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Using Community Data to Test the Discriminate Validity of Ethnic/Racial Group IATs

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Abstract

The present study used a multi-method, multi-measure, multi-group approach to investigate the discriminant validity of prejudice-related IATs. Community members from three ethnic/racial groups in the U.S. completed IATs and explicit measures of attitudes toward African Americans and Latinos, with Whites used as the comparison group. The results of this study provided strong support for the discriminant validity of the IATs by showing, (a) expected patterns of variation among the three participant groups that were unique to each IAT, (b) unique relations between responses on each IAT and corresponding (same-group) explicit measures of prejudice, and (c) invariance across the three participant groups in the degree to which the attitude measures loaded on two latent factors, indicating distinct attitudes toward African Americans and Latinos.

The Implicit Association Test (IAT; Greenwald, McGhee & Schwartz, 1998) has garnered tremendous attention since its introduction ten years ago, especially with regard to its measurement of individual differences in implicit group attitudes (Nosek, Greenwald, & Banaji, 2005, 2007). Respondents on the IAT are asked to categorize stimuli into one of four superordinate categories, representing two concept dimensions (e.g., *racial groups*: Black vs. White; and *evaluation*: good vs. bad). The strength of an individual respondent's association between concepts is determined by his or her speed in correctly categorizing the stimuli under two different sorting conditions. Most White Americans, for example, are significantly faster to complete the task when the stimuli representing the "Black" and "bad" categories require the same response (e.g., left key press) and the stimuli representing the "White" and "good" categories require another response (e.g., right key press), compared to when "Black" and "good" responses are the same and "White" and "bad" responses are the same, indicating an implicit preference for White Americans over Black Americans (Nosek, Banaji, & Greenwald, 2002; Nosek et al., 2005).

The IAT has arguably become the dominant measure of implicit attitudes due to its robust effects, ease of administration, reliability, and predictive validity (see Lane, Banaji, Nosek, & Greenwald, 2007; Nosek et al., 2007). In the intergroup domain specifically, the measure has had success in predicting a variety of relevant judgments and behaviors, including

judgments of individual minority group members, nonverbal behavior during inter-group interactions, preference for a White task partner over a Black partner, and reports of racial discrimination including verbal slurs and physical harm (see Greenwald, Poehlman, Uhlmann, & Banaji, 2009).

The Discriminant Validity of the IAT

Notwithstanding its successes, the IAT has been criticized on the degree to which it measures associations (e.g., White+good) or other cognitive processes that may be related to both task performance and biased judgments. For example, individual differences in the costs of task-switching (Mierke & Klauer, 2001) or in reliance on figure-ground asymmetries (Rothermund & Wentura, 2001) could influence both performance on the IAT and biased group judgments (Gawronski, 2002). As such, the IAT might not be measuring an individual's implicit attitude toward a specific group but rather a more general process that could underlie a number of different "attitudes". Although the IAT may have good reliability and predictive validity, it could still have poor *discriminant validity* in terms of what it is measuring.

Contributing to this potential problem is the IAT's reliance on comparative judgments to complete the tasks: Black vs. White, male vs. female, elderly vs. young adult, etc. These built-in comparisons mean that results from a specific IAT could be interpreted with regard to either or both groups. For example, being faster to categorize White+good than Black+good may indicate a pro-White attitude, an anti-Black attitude, or some combination of the two. In many situations such a distinction is unimportant and the IAT will still produce valid predictions, such as the prediction of a White applicant being hired over a Black applicant, whether the underlying sentiment is pro-White or anti-Black. However, since one dominant group is typically contrasted with a variety of minority groups (e.g., Whites in the U.S. compared with other ethnic/racial groups), it is important to determine whether a particular ethnic/racial IAT reveals an attitude that is specific to the minority group of interest or a general pro-White attitude.

To our knowledge, only one study has investigated this issue. Gawronski (2002) administered two group IATs (German:Asian and German:Turkish) and measures of measures of explicit attitudes to a sample of German participants. The results revealed relatively modest correlations between the two IATs and between each IAT and its respective (same-group) explicit prejudice measure ($r \approx .30$), consistent with the hypothesis that the attitude estimates would be related but not redundant. Structural equation modeling further revealed significant relations between each IAT and the same-group explicit prejudice measure, and simultaneously, that the cross paths between implicit and explicit attitudes toward different groups were not significant.

