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A Systematic Exploration of Different Stimulus Combinations Using the Implicit Relational Assessement Procedure

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A SYSTEMATIC EXPLORATION OF DIFFERENT STIMULUS COMBINATIONS USING THE IMPLICIT RELATIONAL ASSESSMENT PROCEDURE

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The Implicit Associations Test (IAT) and the Implicit Relational Assessment Procedure (IRAP) recently have been used to examine implicit attitudes (i.e., implicit bias). Although both methods attempt to assess implicit attitudes about two categorical stimuli (e.g., Black people and White people), the IRAP assesses attitudes toward each stimulus separately. Conversely, IAT procedures inherently produce a comparison between the two attitudes in an "oppositional" fashion (e.g., a pro-Black people:anti-White people attitude *or* a pro-White people:anti-Black people attitude). As IRAP data have demonstrated non-oppositional relationships for such attitudes (e.g., co-occurring pro-Black people and pro-White people attitudes), alternative experimental stimulus pairings may produce additional valuable information. In the proposed study, a relatively common set of experimental stimuli used in implicit attitude research (i.e., racial and evaluative stimuli) will be presented in both the standard IRAP (S_{IRAP}) configuration and a new format hereafter designated as the orthogonal IRAP (O_{IRAP}) condition. Self-report measures will also be administered to assess the individuals' explicit attitudes about the IRAP stimuli and racial issues. Participants from an introductory psychology class research pool will be quasi-randomly assigned to one of four condition orders. Data will be analyzed to assess for reliability, order effects, and associations between IRAP scores and self-reports.

Keywords: assessment, association, attitude, bias, implicit, oppositional, orthogonal, relational

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CHAPTER 1

INTRODUCTION

Attitude (i.e., bias) has been defined in various ways within and across multiple fields of study. Hughes, Barnes-Holmes, and De Houwer, (2011) stated that "cognitive researchers broadly refer to attitudes as the integration of cognitive and affective evaluations experienced toward some object that can vary in strength (e.g., Crano & Prislin, 2006; Olson & Kendrick, 2008)" (p. 466). A number of researchers have argued that studying implicit attitudes may lead to fundamentally important advances in the diagnosis and treatment of human psychopathology (Wiers, Teachman, & De Houwer, 2007). Direct measures (e.g., self-report questionnaires, interviews, etc.) long represented the primary method for researching attitudes on a variety of topics such as racial prejudice, sexual identity, and political preference (Hughes et al., 2011). However, data suggest that such techniques often capture explicit (i.e., deliberate and delayed) attitudes that often diverge from implicit (i.e., automatic and instantaneous) attitudes (Greenwald & Banaji, 1995). Hughes et al. (2011) noted that this divergence may be due to the inability of humans to introspect adequately (see Nisbett & Wilson, 1977) and the desire to present oneself in a particular fashion (see Paulhus, 1989). Paulhus (1989) noted that such socially desirable responding represents a particularly difficult conceptual hurdle as multiple reasonable potential explanations exist as to why people would deliberately report an attitude inaccurately (e.g., legal reasons, ostracism, inconvenience, etc.).

Procedures that purport to measure implicit attitudes have flourished over the past two decades (see Barnes-Holmes, et al., 2006; Hughes et al., 2011). The Implicit Associations Test (IAT) represents the most well-established of these computerized-categorization techniques. By both its name and definition, the IAT presumes to indirectly measure associations (i.e.,

automatic, pre-existing mental relationships) by recording response latencies following the presentation of particular stimuli. In brief, IAT procedures generally pair each of two descriptive categorical words/phrases (e.g., “Black people” and “White people”) with different evaluative categorical words/phrases (e.g., socially valenced words such as “good” and “bad”) in predetermined patterns. Using the above stimuli as an example, if the words “Black people” and “Good” were presented on left side of the computer screen, then the words “White people” and “Bad” would be presented simultaneously on the right side. Participants are also shown a stimulus in the center of the screen (e.g., other racial and evaluative words/phrases; one per trial) with the above pairings. The participants respond to the center stimulus by pressing a response key that corresponds with the one descriptive or evaluative stimulus present on either the left or the right side of the screen. Pressing the ‘e’ key indicates the left stimulus pairing contains the word/phrase similar to the center word/phrase. Pressing the ‘i’ key indicates that the right stimulus pairing contains the word/phrase similar to the center word/phrase. Later, the stimulus pairings change (e.g., the words “White people” and “Good” appear on the left; the words “Black people” and “Bad” appear on the right) and the procedure essentially repeats. This methodology requires rapid-responding (i.e., low-latency key press responses, often 2000 ms or less following the presentations of the experimental stimuli). The latency differences across the trial types described above purportedly allow a statistically determined, proxy measure of hypothetical associational strengths (Greenwald, Poehlman, Uhlmann, & Banaji, 2009). According to the IAT paradigm, the strength and automaticity of these associations mediates the rapidity of the participants responding and, therefore, elucidates one’s implicit biases with regard to the stimuli used in the IAT.

Greenwald et al. (2009) reported that IAT studies have garnered extensive empirical support with regard to psychometric properties. For example, the Greenwald et al. meta-analysis claimed that IAT scores showed moderate predictive validity and good internal consistency across multiple studies. Nosek, Greenwald, Banaji (2007) stated that multiple IAT studies have generated scores resulting in a median test-retest value of $r = .56$; the intervals between test and retest ranged approximately from the same day to one year apart, with a grand majority of the intervals ranging between approximately one week to one month (obtained by visual inspection of the provided graph). Greenwald et al. also asserted that the automaticity attributed to the implicit association construct holds great utility. For example, Greenwald et al. noted three studies (see Asendorpf, Banse, & Mücke, 2002; Banse, Seise, & Zerbes, 2001; Kim, 2003) that indicate the IAT's rapid-response requirements engender faking-resistant responding. Greenwald et al. also confirmed that explicit attitude measures engendered lower predictive power for culturally-delicate topic areas (e.g., Black-White racial categories), whereas IAT measures generated higher predictive power in such areas. The above aligns with the Hughes et al. (2011) comment that direct measures (e.g., self-reports) reliably account for deliberate, planned, and organized attitudinal statements, while indirect metrics (e.g., responses to computerized implicit attitude programs) account for more sudden, unexpected, and automated attitudinal statements.

The difference between implicit and explicit responding mentioned above may result from a desire (or urge) to mask an unpopular social attitude when one knowingly (or unknowingly) harbors such a view. Hypothetically, when people report attitudes using standard self-report measures, they have time to craft a socially-acceptable alternate response *if* a response based on their initial (i.e., implicit) reaction could be judged unfavorably in the current context. The rapid-response requirements of the IAT appear to prevent this self-censoring. Thus, it is theoretically

consistent that the low-latency IAT requirement would engender responding that aligns with the construct of implicit association more reliably than explicit measures with less stringent or no response latency requirements. In summation, the low-latency requirements required by the IAT seem to decrease or eliminate the ability to represent one's attitude in a deliberate fashion and the implicit association construct may explain why.

The assumption that the strength of these hypothetical mental associations mediate implicit responding has essentially predominated the discussion of attitude in many areas of psychology. Hughes et al. (2011) stated that this associative construct has "dictated the direction of empirical research in this area by specifying the questions to ask and how those questions are to be answered (i.e., by constructing and employing associative procedures)" (p. 474). Hughes et al. do not deny this "a priori associative assumption" (p. 472) may be valid; however, they noted that it does require empirical verification. Hughes et al. stated it as such:

> Whereas physically assigning stimuli to the same or a different response in the procedure is an observable fact, the assumed mental association remains an inference and should not be granted the same ontological status as the procedural association. Unfortunately, this clear distinction between procedure and inferred process is often not maintained. (p. 473)

In other words, the burden of proof lies on demonstrating that implicit associations both exist and mediate the implicit attitude responses seen in this area of research. In light of the absence of direct evidence regarding the existence of such mental associations, Hughes et al. noted that researchers may wish to explore other possible explanatory avenues in order to "protect the field of attitude research against possible biases or limitations in theoretical and methodological development" (p. 487).

As discussed above, the IAT was created as an attempt to measure a hypothetical associational strength construct that presumably represents implicit attitude. More recently, an alternative methodological approach, the Implicit Relational Assessment Procedure (IRAP), has also been used to investigate implicit attitudes. The IRAP is predicated on the Relational Elaboration and Coherence (REC) model, which conceptualizes implicit attitudes as relational responses rather than as mental associations (see Barnes-Holmes, et al., 2006; Barnes-Holmes, Barnes-Holmes, Stewart, & Boles, 2010). The REC model posits that a brief and immediate relational response (BIRR) occurs when a stimulus is encountered. A BIRR is essentially an instantaneous, often covert response under relatively specific stimulus control; this is conceptually akin to the concept of implicit bias. These stimulus-response relationships ostensibly result from historical influences (i.e., learning).

