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Reports

Attitude–goal correspondence and interracial interaction: Implications for executive function and impression formation

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HIGHLIGHTS

- We examined the consequences of emotion regulation during interracial interaction.
- Mismatch in implicit attitudes and expressive goals predicted cognitive depletion.
- Attitude–regulatory goal mismatch also predicted more negative interracial judgments.
- This pattern of effects was found for both high and low-prejudiced Whites.

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ABSTRACT

The present research examined whether mismatches in implicit racial attitudes and regulatory goals may contribute to well-documented cognitive depletion effects after interracial interactions. Consistent with a mismatch account of regulatory demands, both high and low implicitly-biased Whites showed evidence of cognitive depletion after interacting with a Black confederate, but as a function of oppositely-valenced emotion regulation prompts: Whereas high implicitly-biased Whites showed impaired subsequent performance on a Stroop task when instructed to suppress negative (but not positive) emotional expressions during an interracial interaction, low implicitly-biased Whites showed the opposite pattern. Additionally, attitude–regulatory goal mismatch was associated with more negative impressions of a Black confederate, independent of observers' impressions of the confederate. Implications of attitude–goal correspondence for intergroup interaction and the maintenance of intergroup bias are considered.

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Despite substantial improvements in racial attitudes in recent decades, interracial interactions remain challenging for both majority and minority group members in the United States (Bowman & Denson, 2011; Dovidio, Gaertner, Kawakami, & Hodson, 2002). Growing evidence suggests people may expend considerable effort to manage others' impressions during interracial exchanges (Bergsieker, Shelton, & Richeson, 2010), and that these efforts can have detrimental consequences. For instance, Whites' attempts to avoid appearing racist by adopting a colorblind strategy in interracial interactions can backfire, fueling negative impressions by minority partners and reduced capacity for inhibitory control (Apfelbaum, Sommers, & Norton, 2008). However, in their review of the interracial contact literature, Richeson and Shelton (2007) suggested that it may not be the goal to avoid bias, per se, but specific regulatory

goals (e.g., attentional vigilance, suppression) that individuals employ to navigate interracial interactions that may deplete cognitive resources (see also Plant & Devine, 2009; Vorauer, 2006). In the present research, we build on this work by investigating the impact of one such self-regulation strategy, *expressive suppression* – the inhibition of emotion-expressive behavior (Gross, 2008) – on Whites' cognitive functioning after an interracial interaction.

Models of executive control suggest that engagement in one task that requires self-regulation (e.g., inhibiting emotional expressions) can impair performance on subsequent tasks that utilize attentional resources (Muraven & Baumeister, 2000). For instance, Richeson and Shelton (2003) found that Whites generally performed more poorly on the Stroop color-naming task – a measure of executive attentional capacity – after engaging in interracial compared to same-race interactions. Moreover, attempts to regulate negative affect may be especially taxing for Whites with negative implicit racial attitudes. Whites higher in implicit bias (assessed by the Implicit Association Test, IAT; Greenwald, Nosek, & Banaji, 2003) work harder to

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control their nonverbal behavior during interracial interactions and show greater Stroop impairment after an interracial interaction compared to those lower in implicit bias (Richeson & Shelton, 2003; Richeson & Trawalter, 2005; see also Richeson et al., 2003).

In the present research we focused on one particular type of self-regulation, the active inhibition of emotion cues, that may be especially relevant to interracial interaction. In research on expressive suppression by Gross and colleagues (see Gross, 2008, for a review), participants are asked to avoid showing emotions while observing emotionally-evocative stimuli or while engaging in conversation. Previous work on interracial interaction suggests that mismatches in what individuals are feeling and what they are attempting to express may be an important contributor to Whites' regulatory demands in these exchanges (Dovidio, Kawakami, & Gaertner, 2002; Hebl & Dovidio, 2005; Mendes & Koslov, 2013). Specifically, when situational constraints clearly define appropriate behavior, Whites may harbor negative implicit racial attitudes and experience negative affect in interracial interactions (e.g., anxiety, aversion; Dovidio & Gaertner, 2004; Plant & Devine, 2003) but behave in ways to avoid appearing prejudiced (e.g., inhibit negative emotional expressions). These conflicting responses may exact cognitive and social costs. Generally, the attempted control of emotional expressions is a particularly taxing form of self-regulation (Gross, 2008; Richards & Gross, 2000), resulting in impaired cognitive functioning (e.g., on a Stroop task) and reduced neural activity in systems implicated in self-control (Inzlicht & Gutsell, 2007), as well as reduced feelings of rapport within social interactions (Butler et al., 2003).

