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Personality Factors, Ideology, And Sensitivity To Change

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PERSONALITY FACTORS, IDEOLOGY, AND SENSITIVITY TO CHANGE

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In Partial Fulfillment

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Master of Science, Psychology

By

Jahnavi R. Delmonico

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ABSTRACT

This study examined the potential for a predictive relationship between political conservatism and change detection. Research on the visual system has revealed a general tendency to overlook changes in a stationary scene when two versions are displayed alternately with a masking slide, known as the flicker paradigm. We examined whether political conservatism and various related measures predicted whether and how quickly changes were detected during a flicker paradigm task. Measures of interest were conservatism as measured by the Social and Economic Conservatism scale, openness as measured by the short form of the Big Five Inventory, authoritarianism as measured by the Right-Wing Authoritarianism scale, political party, and a single bipolar conservatism scale. Despite predictions that greater conservatism and authoritarianism would shorten response latencies, analysis of a sample collected online indicated that authoritarianism appeared to *lengthen* the time to identify change, while social conservatism showed the expected relationship. This pattern failed to appear in a student sample. Openness and other forms of conservatism did not demonstrate reliable significant predictive relationships with response latencies. The finding that highly correlated factors (social conservatism, authoritarianism) predicted response latencies in opposing directions, combined with the failure to replicate that pattern in a student sample, indicates that the relationship between conservatism and response latencies may be more complicated than initially thought.

KEYWORDS: ideology, politics, political, personality, openness, authoritarianism, right-wing authoritarianism, change blindness, flicker, flicker paradigm, big five, BFI, SECS, RWA, conservatism, liberalism, visual change

This abstract is approved as to form and content

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INTRODUCTION AND LITERATURE REVIEW

The American political system has grown increasingly polarized in recent decades, marked by an apparent resistance to working across Congressional party lines (Andris et al., 2015). On one side of the proverbial fence is the Republican Party, advocating for small government and traditional social mores. On the other is the Democratic Party, advocating for government aid programs and progressive social mores. With cross-party cooperation dwindling, the question of measurable party differences looms large. Though the political climate facing successive generations is ever-changing, researchers have begun to seek stable explanations for, and consequences of, political affiliation. The result is a growing body of research on the physiological, behavioral, and personality correlates of both party membership and political ideology more generally. This research investigated a potential relation between political ideology and visual perception, specifically the ability to detect subtle change in a visual scene.

Conceptualizing Political Ideology

Political ideology has been represented in myriad different ways, and not without controversy. Researchers like Jost, Glaser, Kruglanski and Sulloway (2003) have used measures of personality, such as the Right-Wing Authoritarianism (RWA) scale (Altemeyer, 2006), to tap into political ideology indirectly. Right-wing authoritarianism refers to a tendency to idolize leaders and laud tradition to the exclusion of outsiders and change. Jost et al. used this measure as a surrogate for political conservatism in particular, under the assumption that conservative ideologies tend to support strong

leadership and the status quo. In the years since their seminal study, however, this operationalization has met with some criticism. Norris (2012) reviews several critiques that point to the existence of left-wing authoritarianism, and Altemeyer himself notes that authoritarianism may exist at either end of the political spectrum (Altemeyer, 2005). Crowson, Thoma, and Hestevold (2005) argued that the RWA scale and political ideology, while correlated with one another, showed different patterns of correlation with related concepts (such as the Need for Closure scale), and were therefore unlikely to tap into the same construct. Wronski (2015) noted that from 1973 to the late 1980s, people high in RWA tended to vote with the Democratic Party, which most today would consider a liberal choice. Wronski theorized that this pattern occurred because high-RWA voters seek politicians that are demographically similar to themselves rather than relying on ideological considerations alone. As the Democratic Party grew more diverse, she posited, high-RWA white voters switched parties. Despite these critiques of authoritarianism as a political construct, it has been consistently found to correlate with political conservatism in North American populations (Altemeyer, 2005).

A simpler method of assessing political ideology is to use a single-item, bipolar rating scale. For this method, participants are asked to place themselves somewhere on a scale from "liberal" to "conservative." This approach has been shown to be quite predictive, successfully differentiating between those who voted Democratic versus Republican in about 80% of cases from 1972 up to 2004 (Jost, 2006). Nevertheless, it is not without setbacks. Some studies have indicated that people may not be able to accurately assess their conservatism or liberalism with a single item, resulting in over- or under-estimation of their true attitudes (Zell & Bernstein, 2014). There have also been

some indications that a single item is insufficiently flexible to capture nuanced political opinions. Everett (2013) pointed out that a single-item scale does not differentiate between the social and economic dimensions of political ideology. To address this issue, Everett developed the Social and Economic Conservatism Scale (SECS), which divides ideology into two separate factors and allows for greater flexibility of analysis.

Another common means of identifying political ideology is via the construct of Openness, one of the five factors of the Big Five Inventory (BFI) developed by John (1990) and John, Donahue, and Kentle (1991). High-openness individuals tend to have a welcoming attitude toward new information and experiences. The complete long form of the scale involves six facets, i.e. openness to: ideas, feelings, actions, values, fantasy, and aesthetics. Studies have consistently found openness to correlate with political ideology (Van Hiel & Mervielde, 2004; Caprara, Barbaranelli, & Zimbardo, 1999; Onraet, Van Hiel, Roets, & Cornelis, 2010), with people high in openness showing greater liberalism. Though not necessarily representative of political ideology on its own, openness is commonly considered to tap into an important aspect of ideology.