Gawronski's results provide support for the discriminant validity of the IAT, but a more comprehensive analysis would demonstrate patterns of discriminant validity that are consistent with expected variations among different participant groups. Thus, the goal of the present study was to examine the discriminant validity of the IAT, using data collected from a diverse sample of community members. We recruited African American, Latino, and White community members to complete IATs and explicit attitude measures toward African Americans (Blacks) and Latinos, compared with Whites. We then examined whether the patterns of responses indicated distinct attitudes toward Blacks and Latinos.

Hypotheses

1. As shown in prior research on attitudes toward high-status vs. low-status groups (see Jost et al., 2004), the IATs are expected to reveal overall pro-White attitudes.

However, the degree to which this is true is expected to differ by participants' ethnic/racial group and IAT.

- 1.A. Black:White IAT: African American participants ought to show significantly less pro-White bias than White participants. We expect that additionally, the Latino participants will also demonstrate less pro-White bias than White participants, but more bias than the African American participants, since Latinos will not be responding to their ingroup on this IAT and White Americans will tend to be favored as the high-status group.
- 1.B. Latino:White IAT: Latino participants are expected to show significantly less pro-White bias than White participants, and this time the African American participants are expected to demonstrate a level of bias that is in-between the other two groups since on this IAT they will not be responding to their ingroup.
2. Implicit attitudes revealed by each IAT are expected to predict explicit attitudes toward the same groups, even after shared method variance is controlled.
 - 2.A. Attitudes on the Black-White IAT ought to predict explicit attitudes toward Blacks but not explicit attitudes toward Latinos (vs. Whites), controlling for method variance.
 - 2.B. Attitudes on the Latino-White IAT ought to predict explicit attitudes toward Latinos but not explicit attitudes toward Blacks (vs. Whites), controlling for method variance.
3. Another way to state 2.A and 2.B is in the terms of multi-group confirmatory factor analysis, which has the added advantage of testing for participant group differences in these effects.
 - 3.A. This analysis is expected to support a two-factor latent-variable model in which implicit and explicit attitudes toward Blacks uniquely load on a "Black attitude" factor that is distinct from a second "Latino attitude" factor, with implicit and explicit attitudes toward Latinos uniquely loading on the latter.
 - 3.B. The above specified model is expected to hold for each of the three participant groups, although the groups ought to differ in their means and possibly their variances.

Methods

To obtain a broad sample of community members, participants were recruited from five patient waiting areas within Denver Health, the urban healthcare system serving a disadvantaged, ethnically/racially diverse population in the Denver metropolitan area. Participants completed the study measures on portable Macintosh computers, in either English or Spanish as desired, in return for a \$20 gift card.¹ The protocol for this study was approved by the Colorado Multiple Institutional Review Board.

Of the 284 individuals who consented to participate, the data from 43 were dropped for the following reasons: 4 participants were unable to complete the tasks due to illiteracy or other physical/cognitive problems; 13 participants had computer problems (e.g., power failures); 7

¹We are most grateful to Gwynn Brownell, Claudia Cespedes and Inez Smith for their help with this study.

participants responded too quickly for valid measures (see Greenwald, Nosek, & Banaji, 2003); and 19 participants did not self-identify with one of the focal ethnic/racial participant groups. For the remaining 241 participants, the average age category was 36–45 years-old, the average family income category was \$16,000 – \$35,000 and the average education category was just above high school; 63% were women; 38% were Latino, 34% were White, and 28% were African American.

Study Measures

IAT Measures of Implicit Ethnic/Racial Attitudes—Each participant completed the measures self-paced, beginning with 13 blocks of IAT trials. The first seven blocks were designed to assess implicit attitudes toward Latinos vs. Whites, with an initial 2 blocks of 20 single-category trials (positive vs. negative, and White vs. Latino), 2 blocks of 20 then 40 “consistent” dual-category trials (White+positive vs. Latino+negative), 1 block of 40 “switched” single-category trials (Latino vs. White), and 2 final blocks of 20 then 40 “inconsistent” dual-category trials (Latino+positive vs. White+negative). Blocks 8–13 used the same block structure to assess implicit attitudes toward Blacks vs. Whites. The two measures differed only in their face stimuli.

