive processing between liberals and conservatives could lead to methodological problems for implicit measures. This paper will investigate the immediate implications following from Amodio et al. (2007) and evaluate the importance of the results in terms of substantive conclusions and methodological challenges.

3 Theory

In the first study to look at differences in neurocognitive mechanisms for response-inhibition between conservatives and liberals, Amodio et al. (2007) used the Go / No-Go association task to measure neural activity in response to behavioral inhibition. Overall, they found that liberals have greater activity in the anterior cingulate compared to conservatives. This suggests that liberals are better able to alter their responses, even after a behavioral pattern has been formed, due to higher sensitivity to conflict-related monitoring and response (Amodio et al. 2007).

There are many implications that follow from Amodio et al. (2007)'s study, all of which involve individual differences in cognitive processing between conservatives and liberals. The first is that conservatives tend to have more consistent and structured cognitive styles (Amodio et al. 2007). If this is the case, we should see this pattern on other tests of implicit association, for example, the Implicit Association Test (IAT). Therefore, I hypothesize the following:

Hypothesis 1: Conservatives will show less variation in response times than liberals.

Subsequently, the results of Amodio et al. (2007) suggest that liberals have a lower threshold to meet regarding altering habitual response patterns. If liberals are more sensitive to changing patterns even after they have formed a response pattern, they should be better able to become accustomed to new word pairs in subsequent blocks after the first time. Therefore, I hypothesize the following:

Hypothesis 2: Liberals will have faster average response times over all of the blocks compared to conservatives.

In terms of neural activation, liberals are prone to greater activity when an inhibition response, or a response that breaks their patterned response, is necessary (Amodio et al. 2007). Therefore, with increased neural activity, liberals should be better able to invoke an inhibition response when one is necessary. This potentially has two implications:

1. Liberals should perform better when they are given a task that involves pattern switching, compared to conservatives.
2. Because Liberals are better able to modify an established behavioral pattern, they should be better able to hide their implicit biases.

Therefore, I propose an additional hypothesis:

Hypothesis 3a: Conservatives will make more errors overall compared to liberals.

Following from the theory and previous research (Amodio et al. 2007), the expectation is that once conservatives establish a pattern of behavioral responses (in the first IAT block), they will be less able to modify their responses, both in terms of response times and error rate, compared to liberals in the subsequent IAT blocks. Therefore, I propose an additional three sub-hypotheses regarding error rate, variation, and response time.

Hypothesis 3b: Conservatives will make more errors after establishing a behavioral pattern compared to liberals.

Hypothesis 3c: Conservatives will have less variation in response times in blocks after the first one compared to liberals.

Hypothesis 3d: Conservatives will have slower response times in blocks after the first one compared to liberals.

Regarding Hypothesis 3, liberals are better at switching their response pattern than conservatives. Therefore, conservatives should make more errors. However, there are two mechanisms that lead to error. The first is that conservatives are more prone to make errors in general, meaning that no previous response pattern is required, they just perform worse at implicit tasks than liberals (Hypothesis 3a). The second is that as Amodio et al. (2007) begin to suggest, with conservatives being less sensitive to inhibition responses, after establishing a behavioral pattern in the first block, performance could decline in the subsequent blocks (Hypothesis 3b). This means that conservatives will make more errors in the second, third, and fourth blocks than in the first. The same pattern is hypothesized for variation (Hypothesis 3c) and response times (Hypothesis 3d).

The hypotheses outlined above suggest individual differences in cognitive processing between conservatives and liberals. For this reason, the best test is to use non-political IATs. This way, empirical differences cannot be explained by substantive considerations. For example, using a White/Black vs. Good/Bad IAT might lead to the conclusion that conservatives are slower in their response times than liberals because they are implicitly prejudiced. The theory above does not intend to investigate substantive differences. Instead, it proposes that there are inherent cognitive differences between conservatives and liberals that lead to conservatives having slower response times in general and making more errors. Therefore, non-political IATs should be used to test the theory. It would not be logical to attribute conservatives having slower response times to a Coffee/Tea vs. Good/Bad IAT to ideology. Instead, the theory posits that this slower response time, lower variation, and more errors is due to neurocognitive differences between conservatives and liberals.