Ideology Beyond Ideas

Recent studies of political orientation have consistently found correlations with genetic, physiological, and behavioral attributes. Twin studies have confirmed that there is a genetic component to political ideology (Alford, Funk & Hibbing, 2005; Kandler, Bleidorn & Reimann, 2012), and a study by Hatemi et al. (2011) used sequences from human genomes to identify regions of DNA that may account for political leanings. Neurological studies have further bolstered our understanding of ideological differences.

Amodio, Jost, Master, and Yee (2007) examined event-related potentials (ERPs) in response to performing a new action after having repeated an old action several times. They found that more liberal participants experienced greater amplitudes of brainwave activity after successfully completing the new action, as well as after accidentally continuing the old action (error-related negativity). This effect appeared to be localized within the anterior cingulate cortex (ACC), and the authors theorized that it reflects an increased sensitivity to cues that modify habitual behavior. In a later study, Kanai, Feilden, Firth, and Rees (2011) discovered that people who self-identified as liberal tended to have increased gray matter in the ACC (which could explain the heightened brainwave activity in Amodio et al.'s experiment) compared to those who self-identified as conservative. They also found that the amygdalae of self-identified conservatives had greater volume than those of self-identified liberals.

The amygdala is a key component in feeling, processing, and recognizing fear and other survival-based emotions (Carlson, 2014). The larger amygdalae of conservatives may explain some interesting behavioral findings, including a study by Dodd et al. (2012) in which participants were shown images having either a positive valence (i.e. a rabbit) or a negative valence (i.e. a spider). Measures of skin conductance showed greater arousal for negative stimuli among conservative participants than liberal participants. In addition, eye-tracking mechanisms found that conservative participants spent more time looking at negative images in a collage than did liberal-leaning participants. Another study implicating the amygdala as a factor in political alignment was Vigil's (2010) study of responses to facial expressions pre-tested to appear ambiguous. Vigil found that conservative-leaning participants were more likely to view the ambiguous faces as having

a threatening appearance. This tendency might indicate greater activity of the amygdala among those who were ideologically conservative, resulting in increased fearfulness.

In addition to being more predisposed toward fear, there is research indicating that people high in conservatism are more likely to feel disgust, whether in relation to an experience (Inbar, Pizarro, Iyer, & Haidt, 2012) or a moral decision (Graham, Haidt, & Nosek, 2009). The amygdala has also been implicated in the experience of disgust (Schienle et al., 2002), indicating a possible connection with the previous findings. Evidence also suggests that heightened disgust sensitivity improves the ability to detect "impurity" in the form of deviation from pure whiteness in a visual space (Sherman, Haidt, & Clore, 2012). Given the tendency for conservatives to have higher disgust sensitivity, the ability to detect off-white shades is likely to follow ideological lines—suggesting that one's ideology may influence, or be influenced by, one's visual perception of the world. Speculation about other perceptual phenomena that may be linked to political ideology led to the proposed topic of this study—change blindness.

Change Blindness

Change blindness was first made note of by researchers studying reading. While investigating how information is retained during saccadic eye movements, McConkie and Zola (1979) noted that reading speed did not change when the letters on a line changed cases (i.e. from a to A) during a saccade. This line of research was continued by Pashler (1988), who showed participants a set of letters, followed a second set of letters that was either identical to or slightly different from the first. He found that increasing the interval between these two sets of letters made performance on this task difficult, with accuracy

ranging from 33 to 71 percent when the inter-stimulus interval was 67 milliseconds or greater. Rensink, O'Regan, and Clark (1997) later applied this type of test to visual stimuli, creating a method called the flicker paradigm in which an image and an altered version of that image "flicker" back and forth, with a masking slide between. They found that identifying the difference between the pictures was difficult, requiring several flicker cycles. Change blindness has been heavily studied as a visual phenomenon, and research has addressed the role of attention (Rensink, O'Regan & Clark, 1997), stimulus type (Gusev & Mikhaylova, 2013), and prior experience (Werner & Thies, 1999). Change blindness has even been studied in the context of live interactions, with only about half of participants noticing changes in the physical appearance of a live interaction partner during a momentary distraction (Simons & Levin, 1998), indicating the extent to which change blindness informs our quotidian perceptions.

This Experiment

For the proposed experiment, the question of interest lay not in the visual field itself, but in how quickly and accurately participants are able to respond to the visual change. Studies of change blindness have indicated that fear (regulated by the amygdala) improves performance on change blindness tasks that involve threatening stimuli, such as spiders (Mayer, Muris, Vogel, Nojoredjo & Merckelbach, 2006) and angry faces (Lyyra, Hietanen & Astikainen, 2014). Based on the aforementioned research linking conservatism to the activity of the amygdala, it would make sense to presume that the advantages of fear with regard to change blindness might translate into advantages for more conservative people.

Given the large number of constructs used to capture political ideology, it seemed prudent to use more than one measure in this experiment. Despite the uncertain relationship between RWA and political ideology, the construct may have value as a potential contributing factor to change blindness sensitivity. Representing a desire to maintain the status quo and uphold tradition, right-wing authoritarianism could be said to reflect a desire to avoid change. Though the "change" involved in authoritarianism is generally considered to be social, the possibility of a more visceral reaction to real-time visual change has never been addressed and cannot be ruled out. Given Sherman et al.'s (2012) finding that participants with stronger negative feelings toward disgusting stimuli were better able to identify impurity, we might expect that right-wing authoritarians, who feel negatively toward change, would be better able to detect change (and, therefore, be *less* susceptible to change blindness). Practically, this would mean that they should detect the change more quickly and with greater accuracy. Assuming perceived threat to be the impetus of differential performance, we should also expect activation of the amygdala to be greater for more authoritarian participants; however, that is beyond the scope of this research.

In contrast to authoritarianism, trait openness with its free and willing acceptance of change might reasonably be expected to correlate with change blindness in the opposite direction. If change were not felt to be a threat, then the drive or incentive to identify it would lessen and potentially lower change blindness sensitivity, both in the form of accuracy and response latency.

