Implicit (and explicit) racial attitudes barely changed during Barack Obama's presidential campaign and early presidency

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ABSTRACT

As a high-status, omnipresent Black exemplar, Barack Obama and his rise to the presidency of the United States may have induced a cultural shift in implicit racial attitudes, much like controlled exposures to positive Black and negative White exemplars have done in the laboratory (Dasgupta & Greenwald, 2001). With a very large, heterogeneous sample collected daily for 2.5 years prior to, during and after the 2008 election season ($N = 479,405$), we observed very little evidence of systematic change in implicit and explicit racial attitudes overall, within subgroups, or for particular notable dates. Malleability of racial attitudes – implicit or explicit – may be conditional on more features than the mere presence of high-status counter-stereotypic exemplars.

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Introduction

Since the election of Barack Obama as 44th president of the United States of America, academics, pundits, and ordinary citizens have pondered a variety of social and political questions about the implications of electing the first Black president. His successful candidacy and election was surely a product, in part, of societal changes in racial attitudes. But, was Obama's rise *itself* a mechanism for change? Has the election of Barack Obama affected the citizenry's attitudes toward African Americans more generally? This article examines whether implicit and explicit racial attitudes changed during the emergence, election and early presidency of Barack Obama.

Racial attitudes

Social attitudes evolve over time. Perhaps the most dramatic example is the seismic shift in American society of explicit attitudes and stereotypes about African Americans. The "Princeton Trilogy" studies, for example, document a remarkable decline in endorsing stereotypes of African Americans as superstitious and lazy from more than 70% endorsing in 1933 down to 10% or less in 2001 (Madon et al., 2001). The impact of the civil rights movement is imprinted in the pervasive egalitarian beliefs of today's citizenry, beliefs that have little relation to concepts like "separate but equal" that were popular and daily practice in decades not long past.

Despite this dramatic evidence of change, it is also clear that the stereotypes of yesteryear have not left the public (un)consciousness. Whereas Americans in the 21st century largely decline to endorse stereotypes about African Americans, they have little trouble describing them (Devine, 1989; Devine & Elliot, 1995; Madon et al., 2001). Likewise, the persistence of cultural stereotypes is implicated in the pervasive encoding of implicit associations of *African Americans* with *bad* and *White Americans* with *good* more than the reverse, even among people who hold egalitarian explicit beliefs and attitudes (Nosek, Smyth et al., 2007). At the same time, evidence suggests that these associations are sensitive to the situation and amenable to change, perhaps particularly in response to high-status exemplars or situational circumstances that counter the prevailing stereotypes (Dasgupta & Greenwald, 2001; Lowery, Hardin, & Sinclair, 2001; Mitchell, Nosek, & Banaji, 2003; Sinclair, Lowery, Hardin, & Colangelo, 2005; Wittenbrink, Judd, & Park, 2001).

Attitude malleability and the "Obama effect"

Dasgupta and Greenwald (2001) found that exposure to positive Black exemplars such as Martin Luther King, Jr. and negative White exemplars such as Jeffery Dahmer decreased implicit preferences for White Americans compared to African Americans on the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998; Nosek, Greenwald, & Banaji, 2007). As a prominent and highly accessible exemplar during the 2008 presidential campaign and post-election, Barack Obama may serve as a naturalistic version of the Dasgupta and Greenwald (2001) exposure paradigm. Obama

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is a persistent media presence, ran for and presently holds the most powerful, high-status job on the planet, and contradicts historical racial stereotypes about African Americans.

These factors have produced anecdotal examples and empirical demonstrations of an "Obama effect" on racial attitudes and stereotypes. For example, after finding no implicit preference for White Americans compared to Black Americans in two university samples collected during the campaign season (and relatively weak bias in a third), Plant et al. (2009) concluded that "extensive exposure to Obama resulted in a drop in implicit bias" (p. 961). This research provocatively suggests that a single, prominent exemplar could be sufficient to eliminate a widespread implicit bias that emerges early in childhood (Baron & Banaji, 2006) and exists across every age, gender, racial and national group that has ever been investigated (Nosek, Smyth et al., 2007 – with the exception of African Americans themselves, on average).

As Plant et al. point out, there are reasons to be cautious about their conclusion. The apparent change was obtained in comparatively small, specific samples – undergraduates at University of Wisconsin–Madison and Florida State University. Also, the link between exposure to Obama and change in implicit bias was indirect; they observed a within-sample correlation between accessibility of Obama and implicit race bias. Further, related investigations of an Obama effect in decreasing stereotype threat effects among African Americans reveal mixed evidence for his impact (Aronson, Jannone, McGlone, & Johnson-Campbell, 2009; Marx, Ko, & Friedman, 2009). Finally, other research suggests that the malleability effect due to exposure to high-status exemplars (Dasgupta & Greenwald, 2001) may be weaker than suggested by the existing literature. Joy-Gaba and Nosek (in press) replicated the Dasgupta and Greenwald exposure paradigm with large samples and observed a very weak malleability effect (average $d = .08$). They also found suggestive evidence that exposure to positive Black exemplars alone may not be sufficient to shift implicit race bias. Making race accessible and even exposing participants to negative White exemplars may also be necessary.

