Completing a Race IAT changes racial bias  
Supplementary Online Materials - Reviewed

Ian Hussey & Jan De Houwer

Ghent University, Belgium

Author Note

Corresponding author: Ian Hussey, Department of Experimental-Clinical and Health Psychology, Ghent University, Henri Dunantlaan 2, Gent 9000, Belgium. Email: ian.hussey@ugent.be. Funding provided by Ghent University grants 01P05517 to IH and BOF16/MET\_V/002 to JDH.

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# Experiment 1

## Method

Sample. Participants for all studies were recruited online using the Prolific platform ([www.prolific.ac](http://www.prolific.ac)). The experiment was completed through participants’ internet browsers.

Inclusion and exclusion criteria. In order to form homogenous racial in- and out-groups between the participants and stimuli we recruited white participants only. Other inclusion criteria were age 18 to 65, English as a first language, full use of both hands, normal or corrected to normal vision, and no participation in the researchers’ similar previous experiments.

For all experiments, exclusion criteria were incomplete data on any task and more than 10% of trials < 300 ms on either of the behavioural tasks, with the exception of the AMP[[1]](#footnote-1). 159 individuals provided at least some data. Eleven individuals were excluded on this basis (6.9%). No evidence of condition-dependent attrition or exclusion was found, χ2(1, *n* = 159) < 0.001, *p* > .999.

Procedure and measures. In line with recommendations to prevent selective attrition when recruiting participants online, participants were informed about the duration of the experiment prior to participation (Zhou & Fishbach, 2016).

Counterbalancing. IAT and SC-IAT block order was counterbalanced between participants, as was the order of the SC-IAT and ratings scales.

Modern racism scale. This seven-item self-report measure includes items such as “Black people are getting too demanding in their push for equal rights” and uses a five-point response scale (strongly disagree to strongly agree: McConahay, 1986). Sum scores on this scale were entered as a covariate in all models.

Implicit Association Tests. The IAT assesses the relative speed with which participant can categorize two target categories (black people and white people) and two attribute categories (good and bad). It does so by comparing how quickly participants respond when one set of targets and attributes share a response key (e.g., press left for black people or bad, press right for white people or good) with how quickly they respond when intersections are reversed (e.g., press left for black people or good, press right for white people or bad).

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The IAT stimuli were drawn from that used in the default Project Implicit Race IAT (Xu, Nosek, & Greenwald, 2014). These included the target categories “Black people” (six pictures of black men and women’s faces) and “White people” (six pictures of white men and women’s faces), and the attribute categories “good” (joy, happy, laughter, love, glorious, pleasure, peace, and wonderful) and “bad” (evil, agony, awful, nasty, terrible, horrible, failure, and hurt). The Flowers-Insects IAT was identical other than changing the target categories to “Flowers” (six pictures of flowers) and “Insects”, (six pictures of insects; Greenwald, McGhee, & Schwartz, 1998), using the flowers and insects images included in the default Flowers-Insects IAT script distributed by Millisecond Software (<https://www.millisecond.com/download/library/iat/>).

Single-Category Implicit Association Test. A variant of the IAT, the SC-IAT contains only one target category so as to provide a procedurally non-relative measure of bias towards one category (black people) without a contrast category (e.g., white people; Karpinski & Steinman, 2006). The presence of any learning effects between the groups could therefore be attributed to the IAT condition. Implementations of both the IAT and SC-IAT in Inquisit were obtained from the Millisecond Software test library (<https://www.millisecond.com/download/library/>).

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Ratings scale. Participants rated the six images of black men and women’s faces used in the race IAT using a seven-point scale (1 very negative to 7 very positive).

## Results

General analytic strategy. Typically, responses on the SC-IAT are quantified using a variant of the to control for general responding speed between participants *D* scoring algorithm (Greenwald et al., 2003). We expected to observe relatively small effect sizes, and therefore chose to employ an alternative, more mixed effects modeling as a more power analytic strategy (Bates, Mächler, Bolker, & Walker, 2015). These provide greater power by considering all data points generated by each participant (e.g., 140 reaction times within the SC-IAT’s critical blocks) while still controlling for differences in general responding speed between participants and acknowledging the non-independence of the multiple reaction times generated by each participant. We employed mixed-effects models for all measures in the present article. For the sake of clarity, only results of main or interaction effects testing our pre-registered hypotheses will be reported for each experiment.