Political ideology, which has been correlated with both authoritarianism and openness, should, in theory, display a pattern of change blindness sensitivity consistent

with the relationships it has with each—namely, those high in conservatism (and, theoretically, authoritarianism) should identify changes more readily and with greater accuracy than those high in liberalism (and. theoretically, openness). Political ideology was estimated using the SECS, a single bipolar rating scale, and American party affiliation.

METHODS

Participants

Approval for this study to use human participants was obtained from the Missouri State University IRB (January 11, 2016; approval #2016-112). Participants were at least 18 years of age and were recruited from two sources: a large Midwestern university and Amazon's Mechanical Turk. A total of 136 people participated in this study, seven of whom were removed due to incomplete data for a sample of 129. Three additional participants were removed for reasons discussed in the data cleaning section of this paper. A sample of 56 participants was recruited from lower-level Psychology courses at Missouri State University in exchange for course credit. This student sample was contacted via the SONA research participant database. A second sample of 70 participants was recruited through Amazon's Mechanical Turk (MTurk) interface, which allows verified MTurk users to complete tasks in exchange for money. A study by Buhrmester, Kwang, and Gosling (2011) indicated that samples of MTurk users tend to demonstrate greater demographic diversity than university samples. Thus, the inclusion of an MTurk sample allowed for a larger, more diverse sample than the SONA database offers. MTurk users received one dollar in exchange for participation. The demographic composition of the two samples appears in Table 1.

Materials

The Right-Wing Authoritarianism (RWA) scale (Altemeyer, 2006) contains 20 statements (plus two practice statements) intended to measure attitudes toward authority

and tradition, such as "Gays and lesbians are just as healthy and moral as anybody else," (reverse scored) and "This country would work a lot better if certain groups of troublemakers would just shut up and accept their group's traditional place in society." Agreement with these statements is rated on a 9-point Likert-type scale ranging from -4 (Very strongly disagree) to 4 (Very strongly agree). For scoring purposes responses are assigned numbers from 1 to 9 and summed, resulting in a possible score range of 20 points to 180 points. The minimum encountered in this experiment was 20, while the maximum was only 164. Means, standard deviations, and alphas for this and all other scales appear in Table 2, divided by sample.

The Social and Economic Conservatism Scale (SECS) developed by Everett (2013) consists of 12 divisive political issues, to which participants respond by rating their general attitude toward that concept on a scale from 0 (negative) to 100 (positive). The SECS consists of two factors: social conservatism (seven items, e.g. Abortion) and economic conservatism (five items, e.g. Limited Government). Thus social conservatism, which deals with issues of morality, can range in score from 0 to 700. Economic conservatism, which deals with issues of regulation and governance, can range in score from 0 to 500. The range represented in this experiment was 29 to 700 for social conservatism, and 68 to 500 for economic conservatism. These factors were analyzed separately for this experiment.

The Big Five Inventory (BFI) is a Likert-type questionnaire containing general statements about oneself (i.e. “I am someone who is talkative” or “I am someone who can be moody”). Participants rate whether the statement suits them on a scale of 1 (disagree) to 5 (agree). Each statement measures one of five personality dimensions: openness,

conscientiousness, extraversion, agreeableness, and neuroticism. The most current abbreviated (44-item) version of the scale was used (John, Naumann & Soto, 2008), and only trait openness was included in the analysis. Openness includes ten items, for a sum score range of 10 to 50. Participants in the present experiment ranged from 21 to 50.

The flicker paradigm was developed by Rensink, O'Regan, and Clark (1997). The flicker paradigm involves two slightly different versions of a photograph that alternate rapidly, with a blank slide displayed in between them. Participants are asked to indicate when they have noticed the difference between the photographs by hitting a key; otherwise, the experiment continues to the next pair of pictures after 60 seconds. The first version of the photograph remains onscreen for 400 ms, with the inter-stimulus interval (the blank slide) intervening for 80 ms, followed by the second version of the photograph containing one change for 400 ms. Millisecond Software's InQuisit 4 Web was used to display the images, which were drawn from the Change Blindness Database maintained by Harvard University (Sareen, Ehinger & Wolfe, 2015). In the images, objects appear and disappear from attractive household scenes.

In addition to completing the above measures, participants rated themselves on a 7-point bipolar scale of political ideology ranging from 1 (Strongly liberal) to 7 (Strongly conservative). All of the possible values were represented in the present experiment. Participants were also asked which American political party they identify with—Democrat, Republican, Independent or Other.

Procedure

This experiment was administered online. After reading a consent form and agreeing to continue with the study, participants took the Big Five Inventory, the Right Wing Authoritarianism Scale, and the Social and Economic Conservatism Scale in a randomized order. Then, participants looked for differences among 20 pairs of images using the flicker paradigm. Participants were asked to hit the space bar when they detected the difference between the two versions, and then describe that difference in a text box. If they did not find it, the flicker task timed out after 60 seconds. They were then presented with the next pair of images. In all, the experiment took 40 minutes for each participant to complete.

RESULTS

Data Cleaning

Response time data is notoriously prone to messiness (Van Selst & Jolicoeur, 1994), and online collection methods are easy for participants to abuse. To protect against these issues, we took steps to eliminate outliers and non-compliant participants. After eliminating non-completers, individual missing data points were imputed to replace skipped survey questions if the number of questions did not exceed five percent of the participant's total data using the *mice* library in *R*. We then examined the subset of missed/incorrect responses, i.e. flicker trials on which the participant a) timed out of the flicker task, or b) gave an incorrect/no response when asked to name the difference between photos. We *z*-scored the number of incorrect responses per participant for each sample separately, and found that one participant from each had a z-score over 3.50, indicating that they had missed (or skipped) substantially more flicker trials than the other participants in their sample. These participants were removed, bringing the number of participants to 127.