Because the focus of the study was on comparisons among participant groups and the covariances of IAT and explicit attitude measures, all participants received the same order of measures, with the “consistent” blocks of an IAT always appearing before the “inconsistent” blocks. Prior research has shown that this block ordering might result in a small increase in pro-White bias on the IAT (Greenwald & Nosek, 2001). Nosek et al. (2005) demonstrated, however, that giving participants 40 trials to practice sorting the categories that have switched positions, as we did, usually eliminates this order effect. Nonetheless, caution should be used in interpreting the absolute values of the IAT effects produced in this study.

IAT stimuli: The pictures used to represent Latinos, Blacks, and Whites were selected from a publicly accessible website and edited to portray only the face, from hairline to chin and from ear to ear. On the basis of pre-testing, 10 Latino, 10 Black, and 10 White photos were chosen (5 male and 5 female in each group). Across groups, the photographs were matched in perceived age, attractiveness, and agreement on ethnic/racial identity ($M=99\%$ correct identification for all three groups; contact the first author for pretesting details).

The stimuli used to represent the categories good and bad were selected from those commonly used in IAT research and were, respectively, *pleasant, delight, helpful, joy, beautiful, smile, wonderful, enjoy, cheerful, and success; horrible, angry, terrible, tragic, hate, destroy, brutal, evil, disaster, and ugly*.

IAT Scoring: Scores from each IAT were calculated for each participant, using the dscore method advised by Greenwald et al. (2003). The internal reliability of the Latino-White IAT was $\alpha=.76$, and the reliability of the Black-White IAT was $\alpha=.60$.

Measures of Explicit Ethnic/Racial Attitudes—Explicit ethnic/racial attitudes were assessed with two measures for each of the three groups of interest: Blacks, Latinos and Whites. The first measure was the Feeling Thermometer Scale, on which participants were asked to type in a number for each ethnic/racial group using a 0 – 100 degree scale to describe how warmly or coolly they feel toward the group. The second measure was a set of three semantic differential scales, on which participants were asked to rate each group as, “hardworking – lazy”, “foolish – wise,” and “cooperative – hostile”. All trait ratings were blocked by target group.

Explicit Attitude Scoring: The explicit attitude measures were scored to be as analogous to the IATs as possible. A Black:White thermometer score was calculated by subtracting the warmth rating of Blacks from the warmth rating of Whites, and a Latino:White thermometer score was calculated by subtracting the warmth rating of Latinos from the warmth rating of Whites. The same procedure was followed for the trait ratings, with the additional step of averaging the three difference scores for each trait, for each group: Black:White and Latino:White. The internal reliability of the averaged Latino-White trait rating scale was $\alpha=.58$, and the reliability of the Black-White trait rating scale was $\alpha=.61$.

Results

Table 1 provides descriptive information for all of the attitude measures, overall and by participant group.² These statistics were largely consistent with past research: overall pro-White biases in implicit attitudes and little overall explicit bias. Of greater importance at present is the degree to which the two types of attitudes vary and co-vary according to participants' ethnic/racial group, as an indication of the measures' discriminant validity. These are questions to which we now turn.

Between-Group Differences on the IAT Measures

As shown in Figure 1 (see also Table 1), there were significant differences among the three ethnic/racial groups in both Black:White IAT scores and Latino:White IAT scores, respectively, $F(2,238)=18.03, p < .0001$, Cohen's $d=.78$, and $F(2,238)=25.87, p < .0001$, Cohen's $d=.93$. As predicted, on the Black:White IAT the Black participants demonstrated the lowest level of bias ($M=.05$); the White participants produced the highest level of pro-White bias on this measure ($M=.36$), and the Latino participants scored in between the other two groups ($M=.21$). These differences were all statistically significant: Black vs. White participants, $F(1,238)=36.00, p < .0001$, Cohen's $d=.78$, Black vs. Latino participants, $F(1,238)=10.18, p < .01$, Cohen's $d=.41$, and Latino vs. White participants, $F(1,238)=9.66, p < .01$, Cohen's $d=.40$.