Despite all these cautions, it is difficult to imagine a naturalistic exemplar exposure paradigm with a higher profile than the election of Barack Obama as the first Black US President. As such, we investigated whether implicit and explicit racial attitudes shifted from the period of time prior to the candidacy of Barack Obama to after he was inaugurated President of the United States.

The present study

We leveraged a very large sample of visitors to the Project Implicit website (https://implicit.harvard.edu/) who volunteered to complete an IAT and self-report measures of their attitudes toward White versus African Americans. The site enjoyed sizable traffic throughout the data collection (daily median = 396, STD = 730), and participants found the site through a wide variety of means – such as assignment for class or work, recommendation of friend, links from other sites and media coverage. Although the sample is very heterogeneous and had consistent demographic characteristics over time, it is not representative of the US population.

Method

Participants

Participants were visitors to the Project Implicit main demonstration site who selected the "race IAT" between September 28, 2006 and May 11, 2009 for a total of 957 days of data collection. The start date was four months before Obama's announcement of his candidacy for president, and the end date was almost four months after inauguration and the day before data analysis for this

project began.[1] We included only those study sessions with (a) complete data on all of the key measures and covariates, (b) fewer than 10% of IAT response trials with a latency of less than 300 ms (Greenwald, Nosek, & Banaji, 2003) and error rates below 40% for any response block or 30% overall, and (c) participants who reported being US citizens. The final dataset included 479,405 sessions, a mean of 501 per day. The smallest sample for a single day was 27 sessions and the largest daily sample was 13,898. The middle 80% of daily sample sizes ranged from 171 to 718.[2]

The average age of participants was 28.4 (STD = 11.9); 3% were Asian, 12% were Black, 74% were White, 6% were multi-racial and 5% were another race or unknown; 7% were Hispanic, 87% were non-Hispanic, and 6% did not know or had another ethnicity; 21% had a high school education or less, 58% had some college or were college graduates and 21% were working on or had received an advanced degree; 44% were liberal, 25% were conservative and 31% were moderate; and 59% were female. Regressing age, ethnicity, education, political orientation (strongly liberal to strongly conservative on a seven-point scale), and gender on date of participation showed little change in demographic representation over the course of the data collection (R^2 = .006).[3] In other words, the selection influences appeared to be stable across time, increasing confidence in internal analysis of the dataset.

Materials

Explicit attitude measures: Participants responded to a seven-point Likert scale ranging from "I strongly prefer African Americans to European Americans" to "I strongly prefer European Americans to African Americans" with a midpoint indicating equal liking of both groups.

Implicit Association Test: The IAT measures association strengths between two concepts (Black Americans, White Americans) and two attributes (pleasant, unpleasant). Participants categorized items representing each of the four categories one at a time using two response keys. In the one of the two critical conditions, participants categorized White faces and unpleasant words with one key and Black faces and pleasant words with the other. In the other condition, participants categorized White faces and pleasant words with one key and Black faces and unpleasant words with the other. A faster average response time in the first condition compared to the second is interpreted as an implicit preference for Black Americans compared to White Americans. The order of the two conditions was randomized between subjects. The procedure followed the recommendations of Nosek et al. (2007), and an overview of main effects and variation by demographic categories for the race IAT in a sample of 732,881 from this same website appears in Nosek, Smyth et al. (2007). The IAT was scored following recommendations of Greenwald et al. (2003), with trials in which participants made an error being replaced with the mean latency of the correct responses in that block plus 600 ms.

Procedure

Participants arrived at https://implicit.harvard.edu/ and self-selected to complete the "race IAT." The order of the IAT, explicit atti-

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[1] The substantive results are the same if the start date is moved further back in time. We chose that start date because that month was sufficiently prior to sustained national attention on Obama as a presidential candidate, and that day immediately followed updating of demographic measures at the website to the versions used in this article.

[2] There were 24 days with a sample under 100, 22 were within a week of Christmas Day and one was on Thanksgiving Day in 2007. The 24th was one in which the servers were offline for most of the day.

[3] The sample did become very slightly more liberal across time, but this is consistent with national trends during this time frame (Gallup Poll, May 2009).

tude measures and demographics were randomized between participants.

Results

Main effects

Across the whole sample, participants showed a preference for White Americans over Black Americans both implicitly (IAT D = .34, STD = .45, $t[479403]$ = 524.41, p < .0001, d = .76) and explicitly (M = 0.33, STD = 1.12, $t[479403]$ = 204.13, p < .0001, d = .29). The IAT and self-reported racial attitudes were positively correlated, r = .33, p < .0001.

Variation in racial attitudes over time

Implicit: To test whether the average magnitude of implicit racial attitudes changed over time we regressed session date on IAT score (see Step 1 in Table 1). The results indicated that date was a significant negative predictor of implicit attitude ($F(1, 479403)$ = 6.53, p = .01; $\beta = -1 \times 10^{-10}$). Implicit preference for White Americans compared to Black Americans appeared to be weakening over time. However, reliance exclusively on significance testing can be misleading with massive sample sizes. Date accounted for just .001% of the variance in IAT score (R^2 = .000014). To illustrate, Fig. 1 presents the daily IAT means across the 957 days along with the 7-days moving average. The linear trend is essentially flat. The absolute smallest single day was D = .23 and the absolute largest was D = .48 – that is, an implicit preference for White was observed every day. The middle 80% of mean IAT D's ranged from .30 to .38. In effect size terms, 80% of the daily means were within .09 standard deviations of the grand mean.