A subsequent analysis of Mahalanobis distances including age, single-item conservatism, social conservatism, economic conservatism, right-wing authoritarianism, and openness revealed one outlier in the University sample, who was eliminated for a total of 126 participants. Finally, we z-scored response latencies for each pair of images separately (to account for differences in stimulus difficulty) and removed trials with response times exceeding a z-score of 3.5, the cut-off suggested by Van Selst and

Jolicoeur (1994). This procedure resulted in the elimination of 32 trials, 16 from each sample.

Marmolejo-Ramos, Cousineau, Benites, and Maehara (2014) suggest that an ex-Gaussian distribution is to be expected when working with response latencies due to the slightly delayed floor effect that responding to a stimulus necessitates. The distributions for both samples appeared to fit an ex-Gaussian curve fairly well; however, the samples suffered from problems with linearity, homogeneity, and homoscedasticity, which could jeopardize the power of the experiment. Our experimental design helped to offset these problems by testing a nested model, which allows participants to have different intercepts and thus increases experimental power.

Sample Differences

Though our original intent was to join the two samples together for analysis, an examination of sample demographics revealed that the samples represented substantially different populations. Chi-square analyses revealed significant differences in the distribution of gender ($\chi^2(1) = 23.13$, $p < .001$), as well as the distribution of political party ($\chi^2(3) = 25.21$ $p < .001$) across samples. An examination of group membership (Table 1) shows that the student sample contained a higher percentage of women, as well as a higher percentage of Republican-identifying participants than the MTurk sample. The MTurk sample, on the other hand, had a more equal ratio of men to women and a higher percentage of Democratic participants. An independent *t*-test showed that the mean age was also significantly different across samples ($t(124) = 10.26$, $p < .001$, $d = 1.84$), which is unsurprising given the limited age range of a typical college sample. As

might be expected, the college sample was significantly younger and less varied (M = 19.02, SD = 1.55) than was the MTurk sample (M = 35.69, SD = 12.07).

In light of these demographic dissimilarities we wanted to further examine differences between the two samples in terms of our chosen predictors, so we ran a 2 (database) x 2 (gender) MANOVA with authoritarianism, openness, social conservatism, economic conservatism, and single-item conservatism as outcomes. The MANOVA indicated a significant overall effect of sample ($F(5, 118) = 5.44$, $p < .001$, $\eta_p^2 = .19$), as well as an overall effect of gender ($F(5, 118) = 4.10$, $p = .002$, $\eta_p^2 = .15$), but no interaction between the two. Further comparisons were made through five separate 2 (sample) x 2 (gender) between-subjects ANOVAs, which indicated that the college sample was significantly higher than the MTurk sample in authoritarianism and all measures of conservatism, though not significantly different from it in openness. Gender was significant only for social conservatism ($F(1, 122) = 6.03$, $p = .02$, $\eta_p^2 = .05$), for which women had significantly higher scores (M = 462.05, SD = 135.25) than did men (M = 323.65, SD = 157.90). However, since the majority of female participants belong to the university sample and the majority of male participants belong to the MTurk sample, it is difficult to separate the effects of gender from the effects of other demographic differences between the samples. Table 2 contains means, standard deviations, and comparisons across the two samples (excluding gender as it was only significant in the case described above). Based on these findings, we deemed it prudent to analyze the two datasets separately for the remainder of the analyses.

Correlations

To examine the relationships between the various measures of conservatism, we ran correlations between the measures of interest as well as age. Correlations for the university sample appear in Table 3, and correlations for the MTurk sample appear in Table 4. The two samples demonstrated very similar patterns of correlations, with the most evident difference being that openness was more highly correlated (negatively) with measures of conservatism and authoritarianism in the MTurk sample than in the University sample. This relationship was significant for single-item conservatism and authoritarianism, and marginally significant for economic conservatism ($p = .07$). No significant correlations with openness appeared in the University sample. In all, correlations with openness were generally weaker than hypothesized.

Neither sample showed significant correlations between age and the measures of interest. Social, economic, and the single-item assessment of conservatism were all significantly positively correlated with each other as well as right-wing authoritarianism for both samples, confirming the hypothesis that the concepts are interrelated. For the MTurk sample, correlations between the single-item assessment and both economic conservatism and right-wing authoritarianism were high enough to cause some concern about the assumption of additivity.

Nesting Models

In any analysis involving human participants we can expect a certain amount of variability between individual participants, whether due to ability, attentiveness, or comprehension. It would also be logical, in this experiment, for there to be some variability attributable to stimulus, since some of the differences between flicker stimuli

were easier to spot than others. Multi-level models allow for different intercepts within a group, thereby increasing power by using each piece of information separately. For example, each participant could be allowed a different intercept to account for preexisting differences among participants. Multi-level models also account for the internal structure of the data. In this case, each participant saw each stimulus, so the effect of the participant and the effect of the stimulus could combine to create a unique pattern that measures of central tendency alone could not capture.

To see if these sources of variability were apparent in our dataset, we first tested a model with random intercepts permitted for each participant (University *AIC* = 20697.15; MTurk *AIC* = 27456.15) against a null model (University *AIC* = 20724.00; MTurk *AIC* = 27464.57) and found the random intercepts model to be significantly better for both samples (University $\chi^2(1) = 28.84$, $p < .001$; MTurk $\chi^2(1) = 10.42$, $p = .001$). We then added a second level of nesting, allowing random intercepts for stimulus nested within participant (University *AIC* = 20364.61; MTurk *AIC* = 27013.35) and found it to be a significant improvement as well (University $\chi^2(1) = 334.54$, $p < .001$, MTurk $\chi^2(1) = 444.80$, $p < .001$). We continued to use this nested formulation for the remaining analyses.