Whereas past work has largely focused on the regulatory demands of high implicitly-biased individuals (Richeson & Shelton, 2007), the present research investigated the consequences of emotion regulation as a function of both the valence of the emotional expression (i.e., positive or negative) participants are asked to suppress and their level of implicit racial bias. Specifically, we reasoned that *discrepancies* in implicit racial attitudes and emotion regulation goals (attitude–goal mismatch) may contribute to documented deficits in executive function after interracial interactions by initiating more effortful self-regulation. From this perspective, we hypothesized that even *low* implicitly biased Whites might show deficits in cognitive functioning after an interracial interaction to the extent their regulatory goal conflicts with their more positive implicit racial attitudes (i.e., when attempting to suppress positive expressions). Indeed, whereas research on emotion regulation has typically examined cognitive consequences of suppressing *negative* emotion, suppressing positive emotion may, in some contexts, be just as taxing (Kim & Hamann, 2007). Within interracial interactions, Mendes and Koslov (2013) found that Whites tend to smile and laugh more with Black compared to White partners. Bergsieker et al. (2010) similarly found that Whites showed more ingratiation behaviors, such as smiling, in interracial compared to same-race interactions. Thus, we posited that efforts to suppress positive expressions in interracial interactions may also be cognitively demanding, and particularly for Whites with more egalitarian implicit attitudes.

Richeson and Shelton (2003) and Richeson and Trawalter (2005) have documented systematic effects of Whites' implicit, but not explicit, racial attitudes on Stroop performance after interracial interaction, consistent with relatively high implicitly biased Whites' greater efforts to appear nonprejudiced (see also Dovidio, Kawakami, et al., 2002). Thus, in the present research we focused on correspondence between Whites' *implicit* attitudes and emotion regulation goal. In the present study, White participants, whose levels of implicit bias were assessed in an ostensibly separate study, interacted with a Black partner. Prior to the interaction, participants were administered an expressive suppression procedure adapted from prior studies on emotion regulation (Butler et al., 2003; Butler, Lee, & Gross, 2007; Gross, 1998) in which they were instructed to either avoid expressing negative emotion (negative emotion suppression goal) or avoid expressing positive emotion (positive emotion suppression goal) during the interaction, or received no suppression instructions (control). Cognitive functioning

was assessed with a standard measure of inhibitory control, Stroop interference, used in prior research on executive functioning in interracial interaction (e.g., Richeson & Trawalter, 2005), as well as participants' self-reported difficulty complying with the suppression instructions.

We hypothesized that White participants' cognitive functioning would be impaired under conditions of a *mismatch* in implicit racial attitudes and regulatory goal when interacting with a Black partner. Because of their negative affective orientations toward Blacks (Amodio et al., 2003; Dovidio & Gaertner, 2004), we expected that White participants relatively high on implicit bias would show greater cognitive impairment when attempting to suppress negative compared to positive emotional expressions during an interracial interaction. In contrast, because White individuals lower in implicit racial bias display more positive affect in interracial interactions, including smiling and spontaneously initiating more eye-contact (Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; McConnell & Leibold, 2001), we hypothesized that suppressing positive expressions would be particularly effortful for these individuals, and that they would show greater cognitive depletion when instructed to suppress positive (versus negative) expressions as a consequence.

Finally, given the importance of impression management in intergroup interaction (Bergsieker et al., 2010), we included an additional outcome measure — participants' impressions of the Black confederate. Generally, *processing fluency*, the subjective ease of a given cognitive task, has been shown to affect judgments across a diverse array of instantiations. For example, stocks with easy-to-pronounce names are preferred to those with more disfluent names (Alter & Oppenheimer, 2006) and authors of easy-to-read text are perceived as more intelligent than those of hard-to-read text (Oppenheimer, 2006). Whereas processing ease tends to promote liking, disfluent processing leads to more negative evaluations and lower trust (see Alter & Oppenheimer, 2009, for a review). To the extent implicit attitude–regulatory goal mismatch reflects a more effortful form of self-regulation, it might also thus prompt more negative impressions of an interaction partner.