By month, the smallest IAT D was .326 and the largest was .361 (STD = .008). Eighty percent of the monthly IAT means were between .330 and .351. In other words, 80% of the monthly IAT means were within .02 standard deviations of the grand mean and all were within .05 standard deviations. Finally, the IAT mean for

the first 30 days of data collection (IAT D = .35) showed a slightly stronger implicit preference for Whites than the IAT mean for the last 30 days of the data collection (IAT D = .34; $t(26322)$ = 2.17, p = .03, d = .026). A comparison of the IAT mean of all data collected before Barack Obama declared his presidential candidacy (IAT D = .34) with the IAT mean of all data collected after declaring candidacy (IAT D = .34) indicated no difference in implicit racial attitudes ($t[479403]$ = −1.72, p = .09, d = .002).

In summary, every single day of the 957 examined showed a mean implicit preference for White Americans over Black Americans, the variation around the grand mean by day or month was very weak, and minimal systematic change was observed over time – before, during or after the campaign and election of Barack Obama.[4]

Explicit: We also conducted a parallel analysis on explicit racial preference for White Americans relative to Black Americans. Regressing session date on racial preference ratings indicated that date was a significant *positive* predictor of explicit race bias, $F(1, 479403)$ = 51.66, p < .0001, $\beta = 1 \times 10^{-10}$. That is, explicit attitudes became slightly more pro-White over time. While an *order of magnitude larger* than the effect with implicit attitudes, date still accounted for a trivial .01% of the variance in explicit racial preferences (R^2 = .000108). All of the analyses for the remainder of this results section were also conducted with explicit attitudes as the dependent variable. However, for space considerations, those analyses are not reported in the text. To summarize those effects, explicit attitudes, like the implicit effects reported herein, showed little evidence of change over time overall, for any particular subgroup, and for any particularly notable dates during the election season. If anything, explicit preferences for White strengthened more than implicit preferences for White weakened over the period of our analysis.[5]

Accessibility of Obama as a potential moderator of implicit race bias: Plant et al. (2009) found that implicit race bias measured during the Obama presidential campaign was much weaker than in similar data collections they had conducted prior to the campaign. To increase the plausibility that Obama might be causally involved in this bias shift, they showed that the accessibility of Obama, *within* samples collected during the campaign, was related to the magnitude of implicit race bias. This relationship indirectly suggests that Obama could account for the change between samples before and after the campaign. However, Obama's role remains inconclusive because covariates of variation within one sample (during campaign participants) are not necessarily related to the factors that explain differences across samples (i.e., pre-campaign attitudes compared to during campaign attitudes). For example, the frequency of sexual relations might predict the likelihood that a woman gets pregnant, but gender differences in frequency of sexual relations do not explain why women are more likely to get pregnant than men.

Nonetheless, Obama accessibility is a plausible explanatory factor for the observed differences. While we observed very little change in racial attitudes over time, the accessibility of Obama on a day-to-day basis could still predict implicit race bias. We did not administer individual measures of Obama accessibility. However, we can investigate this hypothesis with a "cultural level" test of relations between Obama accessibility and implicit race bias. As a proxy for "cultural accessibility," we conducted a Lexis–Nexis search of media and news for the word "Obama" for ¼ of the dates in our sample date range. The variation in mentions of Obama in that date range is presented as a moving average with

Table 1
Hierarchical linear regression (N = 479,405) predicting implicit preference for White Americans compared to Black Americans by date (Step 1), demographic variables (added in Step 2), and their interactions (added in Step 3).

Predictor	df	η_p^2	F	p	R^2
Step 1					0.000014
Date	1	0.000014	6.53	0.0106	
Step 2					0.118
Date	1	0.00018	99.71	<.0001	
Age	1	0.00007	37.72	<.0001	
Gender	1	0.00116	633.48	<.0001	
Ethnicity	2	0.0004	107.89	<.0001	
Race	8	0.09576	7195.59	<.0001	
Political orientation	1	0.00504	2755.95	<.0001	
Education	1	0	2.53	0.1118	
Step 3					0.1182
Date	1	0	1.89	0.1691	
Age	1	0.00007	35.81	<.0001	
Gender	1	0.00117	636.89	<.0001	
Ethnicity	2	0.0004	108.08	<.0001	
Race	8	0.09457	7097.6	<.0001	
Political orientation	1	0.00501	2734.87	<.0001	
Education	1	0.00001	3.95	0.0468	
Date × age	1	0.00004	19.34	<.0001	
Date × gender	1	0	1.68	0.1949	
Date × ethnicity	2	0	0.98	0.3751	
Date × race	8	0.00007	4.6	<.0001	
Date × political orientation	1	0.00002	8.79	0.003	
Date × education	1	0	2.42	0.1195	

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[4] Quadratic and cubic regressions revealed no meaningful higher order relationships between session date and IAT score. Also, adding explicit attitudes and its interaction with date as additional predictors did not substantively alter the results.