Response Latency Analyses

For our first analysis, we looked only at trials for which the participant correctly identified the difference between flicker photographs. We intended to see how well the measured variables (openness, right-wing authoritarianism, social conservatism, economic conservatism, single-item conservatism, political party) predicted response

latencies (in milliseconds), with the expectation that more conservative participants would have faster response latencies. In order to control for potentially confounding variables that were not of interest to this study (i.e. age, gender), we chose a hierarchical multilevel model for this analysis. Using the two-level nested formulation previously mentioned we started with age and gender as predictors of response times, and then added the other predictors in a second step.

University Sample. For the University sample, the model including age and gender (*AIC* = 20355.46) was significantly better than the null nested model with no predictors ($\chi^2(2) = 13.15$, $p = .001$). Values for the individual predictors appear in Table 5. Gender was a significant predictor, such that females took less time to identify the difference in pictures. Age was marginally significant, with response latencies increasing as age increased.

For the next step, we added all of the remaining variables of interest: openness, right-wing authoritarianism, social conservatism, economic conservatism, single-item conservatism, and political party. This model (*AIC* = 20342.26) was significantly better ($\chi^2(8) = 29.20$, $p < .001$) than the model containing only age and gender, and the *b*-values for this model are included in Table 6. Age and gender remained significant, and having listed oneself as "Other" with regard to political party appeared to give a significant response time advantage over those listed as Republican, Democrat, and Independent. Effect sizes for all significant predictors were quite small (age $pr^2 = .003$, gender $pr^2 = .006$, party $pr^2 = .001$, authoritarianism $pr^2 = .001$), and none of the relationships had been hypothesized.

To test for issues of suppression due to the moderately high correlations found between predictors, we removed the variable with the highest variable inflation factor (VIF), which was social conservatism (*VIF* = 2.58). With social conservatism removed, authoritarianism became a significant predictor (b = 15.79, SE = 8.03, $t(985) = 1.97$, p = .05) but the overall model was not significantly different (AIC = 20340.30, $\chi^2(1) = 0.04$, p = .84). This finding would seem to indicate that suppression was present, however authoritarianism's positive prediction of response latencies is contrary to the hypothesized pattern.

Mechanical Turk Sample. In contrast to the University sample, controlling for age and gender did not produce a significantly better model than the null nested model for the MTurk sample (AIC = 27014.23, $\chi^2(2) = 3.12$, p = .21), and neither predictor was independently significant. The addition of the remaining predictors for the second step significantly improved the model (AIC = 27013.63, $\chi^2(7) = 14.59$, p = .04), and revealed some significant predictive relationships. Social conservatism demonstrated a significant negative prediction of response latencies, such that greater conservatism appeared to result in quicker responses. Authoritarianism, despite its high positive correlation with social conservatism, significantly predicted response times in the opposite direction, with higher authoritarianism associated with longer response latencies. Hence social conservatism appeared to demonstrate the hypothesized pattern, while authoritarianism reversed it. With the other variables included in the model, female gender became a significant positive predictor of response latencies—the opposite of the relationship found in the University sample. Again, effect sizes for significant predictors were small (social conservatism pr^2 = .004, authoritarianism pr^2 = .001, gender pr^2 = .002).

We again used an analysis of variable inflation factors to identify potentially problematic variables, and found that single-item conservatism had the highest VIF (5.32), which is in line with the fact that it had especially high correlations with both authoritarianism and economic conservatism. We removed it from the equation to see what would change as a result, but the resulting model saw no changes in significance or direction of prediction and was not significantly different from the model with single-item conservatism included (AIC = 27012.15, $\chi^2(1) = 0.51$, $p = .47$).

Correct Response Analyses

For our final analysis, we examined the predictive ability of the measured variables (openness, right-wing authoritarianism, social conservatism, economic conservatism, single-item conservatism, political party) on whether the participant would be able to correctly identify *all* of the changes between flicker stimuli. Participants were coded as having responded to every item correctly (0), or having one or more incorrect/missed item(s) (1). For the University sample, this coding resulted in 32 participants (57.14%) who missed at least one item, compared to 24 participants got every item correct. The miss rate for the MTurk sample was much lower, with only 26 participants (37.14%) missing one item or more, and 44 getting every item correct. Maintaining the nested structure discussed earlier for theoretical reasons, we ran binary logistic regressions predicting whether the responses would be totally correct or partially incorrect.

University Sample. As before, we first used only the variables of age and gender to predict the outcome (see Table 5). For this model (AIC = 83.83) neither predictor was

significant, and the model was not significantly different from a nested null model with no predictors (*AIC* = 80.49, $\chi^2(2) = 0.65$, $p = .72$). We then added the remaining predictors, and the resulting model was not significantly different from the model without these predictors (*AIC* = 95.09, $\chi^2(8) = 4.74$ $p = .78$). No significant predictors appeared. With all variables included the model accurately predicted missing at least one item only 21.88% of the time, and accurately predicted getting every item correct 41.67% of the time, for an overall correct prediction rate of 30.36%. This worse-than-chance prediction rate contradicts the hypothesized relationship wherein measures of conservatism predict greater accuracy.