Results on the Latino:White IAT were analogous: The Latino participants now demonstrated the lowest level bias on this IAT ($M=.01$); the White participants again produced the highest level of pro-White bias ($M=.43$); and the Black participants now scored in between the other two groups ($M=.13$). All group differences were again statistically significant: Latino vs. White participants, $F(1, 238)=49.80, p < .0001$, Cohen's $d=.91$, Latino vs. Black participants, $F(1,238)=3.72, p=.05$, Cohen's $d=.25$, and Black vs. White participants, $F(1,238)=21.44, p < .0001$, Cohen's $d=.60$.

In support of their discriminant validity, the two IATs produced different yet predictable patterns of results among the three ethnic/racial participant groups. This occurred despite the fact that both IATs relied on the same dominant comparison group (Whites), suggesting that the associations revealed reflect more than a general attitude toward the dominant group.

Between-Group Differences on the Explicit Attitude Measures

As shown in Table 1, there were also significant differences among the three ethnic/racial groups in explicit attitudes, as shown in Black:White thermometer scores, $F(2,200)=15.65, p < .0001$, Cohen's $d=.79$, Latino:White thermometer scores, $F(2,211)=11.19, p < .0001$, Cohen's $d=.65$, Black-White trait ratings, $F(2,229)=11.70, p < .0001$, Cohen's $d=.64$, and Latino:White trait ratings, $F(2,230)=3.03, p=.05$, Cohen's $d=.32$. Of great interest is the

²Many analyses reported are based on fewer than 241 cases due to missing data (N for each measure is shown in Table 1). All available data were used in any particular analysis.

finding that the patterns of explicit attitudes reported by the three ethnic/racial participant groups largely followed those found on the IATs, even though the explicit measures revealed different mean levels of bias than the IATs. On both thermometer measures, the White participants expressed the highest levels of pro-White bias, the participants from the target minority group expressed the least pro-White bias (indeed expressing strong in-group favoritism) and participants from the “uninvolved” minority group (i.e., Latinos on the Black:White thermometer and African Americans on the Latino:White thermometer) expressed levels of bias that were between the other two groups. Similar but weaker patterns were found with the trait-rating measures. Thus the discriminant validity of the IAT is further supported by the consistency between IAT and explicit measures in predicted patterns of attitudes among the three ethnic/racial groups.

Relations Between IAT and Explicit Attitude Measures

The bivariate correlations among the IAT and explicit measures of ethnic/racial attitudes showed that, across participants, the Black:White IAT scores were moderately but significantly correlated with Black:White thermometer scores and Black:White trait ratings ($r=.23$ and $r=.24$, respectively). The Latino:White IAT scores were similarly related to the Latino:White thermometer and trait ratings ($r=.26$ and $r=.19$, respectively). There were also, however, significant correlations between measures of Black:White and Latino:White attitudes – for the same type of measure (e.g., Black:White IAT and Latino:White IAT, $r=.40$) and between different types of measures (e.g., Latino:White IAT and Black:White thermometer, $r=.14$).

To examine whether each IAT has a unique relation with explicit attitudes toward the same group, we conducted multivariate regressions in which each explicit attitude measure (e.g., the Black:White thermometer) was simultaneously regressed on both IAT measures. As shown in Table 2, all four regression models showed that once shared variance between the two IATs was controlled, scores on the explicit attitude measure were significantly predicted by the same-group IAT scores but not by the other-group IAT scores. These results provide further support for the discriminant validity of the IAT in the specific attitude being measured. At the same time, the relations between the implicit and explicit measures, though specific to each group, were moderate enough to demonstrate non-redundancy of constructs (i.e., the Black-White IAT and the Black-White thermometer were not redundant measures of the same construct).

Confirmatory Factor Analysis

Thus far the discriminatory validity of the IAT measures has been demonstrated by predicted patterns of variance among the three ethnic/racial participant groups, and predicted patterns of co-variance between IAT and explicit attitude measures for same versus different target groups. Our last analysis of the IATs’ discriminant validity used confirmatory factor analysis to explore further the structure of the data in terms of differences in attitudes toward the two minority groups (Black:White vs. Latino:White) and, simultaneously, differences among the three ethnic/racial participant groups. Such an analysis allows us to take full advantage of the multi-method, multi-measure, multi-group nature of our data.

