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Honest politics: Evaluating candidate perceptions for the 2012 U. S. election with the Implicit Relational Assessment Procedure

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ABSTRACT

Mainstream implicit cognition measures such as the Implicit Association Test (IAT) have produced a substantial volume of data on political attitudes. However, the associative basis of most implicit measures entail interpretive limitations that may be avoided with a relatively new measure known as the Implicit Relational Assessment Procedure (IRAP). The IRAP is a measure of arbitrarily applicable relational repertoires based on a functional and contextual view of cognition. The current study used the IRAP to assess relational repertoires among college undergraduates in respect to images of Barack Obama and Mitt Romney presented in conjunction with positive and negative evaluative words. The results showed distinct patterns of bias on the IRAP that correlated with various political self-reports. The IRAP also distinguished self-reported intentions to vote for Obama or Romney. Some of the results revealed patterns that would not be apparent with a comparable IAT. The current study provides a supportive basis for the reliability and convergent validity of the IRAP for measuring implicit perceptions of political candidates.

1. Introduction

Every four years in the United States, the public encounters a flood of political advertising intended to influence voting for the presidential election. These advertisements tend to involve at least one of two messages. One type of message portrays a candidate in a positive fashion by listing his or her accomplishments in life or in political office and connecting them with desirable ideals and values. The other type of message portrays a candidate's opponent in a negative light by detailing ethically or morally questionable behavior in their life or work and attempting to associate them with undesirable attributes and motives.

Governance in the United States is organized by a two-party system. With rare exceptions, voters respond to election ballots in which the only viable contenders for any given political office are a Democrat and a Republican. The dual nature of this system readily leads to candidates being characterized along a single dimension; one in which candidates endorsing a relatively liberal, "left-leaning" ideology identify as Democrats while those endorsing a relatively conservative, "right-leaning" ideology identify as Republicans. Although the organization of American political ideology along this singular dimension has been contested (Ashton et al., 2005; Treier & Hillygus, 2009), most of the electorate face a voting decision organized by a simple left vs. right portrayal of candidate ideologies.

1.1. Influences on voting decisions

In selecting a candidate, voters do not vote simply on the issues. Many researchers have demonstrated the important influence that perceptions of a politician's character traits have on vote choice (e.g., Bishin, Stevens, & Wilson, 2006; Hayes, 2005, 2010). Candidate trait perceptions are intertwined and influenced by partisan views and ideological stances on issues (Clifford, 2014; Goren, 2007). Just as people quickly and effortlessly make judgments about the character and intentions of people they interact with in their social milieu, voters often rely on heuristics or learned political stereotypes to guide their political judgments (Lau & Redlawsk, 2001).

The character traits most commonly identified as relevant for presidential elections are leadership, integrity, competence, and empathy (Holian & Prysby, 2014). According to theories of issue ownership (Petrocik, 1996), over time, political parties in the United States have developed reputations for owning, or skillfully handling, particular issues. Taken a step further, Hayes's (2005) theory of trait ownership suggests that the public comes to associate particular character traits with party candidates based on the issues that their party owns. For instance, the Democratic Party is associated with focusing on issues related to social welfare programs and thus

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Democratic candidates have the advantage of being perceived as compassionate and empathetic. On the other hand, the Republican Party is seen as skilled at handling issues related to national security and traditional values; therefore, a Republican candidate may hold an initial advantage of being perceived as strong in leadership and integrity (Hayes, 2005, 2010).

In light of confirmation biases in human information processing, Goren (2007) expands on insights from Hayes's (2005) trait ownership theory by arguing that partisan bias leads party identifiers to criticize the perceived character weaknesses of the opposing party nominee. That is, Republicans tend to view Democratic candidates as weak leaders lacking integrity while Democrats view Republican candidates as insensitive leaders lacking compassion. In addition, Clifford (2014) demonstrated across two experiments that the trait inferences that individuals make about politician's issue stances are shaped by the moral foundation associated with the individual's own personal issue stance. In this way, partisan-based stereotypes, issues stances, and associated moral foundations interact to influence voter's perceptions of the personal attributes of political candidates.

In a recent study examining American National Election Study (ANES) data from the 2012 presidential election, Holian and Prysby (2014) found that partisans were less influenced by trait perceptions unless the opposing candidate's personal traits were perceived as being substantially better than those of their identifying party's candidate. Of note, trait perceptions had the largest impact among voters who identified as Independent. Interestingly, although the average Independent in the sample disapproved of Obama's handling of the economy and identified as slightly conservative, only 37% of Independents thought Romney had better character traits and only 47% voted for him. Holian and Prysby suggest that Independents' poor perceptions of Romney's character traits were an influential force that led them to vote for Obama.

1.2. A functional contextual view of voting

Any given voter brings an extensive and personal history to the voting booth that may have shaped not only the voter's selection of a candidate, but also the trait perceptions, social knowledge, and moral foundations that cognitive perspectives in psychology offer in their explanations of voting. As such, these perspectives tend to provide relatively decontextualized views on voting behavior, as the determinants of the vote are located within the cognitive processes theorized to be relevant to perceptions of political figures. From a contextual behavioral science perspective (Vilardaga, Hayes, Levin, & Muto, 2009), voting may be conceptualized as a behavior influenced by a complex history with respect to the names listed on the ballot. As with any behavior, voters respond in part to the direct stimulus functions of the prevailing situation (e.g., a private booth, the ballot text, the selection apparatus). Furthermore, voting is likely influenced by an extended history of experiences with the candidate names over time (e.g., media reports, interpersonal discussions, political advertisements). A substantial portion of this history would involve arbitrarily applicable relational contingencies, the subject matter of Relational Frame Theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001). Perceptions of the candidate names themselves are likely to be acts of deriving stimulus functions based on their participation in relational contingencies. “Barack Obama” is just a collection of letters on a piece of paper, but that text may occasion much more than simple detection of visual features – images, memories, judgments, and emotions may occur that are founded on a rich relational history with these two words and may influence behavior well beyond what would be possible if they were regarded on the basis of their direct stimulus functions alone. Voters do not vote for names, they vote for what they have learned those names represent. In this sense, the candidate's names occasion a defining characteristic of derived relational responding known as entailment.