Mechanical Turk Sample. The first model, controlling for age and gender (*AIC* = 99.81), was not a significant improvement on the null nested model (*AIC* = 96.36, $\chi^2(2) = 0.54$, $p = .76$), nor did it contain significant predictors. The model containing all predictors (*AIC* = 100.41) was worse than the model containing only age and gender, and the difference was marginally significant ($\chi^2(7) = 13.41$, $p = .06$). Two predictors reached significance in this model, both of which had previously been implicated in the regression predicting response times: social conservatism, which decreased the probability of making one or more errors; and authoritarianism, which had a positive relationship with that probability. With all of the predictors included the model accurately predicted getting every item correct 86.36% of the time, and missing at least one item 42.31% of the time. Overall, predictions based on the full model were correct 70% of the time. While this would seem to indicate better predictions, much of the success of this model is probably attributable to the larger overall portion of accurate

responses, making it such that any participant classified as getting every item right has a high chance of being classified correctly.

DISCUSSION

Correlation Outcomes

The correlation analyses revealed a number of expected relationships; for example, in both samples there were significant positive correlations between all three measures of conservatism, as well as right-wing authoritarianism. Contrary to expectation, openness demonstrated little relation to the other variables in the University sample, though the negative correlation with single-item conservatism was larger than the others. In the MTurk sample openness had generally stronger relationships overall, especially with authoritarianism and single-item conservatism, which reached significance. As hypothesized, all significant correlations with openness were negative, indicating that higher scores on conservatism tended to co-occur with lower openness. This result is in line with previous findings (Van Hiel & Mervielde, 2004). Age did not significantly correlate with any of the other variables measured, despite a correlation with higher authoritarianism demonstrated in a previous study (Franssen, Dhont & Van Hiel, 2013).

The relatively high correlations between measures of conservatism and authoritarianism indicated that the instruments were indeed tapping into related, though not identical, concepts. The strength of the correlations between predictors did cause issues with additivity and suppression as indicated by VIFs above 2.5, and these may explain some of the regression findings; specifically, when highly correlated measures (social conservatism, authoritarianism) predicted outcomes in opposite directions. However, removing the variables with high inflation only changed the significance of

other predictors in the University sample, for which the conflicting predictions of social conservatism and authoritarianism were not present. In no case did removing variables significantly improve the model. It is also possible that these seemingly contradictory findings might indicate an interaction, wherein the predictive impact on response latencies is different at different values of conservatism.

Regression Analyses

In general, the expected pattern of higher indicators of conservatism predicting faster recognition of—and therefore response to—changes in a visual scene received mixed support at best. There was no support for this hypothesis in the University sample, for which the only significant predictors were age (indicating that older participants took longer to identify changes), listing oneself as belonging to "Other" for political party (indicating that participants in this category took less time to identify changes) and gender (indicating that females took less time to identify changes). The limited age range (49 of the 56 participants were either 18 or 19), the small number of students in the "Other" category (7 out of 56), and the heavily female-skewed sample (47 of 56 participants were female) make these significant predictors difficult to interpret with confidence. Stronger support appeared in the MTurk sample, with significant effects appearing for both social conservatism and authoritarianism; however, these two predictors were opposite in the sign of their coefficients, which is puzzling as they were significantly positively correlated in the sample. Gender was also significant but indicated a slower response time for females than for males, which is the opposite of the pattern found in the University sample. The more even distribution of gender in the

MTurk sample makes this finding somewhat more convincing, though the many differences between the samples might also be responsible for the disparate findings.

When perfect accuracy was used as an outcome variable, measures of conservatism demonstrated a similar pattern of prediction to that in the response latency model. Again none of the variables of interest significantly predicted the outcome in the University sample, and this time the demographic variables (age, gender) also failed to reach significance. As before, the MTurk sample offered more interesting findings with regard to conservatism, and the same two predictors were implicated: social conservatism and authoritarianism (gender was not significant for this model). Higher scores on social conservatism increased the odds of getting every item right, while higher scores on authoritarianism decreased those odds. However, the full model was nearly significantly *worse* than a model containing only control variables (age, gender) for predictors, so the findings for this analysis must be treated with care.

Measures of Personality and Politics

It could be speculated that the preoccupation with leadership and authority, which features heavily in the right-wing authoritarianism scale but is missing from the construct of social conservatism, may in some way be responsible for the differential effects of the two measures. Perhaps, for instance, right-wing authoritarians are more hesitant to act when uncertain, believing it better to let someone with power and/or prestige make decisions and faltering when that influence is absent. The difficulty and ambiguity of the flicker task may have put them at a disadvantage compared to those who set greater store by their own perceptions and decisions. It is also worth recalling the aforementioned

debate over whether authoritarianism is indeed an ideological construct or a function of the particular sociopolitical climate of a region, and therefore could conceivably correlate with traditionally liberal views under different conditions. With this in mind, it could be that despite the high correlation between authoritarianism and measures of conservatism their content areas are dissimilar enough for a truly opposite pattern of prediction to appear.

Of the measures of conservatism used in this study, social conservatism perhaps most closely resembles the emotionally-laden, fear- and disgust-driven form of conservatism with which Graham et al.'s (2009) study of disgust was concerned. Pertaining to emotionally "hot" topics such as abortion and traditional marriage, social conservatism is likely the facet that best taps into the predicted relationship wherein the amygdala is more readily activated and response latencies shortened as a result. This idea was precisely the pattern demonstrated in the MTurk sample, though the University sample did not display the same relationship. Better performance in terms of correct responses was also associated with higher social conservatism. Economic conservatism, on the other hand, was not a significant predictor in any of the models tested, and a look at the items included in the scale might indicate why: unlike social conservatism, a favorable attitude toward fiscal responsibility and business is not likely to involve the emotional inputs that social conservatism does. If the amygdala is a key player in the differences in perceptual ability between people at opposite ends of the ideological spectrum, then the stronger relationship of the more emotionally-charged social conservatism is understandable. As for the single-item measure of conservatism, no significant predictive relationship appeared for any model. Again high correlations were

present (especially in the MTurk sample) and may have caused suppression—particularly in the case of single-item conservatism, as it had two of the highest correlations of any found in the sample. Political party was significant only for the University sample, and as the only group that differed significantly from the rest was the ambiguous "Other," it is difficult to draw conclusions regarding conservatism from this finding.