Similar to the IAT, the IRAP compares response latencies between different trials in order to determine implicit bias. With regard to the IRAP, the speed of correctly responding to stimulus pairings in the presence of a particular rule is compared to the speed of correctly responding to the same stimulus pairings in the presence of the opposite rule. For example, certain participants may have a history that aligns with the statement "Black people are good." Therefore, when the rule given to that participant prescribes responding on the "Similar" response key in the presence of the stimulus pairing "Black people:Good," the REC model entails that person will respond relatively quickly to the response key "Similar" because the key press response aligns historically with the BIRR. In contrast, when the rule given to that participant prescribes responding on the "Different" key in the presence of the stimulus pairing "Black people:Good," that person will respond relatively slowly to the response key "Different." In other words, the REC model implies that choosing a response that is in opposition to the BIRR will take longer

than a response that aligns with said BIRR. The response latency differences these rules generate are adjusted using an algorithm similar to that used for the IAT (see Appendix A for an explanation of the D_{IRAP} scoring algorithm and rationale). The D_{IRAP} scores generated by this algorithm indicate the valence and strength of the participant's BIRR (i.e., implicit bias). Due to the IRAP's rapid-response requirements (e.g., responding in 2000 ms or less), participants generally appear unable to intentionally construct reliable response patterns across trials that hide their implicit bias. Stated alternatively, it is improbable that participants can exert a *consistent*, specific explicit bias [i.e., an extended and elaborated relational response (EERR) in REC model terms] that obscures one's BIRR, presumably due to the need to rapidly respond to the experimental stimuli (see Barnes-Holmes, Barnes-Holmes, et al., 2010; Barnes-Holmes, Murphy, Barnes-Holmes, & Stewart, 2010). For a more detailed description of the IRAP procedure and stimulus pairings, please see the S_{IRAP} write-up in the Procedures area of the Method section below and Figures 1-3.

As described above, the REC model conceptualizes attitude via an operant, relational responding paradigm rather than by the standard mental associative model espoused by many attitude researchers (Barnes-Holmes, Barnes-Holmes, et al., 2010). One benefit of this approach lies in its parsimony. All else being equal, if prediction and influence of implicit attitudes can be reliably approached in the absence of hypothetical mediating entities (i.e., implicit associational strength), then this simpler theoretical stance may be preferable. Additionally, further exploration of this new approach to attitude research could help guard against limitations caused by the near ubiquitous acceptance of the current associational strength paradigm (Hughes et al., 2011). Therefore, the conceptual and procedural differences inherent in the IRAP may benefit the health of attitude research by injecting variability into this area.

The IRAP appears to provide reliable and valid scores, even in comparison to the well-studied IAT. For example, Barnes-Holmes, Murtagh, Barnes-Holmes, and Stewart (2010) examined attitudes about meat and vegetables using a sample of meat-eaters and vegetarians. Barnes-Holmes, Murtagh, et al. reported a moderate split-half correlation for vegetable ($r = .582$, $p < .001$) and meat ($r = .526$, $p < .01$) trial types, as well as a strong split-half correlation for the overall D_{IRAP} measure ($r = .715$, $p < .0001$). They also noted that these scores represent a relatively high internal consistency for a response latency measure. Barnes-Holmes, Murtagh, et al. also found that the IRAP split-half reliability scores (meat trial types = .58, vegetable trial types = .53, and overall IRAP = .71) compared favorably with the IAT split-half reliability scores from De Houwer and De Bruycker (2007) who reported a correlation coefficient of .81; Barnes-Holmes, Murtagh, et al. found a comparable correlation ($r = .76$) in their IAT condition as well. Barnes-Holmes, Murtagh, et al. additionally showed that "the IAT correlated significantly with the overall IRAP measure, $r = .54$, $p < .01$; the IRAP vegetable trial type, $r = .54$, $p < .01$; and the IRAP meat trial type, $r = .43$, $p < .02$" (p. 300). Barnes-Holmes, Murtagh, et al. reported that the IAT and the IRAP both produced very similar increments of predictive validity; the IAT accounted for 34% of the variance ($p = .04$) and the IRAP accounted for 35% of the variance ($p = .03$). Finally, Barnes-Holmes, Murtagh, et al. stated that the IRAP provided more data than the IAT. Due to procedural nuances, the IAT could only indicate

> a pro-vegetable bias for both groups (although the bias was weaker for the meat-eaters). Based on the IAT alone, one cannot determine if the meat-eaters were pro-vegetable and also anti-meat or strongly pro-vegetable and weakly pro-meat….the IRAP showed that the meat-eaters were generally pro-vegetable but also slightly pro-meat. (Barnes-Holmes, Murtagh, et al., 2010, p. 301)

Overall, Barnes-Holmes, Murtagh, et al. concluded that "the IRAP discriminated between the two groups to the same degree as the IAT and possessed a similar level of internal consistency, but also provided additional information not available from the IAT data alone" (p. 301).

Barnes-Holmes, Waldron, Barnes-Holmes, and Stewart (2009) found IRAP scores that demonstrated internal consistency similar to and predictive validity greater than IAT scores with regard to city/country attitudes. Barnes-Holmes et al. also stated that, "the IAT failed to correlate with any of the explicit measures, but the IRAP displayed a number of significant and marginally significant implicit–explicit correlations" (p. 403); these explicit measures included two "feeling thermometers" and two Likert scales about city/country preferences. Other studies have generated further support for the validity and predictive utility of IRAP scores across multiple domains including adolescent attitudes about smoking in relation to acceptance and rejection (Vahey, Boles, & Barnes-Holmes, 2010), relationships between implicit attitudes and cocaine treatment outcomes (Carpenter, Martinez, Vadhan, Barnes-Holmes, & Nunes, 2012), prisoner and university student self-esteem measures and their correlations with locus of control (Vahey, Barnes-Holmes, Barnes-Holmes, & Stewart, 2009), diagnostic utility of comparing disgusting stimuli appraisal with other specific dimensions in regard to obsessive-compulsive tendencies (Nicholson & Barnes-Holmes, 2012a), and predictive differentiation of live spider avoidance (Nicholson & Barnes-Holmes, 2012b). In summary, accumulating evidence indicates the utility of the IRAP for investigating the phenomenon of implicit attitudes across a wide array of areas.

As Barnes-Holmes, Murtagh, et al. (2010) noted, one promising feature of the IRAP lies in its ability to separately measure the implicit attitudes being investigated (e.g., it can measure a pro-Black people/anti-Black people attitude separately from a pro-White people/anti-White people attitude). In contrast, IAT procedures inherently entail an a priori oppositional

relationship between the two implicit attitudes being investigated (e.g., a pro-Black people attitude entails an anti-White people attitude and vice-versa). The distinctive ability of the IRAP to investigate implicit attitudes for individual stimulus pairings may result in further information regarding the IAT's oppositional assumption. For example, by pairing common descriptive IRAP stimuli (e.g., racial categories; Black people:White people) in certain trials and common evaluative IRAP stimuli (e.g., adjectives; Good:Bad) in other trials, the relationship among these stimuli may be further clarified. To our knowledge, no investigation of implicit response biases between these types of stimuli has been published.

Racial stimuli (e.g., "Black people" and "White people"), which have been examined in multiple IAT and IRAP publications, were chosen for this proposal in order to lend validity to this initial foray into studying these new pairings. The Greenwald et al. (2009) meta-analysis included 32 White-Black race IAT studies. IAT studies have generally indicated that White participants harbor a pro-White people:anti-Black people implicit bias and also that implicit racial bias is not congruent with explicit bias (Barnes-Holmes, Murphy, et al., 2010; Greenwald et al., 2009). The Greenwald et al. meta-analysis concluded that aggregated differences between implicit and explicit measures were largest for these race studies, as well as "other intergroup" studies. In summary, race IATs have generated very strong implicit responding that is not predictive of explicit responding.

In comparison to the multitude of racial IAT studies, only two published IRAP studies conducted and reported results using racial stimuli. Barnes-Holmes, Murphy, et al. (2010) presented two experiments using white, Irish participants. The first study paired the words "safe" and "dangerous" (sample stimuli) with six color images of Black and White men with guns (target stimuli; see Figure 1 for an overview of the general features of IRAP screen

presentations). Participants were assigned to either a public context or a private context group. Participants from both groups showed a pro-White bias for the White trial types, although the magnitude of the bias was weak for the "Dangerous:White" trial type, as well as a pro-Black bias for the "Safe:Black" trial type. Further, the private context group showed a larger pro-Black bias than the public context group, which indicated social desirability effects on IRAP responding may have been absent. The "Dangerous:Black" trial type produced bias in the anti-Black direction; however, the D_{IRAP} scores were near zero indicating a neutral bias. Overall, data indicated the public/private contexts did not significantly affect IRAP performance and that the private context unexpectedly produced significant pro-Black responding on the "Safe:Black" trial type.