According to RFT, there are two types of entailment. *Mutual entailment* is an act of relating stimuli bidirectionally even though only one relation between the stimuli has been conditioned. For example, in the course of a conversation with a trusted acquaintance, a potential voter who is naïve about political parties may be told that Barack Obama is a Democrat. Subsequently, the social category “Democrat” may come to mind after hearing the name Obama, because this relation was directly stated during the conversation. More importantly, the voter may also think of Barack Obama the next time he or she hears the word “Democrats”, even though this exact relation was not directly specified in the conversation. This thought would qualify as an instance of mutual entailment. *Combinatorial entailment* is the act of relating stimuli bidirectionally via relations with other stimuli. Continuing with the previous example, imagine the potential voter sometime later hearing on the radio that “the Democrats want to take away our guns”. Subsequently, the voter may derive that Obama opposes gun ownership, a relationship that has neither been directly trained nor mutually entailed, as the two stimuli (Obama and gun removal) previously were never mentioned together. This thought would qualify as an instance of combinatorial entailment, because the relata bear no pre-existing relationship except via their relations with other stimuli.

The voter's pre-existing feelings and beliefs regarding gun ownership may occasion a third property of arbitrarily applicable relational responding known as the *transformation of stimulus functions*. Stimuli that participate in a network of stimulus relations may acquire new functions in accordance with a contextual cue for a particular function. For example, imagine that our hypothetical voter feels strongly about guns. This conviction may be regarded as a feature of context that selects particular stimulus functions over others within the voter's relational repertoires in respect to the name Barack Obama. If the voter were a member of the National Rifle Association and an avid gun collector, the name may now evoke negative feelings and evaluations. Alternatively, if the voter was disturbed about incidents of gun violence and supportive of gun control regulations, the name may evoke positive feelings and evaluations. In other words, in the context of evaluating suitability for the office of President of the United States, thinking that Obama wants to reduce gun ownership may be upsetting for some voters and appealing to others. In each case, the reactions would qualify as evidence of the transformation of stimulus functions in respect to the name, and may influence the selection of a candidate on the ballot. An otherwise arbitrary visual stimulus (“Barack Obama”) may now bear an evocative function for approach or avoidance, based on a contextual cue interacting with a network of stimulus relations. If the voter already views Barack Obama and Mitt Romney via a relation of difference or opposition, then “Mitt Romney” also may acquire new functions that differ accordingly from those for “Barack Obama”. As with mutual and combinatorial entailment, these transformations occur via the ability to generalize relational repertoires in accordance with an extensive network of conditioned and derived stimulus relations.

Thus, for a voter the significance of each name on the ballot may reflect very indirect, distant, and elaborate contingencies in the voter's history. Because the stimuli participating in the network may be related in various dimensions, voting may be influenced by a conglomeration of reinforcing and punishing stimulus functions. Whether voters choose on the basis of one comparison of the candidates or many, the act of choosing may be driven by the relative balance of positive and negative attributes not just for an

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individual candidate, but also for a candidate in comparison to the other candidate. In other words, voting may occur under the influence of appetitive and/or aversive stimulation – one may vote *for* a candidate or *against* another candidate. The choice may be relatively predictable if only one candidate is perceived in a positive light. Alternatively, if neither candidate is positively regarded, voters may enter the voting booth under aversive stimulus control. For example, one may cast a vote for a candidate that they feel neutrally about simply because they dislike the alternative candidate. It is also possible that both candidates are disliked, in which case one may settle for the candidate who is less disliked than the other – choosing the "lesser of two evils".

1.3. Scrutinizing voting motives

Yoo (2010) has examined another possibility – the dilemma faced by voters who have a positive emotional investment in a political party that is offset by a negative regard for the party's candidate. Reviewing data from seven U. S. presidential elections since 1980, Yoo revealed that these ambivalent voters are both substantial in number and likely to vote. However, the relative impact of positive and negative regard for candidates on voting behavior was not explored. Lavine, Thomsen, Zanna, and Borgida (1998) demonstrated that emotional affect toward the candidates was more predictive of voting than cognitive evaluations of them among ambivalent voters, but the relative impact of positive and negative valence in these experiences was not reported. How might a voter be influenced by a negative regard for a candidate belonging to one's political in-group or a positive regard for a candidate belonging to one's political out-group? In some cases, it seems conceivable that one may publically endorse a candidate and deny negative views about the candidate, or may publically derogate a candidate and deny positive views about the candidate, especially when engaged in debate about the candidate choices in an election – or when responding to questions about them in a political survey. The legitimacy of these public pronouncements is difficult to assess with self-report measures, as there may be ample opportunity to discretely misrepresent one's actual views. If voters were ever motivated to distort their views about the candidates, then research on candidate perception and voting intentions might be aided by measures that can circumvent presentational biases.

1.4. Implicit measures and voting

Implicit measures are known to be valid measures of attitudes that may lack reliable evidence of convergent validity with self-reports (for some examples, see Nosek, Banaji, & Greenwald, 2002), suggesting that they may assess socially sensitive subjects differently than self-report measures. Implicit measures have already demonstrated utility in the measure of political attitudes (for an overview, see Nosek, Graham, & Hawkins, 2010), including for attitudes regarding candidate perception. For example, Sriram and Greenwald (2009) used an abbreviated version of the Implicit Associations Test (IAT) for the 2004 United States presidential election. The study generated supportive evidence for the reliability and convergent validity of an IAT containing images of George W. Bush and John Kerry and positive and negative evaluative words. More recently, Nevid and McClelland (2010) experimented with a modified IAT known as the Single Category IAT (SC-IAT) containing images of Barack Obama contrasted with positive and negative words. The authors reported significant correlations between implicit and explicit evaluations of Obama, but only in a condition in which skin tone in the images was artificially darkened.