Within the intergroup interaction domain, there is some evidence to suggest that regulatory effort may negatively impact impressions. Shelton, Richeson, and Salvatore (2005), for instance, found that racial minority participants who anticipated racial prejudice showed greater behavioral engagement (positive expressiveness) during an interracial interaction but reported liking their White partner less, compared to those who had no such prejudice expectation. Similarly, Frable, Blackstone, and Scherbaum (1990) found that in interactions with stigmatized (Black or obese) partners, nonstigmatized individuals engaged in positive compensatory behaviors (talking, smiling) but simultaneously reported liking their partner *less* than nonstigmatized partners. Frable et al. suggested that perhaps nonstigmatized participants did not like their stigmatized partner as much because they felt that they were doing most of the work of making the interaction run smoothly. Consistent with these prior findings (Frable et al., 1990; Shelton et al., 2005) and research on fluency more generally, we hypothesized that implicit attitude–regulatory goal mismatch would also predict more negative impressions of a Black interaction partner.

Method

Participants

Eighty-four self-identified White introductory psychology students (60% female) participated in exchange for partial course credit.

Procedure

Participants were informed that they would engage in a brief “get-to-know-you” conversation with another participant and were

provided with six conversation questions adapted from the Interpersonal Closeness Procedure (Aron, Melinat, Aron, Vallone, & Bator, 1997; see Appendix). The expressive suppression manipulation was adapted from prior research (Butler et al., 2003, 2007; Richards & Gross, 2000). Before meeting the confederate, participants were randomly assigned to one of three conditions: (a) *negative suppression* condition, in which participants were informed that previous research had shown that emotions can sometimes influence impressions and were instructed to “avoid showing any negative emotions during the conversation”; (b) a *positive suppression* condition, in which they received the identical instructions, substituting “negative” with “positive” emotions, or (c) a control condition, in which they received no instructions about how to regulate their emotions. Participants were told that the confederate had been assigned to a control condition and were asked not to disclose the instructions that they had received. Participants then interacted with one of four Black female confederates, who were unaware of the study aims and whose responses were scripted and standardized.

Stroop performance

After the interaction, participants independently completed a Stroop (1935) color-naming task to assess cognitive depletion. Participants were instructed to indicate the font color of a letter string by pressing the appropriate color-coded key as quickly as possible. On *incompatible* trials a color word appeared in a font color different from its semantic meaning. *Control* trials consisted of a string of Xs in one of the four font colors. Each letter string appeared on the screen for a maximum of 1500 ms, preceded by a fixation cross for 500 ms. The inter-trial interval was 500 ms; incorrect responses were followed by a 500 ms duration error tone. The task consisted of 6 blocks of 12 trials each for a total of 72 critical trials; incompatible and control trials were randomized within each block. Following the procedures of Richeson and Trawalter (2005) and Salvatore and Shelton (2007), Stroop interference scores were computed as the difference in response latencies (in milliseconds) between incompatible and control trials, with higher scores indicating greater cognitive depletion. Incorrect responses and latencies 2.5 standard deviations above or below the mean were recoded as missing data. Four participants showed extreme error rates above 20% and were omitted from the analyses, and data for six participants were not obtained due to a computer program error; thus, Stroop analyses are based on a total of 74 participants. Scores in the present sample ranged from -102.56 ms to 213.19 ms.

Self and partner judgments

Following the Stroop task, participants completed a questionnaire that assessed the extent to which they perceived themselves and their partner as friendly (*friendly, open, interested*); self-reported friendliness $\alpha = .78$; partner friendliness $\alpha = .77$, their reported difficulty complying with the experimenter's instructions, and the extent to which they experienced negative (*uncomfortable, embarrassed, frustrated*; $\alpha = .77$) and positive (*happy, relaxed, “I enjoyed the interaction”*; $\alpha = .76$) emotion during the interaction. All items were on a 1 (*not at all*) to 9 (*very much*) scale. Confederates also reported how friendly they had felt during the interaction ($\alpha = .86$).