The second Barnes-Holmes, Murphy, et al. (2010) study replicated the first study; however, it used a 2000 ms response latency criterion rather than a 3000 ms criterion. The other difference between these studies was the use of the public context group procedures for all participants. The pro-White bias increased roughly three fold (by visual inspection of the included graphs) for the "Safe:White" trial type after the 2000 ms criterion was implemented. The near neutral, non-significant anti-Black bias for the "Dangerous:Black" trial type also changed between experiments. The anti-Black bias for the "Dangerous:Black" trial type significantly differed from zero in the second experiment; the D_{IRAP} score increased more than 10-fold (by visual inspection of the included graphs). From their data, Barnes-Holmes, Murphy, et al. (2010) concluded that reducing the response latency criterion increased response automaticity and, ostensibly, resulted in a more accurate measure of implicit bias. The authors also noted that internal reliability almost doubled from experiment 1 to experiment 2. Finally, Barnes-Holmes, Murphy, et al. stated that

the correlations between the implicit and explicit measures of bias were small or nonexistent, which generally aligns with IAT research findings.

Drake et al. (2010) published four exploratory IRAP studies using racial, religious, gender, and obesity stimuli. As racial IRAPs are of interest regarding this proposal, the race procedure and data will be the focus herein. All four studies began with a practice IRAP using shape (sample stimuli) and color (target stimuli) words to familiarize the participants with the procedure. Next, the participants in the race group completed an IRAP that paired the words "White" and "Black" (sample stimuli) with six different "Good" and six different "Bad" socially valenced words (target stimuli). Drake et al. stated that the results showed:

> "a favorable bias for 'white' in respect to positive evaluations, a neutral effect for negative evaluations, and a neutral effect for 'black' regardless of evaluative valence: Only trials containing 'white' and a positive evaluation produced significant differences between consistent and inconsistent block types" (p. 95).

Drake et al. also noted that the pro-White bias for the "White:Good" stimulus pairing had no oppositional correlate (i.e., no significant anti-black bias was found in the trial types containing the sample "Black"), which demonstrated the race IRAP's sensitivity to non-oppositional biases that would go undetected in a similar IAT.

With regard to racial stimuli, a "standard IRAP" (S_{IRAP}) generally assesses responding in the presence of a racial sample stimulus (e.g., the words Black People and White People across trials) paired with an evaluative target stimulus (e.g., both positive and negative social evaluative words across trials). Figure 1 displays an overview of the general features of IRAP screen presentations; Figures 2 and 3 demonstrate the specific S_{IRAP} stimuli to be utilized in this study. Figure 4 presents one alternative manner in which to pair the racial stimuli together and to pair

the evaluative stimuli together using the IRAP. This will be referred to as an "orthogonal" arrangement because the stimuli shown in Figure 4 are rotated 90 degrees counterclockwise from the "standard" arrangement to the "orthogonal" arrangement. These new pairings produce the specific trial types that will be used in the "orthogonal IRAP" (O_{IRAP}) condition proposed herein (see Figures 5 and 6).

This procedure will result in data allowing multiple comparisons. Reliability of the self-report and the IRAP scores will be of interest, as will any order effects that may arise. Associations between all IRAP and self-report scores will be examined in order to determine what effects are generated by the O_{IRAP} condition. In conjunction with the above, this study will assess the following specific hypotheses: (a) the White Person:Good trials in the S_{IRAP} condition will be correlated with the White Person:Good trials in the O_{IRAP} condition; (b) the Black Person:Bad trials in the S_{IRAP} condition will be correlated with the Bad:Black Person trials in the O_{IRAP} condition; (c) the Modern Racism Scale (McConahay, 1983) scores will be correlated with all five S_{IRAP} trial types, as well as the White Person:Good and Bad:Black Person O_{IRAP} trial types; and (d) the Social Dominance Orientation Scale (Pratto, Sidanius, Stallworth, & Malle, 1994) scores will be correlated with all five S_{IRAP} trial types, as well as the White Person:Good and Bad:Black Person O_{IRAP} trial types.

CHAPTER 2

METHOD

Participants

This study will utilize a sample of convenience consisting of approximately 85 undergraduates enrolled in an introductory psychology course. These students will receive course credit for participating in this research. Due to research sign-up procedures for this course, the participants will self-select the date and time they will participate from the available time slots. The investigators will assign participants to one of the four groups in a quasi-random fashion in order to ensure that different races are assigned equally across groups. To accomplish this, a pre-set order of groups to which participants will be assigned will be created. Each of the four possible groups will be ordered randomly and added to a master list (see the Procedures section below). This will be repeated until each group is listed 40 times. This list will be copied; one list will be used for participants who identify themselves as Black, another will be used for participants who identify themselves as White, and the final list will be used for participants who identify themselves as (a) neither Black nor White or (b) multiracial. Each participant will also be assigned a random identification number in order to preserve confidentiality and anonymity. A six-item demographics survey will be given to delineate sample characteristics (see the Measures section below and Appendix B).

Measures

Implicit Relational Assessment Procedure. The IRAP computer program (Barnes-Holmes, et al., 2006) represents the proxy measure of implicit bias for this study (see Figure 1 for a visual representation and brief description). For this experiment, interest lies in the IRAP's purported ability to measure implicit attitudes. D_{IRAP} scores, which are algorithm-adjusted measures of the distance between response latency means obtained from responding to the different response

rules given for each trial type, will act as a proxy measure of implicit attitudes and, therefore, represent the prime metric of interest gathered by the IRAP program (see Appendix A). Ten D_{IRAP} scores will be analyzed for this experiment: (a) an overall D_{IRAP} score from all S_{IRAP} condition trials, (b) a D_{IRAP} score from the S_{IRAP} condition "Black People:Good" trials, (c) a D_{IRAP} score from the S_{IRAP} condition "Black People:Bad" trials, (d) a D_{IRAP} score from the S_{IRAP} condition "White People:Good" trials, (e) a D_{IRAP} score from the S_{IRAP} condition "White People:Bad" trials, (f) an overall D_{IRAP} score from all O_{IRAP} condition trials, (g) a D_{IRAP} score from the O_{IRAP} condition "White People:Good" trials, (h) a D_{IRAP} score from the O_{IRAP} condition "Bad:Black People" trials, (i) a D_{IRAP} score from the O_{IRAP} condition "White People:Black People" trials, and (j) a D_{IRAP} score from the O_{IRAP} condition "Bad:Good" trials.

The valence of these scores will indicate the direction of the implicit attitude. For example, a positive D_{IRAP} score found in trials containing the stimuli "White People:Good" will indicate agreement with the statement "White people are good," while a negative score will indicate disagreement with the statement "White people are good." A positive D_{IRAP} score found in trials containing the stimuli "White People:Bad" will indicate disagreement with the statement "White people are bad," while a negative score will indicate agreement with the statement "White people are bad." For trials containing the stimulus "Black People," the meaning of the valence is reversed. A positive D_{IRAP} score found in trials containing the stimuli "Black People:Good" will indicate disagreement with the statement "Black people are good," while a negative score will indicate agreement with the statement "Black people are good." A positive D_{IRAP} score found in trials containing the stimuli "Black People:Bad" and "Bad:Black People" will indicate agreement with the statement "Black people are bad," while a negative score will indicate disagreement with the statement "Black people are bad." Two additional stimulus pairings remain: the O_{IRAP}

stimulus pairings “White People:Black People” and “Bad:Good.” For the pairing “White People:Black People,” a positive valence will indicate an attitude of categorical *similarity* for the stimuli in the pair and a negative valence will indicate an attitude of categorical *difference*. For the pairing “Bad:Good,” a positive valence will indicate an attitude of categorical *similarity* for the stimuli in the pair and a negative valence will indicate an attitude of categorical *difference*. For all of the above cases, a score of zero will indicate no bias in the implicit attitude. Larger absolute values of the coefficients will indicate a stronger bias in all cases.

Demographic Information. As mentioned above, a six-item demographics survey (see Appendix B) will be used to gather information about age, gender, race/ethnicity, religion, political affiliation, and socioeconomic status. This information will be used primarily to delineate sample characteristics.

Modern Racism Scale (MRS). The six-item MRS (McConahay, 1986; see Appendix C) “is intended to measure a dimension of the cognitive component of racial attitudes” (p. 92). McConahay (1983) found good internal consistency (α ranged from .81 to .86) and test-retest reliability (r ranged from .72 to .93; time range between test and retest unspecified). McConahay (1986) found strong additional support for the validity of the MRS as a measure of racial prejudice; the MRS correlated with multiple racial issues and measures such as voter choice for Black and White candidates, opinions regarding Black peoples’ use of the bus (mass transit), and the Feeling Thermometer. MRS scores range from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Item three is reverse-coded. Higher scores indicate more racist attitudes.

Social Dominance Orientation Scale (SDO). The 14-item version of the SDO (Pratto, et al., 1994; see Appendix D) purports to measure peoples’ affinity for inequality across social strata. Pratto et al. found good internal consistency ($\alpha = .83$ on average), discriminant validity regarding

policy attitude, predictive utility with regard to new attitudes, and convergent validity with regard to both concern for others and empathy. SDO scores range from 1 (*very negative)* to 7 (*very positive*). Items 8-14 are reverse-coded. Higher scores indicate preference for social stratification and, perhaps, even greater divides than currently perceived.

Evaluative Stimulus Rating Scale (ESRS). The ESRS (see Appendix E), a measure created for this study, will assess the participants' opinions of the evaluative category stimuli (i.e., "good" and "bad" words) to be used in the IRAP procedure. Each of the 12 evaluative stimulus words will be listed alongside a Likert-style scale which will range from -5 (*Extremely Negative*) to 5 (*Extremely Positive*). Means for the six positive words and for the six negative words will be separately calculated to determine the participants' overarching opinions about the words.