4 Methods

In addition to the Go / No-Go task, another prominent measure used to detect implicit biases is the Implicit Association Test (IAT). The IAT uses reaction time of an individual matching word pairs or image/word pairs to detect implicit bias. Individuals who take longer to match specific pairs are said to have a bias against that combination. The typical outcome of interest for an IAT is the “D” score which is calculated by Equation 1, which uses Self/Democrat and Self/Republican as word association blocks (Self/Others vs. Democrat/Republican) (Theodoridis 2017).

$$D = \frac{ResponseTime_{Self/Democrat} - ResponseTime_{Self/Republican}}{SD} \quad (1)$$

where $ResponseTime_{Self/Democrat}$ is the average response times of blocks where an individual is asked to associate “Me/Myself/I” with “Democrat” and $ResponseTime_{Me/Republican}$ is the average response times of blocks where they are asked to associate “Me/Myself/I” with “Republican.” SD is the standard deviation of response times for an individual.

In addition to the “D” score, there are three other outcomes that can be investigated. While the “D” score calculates the difference in response time between blocks for each individual, we can also look at the mean response time for each block or over all of the blocks in the experiment. If, as Hypothesis 2 suggests, liberals are faster than conservatives at these kinds of tasks, we should see that conservatives have larger average response times per block and over all blocks compared to liberals. If conservatives’ response time is higher overall, this means that regardless of the substantive content of the IAT, they are just slower to produce a behavioral response. If conservatives’ response times are only higher during blocks that ask for the opposite association from the one they hold, and lower during blocks that they routinely associate, this will produce an average that is similar to liberals.

Another outcome produced by the IAT is an error rate. Because each block con-

tains instructions on which associations to make (such as Good/Black and Bad/White or Good/White and Bad/Black), an error occurs when the individual does not produce a response that is in line with the instructions. Therefore, an overall error rate can be calculated for each individual as a percentage of the total number of trials over all blocks. Additionally, an error rate can be calculated by block for each respondent.

The third outcome that can be investigated is the variability in response times. At the group level, the standard deviation of the mean response time over all of the blocks can be calculated and measures the variation in response time for conservatives or liberals. When comparing these two standard deviations, Hypothesis 1 predicts that the standard deviation of mean response times should be lower for conservatives than for liberals. In addition to the overall standard deviation, we can calculate the standard deviation by block for each respondent.

To test the three hypotheses outlined in the theory, this paper employs existing IAT data collected from Project Implicit¹ and the 2008-2009 ANES². Three datasets were gathered from the Project Implicit website. The first is a sexuality IAT which uses Gay/Lesbian vs. Good/Bad. Arguably, this is a very political IAT, but is used for the purpose of comparison. The second is an age IAT which uses Young/Old vs. Good/Bad. The third is a disability IAT which uses Disable/Able vs. Good/Bad. Neither of these second two experiments are relatively political, but are still not as ideal. The ANES IAT is also a very political IAT due to its design of White/Black vs. Good/Bad. Along with the sexuality IAT from Project Implicit, this serves as a comparison.

These existing datasets are not ideal, as some of them are relatively political while others are less so. Therefore, this data is supplemented with data on strictly non-political IATs from

¹Project Implicit Open Science Foundation Data: <https://osf.io/y9hiq/>.

²ANES 2008-2009 Data and IAT pilot data: http://www.electionstudies.org/studypages/2008_2009panel/anes2008_2009panel.htm.

Nosek and Hussey (2017)'s 95-topic IAT experimental database³. The 21 categories used for the non-political IATs include Boxers / Briefs, Burger King / McDonalds, Carbohydrates / Protein, Cats / Dogs, Coffee / Tea, Coke / Pepsi, Cold / Hot, East Coast / West Coast, Exercising / Relaxing, Future / Past, Harry Potter / Lord of the Rings, Kobe / Shaq, Letters / Numbers, Morning / Night, Mountains / Ocean, Nerds / Jocks, Short People / Tall People, Speed / Accuracy, Summer / Winter, Vegetables/ Meat, and Yankees / Red Sox. There is no logical reason to believe that any of these associations have ideological or political relevance. We would not expect that conservatives more readily associate Coffee/Good or Winter/Bad than liberals do. Therefore, these 21 IATs provide ideal tests of the theory.