The IAT has also predicted voting intentions. Sheets, Domke, and Greenwald (2011) demonstrated that the IAT provided more predictive validity than self-reports of attitudes and voting intentions for the 2008 U.S. presidential election. The IAT contained images of John McCain and Barack Obama as well as images and words regarded as symbolic of patriotism and Christianity in contrast to non-American and non-religious stimuli. The authors reported that pro-American and pro-Christian attitudes in respect to either candidate were significant correlates of candidate perception and voting intentions, especially among Republicans. Arcuri, Castelli, Galdi, Zogmaister, and Amadori (2008) assessed implicit candidate preference for the Italian general election of 2001 between Silvio Berlusconi and Francesco Rutelli and for a local election in northern Italy in 2005. In each case, the candidate names were presented in an IAT along with positive and negative evaluations. The authors found that IAT scores predicted self-reported voting after the election among decided voters for the national election and among undecided voters for both the national and local election.

The IAT is arguably the most popular and productive measure of implicit cognition in psychology (for reviews, see Greenwald, Poehlman, Uhlmann, & Banaji, 2009; Nosek, Greenwald, & Banaji, 2007). It was developed inside a scientific tradition regarding cognition as an associative mentalistic phenomenon (Greenwald et al., 2002; Hughes, Barnes-Holmes, & De Houwer, 2011); however, this conceptual and methodological strategy entails some interpretive limits on IAT data (Karpinski & Steinman, 2006). For example, the Bush/Kerry IAT implemented by Sriram and Greenwald (2009) resulted in a single score reflecting a relatively pro-Bush, anti-Kerry or pro-Kerry, anti-Bush bias. This score likely reflects a comingling of multiple attitudes that prohibits any distinction of cases in which individuals felt pro-Bush, anti-Kerry from individuals who, for example, felt pro-Bush and neutral toward Kerry, because the IAT measures these cognitive patterns on a comparative basis. This limitation has resulted in the development of IAT variants, such as the SC-IAT used by Nevid and McClelland (2010). This study assessed positive and negative attitudes exclusively toward Barack Obama, measuring repertoires independent of John McCain or any other competitor. Nevertheless, their data reflected a relative bias between negative and positive evaluations rather than separate assessment of each evaluative valence. In other words, the possible propositional nature of cognitive phenomena is difficult to assess with the IAT and other associative measures. Although the previously cited studies clearly indicate that the IAT is a viable metric of political attitudes, it cannot tease apart attitudes particular to each candidate and evaluative valence that may provide unique sources of influence over voting. Instead, it is limited to a general metric that is interpreted as an overarching bias in favor of one candidate or another.

1.5. A functional contextual alternative to associative implicit measures

The Implicit Relational Assessment Procedure (IRAP; Barnes-Holmes et al., 2006) is a relatively new implicit measure of derived stimulus relations (Hughes et al., 2011). Developed in an RFT laboratory (Barnes-Holmes, Hayden, Barnes-Holmes, & Stewart, 2008; Hughes, Barnes-Holmes, & Vahey, 2012), the IRAP may be well suited for measuring candidate perceptions because it allows for assessment of up to four distinct attitudes instead of the single overall bias estimate provided by the IAT. This small but significant methodological distinction from the IAT has resulted in data suggesting that these four attitudes at times may be distinct rather than unitary (e.g., Cullen & Barnes-Holmes, 2008; Kelly & Barnes-Holmes, 2013; Roddy, Stewart, & Barnes-Holmes, 2010). For example, an IRAP

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configured for the 2012 presidential election in the United States might involve an image of Barack Obama and an image of Mitt Romney, as well as a list of positive evaluative words and negative evaluative words. Each candidate and evaluation would be presented together during the IRAP, resulting in four possible combinations known as trial-types: (1) Obama+positive evaluations, (2) Obama+negative evaluations, (3) Romney+positive evaluations, and (4) Romney+negative evaluations.

The IRAP assesses cognitive biases by comparing a subtly different set of repertoires than the IAT. For each trial-type, participants must provide pro-candidate responses during half of the procedure (e.g., selecting "true" for "Romney" and "good") and anti-candidate responses during the other half (e.g., selecting "false" for "Romney" and "good"). Blocks of trials that require pro-Obama and anti-Romney answers may be regarded as "pro-Obama" block-types, while blocks that require pro-Romney and anti-Obama answers may be regarded as "pro-Romney" block-types. Over the duration of the procedure, the order of these two block-types alternate. For each trial-type, the average latency for pro-Obama responses is compared to the average latency for pro-Romney responses; a substantive difference between them is known as an "IRAP effect", which suggests a bias regarding the participant's history with that combination of candidate and evaluative valence.

In most published IRAP studies, IRAP effects are determined by calculating D-scores that represent the difference between mean latencies for one block-type compared to the other block-type as a function of the variability of these means (e.g., Barnes-Holmes, Murtagh, Barnes-Holmes, & Stewart, 2010; see also Greenwald, Nosek, & Banaji, 2003). Positive or negative D-scores suggest biases in relational repertoires, while scores at or near zero suggest a lack of substantive bias. Thus, one might expect an enthusiastic fan of Obama or a committed member of the Republican Party to produce D-scores significantly deviant from zero, albeit in different directions, while an uninterested, uninformed, or simply unbiased voter may produce D-scores near zero. A D-score may be calculated for each of the four trial-types, and these four D-scores may also be averaged for an overall D-score that resembles the D-score often calculated from IAT data.

The Relational Elaboration and Coherence (REC) model, a recent functional account of IRAP effects (Hughes et al., 2012), may describe how IRAP D-scores may reflect cognitive repertoires regarding the candidates. Briefly, the REC postulates that implicit biases are revealed by meaningful differences in latencies between block-types (e.g., pro-Obama vs. pro-Romney), and that those differences reflect different histories in respect to the trial content and response requirements across those block-types. One might expect that self-identified Democrats have more experience hearing, reading, saying, and thinking pro-Obama statements, as well as defending against anti-Obama statements. Alternatively, Republicans likely have more experience with pro-Romney statements and anti-Romney defenses. Responses that are relatively consistent with a respondent's history are called Brief and Immediate Relational Responses (BIRRs), while responses that are relatively inconsistent require additional time and derivations and are called Extended and Elaborated Relational Responses (EERRs). Thus, a Democrat may perform better during pro-Obama block-types than during pro-Romney block-types, while a Republican might exhibit the opposite pattern. An IRAP effect (i.e., a difference in latency/accuracy between two competing relational responses) is inferred when EERRs significantly extend beyond BIRRs.