Trial Type Questionnaire (TTQ). The TTQ (see Appendix F), a measure created for this study, will ask the participants to rate their agreement with four questions that represent each of the sample-target stimulus parings found in the S_{IRAP} condition. These questions (e.g., White people are bad) will be scored by the participant on a Likert-style scale which will range from -3 (*Strongly Disagree*) to 3 (*Strongly Agree*). Using the same scale, four more questions will be asked to assess the new sample-target stimulus parings found in the O_{IRAP} condition. However, the question construction will differ slightly due to the nature of the stimuli. Instead of asking "White people are Black people" and "Bad is Good," four questions will be asked in the following syntax: "White people and Black people are similar", "White people and Black people are different", etc.

Procedure

This study will quasi-randomly assign participants to four counterbalanced groups (see the Participants section above). One group will receive the S_{IRAP} condition, then the O_{IRAP} condition, and finally the surveys. The other three groups will receive the conditions in the following order: (a) the $O_{IRAP,}$ the $S_{IRAP,}$ and the surveys, (b) the surveys, the $S_{IRAP,}$ and the $O_{IRAP,}$ and (c) the surveys, the $O_{IRAP,}$ and the $S_{IRAP.}$ The specifics of these conditions are described below.

Setting and materials. The study will be conducted in small laboratory rooms on the Southern Illinois University campus in Carbondale, IL. A standard personal computer (Windows 7 operating system) with a mouse, keyboard, and display will be used for both the IRAP and survey sections of the experiment. The online survey provider to be used will be Survey Monkey (www.surveymonkey.com). Participants will read and sign an informed consent form (Appendix G) before participating in the study. A debriefing form (Appendix H) will be provided when the participant completes or leaves the study. Note that only one participant will be assessed in a room at a time.

The S_{IRAP} condition stimuli and screen presentation basics. In the S_{IRAP} condition, the participant will be presented with a series of 24-trials called a block. A review of Figure 1 may assist in understanding the basic IRAP stimuli nomenclature and arrangement per trial. Six blocks will be presented in a row during this condition. For each trial in the S_{IRAP} condition, the sample stimulus will consist of either the words “Black People” or “White People” (see Figures 2 and 3). One will be chosen randomly per trial; however, each will be given for 12 of the 24-trials for each block. The target stimuli will consist of six generally preferable, or “good”, social evaluations (i.e., good, worthy, deserving, superior, motivated, and smart) and six generally non-preferable, or “bad”, social evaluations (i.e., bad, deficient, inadequate, inferior, lazy, and

stupid). One of these 12 targets will be chosen randomly per trial; however each will be paired with “Black People” and “White People” once per block. In other words, each sample stimulus will be paired with each target stimulus for one trial during each block through the use of a randomization algorithm. For each trial, there will also be two stimuli that represent response choices at the bottom-left (i.e., Press ‘d’ for Similar) and bottom-right (i.e., Press ‘k’ for Different) sides of the screen. Note that the words “Similar” and “Different” will occasionally switch places through use of a randomization algorithm while the “Press ‘d’” and “Press ‘k’” aspects will remain static.

The S_{IRAP} condition procedure. First, the participants will receive training to familiarize them with both the general procedure and the specific rules that accompany each block. The participants will be told that they will be doing a sorting task. Then they will receive a paper containing examples of the four trial types and correct responses that they will see on the computer screen during the first block of trials (see Figure 2). Using this paper, the experimenter will verbally instruct the participants to choose: (a) “Similar” when “White People” is paired with “Good,” (b) “Different” when “White People” is paired with “Bad,” (c) “Different” when “Black People” is paired with “Good,” and (d) “Similar” when “Black People” is paired with “Bad.” Next, the participants will be told to be aware that the words “Similar” and “Different,” which are paired with “Press ‘d’” and “Press ‘k’” at the bottom of the screen, will change places randomly but that “Press ‘d’” and “Press ‘k’” will remain in the same place throughout the experiment. Then the participants will be shown the following rule on the computer screen: “In this block of trials, respond as if WHITE PEOPLE and GOOD are similar, BLACK PEOPLE and BAD are similar, WHITE PEOPLE and BAD are different, and BLACK PEOPLE and GOOD are different - Try to avoid the red X.” Participants will then be told that the red X will

appear when they do not follow the above rule accurately. They will also be told that (a) they may or may not agree with the rule, (b) we are not measuring agreement with the rule, and (c) we are measuring how well they can follow the rule.

At this point, the experimenter will remove the paper with the trial type examples and answers in order to verbally test the participants' understanding of the rule. The experimenter will state each of the four possible trial types, one at a time, and ask the participants to say "Similar" or "Different." After the participants can answer all four trial types correctly in a row, the experimenter will return the paper containing the four trial types with the correct responses to the participants; the experimenter will tell the participants that they are allowed to use it at any time. Participants will then be instructed that accuracy is very important. Finally, the participants will be told to approach the computer, put their fingers on the 'd' and 'k' keys, read the rule on the screen, and press the spacebar to begin. The 24-trial block, called Practice Block (PB) 1, will then begin. The experimenter must watch the participants during this Practice Block. This will ensure that the experimenter can immediately interrupt the task and discuss performance issues if the participant makes a third incorrect response in the 24-trial block; this will be repeated for every 3rd incorrect response that follows.

When PB1 is complete, the participants will be given a piece of paper (see Figure 3) that lists new correct responses required for PB2; they will be told to choose (a) "Different" when "White People" is paired with "Good," (b) "Similar" when "White People" is paired with "Bad," (c) "Similar" when "Black People" is paired with "Good," and (d) "Different" when "Black People" is paired with "Bad." Then participants will be shown a different rule on the computer screen that corresponds to these new choices: "In this block of trials, respond as if WHITE PEOPLE and BAD are similar, BLACK PEOPLE and GOOD are similar, WHITE PEOPLE and GOOD

are different, and BLACK PEOPLE and BAD are different - Try to avoid the red X." The rest of the PB2 procedures are identical to PB1.

If the participants' scores for the two Practice Blocks are at least 78% accurate and have a median latency of 2000 milliseconds or less, then the participants will be told about these criteria and that they have met them. Note that both criteria must be met for *each* block independently. These participants will next move to the Experimental Set (ES) of blocks: six blocks of 24-trials using the same stimuli as described above. The first ES block will use the same rule used in PB1, the second block will use the same rule used in PB2, and the rules will alternate in this fashion for the final 4 blocks. Before beginning the first ES block, the participants will be told to keep in mind that the final six blocks will alternate in the same way as the Practice Blocks, to make sure to read the rule on the screen before starting a block, to remember that accuracy remains important, and to inform the experimenter when the computer indicates they have finished the six blocks. At this time, the participants will begin the ES. The experimenter will not be watching the trials directly; however, if the experimenter notices that a participant's responding is becoming increasingly inaccurate, the experimenter will ask the participant to pause, review the trial types guide, and then proceed when they are clear about the answers that need to be provided.

If the participants fail to meet the accuracy and latency criteria for either PB1 or PB2, then the participant will repeat the two Practice Block sequence again. There will be two differences between the first set of Practice Blocks (i.e., PB1-PB2) and the other two potential sets of Practice Blocks (i.e., PB3-PB4 and PB5-PB6). First, participants will receive only one more planned instruction for the Practice Blocks, which will precede PB3. The experimenter will tell the participants that (a) the accuracy criteria is 78% or higher and the latency criteria is 2 seconds

or faster; (b) the words "Too Slow!" will appear in red near the bottom of the screen if the trial lasts longer than 2 seconds; and (c) accuracy will remain the top priority. The participants will then be allowed to do PB3 and PB4. The experimenter will continue to watch the participants in order to interrupt the task and discuss performance if the participants make a third incorrect response in a 24-trial block. As before, this will be repeated for every three incorrect responses that follow. Each participant may be run through the two Practice Block sequence up to three times total. If a participant meets the criteria during either PB3-PB4 or PB5-PB6, the procedure from the preceding paragraph will be followed. If a participant never meets criteria in the three sets of two Practice Blocks, the participant will still move to the ES blocks and the procedure from the preceding paragraph will be followed.