Implicit and explicit racial attitudes

In order to avoid biasing participants' interaction responses, data on racial attitudes were collected in a separate online session that included measures of implicit and explicit racial bias and demographic questions. Implicit bias was assessed using the Race IAT (Greenwald et al., 2003) in which category labels were *Blacks* versus *Whites* and evaluative attributes were *Pleasant* (e.g., happy, love) versus *Unpleasant* (e.g., grief, evil). The task consisted of three single-category practice blocks of 24 trials each and 4 double-category critical blocks (two 24-trial practice blocks and two 48-trial primary blocks). Compatible (White/Pleasant

and Black/Unpleasant) and incompatible (White/Unpleasant and Black/Pleasant) blocks were counterbalanced across participants. Scoring followed procedures recommended by Greenwald et al. (2003). Response latencies greater than 1 s and less than 300 ms were recoded as missing data and incorrect responses were replaced with the mean of the correct latencies for that block plus a 600 ms error penalty. Difference scores for mean latencies between incompatible and compatible trials were computed separately for practice and primary trials, divided by their pooled standard deviation, and averaged to compute a D score, with larger values indicating a more negative association with the racial category Black relative to White. Scores in the present sample ranged from -1.20 to $.93$. Overall, participants demonstrated significant implicit bias against Blacks, $M = .28$, $SD = .31$, $t(83) = 8.31$, $p < .001$. Explicit racial attitudes were assessed with Brigham's (1993) Attitudes Toward Blacks Scale ($\alpha = .90$). Implicit bias and explicit racial attitudes showed a modest positive correlation, $r(82) = .27$, $p = .02$.

Observer ratings

After the experimental session was completed, two coders (1 Black male, 1 White male), who were naïve to the study aims and conditions, independently rated participants' nonverbal positive (*cheerful, smiled, laughed, emotionally expressive, showed positive emotion*; average intraclass $r = .87$) and negative (*anxious, uncomfortable, nervous, frowned, showed negative emotion*; average intraclass $r = .61$) expressivity on a 1 (*not at all*) to 9 (*very much*) scale and confederates' verbal friendliness using the same three items (*friendly, open, interested*; average intraclass $r = .63$).

Results

Emotional experience and expressivity

Table 1 presents the means, standard deviations, and correlations for all measures used in the study. To examine whether participants complied with the specific expressive suppression instructions administered, we submitted observers' ratings of participants' positive and negative expressivity as well as participants' reported emotional experience during the interaction to a series of one-way analyses of variance.

An effect of suppression condition was found for observers' ratings of participants' positive expressivity, $F(2,78) = 12.16$, $p < .001$, $\eta_p^2 = .24$.¹ Bonferroni-adjusted pairwise comparisons of condition effects revealed that, as expected, participants in the positive suppression condition expressed less positive emotion ($M = 2.33$, $SD = .95$) than those in the negative suppression condition ($M = 4.13$, $SD = 1.76$), $p < .001$, $d = 1.27$, and the control group ($M = 4.05$, $SD = 1.70$), $p < .001$, $d = 1.25$. No significant differences were found across conditions for observers' ratings of participants' negative expressivity, $F = .90$; means on this measure were generally low across conditions (negative suppression condition: $M = 1.91$, $SD = .84$; positive suppression condition: $M = 2.00$, $SD = .90$; control group: $M = 2.24$, $SD = .91$), consistent with the notion that Whites may generally seek to inhibit expressions of negative affect in interracial interactions (Dovidio & Gaertner, 2004; see also Mendes & Koslov, 2013).

With respect to their reported emotional experience, suppression condition affected participants' reported positive, $F(2,81) = 5.99$, $p = .004$, $\eta_p^2 = .13$, and negative, $F(2,81) = 6.61$, $p = .002$, $\eta_p^2 = .14$, emotional experience. Participants in the positive suppression condition ($M = 5.24$, $SD = 1.68$) reported experiencing less positive emotion than those in the negative suppression condition ($M = 6.66$, $SD = 1.56$), $p = .003$, $d = .88$, and control group ($M = 6.06$, $SD = 1.39$), $p = .052$, $d = .53$. Similarly, participants in the negative suppression condition ($M = 2.91$, $SD = 1.76$) reported experiencing less

¹ Recordings for three participants were not obtained due to equipment malfunction.

Table 1
Means, standard deviations, and zero-order correlations of measures.