Given that elections in the United States typically involve two candidates, and that each candidate is subjected to positive and negative media appraisals, the IRAP may be well-suited for assessment of implicit attitudes regarding each possible combination of candidate and evaluation. The following sections detail a study conducted shortly before the 2012 United States Presidential election with an IRAP configured to assess positive and negative evaluations of Barack Obama and Mitt Romney administered along with a collection of political self-report measures. We hypothesized that Democrats would produce overall IRAP D-scores indicative of pro-Obama, anti-Romney attitudes while Republicans would produce overall D-scores indicative of pro-Romney, anti-Obama attitudes. More specifically, we hypothesized that Democrats would exhibit pro-Obama D-scores for both Obama trial-types and Republicans would exhibit pro-Romney D-scores for both Romney trial-types. Furthermore, we hypothesized that the IRAP would correlate with self-reports of political attitudes. Finally, we hypothesized that the IRAP would distinguish participants reporting an intention to vote for Obama from those intending to vote for Romney.

2. Method

2.1. Participants

Data was collected from a sample of undergraduate students attending a public university in the central United States. Participants were recruited "for a study on political attitudes" from general psychology classes as well as a variety of upper-level psychology courses and received either course credit or extra credit for participating. Data collection began on October 22, 2012, and concluded on the day of the election, November 6, 2012. Fifty-eight people presented for the study.

2.2. Sample demographics

The average age of the sample was 21.5 years (SD=5.7). The sample was mostly female (58.6%; $N=34$) and Christian (74.1%; $N=43$) and endorsed the United States as their country of origin (94.8%, $N=55$). Twenty-five participants (43.1%) identified as Caucasian and 21 (36.2%) as African American. Sixteen participants (27.6%) reported majoring in Psychology, 8 (13.8%) endorsed "Undecided/Undeclared", and 34 (58.6%) selected "Other". All educational (e.g., "Freshman") and socioeconomic categories were represented in the sample, although a majority of participants ($N=33$; 56.9%) reported income of $25,000 or less. In respect to party identity, 31 participants (53.4%) identified as Democrat, 11 (19.0%) as Republican, and 16 (27.6%) as "Other".

2.3. Measures

2.3.1. Demographics

A 10-item questionnaire assessed a variety of demographic categories, including for age, race, religion, and sex. An item for party identity instructed the participant to "select the party that you most identify with" and provided the options "Democrat", "Republican", and "Other".

2.3.2. Semantic Differential Scale

A questionnaire was devised to assess perception of each word included in the political IRAP. Participants were instructed to indicate how positively or negatively each word was perceived on a scale of −5 (Extremely Negative) to 5 (Extremely Positive). Two means were calculated, one for the six positive words and another for the six negative words. The Cronbach's alphas obtained in the current study were .700 for positive words and .815 for negative words.

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2.3.3. Candidate Perception Questions

Two questions inquired about one's regard for the candidates. Each stated "Using the scale below, identify your perception of _____:". One question ended with "Barack Obama" and the other with "Mitt Romney". There were seven options for each question ranging from -3 (Extremely Negative) to 0 (Neutral) to +3 (Extremely Positive).

2.3.4. Political Dimension Question

A single question designed to assess political identity on a dimensional scale stated "Using the scale below, identify your political identity:". There were seven options in this Likert-type scale, ranging from 1 (Extremely Conservative) to 4 (Centrist) to 7 (Extremely Liberal).

2.3.5. Society Works Best Scale

The Society Works Best scale is a 14-item measure of political ideology based on attitudes toward a variety of "bedrock social issues" (Smith, Oxley, Hibbing, Alford, & Hibbing, 2011). Each item offers two choices to the initial statement "Society works best when…". The choices represent attitudes that are either relatively conservative or liberal in respect to issues relevant to leadership, perception of outgroups, and attitudes toward societal norms and rules. In this study, the 14 items were presented in a random order. Consistent with the methods described by Smith and colleagues (2011), conservative options were coded a value of 1 and liberal options a value of −1 and all items were summed. The current study obtained a Cronbach's alpha of .592.

2.3.6. Voting Intention Question

A single question offered a forced choice between two candidates, stating "Of the two choices below, which person would you vote for (please select one even if you would not actually vote for either person)?:". The choices were "Barack Obama" and "Mitt Romney".

2.3.7. Implicit Relational Assessment Procedure

The IRAP presents a series of blocks, each of which contains the same collection of randomly ordered trials. Each trial involves a sample (presented at the top of the screen), a target (presented just below the sample), and two response options (presented at each corner along the bottom of the screen). For each trial, the participant selects a response option by pressing the "d" or "k" key. A correct answer clears the screen for 400ms and then presents the next trial, while an incorrect selection results in a red "X" appearing in the middle of the screen until a correct selection is made. The correct answers are determined by the block-type; odd-numbered blocks require one pattern of answers for each trial (e.g., pro-Obama and anti-Romney answers), and even-numbered blocks require the opposite pattern of answers (e.g., pro-Romney and anti-Obama answers). Thus, a "block-pair" refers to successive blocks of different block-types (e.g., blocks #3 and #4).

Two IRAPs were administered. The first IRAP was used to provide general familiarity with the requirements of the procedure. It contained two samples (the words "flower" and "insect") and four evaluative targets (the words "good", "pleasant", "repulsive", and "unpleasant"). The second IRAP was used to measure perceptions of political candidates. The samples were an image of Barack Obama and an image of Mitt Romney. The targets were selected based on data provided by six lab assistants who rated the pleasantness/unpleasantness of a list of words compiled from a variety of sources (e.g., Drake et al., 2010; Nosek et al., 2010). Six positive evaluative targets ("excellent", "friend", "good", "safe", "trustworthy", and "wonderful") and six negative evaluative targets ("awful", "bad", "disaster", "enemy", "horrible", and "terrible") were chosen for their relevance and perceived valence. For both IRAPs, the response options were always "true" and "false", and their locations were determined randomly from trial to trial with 3 trials set as the maximum run for the same positions. Each trial of the political IRAP contained an image of one of the candidates and an evaluative word, allowing for four possible trial-types: Obama image+positive evaluation, Obama image+negative evaluation, Romney image+positive evaluation, and Romney image+negative evaluation (see Fig. 1).