The O_{IRAP} condition procedure, stimuli and screen presentations. The O_{IRAP} condition will be identical to the S_{IRAP} condition except the sample stimuli will be "White People" and "bad" social evaluative terms (i.e., bad, deficient, inadequate, inferior, lazy, and stupid) while the target stimuli will be "Black People" and "good" social evaluative terms (i.e., good, worthy, deserving, superior, motivated, and smart; see Figure 4). This entails that the following pairings will be trained before the first O_{IRAP} condition Practice Block: choose (a) "Similar" when "White People" is paired with "Good," (b) "Different" when "White People" is paired with "Black People," (c) "Different" when "Bad" is paired with "Good," and (d) "Similar" when "Bad" is paired with "Black People" (see Figure 5). Then participants will be shown the following rule on the computer screen before the Practice Block begins: "In this block of trials, respond as if WHITE PEOPLE and GOOD are similar, BLACK PEOPLE and BAD are similar, WHITE PEOPLE and BLACK PEOPLE are different, and GOOD and BAD are different - Try to avoid the red X." The following pairings will be trained before the second O_{IRAP} Practice Block:

choose (a) “Different” when “White People” is paired with “Good,” (b) “Similar” when “White People” is paired with “Black People,” (c) “Similar” when “Bad” is paired with “Good,” and (d) “Different” when “Bad” is paired with “Black People” (see Figure 6). Then participants will be shown the following rule on the computer screen before the block begins, “In this block of trials, respond as if WHITE PEOPLE and GOOD are different, BLACK PEOPLE and BAD are different, WHITE PEOPLE and BLACK PEOPLE are similar, and GOOD and BAD are similar -Try to avoid the red X.”

Due to (a) the preliminary nature of this study and (b) the procedural attributes of the IRAP, not all standard “descriptive racial:evaluative adjective” stimulus pairings will be examined. The stimulus pairings “White People:Good” and “Bad:Black People” to be used in the O_{IRAP} condition were chosen based on preliminary data that indicated they would engender higher predictive validity than “Bad:White people” and “Black People:Good.” As these stimulus pairings cannot be counterbalanced with oppositional trial types within a six block O_{IRAP} sequence, certain participants could potentially perceive this study as having an inherent racial bias. It should be noted that multiple studies have been done using these stimulus combinations in our lab, albeit in a counterbalanced fashion; no participant has yet registered such a complaint. Nonetheless, it is important to attempt to mitigate a strong negative reaction to the study itself if at all possible. To this end, our informed consent and debriefing forms (see Appendices G and H) attempt to ensure participants’ awareness of: (a) the possibility encountering disturbing racial stimulus pairings, (b) the option to withdraw from the study at any time, (c) the rationale for using the stimulus pairings, and (d) the contact information they can utilize to register concerns.

Survey administration. The self-report measures will be presented in random order via an online survey provider. The experimenter will enter the participant’s number on the website and

then will instruct the participant to fill out the surveys (delineated above) as accurately as possible. If participants have questions, they will be told to just answer the question as best they can. If the question is technical (e.g., what does this word mean, how do I click the button I want, etc.), then the experimenter will assist the participant in the most minimalistic fashion possible to solve the issue at hand.

CHAPTER 3

PLANNED ANALYSES

Power Analysis

A prospective sample size of 85 was calculated online using $\alpha = .05$, $\beta = .2$, and $r = .3$ (see http://www.cct.cuhk.edu.hk/stat/other/correlation.htm).

Reliability

Internal consistency will be assessed using Cronbach's alpha for the four self-report measures (i.e., the MRS, SDO, ESRS, and TTQ). Split-half correlations will be used to assess the reliability of the scores from the S_{IRAP} condition and the O_{IRAP} condition.

Order Effects

The four self-report measures (i.e., the MRS, SDO, ESRS, and TTQ), the overall D_{IRAP} score for the S_{IRAP} condition, and the overall D_{IRAP} score for the O_{IRAP} condition will be examined for order effects using a MANOVA. Four comparisons will be analyzed: the survey condition's effect on the IRAP scores (i.e., overall D_{IRAP} scores from the S_{IRAP} and O_{IRAP} conditions), the IRAP condition's effect on the survey scores, the S_{IRAP} condition's effect on the O_{IRAP} condition's D_{IRAP} scores, and the O_{IRAP} condition's effect on the S_{IRAP} condition's D_{IRAP} scores.

Hypotheses:

Associations between the 5 D_{IRAP} scores from the S_{IRAP} condition, the 5 D_{IRAP} scores from the O_{IRAP} condition, and the scores from the four self-report measures (i.e., the MRS, SDO, ESRS, and TTQ) will be examined using a Pearson's product-moment correlation matrix (see Table 1). This will allow the analysis of the hypotheses that (a) the White Person:Good trials in the S_{IRAP} condition will be correlated with the White Person:Good trials in the O_{IRAP} condition; (b) the Black Person:Bad trials in the S_{IRAP} condition will be correlated with the Bad:Black

Person trials in the O_{IRAP} condition; (c) the MRS scores will be correlated with all five S_{IRAP} trial types, as well as the White Person:Good and Bad:Black Person O_{IRAP} trial types; and (d) the SDO scores will be correlated with all five S_{IRAP} trial types, as well as the White Person:Good and Bad:Black Person O_{IRAP} trial types.

Demographics:

The demographic data will also be presented (see Table 2).

Table 1

Summary of Intercorrelations, Means, and Standard Deviations for Scores on the IRAP and Surveys

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	*M*	*SD*
1. S_{IRAP} all trials																
2. S_{IRAP} BP-G trials																
3. S_{IRAP} BP-B trials																
4. S_{IRAP} WP-G trials																
5. S_{IRAP} WP-B trials																
6. O_{IRAP} all trials																
7. O_{IRAP} WP-G trials																
8. O_{IRAP} B-BP trials																
9. O_{IRAP} WP-BP trials																
10. O_{IRAP} G-B trials																
11. MRS																
12. SDO																
13. ESRS																
14. TTQ																
M																
SD																

Note. IRAP = Implicit Relational Assessment Procedure; MRS = Modern Racism Scale; SDO = Social Dominance Orientation Scale; ESRS = Evaluative Stimulus Rating Scale; TTQ = Trial Type Questionnaire; S_{IRAP} = Standard IRAP Condition; O_{IRAP} = Orthogonal IRAP Condition; BP = Black People; WP = White People; G = Good (i.e., positive social labels such as good, worthy, deserving etc.); B = Bad (i.e., negative social labels such as bad, deficient, inadequate, etc.)

Table 2

Demographic Information

Characteristic	Total (n = ___)	Percentage
Gender		
Male		
Female		
Category 3		
Race/Ethnicity		
Black or African-American		
White or Caucasian		
Category 3		
Category 4		
Religion		
Category 1		
Category 2		
Category 3		
Category 4		
Political Affiliation		
Democrat		
Republican		
Category 3		
Socioeconomic Status		
$25,000 or less		
$25,001-$50,000		
$50,001-$75,000		
$75,001 or more		

Note. Mean age = ___

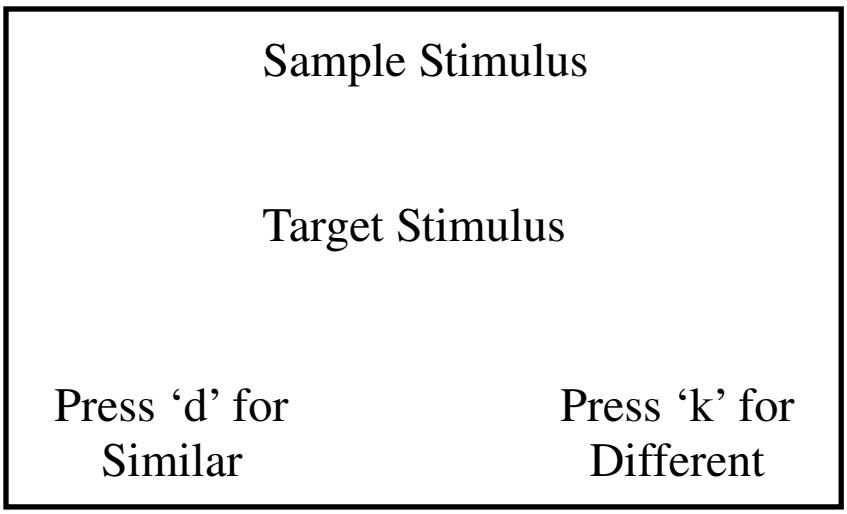

Figure 1. A generic Implicit Relational Assessment Procedure (IRAP) screen example. The IRAP is essentially a computerized sorting task. An individual IRAP trial involves the presentation of four stimuli: A sample stimulus, a target stimulus, and two response options. The sample and target stimuli can be any combination of words and pictures. These stimuli are determined pre-experimentally and entered into the program before administration. Participants press the “d” and “k” keys on the keyboard to respond to the trial. The response descriptions under the “Press ‘d’ for” and “Press ‘k’ for” (i.e., Similar and Different) switch places in a randomized fashion between trials while “Press ‘d’” and “Press ‘k’” remain stationary. A block of trials consists of pairing all possible of sample and target stimuli using randomization algorithms (e.g., 24 pairings per block for the experiment herein).