[5] Explicit attitude analyses are available in supplementary materials at http://briannosek.com/.
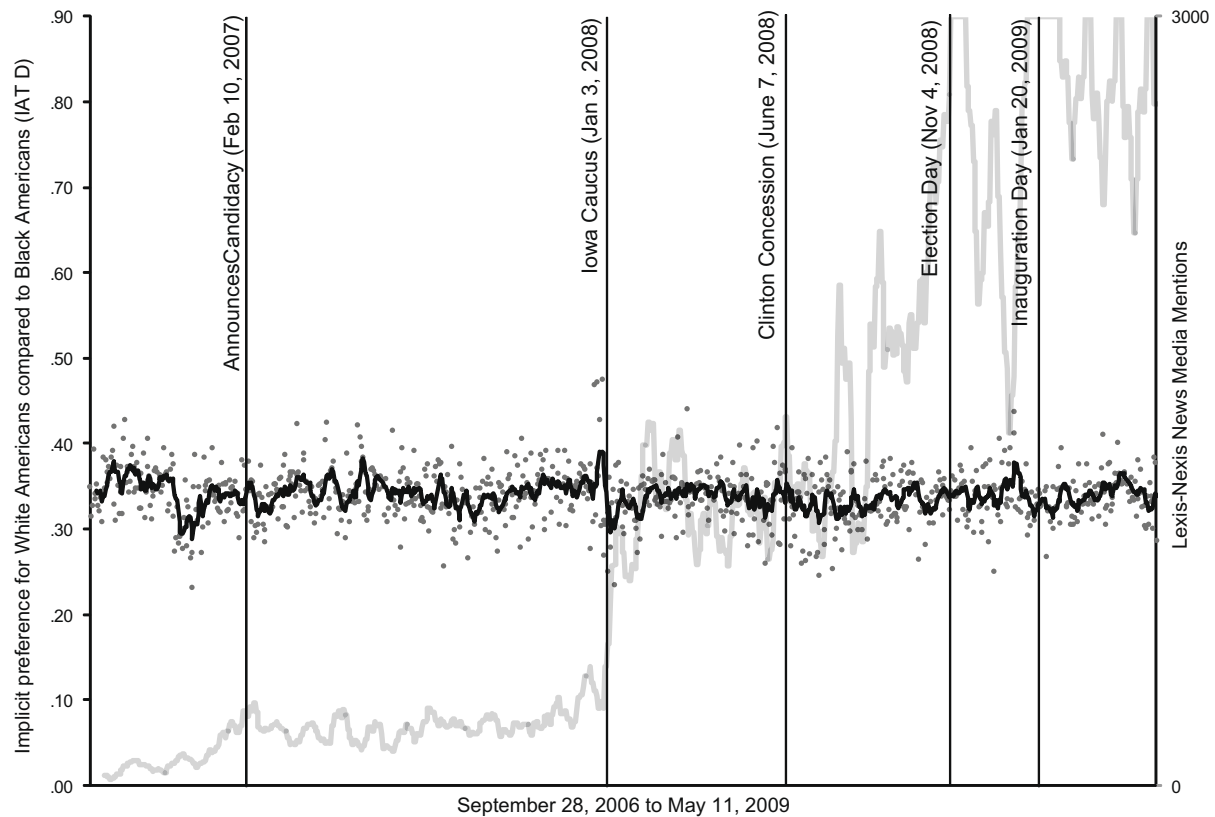
Fig. 1. Data points indicate the mean daily IAT effects from September 28, 2006 to May 11, 2009 with 7-days moving average in black. Light-gray line indicates a moving average of the number of daily news articles containing "Obama" in the Lexis–Nexis database.

the light-gray line in Fig. 1.[6] Confirming the obvious, Obama received very few media mentions prior to his candidacy, many more after he won the Iowa caucuses, more still as election day approached, and was consistently extremely high following inauguration. Despite the wide variation in Obama's presence in news media by day, that variability was unrelated to the average implicit race bias across days ($r = -.09$, ns). As such, at an aggregate level, the daily level of accessibility indexed by the volume of media coverage of Obama was unrelated to implicit race bias. Importantly, that does not mean that accessibility at an individual level is unrelated to implicit racial attitudes. The lack of relationship simply suggests that the change in Obama's media presence over time did not influence implicit race attitudes *on average*.

Moderation of change in implicit racial attitudes by social group memberships and political orientation

The preceding analysis suggests that implicit racial attitudes remained virtually constant over the more than 2.5 years period. It is possible, however, that changes in implicit attitudes did occur, but differently for particular sub-demographics. After the first regression with session date predicting IAT score, we added a second step (see Table 1) with date, age, gender, race, ethnicity and political orientation as regressors predicting IAT score. Addition of these variables improved the model fit substantially, ($F(15, 479389) = 4277.6$, $p < .0001$) such that the model accounted for 11.8% of the variance in IAT D score ($R^2 = .1180$). This finding replicates previous research (Nosek et al., 2007), with women showing less implicit race bias than men ($\eta_p^2 = .00116$), liberals showing less implicit race bias than conservatives ($\eta_p^2 = .00504$), and Black participants show-

ing the weakest implicit pro-White bias and White participants showing the strongest ($\eta_p^2 = .09576$).