Outlier removal. Reaction times on the SC-IAT test blocks that deviated from the mean by > 2.5 standard deviations were removed as outliers (0.55% of trials removed). This approach was also applied for the AMP and Shooter bias task in subsequent experiments.

Analyses. Results for all main and interaction effects in the analyses of both the SC-IAT and the self-report ratings are present in Table 1 and 4.

Table 1. *Linear mixed-model of SC-IAT effects (Experiment 1).*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 95% CI | |  | 95% CI | |  |
|  | *B* | lower | upper | β | lower | upper | *p* |
| Intercept | 662.79 | 601.30 | 724.28 |  |  |  | <.001 |
| SCIAT block | -0.99 | -4.42 | 2.44 | 0.00 | -0.02 | 0.01 | .571 |
| IAT condition | -7.60 | -24.30 | 9.11 | -0.03 | -0.09 | 0.03 | .373 |
| SCIAT block \* IAT condition | 4.46 | 1.03 | 7.89 | 0.02 | <0.01 | 0.03 | .011 |
| Racism | 0.72 | -2.57 | 4.00 | 0.01 | -0.05 | 0.08 | .669 |

# Experiment 2

## Method

Sample. 232 individuals provided at least some data and were paid £0.90, 19 were excluded (8.2%). No evidence of condition-dependent attrition or exclusion was found, χ2(1, *n* = 232) = 1.64, *p* = .200.

### Procedure and measures.

AMP. This task presents participants with Chinese characters and asks them to rate them either as positive or negative. Prime stimuli are flashed briefly on screen before each Chinese character. However, participants are instructed to ignore these primes and rate the valence of the Chinese characters only. Previous research demonstrates that participants unintentionally misattribute the valence of the primes for that of the Chinese characters, providing a measure of automatic evaluations of the primes (Payne & Lundberg, 2014). In this case, a single-category version of the AMP was employed so as to provide a measure of implicit racial bias towards black people in the absence of a racial contrast category (e.g., white people). Two forms of prime were used: images of black people (black primes) and grey squares (neural primes: see Payne et al., 2010). All other details of the AMP followed typical practices for this widely used implicit measure.

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Participants also provided an exploratory single-item self-report measure of stimulus awareness after the AMP. This asked whether the images that were presented in the AMP were of a) black people, b) white people, c) both, or d) I don’t know. No analysis of this data has been conducted so far.

## Results

Outlier removal. Trials on the AMP where reaction time deviated from the mean by > 2.5 standard deviations were removed as outliers (1.09% of trials removed).

Analyses. Results for all main and interaction effects in the analyses of both the AMP and the self-report ratings are present in Table 2 and 4.

Table 2. *Logistic mixed-model of AMP effects (Experiment 2).*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | 95% CI | |  |
|  | OR | lower | upper | *p* |
| Intercept | 5.18 | 2.09 | 12.87 | <.001 |
| Prime type | 1.04 | 1.00 | 1.07 | .029 |
| IAT condition | 1.12 | 0.91 | 1.36 | .282 |
| Prime type \* condition | 0.92 | 0.90 | 0.95 | <.001 |
| Racism | 0.96 | 0.91 | 1.01 | .099 |

# Experiment 3

## Method

Sample. Sample size was selected by increasing the sample relative to the previous experiments. 294 individuals provided at least some data and were paid £2, 48 were excluded (16.3%). Some evidence of condition-dependent attrition or exclusion was found, χ2(1, *n* = 294) = 4.21, *p* = .040, with greater attrition in the Flowers-Insects IAT condition (31/147) than the Race IAT condition (17/147).

Shooter bias task. XXX

## Results

Outlier removal. 1.09% of trials on the Shooter Bias task were first removed as outliers.

Analyses. The analysis of reaction times within the task was preregistered to make conclusions on the basis of either the main effect for IAT condition or the interaction effect between IAT condition and trial type (gun vs no gun). A main effect for IAT condition was found (*B* = -6.00, 95% CI = [-10.93, -1.08], β = -0.06, 95% CI = [-0.11, -0.01], *p* = .017). However, on reflection, only the interaction effect can be considered a meaningful test of the hypothesis here given that mere differences in RTs between the conditions do not reflect a differential tendency or speed when choosing to shoot vs not shoot. As such, only the interaction effect was interpreted as a test of our hypothesis in the main text. Results for all main and interaction effects in the analyses of both the Shooter Bias task and the self-report ratings are present in Table 3 and 4.