Measure	M (SD)	Participant								Observers' ratings		
		1	2	3	4	5	6	7	8	9	10	11
<i>Participant</i>												
1. Stroop interference	65.62 (67.72)	–	–.06	–.01	.07	.12	–.14	.16	–.14	.16	.18	.01
2. IAT	0.28 (.31)		–	.27*	.05	–.31**	.16	–.23*	–.18	.07	.02	.05
3. ATB	2.31 (.81)			–	.00	–.07	.10	–.17	–.05	.00	.08	.05
4. Task difficulty	3.45 (2.89)				–	–.41**	.63**	–.31**	–.06	–.34*	–.13	–.24*
5. Positive emotion	5.99 (1.64)					–	–.67**	.78**	.42**	.29**	.16	.33**
6. Negative emotion	3.56 (2.03)						–	–.44**	–.15	–.25*	–.24*	–.24*
7. Friendliness (self)	6.73 (1.42)							–	.45**	.35**	.03	.33**
8. Friendliness (partner)	7.27 (1.16)								–	–.09	.07	.34**
<i>Observers' ratings</i>												
9. Positive expressivity (P)	3.51 (1.71)									–	–.17	.16
10. Negative expressivity (P)	2.05 (.90)										–	.07
11. Friendliness (C)	5.11 (.82)											–

Note. IAT = Race Implicit Association Test (Nosek, Banaji, & Greenwald, 2002); ATB = Attitudes Toward Blacks Scale (Brigham, 1993). Stroop scores are in milliseconds. Higher IAT scores indicate stronger pro-White bias; higher Stroop scores indicate greater cognitive depletion. See text for a description of the measures. P = Observers' ratings of participant; C = Observers' ratings of confederate.

* $p < .05$.

** $p < .01$.

negative emotion than those in the positive suppression condition ($M = 4.62$, $SD = 2.20$), $p = .001$, $d = .86$, and somewhat, but not significantly, less negative emotion than those in the control group ($M = 3.17$, $SD = 1.70$). No interaction effects with implicit or explicit bias were found for self-reported emotional experience or observer ratings of participants' expressivity.

Primary analyses

To assess participants' cognitive functioning, we next examined participants' reported difficulty complying with the experimental task instructions and their performance on the Stroop task. These measures were not significantly correlated, $r(72) = .07$, $p = .55$, suggesting that they reflected different aspects of effortful processing.

For each outcome measure, we first conducted a one-way analysis of variance to test for an effect of the suppression manipulation. We then ran a series of regression analyses to test our hypothesized pattern of interaction effects of implicit bias and expressive suppression. Suppression condition was dummy-coded with positive suppression as the reference group (i.e., contrast 1 was coded 1 for the negative suppression condition and 0 for all other conditions; contrast 2 was coded 1 for the control condition and 0 for all other conditions; see Aiken & West, 1991), which allowed us to test two theoretically important comparisons. The first contrast was of primary interest, allowing us to assess the hypothesized effects of the positive versus negative suppression instructions for relatively low and relatively high implicitly biased participants. The second contrast allowed us to examine the effects of the conceptually more novel self-regulation condition, positive expressive suppression (see Kim & Hamann, 2007), relative to a control group. Mean comparisons of the negative suppression condition to the control group were included, where informative, for descriptive purposes. Implicit bias, explicit bias and the two suppression condition contrasts were included as predictors in the first model, and their interaction terms (one for each of the two contrasts) were included along with all main effects (mean-centered) in the second model.²

Reported task difficulty

A main effect of suppression condition was obtained for reported task difficulty, $F(2,81) = 18.47$, $p < .001$, $\eta_p^2 = .29$. As expected, participants reported more difficulty complying with instructions to

² All of the significant Condition \times IAT effects remained significant when explicit bias was included in the model.

suppress positive expressions ($M = 5.67$, $SD = 3.36$) than negative expressions, ($M = 2.93$, $SD = 2.18$), $p < .001$, $d = .97$. Participants in the control group reported the least difficulty complying with task instructions ($M = 1.82$, $SD = 1.42$; vs. positive suppression, $p < .001$, $d = 1.49$; vs. negative suppression, $p = .09$, $d = .60$). No significant main effects of implicit or explicit bias on reported task difficulty were found, $ps > .34$; however, a significant Suppression Condition \times Explicit Bias interaction was obtained, $\beta = .31$, $t(74) = 2.42$, $p < .02$. The more people expressed explicit bias toward Blacks, the less difficult they found the instruction to suppress positive emotions, $\beta = -.34$, $t(74) = -2.27$, $p < .03$. No other effects of explicit bias, including interactions with experimental condition, were found for the outcome measures reported below; therefore, all subsequent analyses excluded explicit bias.²