To test whether demographic variables moderated change in implicit race preference over time, we added the interaction terms of date with each demographic measure to the regression (Step 3 in Table 1). This produced virtually no change in overall model fit ($R^2 = .1182$, a change in R^2 of .0002), suggesting that the moderators had a trivial impact. Even so, some of the demographic × date interactions were statistically significant because of the enormous sample size. The potential interpretation of these very weak effects is that older adults, liberals, Whites and Asians showed a greater decrease in implicit preference for Whites over time than younger adults, conservatives, and Blacks respectively.[7]

Variation in implicit racial attitudes among important dates in Obama's candidacy and presidency

The results so far suggest that there was little systematic change in implicit racial attitudes over the 2.5 years span, and that demographic variables had minimal moderating effects. Different trends could possibly be observed during specific periods of Obama's candidacy, election transition, and early presidency even though few to no effects occurred over the entire time span. Fig. 1's apparent stability contradicts this possibility. Even so, we looked for evidence of malleability in implicit racial attitudes during different stages in Barack Obama's rise to power: before candidacy (September 28, 2006–February 10, 2007), early candidacy to Iowa caucus (February 11, 2007–January 3, 2008), caucus to Hillary Clinton's concession making Obama the de facto nominee (January 4, 2008–June 7, 2008), presidential election sea-

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[6] Lexis–Nexis searches index up to 3000 entries in a search, so any value above 3000 was coded as 3000.

[7] Black participants showed no change in implicit racial preferences across time.

son to election day (June 8, 2008–November 7, 2008), election to inauguration (November 8, 2008–January 20, 2009), and early presidency (January 21, 2009–May 11, 2009). After isolating these dates, we compared the means and reran the regressions on just the data within these ranges to see if any evidence of change could be observed. Mean IAT effects in order were $D = .34, .34, .34, .33, .34, .34$. Further, none of the subsamples showed internal regression trends of date predicting IAT score that exceeded $R^2 = .00044$.

Variation in implicit racial attitudes around specific dates and for specific subsamples

Weeks before and after important election and presidency events: Perhaps the only remaining possibilities for malleability in implicit racial attitudes are short-term effects that occurred near important or notable events. To assess the impact of notable events, we compared the week before and after landmarks during Obama's campaign, election, and presidency.

Comparisons of IAT D during the week before and the week after Obama announced his candidacy for president ($Ms = .33$ versus .35) showed no significant difference in implicit racial preference, $F(1, 7224) = 2.61$, $p = 0.11$. However, the IAT D during the week before the Iowa caucuses ($M = .35$) was significantly higher than during the week after ($M = .31$; $p = .047$; $F(1, 2328) = 3.96$, $p = 0.047$, $R^2 = .0017$). Notably, the effect is so small that it barely reaches statistical significance with more than 2300 degrees of freedom.

Additional week-by-week comparisons were not predictive of implicit preference including the weeks surrounding the breaking story of the Reverend Wright scandal (March 13, 2008; $F(1, 5091) = 0.05$, $p = 0.82$), Hillary Clinton's concession (June 7, 2008; $F(1, 3119) = 0.05$, $p = 0.83$), Obama's nomination (August 25, 2008; $F(1, 4093) = 0.44$, $p = 0.51$), election day (November 4, 2008; $F(1, 14648) = 0.14$, $p = 0.71$), and Obama's inauguration as president (January, 20, 2009; $F(1, 7479) = 0.47$, $p = 0.49$). With the large number of non-effects, the single significant result around the Iowa caucus looks suspiciously like Type I error.

Specific subsamples that show some evidence of malleability elsewhere: One of the notable features of these results is how dramatically different they are than those reported by Plant et al. (2009) in which implicit race bias disappeared completely in two of their studies. It is reasonable to wonder if the discrepancy between our results and theirs is a consequence of unique qualities of their two university student samples (UW-Madison and Florida State). We restricted our dataset to participants that reported "some college", were 18–25 years old, and reported living in Madison, WI zipcodes ($N = 338$), or Tallahassee, FL zipcodes ($N = 302$) and then reran the regressions reported above. There was no relationship between date and IAT effect in either the Madison ($F(1, 336) = 1.13$, $p = .286$) or Tallahassee ($F(1, 300) = 0.0$, $p = .99$) samples. Further, both samples showed mean IAT effects similar to the overall sample (mean IAT D's = .38 and .32). Alternative analysis strategies with these subsamples, such as comparing effects pre- and post-candidacy, also failed to reveal evidence of change in implicit race bias over time.