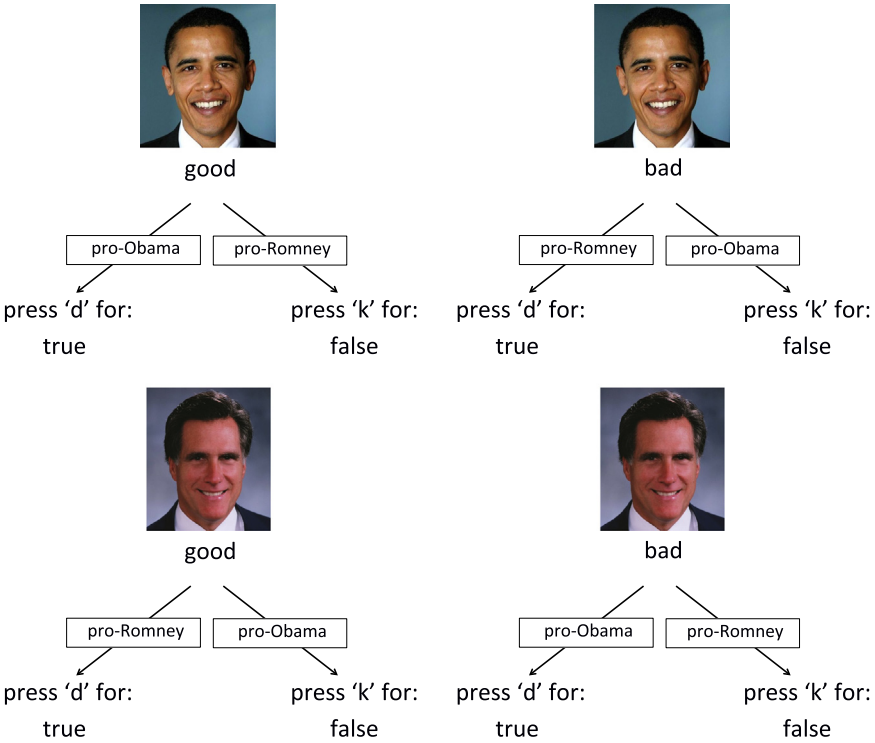

Fig. 1. IRAP Trial-Types. Arrows with captions denote required selections for pro-Obama and pro-Romney block-types and did not actually appear on screen.

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Trial-types were ordered randomly, with 2 trials set as the maximum run for the same trial-type.

Participants initially were presented with a set of instructions derived from the "Experimenter's script" downloaded from ira-presearch.org/downloads-and-training/. Instructions included the presentation of figures to illustrate the response requirements for each trial-type for each block of the procedure. Half of the participants were assigned to engage a pro-Obama block-type first, while the other half engaged a pro-Romney block-type first. One practice block-pair was administered with the practice IRAP, while up to three practice block-pairs were administered with the political IRAP. Participants were required to provide 80% correct responses with a median latency of less than 2000 ms on each practice block-pair to proceed to the experimental blocks. To encourage quick responding during practice blocks, the message "Too slow!" appeared near the center of the screen after 2000 ms during a trial. After meeting criteria, participants engaged one experimental block-pair of the practice IRAP and three experimental block-pairs of the political IRAP. The experimenter provided guidance and feedback during the practice blocks and then observed from a distance during the experimental blocks.

2.4. General procedure

All experimental sessions involved a single experimenter and participant and required less than one hour. Upon arrival to the laboratory, participants read and signed a consent form and were assigned a participant number. All activities were conducted on an IBM-compatible computer running a recent version of Microsoft Windows. Self-report measures were presented in random order via an online survey program (surveymonkey.com). The IRAPs were introduced and administered with the assistance of the experimenter. The sequence of self-reports and IRAPs was counterbalanced across participants throughout data collection. Furthermore, the block-type order of the IRAP (Pro-Obama or Pro-Romney first) was also counterbalanced throughout data collection. Upon completion of these tasks, participants were provided a debriefing about the study and credited for participating.

3. Results

3.1. Attrition

Of the initial 58 participants, 5 (8.6%; 4 Democrats, 1 Republican) failed the performance criteria and did not produce data from the political IRAP. Seven additional participants (12.1%; 5 Democrats, 1 Republican, 1 "Other") produced IRAP test block data bearing average accuracies below 80% correct. These 12 participants were excluded from further analyses, leaving a final sample of 46 people (22 Democrats, 9 Republicans, 15 "Other").

3.2. Comparison of demographics by party identity

The size of the "Other" party identity category was larger than anticipated, and the size of the Republican category was smaller than anticipated. Given this unexpected imbalance, as well as the prominence of racial and religious points of contention between the political parties during this election, a set of chi-square statistics was calculated for each demographic variable with respect to each party identity in order to further characterize the sample. For the race and religion variables, certain categories were combined in order to mitigate concerns about low expected frequencies among the cells. African American, Asian, Hispanic, and Other were combined into a single racial category, and Agnostic, Atheist, Muslim, and Other were combined into a single religious category. All chi-squares were non-significant (all $ps > .136$) except for analyses for race, χ^2 (2, $N=46$)=11.469, $p=.003$, and for religion, χ^2 (2, $N=46$)=9.665, $p=.008$. Observed cell counts for each of these variables showed that White and Christian participants populated all three political categories, while virtually all non-White and non-Christian participants populated only the Democrat and Other categories (1 non-White participant identified as Republican).

3.3. Semantic Differentials and party identity

Responses for the Semantic Differential Scale were divided into an average score for positive words and an average score for negative words. A two-way, mixed factors ANOVA was conducted on these means to allow assessment of the semantic functions of the positive and negative words entered into the IRAP in respect to each party identity. A main effect for evaluative valence, [$F(1,43)=1363.655$, $p<.001$], was supportive of the expected differences in the mean ratings for positive ($M=4.03$, SD=.67) and negative ($M=-3.84$, SD=.85) words. Non-significant results were obtained for party identity ($p=.742$) and for any interaction of valence and party identity ($p=.845$).