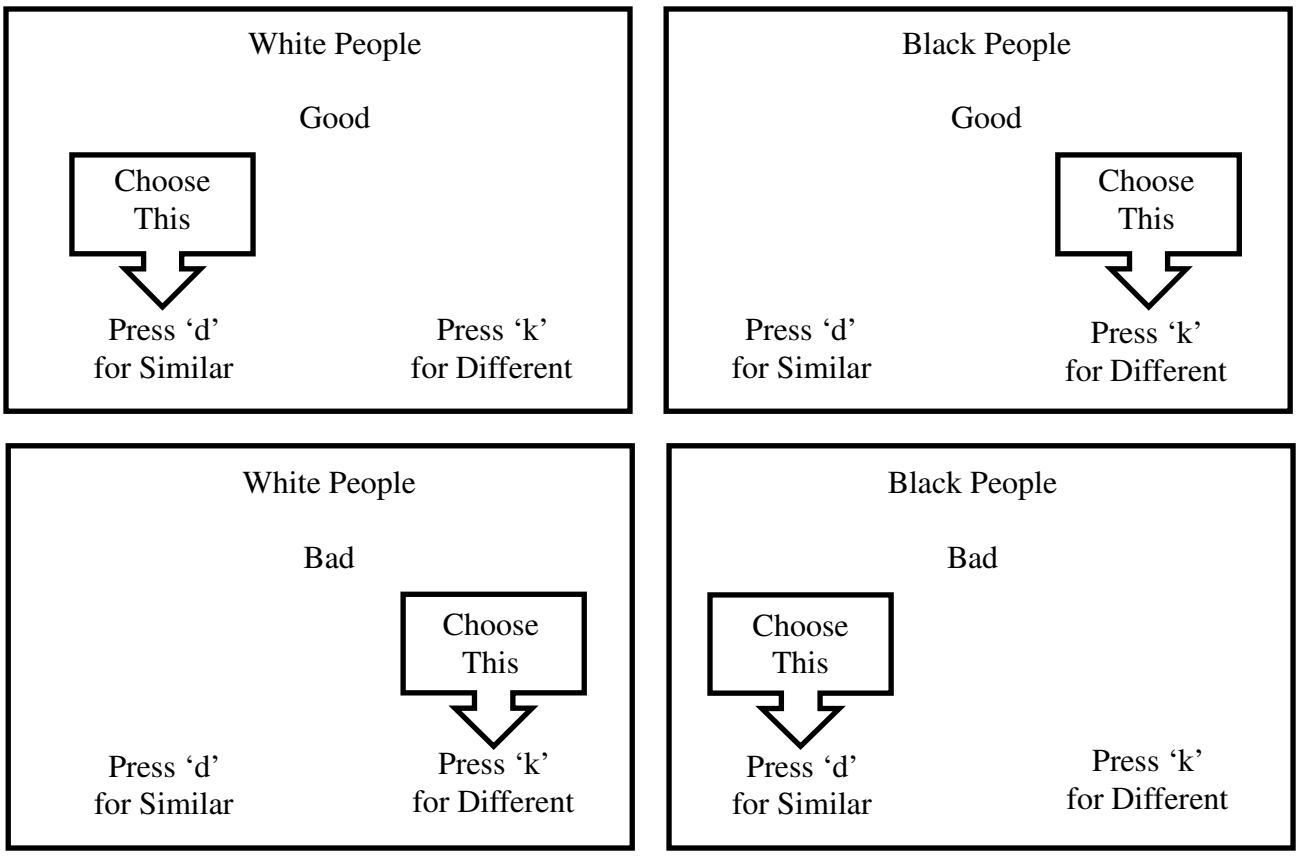

Figure 2. The four trial types presented in the S_{IRAP} condition for the rule: WHITE PEOPLE and GOOD are similar, BLACK PEOPLE and BAD are similar, WHITE PEOPLE and BAD are different, and BLACK PEOPLE and GOOD are different. Participants are trained to respond to this rule accurately before experimental IRAP data are collected. The "Choose This" arrowed boxes presented above clarify which responses the participant is trained to choose during this block of trials; these arrowed boxes are not present on the screen during any trials.

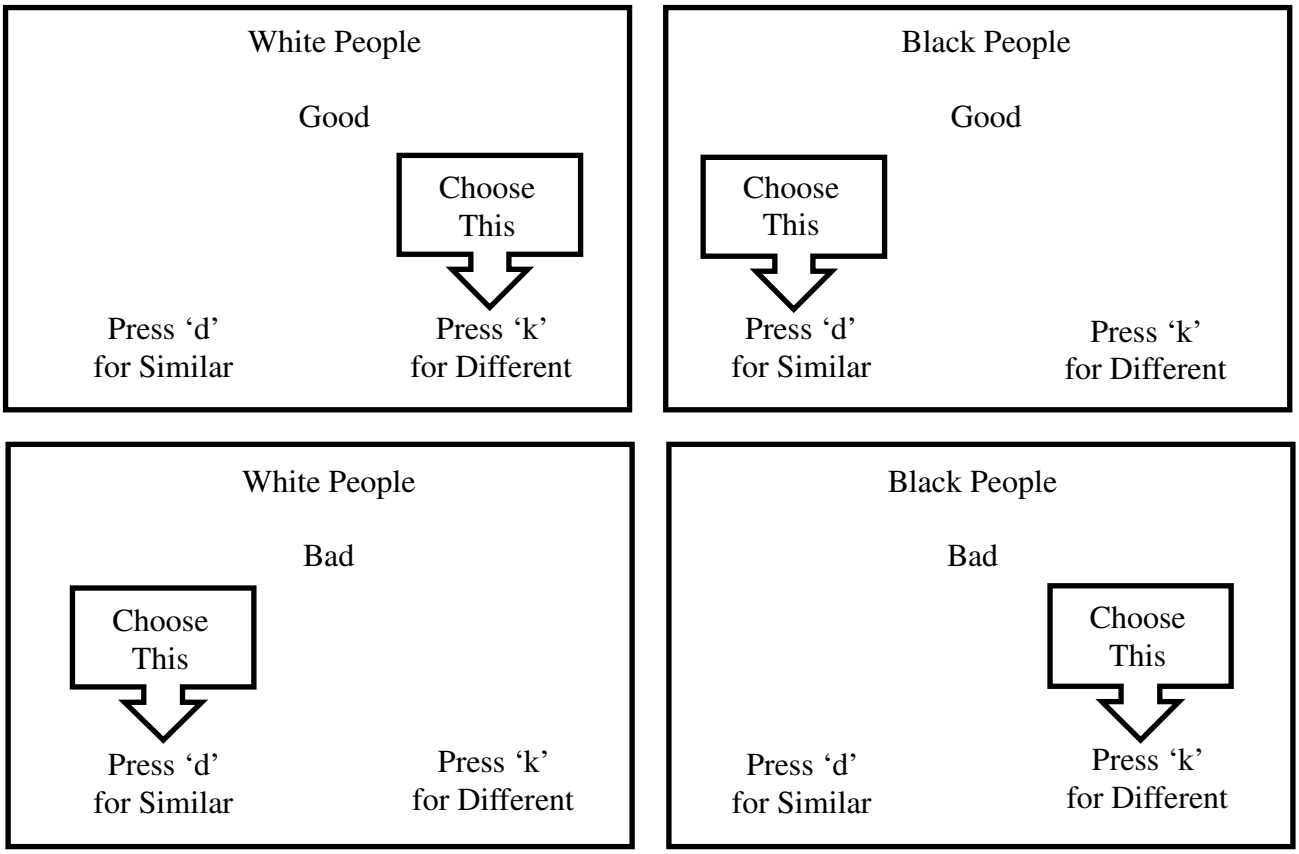

Figure 3. The four trial types presented in the S_{IRAP} condition for the rule: WHITE PEOPLE and GOOD are different, BLACK PEOPLE and BAD are different, WHITE PEOPLE and BAD are similar, and BLACK PEOPLE and GOOD are similar. Participants are trained to respond to this rule accurately before experimental IRAP data are collected. The "Choose This" arrowed boxes presented above clarify which responses the participant is trained to choose during this block of trials; these arrowed boxes are not present on the screen during any trials.

Standard IRAP Stimuli

Sample Stimuli	Black People	White People
Target Stimuli	Good	Bad

Orthogonal IRAP Stimuli

Sample Stimuli	White People	Bad
Target Stimuli	Black People	Good

Figure 4. A visual representational of the stimuli differences between the standard Implicit Relational Assessment Procedure (S_{IRAP}) condition and the orthogonal Implicit Relational Assessment Procedure (O_{IRAP}) condition. In the S_{IRAP} procedure, the sample stimuli row contains two different social categories and the target stimuli row contains two different social evaluations. For this study, interest lies in pairing those stimuli in a different fashion. In this case, all the cells are essentially rotated 90 degrees (i.e., orthogonally) counterclockwise from the S_{IRAP} condition to the O_{IRAP} condition to create the new pairings that will be investigated herein.