Subsamples of how people found the website: The data collection averaged more than 15,000 usable IAT scores per month over the 2.5 years period for this analysis. The sizable traffic is due to the website's sustained popularity across a variety of contexts. It is possible that the circumstances of arriving at the site could moderate the amount of change over time. The race IAT study included an item in which participants reported how they arrived as the website. We collapsed responses on that variable into seven categories: media coverage ($N = 50,905$), recommendation from others ($N = 62,925$), assignment for work or class ($N = 160,398$), public forums ($N = 34,676$), specific web searches ($N = 2,714$), or other

pathways ($N = 27,001$). We added this variable and its interaction with date as a 4th step of the hierarchical regression reported in Table 1. Adding those two variables accounted for a change in R^2 of .0004 from Step 3 suggesting that these differences were minimally related to the observed effects and their change over time.

Cultural malleability of implicit racial bias? A day-by-day analysis

The most notable feature of these results, perhaps, is the stability of implicit racial attitudes on a day-to-day basis (Fig. 1). The grand mean of the sample over the 957 days of data collection was IAT $D = .34$, and the standard deviation across days was just .03. However, visual inspection of Fig. 1 indicates some variability within the relatively tight range. This variation could be due to (a) random error in the estimate of the mean, (b) daily variation in *sample characteristics* that happen to covary with implicit racial attitudes, or (c) actual cultural malleability in implicit racial attitudes.

Some "natural" variation in means across days will occur as a function of the accuracy of the estimate. Larger samples lead to smaller random errors and a more accurate estimate of the mean. Fig. 2 plots the daily sample size by daily IAT mean. Two black lines illustrate the border of ±2 standard errors of the grand mean by daily sample size. If variation in sample means is entirely attributable to the random noise of sampling estimates, then we would expect that about 95% of the data points would be within the black bars. Approximately 88% of the data points fall within the range suggesting that most of the variability by day is attributable to chance factors.

The remaining variability could be attributable to either variation in day-to-day sampling characteristics that are also associated with IAT effect magnitudes. If, for example, a blog that is popular among African Americans posted a link to the project, then the overall race bias estimate on that day would likely be lower than the average day because of sampling variation. An in-depth investigation of sampling factors is beyond the scope of this article. For the present purposes, it is clear that there is little systematic evidence for cultural shifts in day-to-day implicit bias. Claims to the contrary will need to show that such shifts exceed random error of estimation and possible variation in sampling between occasions.[8]

Discussion

We explored the possibility that the pervasive implicit and explicit preference for White people compared to Black people declined during Barack Obama's political rise to power and found that, essentially, it did not. The lack of change was minimally moderated by a variety of demographic variables, and we found no evidence that particular time periods or events were associated with shifts in implicit racial attitudes. Finally, explicit preferences for White Americans over Black Americans may have actually strengthened over time, but – even though it was an order of magnitude larger than the effect of time on implicit attitudes – the change was very slight.

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[8] As a final analysis to test for evidence of systematic variation in implicit race bias across days, we calculated autocorrelations. An autocorrelation is the cross-correlation of a variable with itself shifted by time. For example, correlating implicit race bias by day with implicit race bias by day +1 reveals whether the prior day predicts the subsequent day. If autocorrelations across day lags are consistently zero, then daily means are independent – the variability may all be random, or at least not time dependent. We calculated autocorrelations with lags from 1 to 18 days, with lags of 1–5 days revealing correlations of .14, .08, .08, .07, .02, respectively, and none of the others exceeding .11. The small positive correlations (especially with a time lag of 1 day) suggest that there may be a small amount of meaningful variation by day. That variation may be predicted by factors that were not investigated in this report.
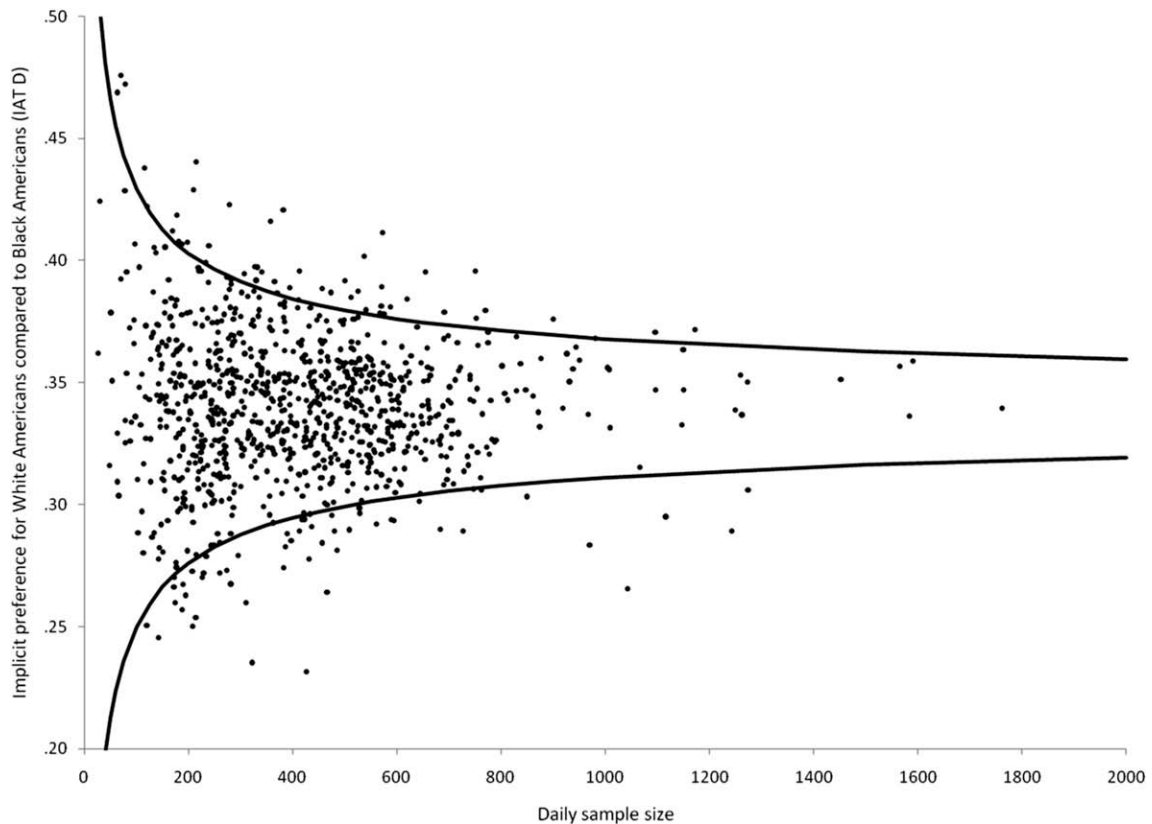
Fig. 2. Mean daily IAT effects by daily sample size with lines representing ±2 standard errors of the grand mean by sample size.