The latent variable model that was estimated simultaneously in all three ethnic/racial participant groups is given in Figure 2. The model hypothesizes two latent factors, one representing a latent attitude factor towards Latinos and the second representing a latent attitude factor towards Blacks. Each factor has three indicators: IAT scores, Thermometer scores, and Trait scores. As the figure indicates, these two latent variables are allowed to correlate. Additionally, residuals to the observed variables are allowed to correlate when

they share the same measurement approach (i.e., Latino IAT residual with Black IAT residual), thus capturing variance specific to each way of measuring the latent attitudes.

This model was initially estimated, using AMOS (Arbuckle, 2003) to provide maximum likelihood parameter estimates, in all three participant groups, imposing no between-group constraints, i.e., allowing different loadings, means (and intercepts), latent variable variances and covariances, and residual variances and covariances across groups. The metrics of the latent factors were determined by fixing the loadings of the two Trait indicators to 1.0 and estimating the variances of the latent factors. This initial unconstrained model was quite consistent with the data $\chi^2_{15}=23.32$, $p = .077$, RMSEA=.048 (90% CI: .000 – .085), CFI=.963. The model was then re-estimated with equal indicator loadings for the three groups, thereby forcing measurement invariance across the groups. The fit of this model was also quite good, $\chi^2_{23}=33.85$, $p = .067$, RMSEA=.045 (90% CI: .000 – .075), CFI=.952. Since this second model is a more constrained version of the first one, the difference in the resulting χ^2 's is itself distributed as a χ^2 that can be used to test whether the more constrained model fit the data less well. In the present case, the difference $\chi^2_8=10.53$, $p > .20$, showing that one can assume that the loadings of the indicators on the two latent variables in all three groups are equivalent. This suggests that the three indicators are equally good measures of the two latent factors in all three groups.

Two further models were examined that imposed further constraints across the three groups. First, a model was estimated in which the intercepts to the indicators of the latent variables as well as the means of the latent variables were constrained to be equal across groups. This version of the model makes the strong assumption that the means of all variables are equal across the three groups. Not surprising, and consistent with the earlier results, this model was quite inconsistent with the data, $\chi^2_{35}=140.95$, $p < .001$. The final model, given measurement invariance (i.e., equal loadings), constrained the variance of the two latent factors and their covariance to be equal across the three groups. This model was also inconsistent with the data, $\chi^2_{29}=60.20$, $p < .001$. Thus we have evidence that while the loadings are equivalent for the three groups, the means and the variances/covariance of the latent factors are not.

Returning to the model that was consistent with the data in which measurement invariance was imposed, the resulting parameter estimates for the three groups are given in Table 3. These results show that all three measured variables show significant loadings on the latent variables and, importantly, the extent to which these tap the respective latent variables are invariant across groups. Second, the significant intercept differences are in line with what we have already reported: Whites show higher levels of prejudice against both groups on all three measures, while the two minority groups show less derogation of the other outgroup and relative ingroup favoritism. Unsurprisingly, all residual correlations are significant, demonstrating considerable method variance in all three measurement procedures, for all three participant groups. And importantly, although there are significant covariances between the two latent variables in all three groups, the correlations between the latent variables are, in the case of all three groups, significantly less than 1.0, indicating discriminant validity. Even though each measure represents a comparison of one of the two minority groups with Whites, they are clearly tapping different latent constructs, assessing prejudice directed to that particular minority group.

Discussion

The present study contributes to the debate surrounding the IAT by investigating the measure's discriminant validity, using a multi-method (implicit and explicit measures),

multi-measure (Black:White and Latino:White attitudes), multi-group (African American, Latino and White participants) approach, that allowed us to test patterns of variances and covariances that would be expected if the measures had discriminant validity. The results of this study provided strong support for the discriminant validity of the two IATs assessed here.