3.4. Correlations among political self-reports

Descriptive statistics for the political self-reports among each party identity are displayed in Table 1. These data show that the Other group, on average, reported relatively moderate attitudes regarding Perception of Obama and Perception of Romney and on the Political Dimension Question, with Democrats and Republicans reporting more extreme attitudes consistent with their party identity. On the Society Works Best Scale, Republicans reported a relatively conservative ideology, while Democrats were relatively moderate. The Other group was the most liberal. Since statistical comparisons of party identities would be problematic given the small size of the Republican category, a collection of Pearson correlations was conducted on these measures. Results are displayed

Table 1
Descriptive statistics of political self-reports and IRAP D-scores by party identity.

Measure	Democrat (n=22)		Republican (n=9)		Other (n=15)		Full sample (N=46)	
	M	(SD)	M	(SD)	M	(SD)	M	(SD)
Perception of Obama	1.82	(1.40)	-1.44	(1.81)	.60	(1.55)	.78	(1.94)
Perception of Romney	-1.32	(1.36)	.56	(1.51)	-.27	(1.28)	-.61	(1.53)
Political Dimension Question	4.45	(1.57)	2.78	(1.30)	4.07	(1.28)	4.00	(1.53)
Society Works Best Scale	-1.18	(3.87)	2.00	(3.00)	-3.60	(4.85)	-1.35	(4.46)
Overall IRAP D-Score	.147	(.21)	-.192	(.22)	.108	(.18)	.068	(.24)
Obama positive	.473	(.37)	.086	(.41)	.466	(.40)	.395	(.41)
Obama negative	.227	(.28)	-.179	(.37)	.204	(.29)	.140	(.34)
Romney positive	-.162	(.36)	-.447	(.30)	-.335	(.30)	-.275	(.34)
Romney negative	.048	(.33)	-.227	(.53)	.097	(.31)	.010	(.38)

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in Table 2. Perception of Obama, Perception of Romney, and the Political Dimension Question were all significantly correlated with each other and in the expected directions.

3.5. IRAP data

Consistent with recent conventions, raw IRAP data was subjected to the D-score algorithm detailed in previous studies (e.g., Barnes-Holmes et al., 2010). The algorithm produces a D-score for each trial-type (Obama positive, Obama negative, Romney positive, and Romney negative) as well as an overall D-score. In this study, positive values indicate a pro-Obama/anti-Romney bias. More specifically, positive D-scores for the two Obama trial-types would indicate pro-Obama biases, while negative D-scores would indicate anti-Obama biases. Alternatively, positive D-scores for the two Romney trial-types would indicate anti-Romney biases, while negative D-scores would indicate pro-Romney biases.

3.5.1. Internal reliability

The D_{IRAP} algorithm was modified such that two overall D-scores were generated – one for odd-numbered trials within each trial-type and one for even-numbered trials within each trial-type. These two D-scores were subjected to a Pearson correlation that was significant ($r=.369$, $N=46$, $p=.012$). A Spearman-Brown correction resulted in an estimation of the split-half reliability of the IRAP data at $r=.539$.

3.5.2. Order effects

A two-way between subjects ANOVA was conducted to assess for possible order effects on IRAP D-scores. Instrument order (self-report vs. IRAP first) and block-type order (Pro-Obama vs. Pro-Romney first) were specified as the independent variables, and the overall D-score was specified as the dependent variable. Results revealed no main effect for instrument ($p=.467$) or block-type ($p=.356$) and no interaction ($p=.780$). Thus, order effects were not analyzed in subsequent analyses.

3.6. IRAP effects within party identities

For each party identity, *t*-tests were conducted on the overall D-score and each trial-type D-score. Average D-scores for each party identity are displayed with their respective effect sizes in Fig. 2.

Table 2
Pearson correlations and their respective 95% confidence intervals among political self-reports and IRAP D-scores.

Measure	1		2		3		4	
	r	95% CI	*r*	95% CI	*r*	95% CI	*r*	95% CI
1. Perception of Obama								
2. Perception of Romney	**-.443****	[-.65, −.18]						
3. Political Dimension Question	**.492****	[.24, .68]	**-.322***	[−.56, −.04]				
4. Society Works Best Scale	-.299	[.00, .55]	-.143	[−.43, .16]	.111	[−.29, .31]		
5. Overall IRAP D-score	**.563****	[.33, .73]	**-.355***	[−.59, −.07]	.268	[−.02, .52]	.265	[-.04, .52]
Obama positive	**.299***	[.01, .54]	.000	[−.29, .29]	.096	[−.20, .38]	.142	[-.17, .42]
Obama negative	**.309***	[.02, .55]	**-.327***	[−.56, −.04]	.109	[−.19, .39]	.162	[-.15, .44]
Romney positive	**.490****	[.23, .69]	-.256	[−.51, .04]	.215	[−.08, .48]	.165	[-.14, .44]
Romney negative	**.373***	[.09, .60]	**-.365***	[−.59, −.08]	.276	[−.02, .52]	.225	[-.08, .49]