What accounts for the difference between these results versus Plant et al.?

Why did Plant et al. find evidence for reduced implicit preference for White where we did not? The surest answer is that we do not know. These data do, however, provide some evidence against some explanations. The difference is unlikely due to unique qualities of the university samples in Plant et al. (2009). Subset analyses of similar samples did not replicate their effect, and in the whole sample the effect did not covary by demographic characteristics that might be relevant – age, education, ideology. The particular days or weeks during which the Plant et al. studies were administered are another unlikely source of the discrepancy. At no point across the more than 2.5 years of our data collection was there a systematic decline (or rise) in implicit preference for Whites.

So what explains the difference? In our view, the two most plausible candidates are Type I error or an unrecognized feature of the immediate situation during data collection. Referring to Plant et al.'s null effects on the race IAT as possibly Type I error may seem odd. However, in the face of persistent evidence that the race IAT elicits an implicit preference for White Americans relative to Black Americans (every single one of 957 days in this sample; see also Nosek, Smyth et al., 2007), the appropriate null assumption is that any given sample will show a pro-White effect.

Alternatively, an influential situational factor may have been present in Plant et al.'s studies and not in ours. An obvious difference is that our study was conducted via the internet while theirs was done in the laboratory. That, itself, is not an explanation. In both cases, participants were sitting at a computer and completing a very similar procedure. The key difference could have been systematic features of the laboratory environment that could have shifted implicit evaluations. For example, if con-

textual factors of the laboratory setting communicated egalitarian ideals, then implicit biases might have been reduced (e.g., Sinclair et al., 2005). Our participants, in contrast, were in uncontrolled situations that are unlikely to systematically shift bias one way or another across the whole sample. Whatever the ultimate explanation, at present there is no reason to expect that the effect of Obama's candidacy could only be observed when participants visited a laboratory and not when completing the same procedure on the internet.[9]

Limitations

The present analyses were not conducted on a representative sample of the United States. However, analyses controlling for demographic effects did not substantially alter the estimated effect suggesting that no subgroup within the present sample showed strong evidence for malleability over this time period. Another limitation is that the data are cross-sectional, not longitudinal. We did not track individuals over time, so the interpretation of change (or non-change in this case) minimally depends on the sample charac-

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[9] Another possible explanation of the study differences is that data could not be collected validly in the lab or on the internet. Both, however, are well-established as valid data collection vehicles (e.g., Nosek, 2005; Nosek, Smyth et al. (2007) for validity of the virtual laboratory used for the present data collection). Further, other reports show that implicit racial attitudes in data collected at https://implicit.harvard.edu/ correlated with support for Obama (Greenwald, Smith, Sriram, Bar-Anan, & Nosek, 2009). This suggests that support for Obama is connected to implicit racial attitudes despite the fact that exposure to Obama does not appear to reduce implicit preference for Whites compared to Blacks. Finally, other studies using the same virtual laboratory have created and altered associations measured with the IAT showing that they can be created and shifted in this experimental context (e.g., Bar-Anan, De Houwer, & Nosek, 2009; Bar-Anan & Nosek, 2008; Ranganath & Nosek, 2008).

teristics being comparable over time. The analyses of demographics showed that the sample characteristics stayed stable across the period of the data collection, and sub-analyses of particular groups replicate the aggregate trend. Further, not a single day sampled revealed a null or reversed effect, illustrating the robustness of the implicit effect in the presence of possible sampling or selection idiosyncrasies. In all, there is little reason to anticipate that shifts in implicit racial attitudes would not have been observed in this sample if they had occurred in reality.