Openness did not display the predicted (or any) relationship to response latencies or response correctness. Personality factors not controlled for may have intervened in the expression of openness on response times—for instance, a more conscientious or agreeable participant might have been more willing to pay extended attention to the flicker task and performed better as a result. It is also plausible that the quality of openness, a multi-faceted concept involving many life domains, is too general a concept to predict specific visual phenomena.

Sampling and Stimuli Issues

The consistent, significant differences between the two samples present striking evidence of an oft-acknowledged (but seldom addressed) issue with university-based research: university samples are frequently taken to represent the wider population when, in fact, they rarely do. Though Mechanical Turk has its own limitations (access to a computer, familiarity with Amazon.com), it did provide a more varied (and compliant) sample than did the University database. Additionally, characteristics of a University population tend to vary depending on the reputation, location, and emphasis of the school. The sample culled from a large, public Midwestern university may not match the sample culled from a small, private Northwestern university, for example. While not

directly related to the research at hand, the substantive difference between samples is worth noting.

Another possible contributor to the somewhat inconclusive findings is the nature of the stimuli used. The change blindness studies linking fear to faster recognition of change (Mayer et al., 2006; Lyyra et al., 2014) both used evolutionarily important, fear-inducing stimuli. In the current experiment, stimuli were relatively mundane and non-threatening. The appearance and disappearance of a wall hanging, though surprising, is unlikely to pose a threat to health and safety—and by that token, less likely to activate the amygdala. In this vein, a study Achaibou, Loth and Bishop (2016) found that the amygdala was preferentially activated when participants engaged in a flicker task containing threatening stimuli (angry faces) as opposed to non-threatening stimuli (houses), for which areas of the frontal cortex were activated instead. The relatively weak contribution of the amygdala to non-threatening change detection could indicate that the activity of the amygdala associated with conservatism does not offer a great advantage for non-threatening stimuli. The nature of the stimuli may have limited the effect of conservatism by failing to tap into fearful or threatening scenarios.

Conclusion and Future Directions

The results of this experiment defy easy interpretation, but open the door for further exploration. The nature of the relationship between authoritarianism and conservatism has interested many researchers in the past (Norris, 2012), and here we find evidence both affirming (high correlations) and disconfirming (differential predictions) the idea that they are essentially the same. The relationship between social and economic

conservatism—ways in which they differ, their origins and correlates, similarities and predictions—also merits further exploration as their differential performance in the current study lends credence to Everett's (2013) suggestion that they be treated as separate constructs. Finally, the main question of interest remains: do ideological leanings relate to one's ability to detect visual change? The concept received support only in some samples, only for some measures of conservatism, and in apparently contradictory directions. This may be an indication that the relationship is more complex than initially believed, and that different facets of ideology could represent (or produce) different effects.

Potential future directions are numerous, such as including a liking component to determine whether an emotional response, rather than a physical response, might accompany the experience of visual change—i.e. do people prefer stimuli that do not change to stimuli that do, and if so does this preference follow ideological lines. Recording the activity of the amygdala would also offer insight into its potential mediating role in responses to change, indicating whether increased activity in the amygdala improves chances of noticing visual change. Lastly using different, threatening stimuli might affect the relationship between conservatism and change detection, and in particular we might expect the effect of conservatism to be strengthened when the already active amygdala is excited. With these questions in mind the continued exploration of the perceptual causes, correlates, and consequences of ideology could prove to be a fruitful endeavor. The present study offers an interesting, unexplored perspective with enough significant findings to merit further study. The question of physical, psychological, and perceptual differences in conjunction with ideology could explain

some of the most passionate political disagreements of our time. Understanding changeable and inconstant constructs such as political party affiliation from a deeper perspective could lead to a more compassionate view of diverse ideological perspectives.

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Table 1. Demographics for University and Mechanical Turk Samples

	University Sample		MTurk Sample	
	N	*%*	*N*	*%*
Gender:				
Female	47	83.93	28	40.00
Male	9	16.07	42	60.00
Ethnicity:				
Not Hispanic or Latino/a	53	94.64	64	91.43
Hispanic or Latino/a	2	3.57	5	7.14
Race:				
White	51	91.07	55	78.57
Black	3	5.36	3	4.29
Native American/Alaska	1	1.79	1	1.43
Native				
East Asian	0	0.00	6	8.57
South Asian	1	1.79	1	1.43
Multiracial	0	0.00	2	2.86
Other	0	0.00	2	2.86
Political Party:				
Republican	25	44.64	13	18.57
Democrat	10	17.86	35	50.00
Independent	14	25.00	22	31.43
Other	7	12.50	0	0.00

Note: Percentages based on sample totals

Table 2. Means, Standard Deviations, Alphas, and Difference Statistics for University and Mechanical Turk Samples

	University Sample			MTurk Sample			Mean Differences		
	M	*SD*	α	*M*	*SD*	α	*F*	*p*	η_p^2
Authoritarianism	87.61	24.17	0.89	56.44	35.17	0.96	23.37	<0.001	0.16
Openness	35.36	5.88	0.73	37.63	6.98	0.87	2.03	0.15	0.02
Social Conservatism	497.14	108.16	0.80	333.14	157.04	0.86	22.20	<0.001	0.15
Economic Conservatism	317.54	65.60	0.58	266.51	97.52	0.79	10.52	0.002	0.08
General Conservatism	4.13	1.34	-	3.16	1.73	-	8.17	0.005	0.06