Similar to what was found on the explicit attitude measures, the three ethnic/racial participant groups produced significantly different IAT results that, critically, shifted radically depending on the target group. Whereas the African American participants produced the lowest level of implicit bias on the Black:White IAT and the Latino participants showed significant pro- White bias on this measure, the two groups completely switched positions on the Latino:White IAT. Confirmatory Factor Analysis provided additional support for the distinctiveness of the IAT measures by showing that a two-factor solution, positing separate attitudes toward Blacks and Latinos, fit the data well. Moreover this two-factor model fit the data across the three participant groups, indicating that the distinctiveness of attitudes toward Blacks and Latinos was equally valid among all three groups.

The implications of these results for attitude measurement are relatively straightforward: an IAT that contrasts the majority group (e.g., Whites) with a particular minority group (e.g., Blacks) reveals a different implicit attitude than an IAT that contrasts the same majority group with a different minority group (e.g., Latinos). It is thus important for researchers to use IATs that are specific to the particular groups of interest. With that said, one might wonder about the significance of using “Whites” or a similar group as the constant comparison. What if the comparison was Asian:Latino and Asian:Black? We did not test such comparisons in our study, however our intuition is that the comparative group context likely matters (Mitchell, Nosek, & Banaji, 2003; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987) and researchers would be well advised to use group comparisons that reflect the specific social context of interest.

Before closing, two additional issues ought to be addressed. The first is the relation between implicit and explicit attitudes. The goal of the present study was to investigate the discriminant validity of IATs toward different groups, and we used explicit attitude measures to show that each IAT loaded with the explicit measures on the latent factor specific to a target group (i.e., Blacks or Latinos). Our particular interest in this model should not be taken to indicate that IAT (or implicit measures, more generally) and self-report attitude measures are redundant assessments of the same construct. Rather we are simply saying that they both tell us something about the underlying evaluation of a specific social group, but there is still substantial method variance (shared residual correlations) between the implicit measures and the explicit measures. We refer readers interested in this aspect of the debate to other investigations designed to address the distinctiveness of implicit and explicit measures (e.g., Cunningham, Preacher, & Banaji, 2001; Nosek & Smyth, 2007).

The second issue this study addresses is the ongoing debate on whether implicit attitudes reflect “personal” or “cultural” associations. We agree with other scholars that to some extent this is a false dichotomy (e.g., Banaji, 2001). However, to the degree that “personal” is meant to imply that implicit attitudes vary from person to person in predictable and meaningful ways, our data suggest that the IAT does reveal something about a person’s attitude. Although the African American, Latino and White participants in this study all presumably are knowledgeable of American culture, there were clear differences among the three groups in their implicit attitudes, revealing personal (ingroup) as well as cultural (pro-White) preferences. Moreover, the confirmatory factor analysis showed that even within

each group, the two IATs revealed sensible patterns of responses that covaried with other (explicit) measures of attitudes and distinguished between attitudes toward different groups.

In summation, prior research has shown the IAT to be a reliable measure with predictive validity. The present study provides additional support for this instrument by showing that it also possesses discriminant validity by revealing implicit associations that are specific to the target groups being evaluated, and predictably variable across participant groups. These data do not preclude the influence of other cognitive processes or meta-attitudes in the production of IAT responses. The 16% shared variance of the two IATs may be due to the fact that they had a common comparison group (Whites), or that another psychological process may have contributed to responses on both measures (e.g., ethnocentrism; see Cunningham, Nezlek & Banaji, 2004).

However, it would be quite difficult to explain the pattern of results obtained in this study without regard to specific underlying group attitudes. The IAT is certainly not perfect, but it has proven itself to be a very useful addition to social psychology's toolbox.

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Figure 1.

Mean scores for the Latino-White and Black-White IAT measures, by ethnic/racial participant groups. Higher numbers indicate greater pro- White bias on the measure.

Figure 2. Latent Variable Confirmatory Factor Model, estimated across ethnic/racial participant groups. L = Attitudes toward Latinos, B = Attitudes toward Blacks, IAT = Implicit Association Test, Therm = Thermometer measure, Trait = Trait ratings.

Table 1

Descriptive statistics for the attitude measures, overall and by ethnic/racial group.