Finally, political orientation was measured with a 7-point party identification scale. The three conservative responses were pooled together as were the three liberal responses to make a binary indicator of conservativeness (1 = conservative, 0 otherwise). Independents / neutral individuals were dropped from the analysis because there were no theoretical predictions for this group of individuals.

5 Results

The mean response time was calculated by averaging the response times over all of the test blocks. The mean response time by group (liberals) is calculated by finding the average of the mean response time over all of the individuals in the group (who identify as liberals). The mean response time for the first block is the average response time for trials only presented in the first block. Subsequently, the mean response time for the last three blocks is calculated from trials after the first block until the end of the experiment.

The standard deviation of the mean response time is also calculated at the group level. Additionally, we calculate the standard deviation for the first block and the last three blocks

³This data was obtained courtesy of Brian Nosek and Ian Hussey through a private OSF link.

separately. The analyses that follow use Welch Two Sample t-tests with two-tailed p-values.

Hypothesis 1 posits that conservatives will show less variation in response times than liberals. This means that we should expect to see smaller standard deviations for conservatives than for liberals. Table 1 shows the results for the Project Implicit Sexuality IAT which uses Gay/Lesbian and Good/Bad. The standard deviation of response times for conservatives is significantly smaller than the standard deviation in response times for liberals, supporting Hypothesis 1. The same pattern is found in Table 3 which uses the Age IAT and Table 5 which uses the Disability IAT: conservatives have a significantly smaller standard deviation in response times compared to liberals. However, hypothesis 1 is not supported in the ANES Race IAT, where conservatives have a higher standard deviation in response times than liberals.

Figure 1 displays the results from the strictly non-political IATs, which is a better test of the theory. We expect that individual differences in cognitive processing between liberals and conservatives has nothing to do with the content of the IAT – conservatives are just slower in general and have a hard time switching their patterned behaviors. However, what we see is the opposite. Column 4 in Table 1 shows the p-value of a t-test comparing the standard deviation across all trials in all blocks between liberals and conservatives. Out of 21 IATs, only three of them are significant but in the wrong direction – conservatives are significantly more consistent in their response times than liberals, which is the opposite of what Hypothesis 1 suggests.

With regard to Hypothesis 3c, Column 5 shows p-values for a t-test of the standard deviation of the response times for the first block between conservatives and liberals. The same pattern is exhibited here as in Column 4 – three of the 21 IATs produce significant results, but in the opposite direction. The same is true for Column 6, which presents the results for the standard deviation of the last three blocks. The theory suggests that conservatives should be significantly slower after they establish a pattern – therefore, there should

be greater differences between conservatives and liberals regarding response time consistency when only the last three blocks are compared. This is not the case and Hypothesis 3c is generally not supported.

Hypothesis 2 suggests that liberals will have lower average response times compared to conservatives. Alternatively, this could be phrased as conservatives have higher mean response times over all of the blocks compared to liberals. This idea is supported by the data in the more politically-relevant existing IATs: Table 1 (Sexuality) and Table 7 (Race). However, in the less politically-relevant IATs (Table 3 (Age) and Table 5 (Disability)) from Project Implicit, the direction is as predicted (conservatives are slower than liberals), but the p-values fail to meet significance.

Returning to the strictly non-political IATs presented in Table 1, Hypothesis 2 is supported in five of the 21 cases (with another of marginal significance) when mean response time over all of the blocks is used (Column 1). Overall, there is mixed support for Hypothesis 2. Column 2 presents the results for mean response time for the first block. In this specification, conservatives are significantly slower in four of 21 cases, but significantly slower in one IAT out of the 21 presented. Column 3 shows the results for the mean response time of the last three blocks, which the theory would predict should show the greatest difference between liberals and conservatives (Hypothesis 3d). This trend is seen – conservatives are significantly slower than liberals in 5 of the 21 IATs (plus one of marginal significance). Additionally, despite not all having significant results, all of the IATs show results that are in the hypothesized direction. There is some evidence that conservatives are slower than liberals after establishing a pattern of responses (Hypothesis 3d), but there are not enough significant results to propose that there is an effect of conservatism on response time.