Table 3. Correlations Between Measures of Conservatism, Openness, Authoritarianism, and Age for the University Sample

	1.	2.	3.	4.	5.
1. Age					
2. Single-Item Conservatism	0.00				
3. Economic Conservatism	0.04	0.42**			
4. Social Conservatism	0.03	0.35**	0.52**		
5. Right-Wing Authoritarianism	0.14	0.39**	0.42**	0.63**	
6. Openness	-0.03	-0.18	0.01	-0.01	-0.10

** $p < .05$, **$p < .01$*

Table 4. Correlations Between Measures of Conservatism, Openness, Authoritarianism, and Age for the Mechanical Turk Sample

	1.	2.	3.	4.	5.
1. Age					
2. Single-Item Conservatism	0.13				
3. Economic Conservatism	0.06	0.72**			
4. Social Conservatism	0.17	0.59**	0.40**		
5. Right-Wing Authoritarianism	0.11	0.71**	0.49**	0.65**	
6. Openness	0.05	-0.24*	-0.22	-0.18	-0.43**

** $p < .05$, **$p < .01$*

Table 5. Regression Statistics for the Prediction of Response Latency in the University Sample

	b	*SE(b)*	*t*	*df*	*p*
Step 1:					
Age	206.31	110.83	1.86	992	0.06
Female (vs. Male)	-1165.67	464.08	2.51	992	0.01
Step 2:					
Single-item Conservatism	279.51	156.25	1.79	984	0.08
Economic Conservatism	-5.67	3.30	1.72	984	0.08
Social Conservatism	0.51	2.51	0.20	984	0.88
Right-Wing Authoritarianism	14.56	10.08	1.44	984	0.12
Openness	-42.19	29.50	1.43	984	0.16
Democrat (vs. Republican)	218.36	565.64	0.39	984	0.71
Independent (vs. Republican)	525.91	483.84	1.09	984	0.27
Other Party (vs. Republican)	-1675.53	586.36	2.86	984	0.004
Independent (vs. Democrat)	307.55	535.89	0.57	984	0.57
Other Party (vs. Democrat)	-1893.89	676.00	2.80	984	0.005
Other Party (vs. Independent)	-2201.44	612.98	3.59	984	<0.001
Age	297.90	117.51	2.54	984	0.01
Female (vs. Male)	-1359.71	513.91	2.65	984	0.008

Table 6. Regression Statistics for the Prediction of Response Latency in the Mechanical Turk Sample

	b	*SE(b)*	*z*	*df*	*p*
Step 1:					
Age	18.39	14.39	1.28	1304	0.20
Female (vs. Male)	470.227	351.29	1.33	1304	0.18
Step 2:					
Single-item Conservatism	165.60	231.86	0.71	1297	0.46
Economic Conservatism	-3.85	2.63	1.46	1297	0.14
Social Conservatism	-5.39	1.82	2.97	1297	0.003
Right-Wing Authoritarianism	17.51	8.89	1.93	1297	0.05
Openness	-18.05	28.85	0.63	1297	0.53
Democrat (vs. Republican)	-192.76	747.39	0.26	1297	0.80
Independent (vs. Republican)	-238.52	645.58	0.37	1297	0.71
Independent (vs. Democrat)	-45.76	503.00	0.09	1297	0.93
Age	26.39	15.23	1.73	1297	0.08
Female (vs. Male)	972.94	425.34	2.29	1297	0.02

Table 7. Regression Statistics for the Prediction of Committing One or More Errors in the University Sample

	b	*SE(b)*	*z*	*df*	*p*
Step 1:					
Age	-0.23	0.29	0.78	52	0.43
Female (vs. Male)	-0.10	0.77	0.12	52	0.90
Step 2:					
Single-item Conservatism	-0.15	0.35	0.43	44	0.67
Economic Conservatism	0.44	0.38	1.14	44	0.27
Social Conservatism	-0.66	0.47	1.40	44	0.16
Right-Wing Authoritarianism	0.45	0.42	1.08	44	0.28
Openness	-0.34	0.31	1.10	44	0.27
Democrat (vs. Republican)	-0.06	0.96	0.07	44	0.95
Independent (vs. Republican)	-0.19	0.81	0.23	44	0.82
Other Party (vs. Republican)	-0.13	1.00	0.14	44	0.89
Independent (vs. Democrat)	-0.12	0.91	0.13	44	0.89
Other Party (vs. Democrat)	-0.07	1.14	0.06	44	0.95
Other Party (vs. Independent)	0.05	1.03	0.05	44	0.96
Age	-0.29	0.32	-0.90	44	0.37
Female (vs. Male)	0.20	0.92	0.21	44	0.83

Table 8. Regression Statistics for the Prediction of Committing One or More Errors in the Mechanical Turk Sample

	b	*SE(b)*	*z*	*df*	*p*
Step 1:					
Age	-0.05	0.25	0.20	66	0.85
Female (vs. Male)	-0.37	0.51	0.72	66	0.47
Step 2:					
Single-item Conservatism	0.23	0.64	0.36	59	0.72
Economic Conservatism	0.15	0.41	0.37	59	0.71
Social Conservatism	-1.71	0.74	2.31	59	0.02
Right-Wing Authoritarianism	1.27	0.63	1.99	59	0.05
Openness	0.20	0.35	0.58	59	0.56
Democrat (vs. Republican)	-0.77	1.18	0.65	59	0.51
Independent (vs. Republican)	-0.15	1.12	1.37	59	0.17
Independent (vs. Democrat)	-0.78	0.89	0.87	59	0.38
Age	0.03	0.29	0.09	59	0.99
Female (vs. Male)	0.47	0.70	0.67	59	0.50