Measure, Overall by Participant Group	N	Mean	SD	Effect Size (Cohen's d)
IAT -Black:White, Overall	241	0.22	0.34	1.30
• African Americans	67	0.05	0.30	0.34
• Latinos	91	0.21	0.36	1.20
• Whites	83	0.36	0.29	2.57
IAT -Latino:White, Overall	241	0.19	0.43	0.87
• African Americans	67	0.13	0.36	0.74
• Latinos	91	0.01	0.43	0.04
• Whites	83	0.43	0.38	2.26
Thermometer -Black:White, Overall	203	-0.62	24.00	0.05
• African Americans	53	-14.49	25.28	1.16
• Latinos	74	0.65	19.19	0.07
• Whites	76	7.83	23.23	0.68
Thermometer -Latino:White, Overall	214	-1.41	23.90	0.12
• African Americans	57	-1.60	20.80	0.16
• Latinos	77	-10.13	22.98	0.89
• Whites	80	7.11	24.03	0.60
Traits -Black:White, Overall	232	-0.01	1.46	0.01
• African Americans	65	-0.70	1.68	0.84
• Latinos	85	0.38	1.28	0.60
• Whites	82	0.13	1.26	0.21
Traits -Latino:White, Overall	233	-0.25	1.29	0.40
• African Americans	66	-0.31	1.03	0.61
• Latinos	85	-0.47	1.25	0.75
• Whites	82	0.01	1.47	0.02

NOTE: IAT scores are d-scores, with higher numbers indicating more pro-White bias; Thermometer scores are differences in degree ratings, with higher numbers indicating more pro-White bias; Traits scores are differences in scale ratings, with higher numbers indicating more pro-White bias.

Table 2

Results of each explicit attitude measure regressed simultaneously on both IAT measures.

Explicit Measure (N) ▪ Predictors	Unstandardized Parameter Est.	Standard Error	<i>t</i> -value	Cohen's <i>d</i>
Black-White Thermometer (203)				
▪ Intercept	−4.64	2.03		
▪ Latino-White IAT	2.55	4.16	0.61	0.09
▪ Black-White IAT	15.19	5.47	2.78**	0.39
Latino-White Thermometer (214)				
▪ Intercept	−4.80	1.94		
▪ Latino-White IAT	13.69	4.08	3.36***	0.46
▪ Black-White IAT	1.99	5.20	0.38	0.05
Black-White Traits (232)				
▪ Intercept	−0.24	0.11		
▪ Latino-White IAT	−.01	0.23	0.03	0.00
▪ Black-White IAT	1.02	0.30	3.41***	0.45
Latino-White Traits (233)				
▪ Intercept	−0.43	0.10		
▪ Latino-White IAT	0.43	.21	2.10*	0.28
▪ Black-White IAT	0.39	0.26	1.51	0.20

Notes:

*
p < .05,**
p < .01,***
p < .001

Table 3

Parameter Estimates from Latent Variable Model: Measurement Invariance

	Participant Groups		
	African Americans	Latinos	Whites
■ Loadings			
■ Black:White Thermometer	16.717*	16.717*	16.717*
■ Black:White IAT	0.077*	0.077*	0.077*
■ Latino:White Trait	1.000	1.000	1.000
■ Latino:White Thermometer	17.435*	17.435*	17.435*
■ Latino:White IAT	0.068*	0.068*	0.068*
■ Intercepts			
■ Black:White Trait	-0.701	0.383	0.129
■ Black:White Thermometer	-15.989	0.186	7.744
■ Black:White IAT	0.051	0.214	0.364
■ Latino:White Trait	-0.310	-0.466	0.009
■ Latino:White Thermometer	-2.128	-10.190	7.357
■ Latino:White IAT	0.132	0.009	0.433
■ Latent Factor Variances and Covariances			
■ Black Factor Variance	1.471	0.379	0.728
■ Latino Factor Variance	0.501	0.322	1.392
■ Latino-Black Factor Covariance	0.400*	0.216*	0.538*
■ Latino-Black Factor Correlation	0.466*	0.617*	0.534*

Note: To correctly estimate the model, Trait loadings were fixed at 1.

* $p < .05$.