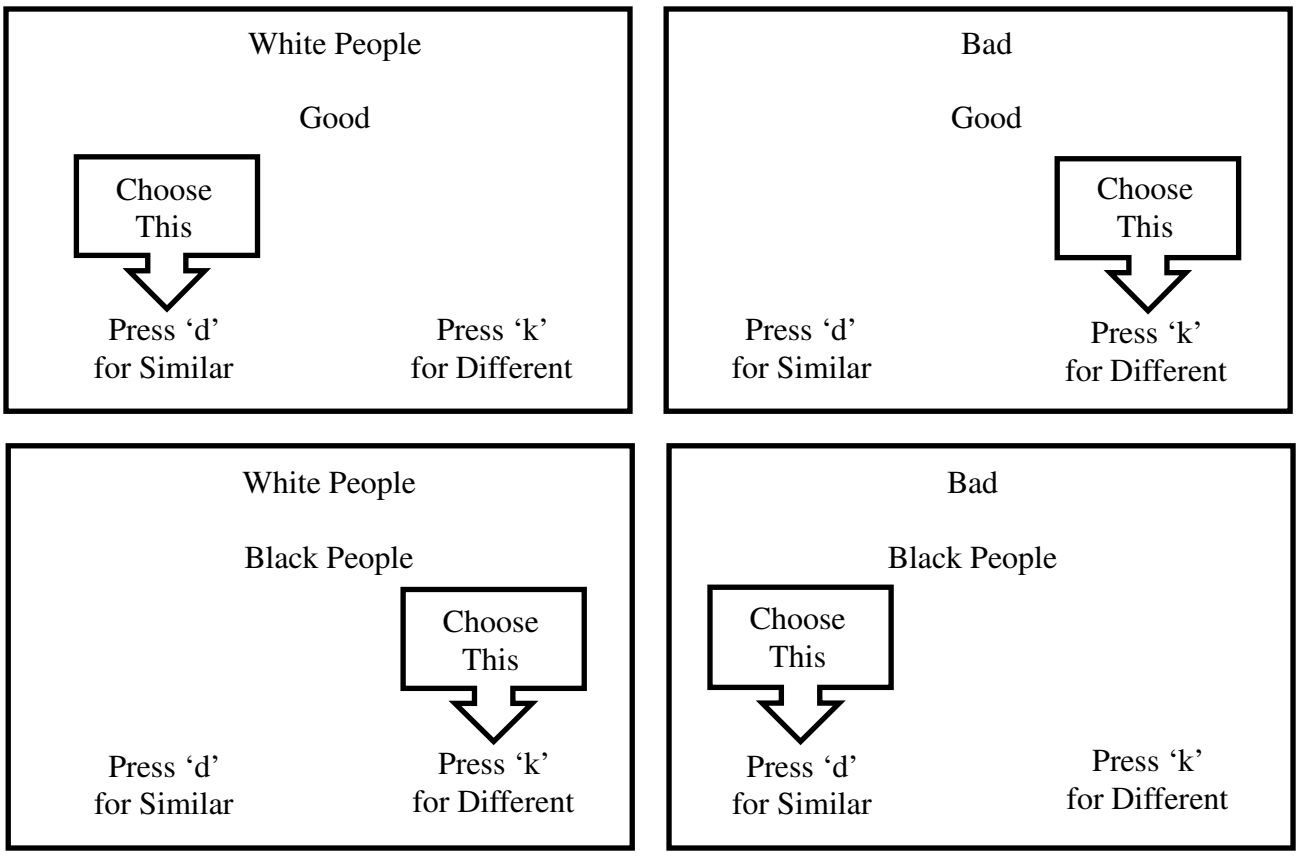

Figure 5. The four trial types presented in the O_{IRAP} condition for the rule: WHITE PEOPLE and GOOD are similar, BLACK PEOPLE and BAD are similar, WHITE PEOPLE and BLACK PEOPLE are different, and GOOD and BAD are different. Participants are trained to respond to this rule accurately before experimental IRAP data are collected. The "Choose This" arrowed boxes presented above clarify which responses the participant is trained to choose during this block of trials; these arrowed boxes are not present on the screen during any trials.

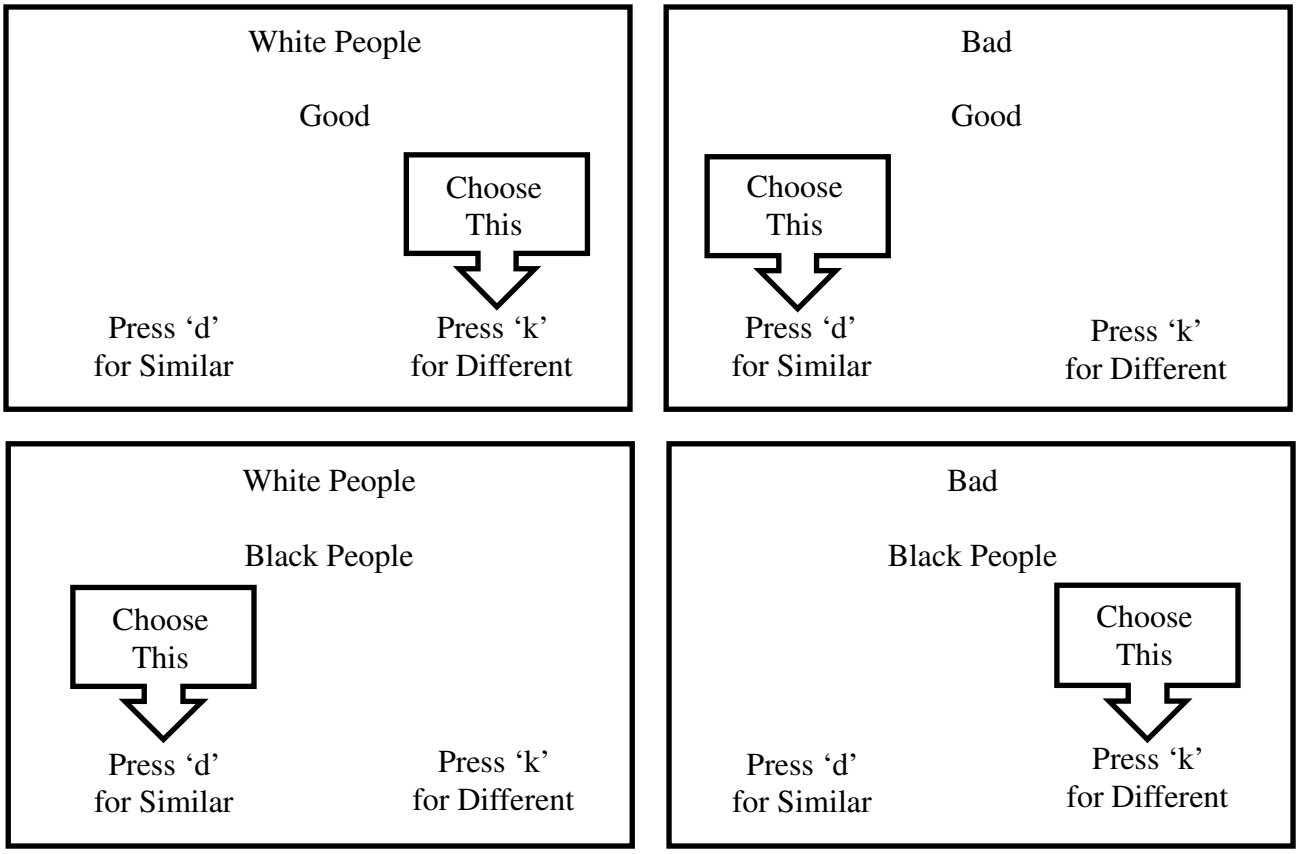

Figure 6. The four trial types presented in the O_{IRAP} condition for the rule: WHITE PEOPLE and GOOD are different, BLACK PEOPLE and BAD are different, WHITE PEOPLE and BLACK PEOPLE are similar, and GOOD and BAD are similar. Participants are trained to respond to this rule accurately before experimental IRAP data are collected. The "Choose This" arrowed boxes presented above clarify which responses the participant is trained to choose during this block of trials; these arrowed boxes are not present on the screen during any trials.

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APPENDICES

Appendix A

D_{IRAP} Scoring and Rationale

Aggregating response latency into a mean in order to examine implicit attitudes is difficult due to individual latency differences across participants. Thus, Greenwald, Nosek, and Banaji (2003) developed the D-algorithm for the Implicit Association Test to attenuate individual differences in response time that are due to innumerable potential factors (e.g., learning history, environmental effects, etc.). Since the Implicit Relational Assessment Procedure also uses similar latency measures and the D-algorithm proved to be a robust and valid measure of implicit attitude, the D_{IRAP} algorithm was created by modifying the D-algorithm (Vahey et al., 2009). The D_{IRAP} algorithm transforms the raw latency data for each participant using the following steps:

1. Only response-latency data from test blocks are used;
2. Latencies above 10,000 ms are eliminated from the dataset;
3. The data are eliminated for a participant for whom more than 10% of test-block trials have latencies less than 300 ms;
4. Compute 12 standard deviations for the four trial types: 4 for the response latencies from across test blocks 1 and 2, 4 from across the latencies from test blocks 3 and 4, and a further 4 from across test blocks 5 and 6;
5. Compute the 24 mean latencies, one for each of the four trial types in each of the six test blocks;
6. For each pair of test blocks, use step 5 to compute difference scores for each of the four trial types, by subtracting the mean latency of each trial type's consistent test trials from the mean latency of their corresponding inconsistent test trials;
7. Divide each difference score by its corresponding standard deviation from step 4, yielding 12 DIRAP scores—1 score for each trial type for each of the 3 pairs of test blocks;
8. Calculate 4 overall trial-type DIRAP scores by averaging the 3 scores for each trial type across the three pairs of test blocks;