Hypothesis 3a predicts that conservatives will make more errors overall compared to liberals. Preliminary tests using the overall percentage of errors over all of the blocks were computed on the Project Implicit datasets. Hypothesis 3a is supported by Table 2 (Sexuality)

Table 1: **Project Implicit Sexuality IAT**: (Gay/Lesbian vs. Good/Bad)

Group	Mean RT	St. Dev	N	df	t	<i>p-value</i>
Conservatives	1108.587	878.424	18491	129230	-2.831	0.004641
Liberals	1074.599	4016.376	157524			

Note: Welch Two Sample t-test, two-tailed p-value.

Table 2: **Project Implicit Sexuality IAT**: (Gay/Lesbian vs. Good/Bad)

Group	Error Rate	St. Dev	N	df	t	<i>p-value</i>
Conservatives	10.844	9.130	18491	21794	-13.587	> 0.001
Liberals	9.894	7.822	157524			

Note: Welch Two Sample t-test, two-tailed p-value.

and Table 6 (Disability), where conservatives have a significantly higher percentage of errors than liberals. The Race IAT (Table 8) shows the same pattern, but the p-value fails to meet significance. Hypothesis 3a is not supported by the Age IAT (Table 4), where liberals actually have a significantly higher error rate than conservatives. Looking at the strictly non-political IATs in Table 1, we can see that conservatives have significantly more errors on 1 of the 21 IATs and marginally less errors on one IAT (Column 7). Therefore, Hypothesis 3a is largely unsupported.

Hypothesis 3b suggests that conservatives will make more errors after establishing a behavioral pattern than liberals. We do not expect there to be significant differences in the number of errors in the first block, and overall this is what we see (Column 8). Conservatives make significantly more errors in 1/21 IATs and significantly less errors in 1/21 IATs, with one marginally significant as well. We do, however, expect that conservatives make significantly more errors in the last three blocks (Column 9). This is the case in 1/21 IATs – conservatives make significantly more errors in the last three blocks than liberals. However, conservatives make marginally less errors in 2/21 IATs and overall, the results have mixed directions. Overall, Hypothesis 3b is not supported.

Table 3: **Project Implicit Age IAT:** (Young/Old vs. Good/Bad)

Group	Mean RT	St. Dev	N	df	t	<i>p-value</i>
Conservatives	953.0765	1971.07	18377	48805	-0.37116	0.7105
Liberals	946.0215	3726.288	92630			

Note: Welch Two Sample t-test, two-tailed p-value.

Table 4: **Project Implicit Age IAT:** (Young/Old vs. Good/Bad)

Group	Error Rate	St. Dev	N	df	t	<i>p-value</i>
Conservatives	7.348	7.342	18377	25838	7.3994	> 0.001
Liberals	7.785	7.186	92630			

Note: Welch Two Sample t-test, two-tailed p-value.

Table 5: **Project Implicit Disability IAT:** (Disable/Able vs. Good/Bad)

Group	Mean RT	St. Dev	N	df	t	<i>p-value</i>
Conservatives	1040.961	1279.239	7079	15677	-0.82721	0.4081
Liberals	1025.438	2220.169	40751			

Note: Welch Two Sample t-test, two-tailed p-value.

Table 6: **Project Implicit Disability IAT:** (Disable/Able vs. Good/Bad)

Group	Error Rate	St. Dev	N	df	t	<i>p-value</i>
Conservatives	8.993	8.585	7079	9129.3	-2.6778	0.007
Liberals	8.702	7.640	40751			

Note: Welch Two Sample t-test, two-tailed p-value.