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

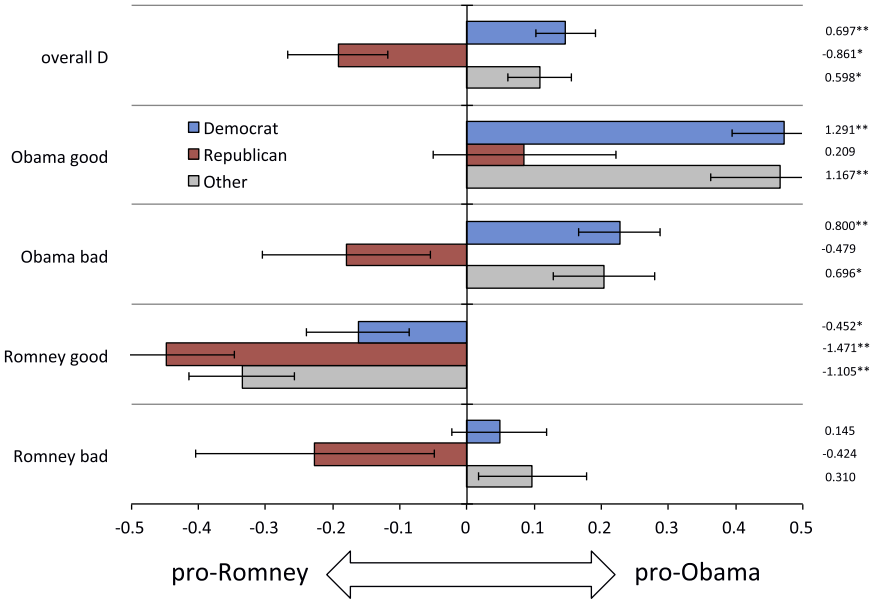

Fig. 2. Average IRAP D-scores and Standard Error Bars for Each Party Identity. Cohen's D effect sizes are displayed along the right margin, with asterisks denoting statistical significance (*$p < .05$, **$p < .01$).

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3.6.1. Democrat

Results were significant for the overall D-score, $t(21)=3.269$, $p=.004$, Obama positive, $t(21)=6.063$, $p<.001$, Obama negative, $t(21)=3.751$, $p<.001$, and Romney positive, $t(21)=-2.121$, $p=.046$. Results were not significant for Romney negative ($p=.504$). Participants identifying as Democrat had significantly pro-Obama D-scores except for a pro-Romney bias with the Romney positive trial-type and no response bias for the Romney negative trial-type.

3.6.2. Republican

Results were significant for the overall D-score, $t(8)=-2.583$, $p=.032$, and Romney positive, $t(8)=-4.412$, $p=.032$. Results were not significant for Obama positive, Obama negative, or Romney negative (all $ps>.189$). Participants identifying as Republican had significantly pro-Romney D-scores on the overall D-score and with the Romney positive trial-type and no response bias for the Romney negative trial-type or either Obama trial-type.

3.6.3. Other

Results were significant for the overall D-score, $t(14)=2.271$, $p=.039$, Obama positive, $t(14)=4.520$, $p<.001$, Obama negative, $t(14)=2.696$, $p=.017$, and Romney positive, $t(14)=-4.279$, $p<.001$. Results were not significant for Romney negative ($p=.250$). Participants identifying as Other had significantly pro-Obama D-scores except for a pro-Romney bias with the Romney positive trial-type and no response bias for the Romney negative trial-type.

3.7. Correlations among IRAP D-scores and political self-reports

Table 1 displays descriptive statistics for all IRAP D-scores by party identity. Due to differences in cell sizes, Pearson correlations were used to examine the relationship between D-scores and political self-reports. These results are displayed in Table 2. Perception of Obama was significantly positively correlated with all D-scores, and Perception of Romney was significantly negatively correlated with the overall D-score as well as the Obama negative and Romney negative D-scores.

3.8. Prediction of voting intention

A collection of receiver operating characteristic (ROC) curves was estimated to assess the ability of the IRAP to distinguish self-reported intention to vote for Obama or Romney. Five participants (3 Democrats and 2 Others) who did not respond to the Voting Intention Question were excluded from these analyses. The area under the curve (AUC) was calculated for the overall D-score, and another analysis calculated the AUCs for each of the trial-type D-scores. The AUC represents the probability that a randomly selected Obama supporter would have a higher D-score than a randomly selected Romney supporter. For all D-scores, the AUCs were significantly different from chance. For each D-score in these analyses, the AUC, obtained p-value, and 95% confidence intervals are displayed in Table 3.

Table 3
ROC statistics.

IRAP D-scores	AUC	p	95% CI
Overall D-score	.911	<.001	[.792, 1.000]
Obama positive	.730	.022	[.532, .928]
Obama negative	.779	.005	[.612, .946]
Romney positive	.776	.006	[.625, .927]
Romney negative	.716	.032	[.539, .892]

Note. AUC=Area Under the Curve; CI=Confidence Interval.

4. Discussion

The current study supports the utility of the IRAP as a measure of implicit social cognition in respect to perception of political candidates. Significant effects were observed with the overall D-score as well as 3 of the 4 trial-types, showing clear biases in evaluative repertoires regarding the candidates. Self-reported perception of Obama significantly correlated with all 5 D-scores, and perception of Romney significantly correlated with 3 of the 5 D-scores, all in the expected directions. As with other studies on implicit political cognition (for review, see Nosek et al., 2010), evidence for convergent validity was good. Furthermore, the overall D-score and each of the trial-type D-scores significantly distinguished between self-reported intentions to vote for Obama or Romney, providing tentative support for the concurrent validity of the candidate perceptions IRAP.

The pattern of IRAP biases among the four trial-types was not perfectly complimentary between Democrats and Republicans. Although Democrats exhibited a significant pro-Obama bias with the Obama negative trial-type (indicating a relative proficiency for the selection of "false" during these trials), Republicans did not exhibit a significant pro-Romney bias with the Romney negative trial-type. Although Republicans produced a small to moderate effect size for this trial-type, there appeared to be sufficient variability around a relatively low average D-score to render a non-significant effect. This suggests that the Republicans in the sample may have lacked a substantive repertoire for denying or disagreeing with negative evaluations of Romney. This pattern may reflect more general perceptions of the candidate, as he failed to win a series of Republican primary elections during the initial phases of the campaign. These primaries were won by a variety of conservative contenders rather than a single front-runner, resulting in Romney attaining the Republican nomination relatively late in the calendar. It seems that many conservatives in the United States regarded Romney as a second choice at best through much of the campaign season.