Closing

While the present study suggests that the extensive exposure to Barack Obama as a presidential candidate did not produce a cultural shift in implicit and explicit racial attitudes, these data should not be taken as evidence against the malleability of implicit (or explicit) social cognition generally. Attitudes, both implicit and explicit, are sensitive to the social context and do change. Obama, as a high-status African American exemplar, may still have strong effects on the expression of implicit racial attitudes under certain conditions. In this study, Obama was not made accessible prior to completing the study materials. Other research provides suggestive evidence that making race accessible may be an important condition for obtaining racial malleability effects (Joy-Gaba & Nosek, in press). However, the present data do suggest that malleability effects in implicit social cognition might be more constrained than implied by the existing published theory and empirical evidence.

Exploring the shifts in implicit racial attitudes during the rise of Barack Obama is a stringent test of attitude malleability in a naturalistic setting. The seeming absence of his influence challenges claims that a single high-status Black exemplar can decrease or eliminate implicit preferences for Whites over Blacks. Even so, the fact that Barack Obama became a candidate and was elected president is ample evidence that American attitudes about race have changed dramatically in recent history, even if not in response to Obama himself.

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References

Aronson, J., Jannone, S., McGlone, M., & Johnson-Campbell, T. (2009). The Obama effect: An experimental test. *Journal of Experimental Social Psychology, 45*, 957–960.

Bar-Anan, Y., De Houwer, J., & Nosek, B. A. (2009). The role of contingency memory, intentional processes and number of pairings in evaluative conditioning. Unpublished manuscript.

Bar-Anan, Y., & Nosek, B. A. (2008). Transitive relations cause indirect association formation between concepts. Unpublished manuscript.

Baron, A. S., & Banaji, M. R. (2006). The development of implicit attitudes: Evidence of race evaluations from ages 6, 10 and adulthood. *Psychological Science, 17*, 53–58.

Dasgupta, N., & Greenwald, A. G. (2001). On the malleability of automatic attitudes: Combating automatic prejudice with images of admired and disliked individuals. *Journal of Personality and Social Psychology, 81*, 800–814.

Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology, 56*, 5–18.

Devine, P. G., & Elliot, A. J. (1995). Are racial stereotypes really fading? The Princeton trilogy revisited. *Personality and Social Psychology Bulletin, 21*, 1139–1150.

Greenwald, A. G., McGhee, D. E., & Schwartz, J. K. L. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology, 74*, 1464–1480.

Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the implicit association test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology, 85*, 197–216.

Greenwald, A. G., Smith, C. T., Sriram, N., Bar-Anan, Y., & Nosek, B. A. (2009). Race attitude measures predicted vote in the 2008 US Presidential Election. *Analyses of Social Issues and Public Policy, 9*, 241–253.

Joy-Gaba, J. A., & Nosek, B. A. (in press). The surprisingly limited malleability of implicit racial evaluations. *Social Psychology*.

Lowery, B. S., Hardin, C. D., & Sinclair, S. (2001). Social influence effects on automatic racial prejudice. *Journal of Personality and Social Psychology, 81*, 842–855.

Madon, S., Guyll, M., Aboufadel, K., Montiel, E., Smith, A., Palumbo, P., et al. (2001). Ethnic and national stereotypes: The Princeton trilogy revisited and revised. *Personality and Social Psychology Bulletin, 27*, 996–1010.

Marx, D. M., Ko, S. J., & Friedman, R. A. (2009). The "Obama effect": How a salient role model reduces race-based performance differences. *Journal of Experimental Social Psychology, 45*, 953–956.

Mitchell, J. P., Nosek, B. A., & Banaji, M. R. (2003). Contextual variations in implicit evaluation. *Journal of Experimental Psychology: General, 132*, 455–469.

Nosek, B. A. (2005). Moderators of the relationship between implicit and explicit evaluation. *Journal of Experimental Psychology: General, 134*, 565–584.

Nosek, B. A., Greenwald, A. G., & Banaji, M. R. (2007). The implicit association test at age 7: A methodological and conceptual review. In J. A. Bargh (Ed.), *Social psychology and the unconscious: The automaticity of higher mental processes* (pp. 265–292). New York: Psychology Press.

Nosek, B. A., Smyth, F. L., Hansen, J. J., Devos, T., Lindner, N. M., Ranganath, K. A., et al. (2007). Pervasiveness and correlates of implicit attitudes and stereotypes. *European Review of Social Psychology, 18*, 36–88.

Plant, A. E., Devine, P. G., Cox, W. T. L., Columb, C., Miller, S. L., Goplen, J., et al. (2009). The Obama effect: Decreasing implicit prejudice and stereotyping. *Journal of Experimental Social Psychology, 45*, 961–964.

Ranganath, K. A., & Nosek, B. A. (2008). Implicit attitude generalization occurs immediately, explicit attitude generalization takes time. *Psychological Science, 19*, 249–254.

Sinclair, S., Lowery, B., Hardin, C., & Colangelo, A. (2005). Social tuning of automatic racial attitudes: The role of affiliative motivation. *Journal of Personality and Social Psychology, 89*, 583–592.

Wittenbrink, B., Judd, C. M., & Park, B. (2001). Spontaneous prejudice in context: Variability in automatically activated attitudes. *Journal of Personality and Social Psychology, 81*, 815–827.