Table 3. *Linear mixed-model of Shooter Bias effects (Experiment 3).*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 95% CI | |  | 95% CI | |  |
|  |  | *B* | lower | upper | β | lower | upper | *p* |
| *Reaction time* | |  |  |  |  |  |  |  |
|  | Intercept | 633.16 | 609.60 | 656.71 |  |  |  | <.001 |
|  | Trial type | -28.85 | -30.13 | -27.57 | -0.29 | -0.30 | -0.28 | <.001 |
|  | IAT condition | -6.00 | -10.93 | -1.08 | -0.06 | -0.11 | -0.01 | .017 |
|  | Trial type \* IAT condition | 0.98 | -0.30 | 2.26 | 0.01 | >-0.01 | 0.02 | .133 |
|  | Racism | -0.09 | -1.45 | 1.27 | 0.00 | -0.05 | 0.05 | .901 |
| *Sensitivity (d')* | |  |  |  |  |  |  |  |
|  | Intercept | 2.65 | 2.09 | 3.22 |  |  |  | <.001 |
|  | IAT condition | 0.02 | -0.10 | 0.14 | 0.02 | -0.1 | 0.15 | .741 |
|  | Racism | <0.01 | -0.03 | 0.04 | 0.01 | -0.11 | 0.14 | .823 |
| *Response bias (c)* | |  |  |  |  |  |  |  |
|  | Intercept | 0.07 | -0.11 | 0.25 |  |  |  | .446 |
|  | IAT condition | <0.01 | -0.03 | 0.04 | 0.01 | -0.11 | 0.14 | .840 |
|  | Racism | >-0.01 | -0.01 | 0.01 | -0.03 | -0.15 | 0.10 | .673 |

Table 4. *Linear mixed-model of self-reported evaluations (All experiments).*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 95% CI | |  | 95% CI | |  |
|  |  | *B* | lower | upper | β | lower | upper | *p* |
| *Experiment 1* | |  |  |  |  |  |  |  |
|  | Intercept | 5.77 | 5.26 | 6.28 |  |  |  | <.001 |
|  | IAT condition | -0.04 | -0.18 | 0.10 | -0.04 | -0.17 | 0.09 | .560 |
|  | Racism | -0.08 | -0.11 | -0.06 | -0.40 | -0.52 | -0.27 | <.001 |
| *Experiment 2* | |  |  |  |  |  |  |  |
|  | Intercept | 4.99 | 4.45 | 5.52 |  |  |  | <.001 |
|  | IAT condition | 0.10 | -0.02 | 0.22 | 0.10 | -0.01 | 0.21 | .089 |
|  | Racism | -0.04 | -0.07 | -0.01 | -0.14 | -0.25 | -0.03 | .013 |
| *Experiment 3* | |  |  |  |  |  |  |  |
|  | Intercept | 5.01 | 4.48 | 5.54 |  |  |  | <.001 |
|  | IAT condition | 0.19 | 0.08 | 0.31 | 0.18 | 0.08 | 0.28 | <.001 |
|  | Racism | -0.03 | -0.06 | >-0.01 | -0.11 | -0.22 | -0.01 | .034 |
| *Meta-analysis* | |  |  |  |  |  |  |  |
|  | Intercept | 5.3 | 4.99 | 5.61 |  |  |  | <.001 |
|  | IAT condition | 0.1 | 0.03 | 0.17 | 0.10 | 0.03 | 0.16 | .004 |
|  | Racism | -0.05 | -0.07 | -0.04 | -0.21 | -0.28 | -0.15 | <.001 |

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1. Our original pre-registered criteria also excluded participants with 10% of trials on the AMP with reaction times < 300 ms. However, this criterion failed to take in to account the distribution of reaction times on the AMP and resulted in an unacceptably high attrition rate (47.9% of remaining sample). As such, this exclusion criterion was dropped. This analytic decision was made before the any hypothesis tests were run. [↑](#footnote-ref-1)