Table 7: **ANES Race IAT:** (White/Black vs. Good/Bad)

Group	Mean RT	St. Dev	N	df	t	<i>p-value</i>
Conservatives	1254.615	881.8145	1002	1623.5	-2.3445	0.01917
Liberals	1177.895	494.9763	831			

Note: Welch Two Sample t-test, two-tailed p-value.

Table 8: **ANES Race IAT:** (White/Black vs. Good/Bad)

Group	Error Rate	St. Dev	N	df	t	<i>p-value</i>
Conservatives	8.534	10.896	1002	1771.6	-1.0383	0.2993
Liberals	8.005	10.848	831			

Note: Welch Two Sample t-test, two-tailed p-value.

Domain	(1) Mean RT		(2) Mean RT		(3) Mean RT		(4) SD		(5) SD		(6) SD		(7) Errors		(8) Errors		(9) Errors	
	All Blocks	First Block	First Block	First Block	Last 3	All Blocks	All Blocks	First Block	First Block	First Block	Last 3	All Blocks	All Blocks	First Block	First Block	First Block	Last 3	Last 3
Boxers / Briefs	0.04871**	0.2139	0.9867	0.03545**	0.03762**	~0.03762**	~0.2603	~0.03576**	0.3976	0.8392	~0.03576**	0.3976	0.3976	~0.8392	0.3976	0.8392	0.2976	0.2976
Burger King / McDonalds	0.827	0.9867	0.9867	0.7658	~0.96	~0.96	~0.5729	0.8276	0.7155	~0.6747	0.8276	0.7155	0.7155	~0.6747	0.7155	~0.6747	0.6112	0.6112
Carbohydrates / Protein	0.1001	0.009962***	0.009962***	0.3087	0.3568	0.3568	~0.1539	0.2731	0.9524	0.6962	0.2731	0.9524	0.9524	0.6962	0.9524	0.6962	0.9885	0.9885
Cats / Dogs	0.03734**	0.2636	0.2636	0.02701**	0.8164	0.8164	~0.3404	0.5219	0.6516	~0.6421	0.5219	0.6516	0.6516	~0.6421	0.6516	~0.6421	0.5516	0.5516
Coffee / Tea	0.1673	0.008037***	0.008037***	0.4064	0.8273	0.8273	~0.1137	0.7276	~0.6872	~0.9604	0.7276	~0.6872	~0.6872	~0.9604	~0.6872	~0.9604	~0.6559	~0.6559
Coke / Pepsi	0.2492	0.2614	0.2614	0.3323	~0.2029	~0.2029	~0.2009	~0.3122	~0.3838	~0.6753	~0.3122	~0.3838	~0.3838	~0.6753	~0.3838	~0.6753	~0.3783	~0.3783
Cold / Hot	0.1328	0.1285	0.1285	0.2273	~0.4482	~0.4482	~0.668	~0.4717	~0.1135	~0.8729	~0.4717	~0.1135	~0.1135	~0.8729	~0.1135	~0.8729	~0.07761*	~0.07761*
East Coast / West Coast	0.675	0.4659	0.4659	0.838	0.8501	0.8501	0.7021	~0.9906	0.6748	~0.8574	~0.9906	0.6748	0.6748	~0.8574	~0.8574	~0.8574	0.6062	0.6062
Exercising / Relaxing	0.4289	0.3637	0.3637	0.523	0.3749	0.3749	~0.9588	0.3171	~0.07783*	~0.7532	0.3171	~0.07783*	~0.07783*	~0.7532	~0.7532	~0.7532	~0.05016*	~0.05016*
Future / Past	0.01978**	0.1536	0.1536	0.02109**	~0.06803*	~0.06803*	~0.9561	~0.04008**	0.4451	0.3949	~0.04008**	0.4451	0.4451	0.3949	0.3949	0.3949	0.5185	0.5185
Harry Potter / Lord of the Rings	0.002672***	0.01522**	0.01522**	0.00374***	~0.08492*	~0.08492*	~0.6421	~0.04626**	0.6239	0.3588	~0.04626**	0.6239	0.6239	0.3588	0.3588	0.3588	0.7382	0.7382
Kobe / Shaq	0.5615	~0.6021	~0.6021	0.2925	~0.5308	~0.5308	~0.9581	~0.4709	0.3933	~0.8534	~0.4709	~0.4709	~0.4709	~0.8534	~0.8534	~0.8534	0.3106	0.3106
Letters / Numbers	0.07987*	0.5592	0.5592	0.04052**	~0.1666	~0.1666	~0.7001	~0.1653	0.7903	~0.736	~0.1653	~0.1653	~0.1653	~0.736	~0.736	~0.736	0.6989	0.6989
Morning / Night	0.7914	~0.2831	~0.2831	0.2652	0.5247	0.5247	0.2787	~0.6991	~0.6713	~0.4955	~0.6991	~0.6713	~0.6713	~0.4955	~0.4955	~0.4955	~0.7548	~0.7548
Mountains / Ocean	0.1154	0.1998	0.1998	0.1268	~0.5221	~0.5221	~0.9311	~0.4404	~0.5479	0.7644	~0.4404	~0.5479	~0.5479	0.7644	0.7644	0.7644	~0.4346	~0.4346
Nerds / Jocks	0.2669	0.7921	0.7921	0.1656	0.3083	0.3083	0.2699	0.4372	~0.1552	~0.05012*	0.4372	~0.1552	~0.1552	~0.05012*	~0.05012*	~0.05012*	~0.2416	~0.2416
Short People / Tall People	0.3186	0.1668	0.1668	0.5878	~0.2994	~0.2994	~0.2618	~0.5141	0.01644**	0.03282**	~0.5141	0.01644**	0.01644**	0.03282**	0.03282**	0.03282**	0.02406**	0.02406**
Speed / Accuracy	0.3027	0.1329	0.1329	0.4941	~0.3064	~0.3064	~0.0389**	~0.5802	0.3162	0.4545	~0.5802	0.3162	0.3162	0.4545	0.4545	0.4545	0.3267	0.3267
Summer / Winter	0.9021	0.6406	0.6406	0.9547	0.7657	0.7657	0.7912	0.818	0.8151	0.4072	0.818	0.8151	0.8151	0.4072	0.4072	0.4072	0.9322	0.9322
Vegetables / Meat	~0.7998	~0.04402**	~0.04402**	0.5556	~0.8392	~0.8392	0.05469*	~0.5087	~0.4975	~0.0006342***	~0.5087	~0.4975	~0.4975	~0.0006342***	~0.0006342***	~0.0006342***	~0.9555	~0.9555
Yankees / Red Sox	0.02839**	0.01255**	0.01255**	0.09508*	~0.3643	~0.3643	~0.07859*	~0.6253	0.7353	0.6376	~0.6253	0.7353	0.7353	0.6376	0.6376	0.6376	0.7826	0.7826