Among participants who did not identify as Democrat or Republican (the "Other" party identity category), the pattern of statistically significant biases with the IRAP was identical to Democrats. Given the apparent lack of in-group affiliation with Obama's Democratic party, the clear pro-Obama biases among Others might be unexpected. On self-reports, the Other participants indicated a relatively moderate, "centrist" position on the Political Dimension Question and each of the Candidate Perception Questions. Perhaps their pro-Obama biases may be explained by ideological compatibility – Others reported an ideology on the Society Works Best scale more liberal than not just Republicans but also Democrats (although this difference was not assessed statistically). Alternatively, perhaps Others were representative of the Independents who were more likely to vote for Obama in part because of unfavorable regard for Romney (as suggested by Holian & Prysby, 2014) – although the self-reports of each candidate among Others in the current study were statistically neutral, the averages leaned weakly pro-Obama and weakly anti-Romney. In any case, these results may further challenge the notion of a singular, left vs. right dimension in the political culture of the United States, as Democrats viewed their party and their ideology as relatively moderate/centrist, while Others viewed themselves as a centrist group in respect to party identity but with the most liberal ideology.

A number of patterns in the data would have been indiscernible with a similarly populated IAT. Democrats (as well as Others) exhibited a significant pro-Romney bias along with Republicans for the Romney positive trial-type, even though the overall D-score among Democrats (and Others) was significantly pro-Obama. Also, the lack of significant results for the Romney negative trial-type among Republicans would not be suggested by the large pro-Romney effect with the overall D-score. The correlational analyses

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also revealed some differential relationships between the trial-types and the Perception of Romney question; although the overall D-score was significantly correlated with self-report, only two of the four trial-type D-scores were significantly correlated. It may not be appropriate to interpret trial-type D-scores as entirely independent of each other, as a given trial of the IRAP is presented in an assessment context where both candidates are relevant. Throughout the procedure, positive evaluations of Romney were presented along with negative evaluations of Romney and also positive and negative evaluations of Obama. One's positive regard for Romney in that moment conceivably could be a function, at least in part, of attitudes toward Obama. An IRAP containing an alternative sample than Obama (e.g., Ronald Reagan, Jesus Christ, Adolf Hitler) may occasion a different pattern of responding to positive evaluations of Romney. Nevertheless, the data suggest that in a context in which Obama and Romney are being evaluated, Democrats and Others displayed robust repertoires for evaluating Romney positively while Republicans were relatively neutral with regard to negative evaluations of Romney. The associative focus of the IAT would preclude these inferences from an Obama/Romney IAT.

The current data seems agreeable with the REC model, especially for the overall D-scores and the trial-types referring to one's political in-group (e.g., Obama trial-types for Democrats). The observed biases for positive evaluations in respect to each party identity's candidate corresponded with expectations, as well as the pro-Obama effect among Democrats for Obama and negative evaluations. The lack of a significant effect among Republicans for Romney and negative evaluations, as discussed above, may suggest a relative difficulty denying negative evaluations of a candidate who appeared to struggle for his party's nomination from the beginning of the election season. However, biases were not so apparent with trial-types involving the candidate representing a participant's political out-group (e.g., Obama trial-types for Republicans). One may presume that Democrats have more experience hearing, reading, saying, and thinking anti-Romney statements, while Republicans have more experience with anti-Obama statements. Nevertheless, the data did not indicate significant anti-candidate biases for any party identity, and in fact Democrats exhibited a pro-Romney bias for the Romney positive trial-type.

These effects (or lack thereof) may raise questions about the sources of stimulus control that would support the obtained repertoires and the methodological and psychometric issues that could have contributed to the observed trends in the data. It seems possible that participants regarded the candidates differently because of substantial differences in histories with respect to each candidate. At the time of the study, Obama had been president for almost 4 years and was a widely known figure, whereas Romney was less known by comparison. Voters from all party identities had four years to develop evaluations of Obama as President but a comparatively shorter time to develop evaluations of Romney. Conceivably, this imbalance in candidate exposure may have impacted IRAP performance and contributed to the pro-Obama biases for Others as well as the lack of significant pro-Romney bias among Republicans for Romney and negative evaluations. Perhaps additional research investigating the controlling variables on IRAP effects at the level of the four trial-types may cast further light on the current data, especially for unexpected pro-candidate biases as well as a lack of anti-candidate biases.

4.1. Limitations

This study was not meant to illuminate voting intentions of the electorate, as it involved a sample of convenience at a public university that likely would not adequately generalize to the voting population. Republicans may have been underrepresented in the sample, as they numbered fewer even than the Other party identity. It's possible that there was a self-selection bias for participants, as recruitment for the study may have appealed differentially to those with an interest in politics. Some studies have shown that a participant's interest and awareness of political issues may influence performance on implicit political measures (e.g., Choma & Hafer, 2009). Furthermore, the attrition rate with the IRAP was noteworthy; 12 of the 58 original participants failed either to meet or sustain criterion performance, and 9 of the 12 were Democrats. Future research may benefit from efforts to minimize attrition and/or investigate the possible differential likelihood of failing the IRAP based on demographic variables such as party identity.

Researchers also may consider alternative measures with future studies. The relatively simple party identity question on the demographics form resulted in a substantial number of participants endorsing “Other”, which obscured their ideological leanings or affiliations. Curiously, the Society Works Best scale exhibited a poor internal reliability estimate in this study, even though Smith and colleagues (2011) reported acceptable reliability in their validation study. Perhaps the decision to randomize the order of the questions in this measure adversely affected this statistic. The results obtained with the Semantic Differential Scale supported the use of the evaluative words chosen for the political IRAP in the current study, as the participants clearly distinguished the words in respect to evaluative valence. However, fairly generic evaluative words were used instead of specific, individually-tailored evaluations. For example, terms such as “foreign Muslim” or “tax evader” may have better reflected some of the popularly held critical evaluations of the candidates (regardless of their veracity) and could have influenced responding differently than was obtained in the current study. Alternatively, selecting targets that reflect trait descriptors of demonstrated importance to voters (e.g., integrity, empathy, leadership, competence; Holian & Prysby, 2014) may be a desirable strategy. Finally, although the IRAP was a significant predictor of voting intentions, a self-report of intentions might not predict actual voting. A future study assessing actual voting behavior among IRAP completers would represent an improvement over the current research design.

5. Conclusion

The IRAP used in this study demonstrated supportive reliability and validity evidence in the domain of political attitudes. The current data also offers insights that would have been unavailable with the use of more mainstream implicit measures such as the IAT. We hope it provides researchers with the basis for future work on implicit cognition as well as studies of political ideology interpreted via a contextual behavioral science perspective.

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