9. Two compound DIRAP scores, one for positive target words (DIRAP-POS) and one for negative target words (DIRAP-NEG), were then calculated by averaging the two positive and then the two negative trial-type DIRAP scores from step 8; and

10. We calculated a single overall DIRAP score called DIRAP-Total by averaging the 4 trial-type DIRAP scores from step 8. (Vahey et al., 2009, p. 379)

Appendix B

Demographic Information

Age (in years) _____

Gender
____ Female
____ Male
____ Other (please specify): _____

Race/Ethnicity (select as many as are appropriate for you)
____ American Indian or Alaska Native
____ Asian
____ Black or African-American
____ Hispanic or Latino
____ Native Hawaiian or Other Pacific Islander
____ White or Caucasian
____ Other (please specify): _____

Religion (select the category that you most identify with)
____ Agnostic (undecided as to the existence of God or an afterlife)
____ Atheist (do not believe in the existence of God or an afterlife)
____ Buddhist
____ Christian (any denomination of Catholics, Protestants, etc.)
____ Hindu
____ Jewish
____ Muslim
____ Other (please specify) _____

Political Affiliation (select the party that you most identify with)
____ Democrat
____ Republican
____ Other (please specify) _____

Socioeconomic Status (if someone other than you is providing more than 50% of your income, please report his or her annual income instead)
____ $25,000 or less
____ $25,001-$50,000
____ 50,001-$75,000
____ $75,001 or more

Appendix C

Modern Racism Scale (MRS)

Please mark the response that most accurately represents your views.

1. Over the past few years, Blacks have gotten more economically than they deserve.

Strongly Disagree 1 2 3 4 5 Strongly Agree

2. Over the past few years, the government and news media have shown more respect for Blacks than they deserve.

Strongly Disagree 1 2 3 4 5 Strongly Agree

3. It is easy to understand the anger of Black people in America.

Strongly Disagree 1 2 3 4 5 Strongly Agree

4. Discrimination against Blacks is no longer a problem in the United States.

Strongly Disagree 1 2 3 4 5 Strongly Agree

5. Blacks are getting too demanding in their push for equal rights.

Strongly Disagree 1 2 3 4 5 Strongly Agree

6. Blacks should not push themselves where they are not wanted.

Strongly Disagree 1 2 3 4 5 Strongly Agree

Appendix D

Social Dominance Orientation Scale (SDO)

Which of the following objects or statements do you have a positive or negative feeling towards? Under each object or statement, circle a number from 1 to 7 which represents the degree of your positive or negative feeling.

1	2	3	4	5	6	7
very negative	negative	slightly negative	neither positive nor negative	slightly positive	positive	very positive

1. Some groups of people are simply not the equals of others.

Very Negative 1 2 3 4 5 6 7 Very Positive

2. Some people are just more worthy than others.

Very Negative 1 2 3 4 5 6 7 Very Positive

3. This country would be better off if we cared less about how equal all people were.

Very Negative 1 2 3 4 5 6 7 Very Positive

4. Some people are just more deserving than others.

Very Negative 1 2 3 4 5 6 7 Very Positive

5. It is not a problem if some people have more of a chance in life than others.

Very Negative 1 2 3 4 5 6 7 Very Positive

6. Some people are just inferior to others.

Very Negative 1 2 3 4 5 6 7 Very Positive

7. To get ahead in life, it is sometimes necessary to step on others.

Very Negative 1 2 3 4 5 6 7 Very Positive

8. Increased economic equality.

Very Negative 1 2 3 4 5 6 7 Very Positive

9. Increased social equality.

Very Negative 1 2 3 4 5 6 7 Very Positive

10. Equality.

Very Negative 1 2 3 4 5 6 7 Very Positive

11. If people were treated more equally we would have fewer problems in this country.

Very Negative 1 2 3 4 5 6 7 Very Positive

12. In an ideal world, all nations would be equal.

Very Negative 1 2 3 4 5 6 7 Very Positive

13. We should try to treat one another as equals as much as possible.

Very Negative 1 2 3 4 5 6 7 Very Positive

14. It is important that we treat other countries as equals.

Very Negative 1 2 3 4 5 6 7 Very Positive

Appendix E

Evaluative Stimulus Rating Scale (ESRS)

Please refer to this scale to indicate how positively or negatively you perceive each word listed below. Circle one number for each word listed below.

Extremely Negative	-5	-4	-3	-2	-1	0	1	2	3	4	5	Extremely Positive
Deficient:	-5	-4	-3	-2	-1	0	1	2	3	4	5	
Deserving:	-5	-4	-3	-2	-1	0	1	2	3	4	5	
Good:	-5	-4	-3	-2	-1	0	1	2	3	4	5	
Lazy:	-5	-4	-3	-2	-1	0	1	2	3	4	5	
Worthy:	-5	-4	-3	-2	-1	0	1	2	3	4	5	
Smart:	-5	-4	-3	-2	-1	0	1	2	3	4	5	
Inadequate:	-5	-4	-3	-2	-1	0	1	2	3	4	5	
Superior:	-5	-4	-3	-2	-1	0	1	2	3	4	5	
Stupid:	-5	-4	-3	-2	-1	0	1	2	3	4	5	
Bad:	-5	-4	-3	-2	-1	0	1	2	3	4	5	
Motivated:	-5	-4	-3	-2	-1	0	1	2	3	4	5	
Inferior:	-5	-4	-3	-2	-1	0	1	2	3	4	5	

Appendix F

Trial Type Questionnaire (TTQ)

Black people are good.

-3	-2	-1	0	+1	+2	+3
Strongly Disagree	Moderately Disagree	Mildly Disagree	Neutral	Mildly Agree	Moderately Agree	Strongly Agree

Black people are bad.

-3	-2	-1	0	+1	+2	+3
Strongly Disagree	Moderately Disagree	Mildly Disagree	Neutral	Mildly Agree	Moderately Agree	Strongly Agree

White people are good.

-3	-2	-1	0	+1	+2	+3
Strongly Disagree	Moderately Disagree	Mildly Disagree	Neutral	Mildly Agree	Moderately Agree	Strongly Agree

White people are bad.

-3	-2	-1	0	+1	+2	+3
Strongly Disagree	Moderately Disagree	Mildly Disagree	Neutral	Mildly Agree	Moderately Agree	Strongly Agree

White people and Black people are similar.

-3	-2	-1	0	+1	+2	+3
Strongly Disagree	Moderately Disagree	Mildly Disagree	Neutral	Mildly Agree	Moderately Agree	Strongly Agree

White people and Black people are different.

-3	-2	-1	0	+1	+2	+3
Strongly Disagree	Moderately Disagree	Mildly Disagree	Neutral	Mildly Agree	Moderately Agree	Strongly Agree

The words good and bad are similar.

-3	-2	-1	0	+1	+2	+3
Strongly Disagree	Moderately Disagree	Mildly Disagree	Neutral	Mildly Agree	Moderately Agree	Strongly Agree

The words good and bad are different.

-3	-2	-1	0	+1	+2	+3
Strongly Disagree	Moderately Disagree	Mildly Disagree	Neutral	Mildly Agree	Moderately Agree	Strongly Agree

Appendix G

Informed Consent

The objective of this study is to find out if a computerized task can be a useful measure of behavior. More specifically, we want to investigate the Implicit Relational Assessment Procedure (IRAP) as a potential measure of attitudes towards race and how it relates to several self-report psychological measures.

I understand that as a participant in this study, I will be asked to complete a computer task and a variety of questionnaires. As a participant in this study, I agree to complete the questionnaires and the other computerized tasks. This study will require approximately 60 minutes of my time. For my participation, I will receive 4 credits. Furthermore, I understand that all material received from my participation will be kept confidential and that my name/identity will in no way be connected with my answers. Instead, only an assigned participant number will be used in association with my answers.

These activities will involve words and statements about racial issues. It is possible that I may find some parts of this study to be uncomfortable. I understand that my participation in this research is voluntary and that I may withdraw from the study at any time, without penalty. If I have any questions or concerns about this study, I may contact Dr. Chad Drake at 618-453-8331.

I have read and understand the information above,

Signature Date

Proposed for this project and subject to future approval

Appendix H

Debriefing

You have just completed a study involving the Implicit Relational Assessment Procedure (IRAP). The study investigators are interested in examining the psychometric properties of the IRAP (such as reliability and validity) so that it may one day be used as a measure for applied purposes, such as psychotherapy and education. In order to establish the usefulness of this measure, we need to administer the IRAP along with other measures so that we can understand how people react to the measure.

The rules used and pairings of words can be distressing for some people. These particular word pairings were used because they have proven to be helpful in investigating racial stereotypes and issues. In no way are any of these rules or word pairings meant to indicate anything about our opinions of race.

We appreciate your willingness to contribute to our efforts to understand the IRAP. If you have any additional questions or need information regarding counseling for any persistent, negative emotional responses that occur following this study, please contact Dr. Chad Drake at 618-453-8331.

Proposed for this project and subject to future approval

VITA

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A Systematic Exploration of Different Stimulus Combinations Using the Implicit Relational Assessment Procedure

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