Figure 1: **Non-Political IAT Results:** This table presents p-values from t-tests comparing conservatives and liberals on a variety of non-political IATs.

Table 9: **Summary:** Support for Hypotheses 1-3 Using Existing Data

	Hypothesis 1 (Consistency)	Hypothesis 2 (Response Time)	Hypothesis 3 (Error Rate)
Race	X / S	Yes	NS
Sexuality	Yes	Yes	Yes
Disability	Yes	NS	Yes
Age	Yes	NS	X / S

6 Discussion

Table 9 provides a summary of the empirical results from the existing data from Project Implicit and the ANES 2008-2009 IAT pilot. “Yes” indicates that the hypothesis was supported in the IAT dataset, while “NS” indicates a non-significant result but in the right direction. In contrast, “X / S” indicates that the hypothesis was significant in the opposite direction. One important point to note is that not all topics are similar in terms of political relevance. Instead, the four studies can be ranked in terms of political relevance.

$$Political \longrightarrow Non - political \tag{2}$$

$$Race \rightarrow Sexuality \rightarrow Disability \rightarrow Age$$

This spectrum provides one lens through which to discuss the results. Hypothesis 1, that conservatives are more consistent in their response times, is not supported for the most politically-relevant IAT, but is supported by the remaining three. This suggests that conservatives show less variable attitudes when the task is increasingly non-political. Alternatively, these results suggest that when the IAT is politically-relevant, conservatives’ behavioral responses may be significantly more variable because they are trying to battle with social desirability bias – trying to hide their implicit and / or explicit biases. The directions of the difference in the standard deviations between liberals and conservatives are mixed across

the 21 non-political IATs. Conservatives are neither more consistent over all of the blocks (Hypothesis 1) or after they have established a behavioral pattern (Hypothesis 3c).

In terms of response time, conservatives are significantly slower in their behavioral responses on the two most politically-relevant IATs. Unfortunately, this also provides evidence for either true implicit bias or social desirability bias. This is supported by the fact that conservatives are not significantly slower on the more non-political IATs (Disability and Age), although the expected direction is seen. On the non-political IATs, conservatives are indeed slower, but only a fraction of the IATs show significance. Despite the correct direction, there is not enough evidence to conclude that conservatives are generally slower (Hypothesis 2) or slower after they have established a behavioral pattern (Hypothesis 3d).

For error rate, the results are more variable. Conservatives are actually significantly less likely to make errors on the Age IAT (most non-political) compared to liberals. There is no substantive reason why this would logically be the case. Subsequently, there is no significant difference between the error rate of conservatives and liberals on the most politically-relevant IAT (Race). Meanwhile, conservatives make significantly more errors on the Sexuality and Disability IATs. This provides additional evidence for conservatives responding to social desirability bias – more errors are made on topics that they have more ambiguous implicit attitudes on but individuals cannot override their implicit bias for race IATs and are less likely to try because it is a more salient division in society. Conservatives do not make significantly more errors overall on the non-political IATs or after they have established a behavioral pattern. There is no support for Hypothesis 3a or Hypothesis 3b.

7 Conclusion

In a traditional IAT study, target block response times are subtracted within respondents and an overall “D” score is calculated as a measure of implicit bias. When the results

are divided into conservatives and liberals, it is not immediately important if conservatives are generally slower on IATs because the “D” score is calculated within respondent. However, there are two ways that conservatives being slower could generate methodological and substantive problems for IAT studies.

The first is a methodological problem: conservatives are not slower overall, but they are slower after they are forced to change the behavior pattern they established previously. This poses a problem for subtracting block response times within respondents. More specifically, this could be a methodological problem when scholars do not use political ideology as a factor when they analyze the results of an IAT. For example, if a researcher runs an IAT and separates the data by age group, it may be the case that more conservatives are in the older age group and more liberals are in the younger age group. Subtracting block response times by respondents will lead to larger differences for conservatives if they are only slower on the blocks after the first one, where liberals will show constant response times across the blocks overall. By not controlling for ideology, the researcher could conclude that the older group is biased towards the IAT target words (because the larger differences in response times for the conservatives in the older group contributed to a larger “D” score), when in fact, the results are due to a larger number of conservatives in the older group than the younger group, not necessarily age on its own.

The second is a substantive problem: conservatives are not slower overall, but they are slower after they are forced to change the behavior pattern they established in the first block. This would mean that subtracting within respondent would be hazardous to the results. If conservatives are slower on the last three blocks than the first block, the subtraction of response times between blocks will lead to a high number – not because conservatives are biased against the particular word pairs, but because they are slower in the later blocks. This poses validity issues – conservatives will look worse (i.e. more prejudiced or more bias) because of the methodology of the test and individual cognitive differences compared to

liberals, not because they are biased against the word pairs (Coffee/Tea vs. Good/Bad or Summer/Winter vs. Good/Bad).

Fortunately, the results of this study on the individual cognitive differences between liberals and conservatives suggests that conservatives are not actually slower overall or on later blocks. Additionally, conservatives and liberals tend to be just as consistent in their response times and tend to make the same number of errors across IAT blocks. Therefore, underlying individual differences in cognitive processing between liberals and conservatives do not pose a problem for IAT studies. There is no need to control for political ideology when analyzing IAT data, as political ideology does not lead to validity or reliability (noise) issues.

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