Table 2 shows results of the regression analyses. Implicit Bias \times Condition interactions did not reach statistical significance for the two tested contrasts (Suppress Positive versus Suppress Negative, $t(74) = 1.89$, $p = .06$, and Suppress Positive versus the Control, $t(74) = 1.82$, $p = .07$). For comparative purposes to results for Stroop performance, Fig. 1 shows predicted values for the reported difficulty of the task instructions as a function of the suppression condition and participants' level of implicit bias. Whereas participants relatively low (1 SD below the mean) on implicit bias reported greater difficulty suppressing positive expressions than either negative expressions, $\beta = -.70$, $t(74) = -3.99$, $p < .001$, or receiving no suppression instructions, $\beta = -.83$, $t(74) = -4.96$, $p < .001$, those relatively high (1 SD above the mean) on implicit bias showed no difference in their assessments of the difficulty of suppressing positive versus negative expressions, $p = .26$, and reported greater difficulty complying with the positive emotion suppression instructions compared to the control group, $\beta = -.45$, $t(74) = -3.20$, $p = .002$.

Stroop performance

An initial examination of condition effects showed no differences across conditions in participants' overall Stroop performance, $F(2,71) = 1.06$, $p = .53$. As hypothesized, Suppression Condition \times Implicit Bias interaction effects were obtained when comparing the positive emotion suppression to the negative suppression and control group (see Table 2). No moderating effect of implicit bias was found when comparing the negative suppression and the control group, $p = .62$.

Fig. 2 shows predicted Stroop interference scores for participants as a function of their level of implicit bias, revealing distinct profiles

Table 2
Multiple regression analyses for task difficulty, Stroop interference, and confederate friendliness.

	Task difficulty				Stroop interference				Friendliness			
	B	SE(B)	β	R ²	B	SE(B)	β	R ²	B	SE(B)	β	R ²
Step 1				.29				.03				.03
IAT	-.41	.90	-.05		-5.04	25.70	-.02		-.64	.42	-.17	
Contrast 1	-2.79	.68	-.46**		16.58	19.49	.12		.06	.32	.03	
Contrast 2	-3.72	.67	-.60**		-11.30	20.03	-.08		.05	.31	.02	
Step 2				.33				.22				.12
IAT	-3.44	1.72	-.37*		-149.55	43.97	-.72**		1.20	.79	.32	
Contrast 1	-2.87	.70	-.48**		14.49	18.65	.10		.15	.32	.06	
Contrast 2	-4.01	.68	-.65**		-26.84	18.76	-.18		.24	.31	.10	
IAT × Contrast 1	5.00	2.64	.25		247.35	69.02	.54**		-2.71	1.22	-.33*	
IAT × Contrast 2	3.81	2.10	.29		185.00	54.67	.61**		-2.43	.97	-.46*	
R ² change				.04				.19**				.08*

Note. Suppression condition coded with positive suppression as the reference group (=0). Step 1 Contrast 1 (main effect) = Negative Suppression (=1) vs. Other (=0); Contrast 2 = Control (=1) vs. Other (=0). In Step 2, Contrast 1 (conditional effect) reflects negative suppression vs. positive suppression; Contrast 2 reflects control vs. positive suppression (see Aiken & West, 1991). IAT = Race Implicit Association Test (Nosek et al., 2002), mean-centered. Stroop interference scores are in milliseconds.

* $p < .05$.

** $p < .01$.

of cognitive depletion consistent with the differing hypothesized regulatory demands of high and low implicitly-biased individuals in interracial interactions. Whereas relatively low-bias (1 SD below the mean) participants were more cognitively depleted after suppressing positive expressions compared to negative expressions, $\beta = -.40$, $t(64) = -2.03$, $p < .05$, or receiving no suppression instructions, $\beta = -.56$, $t(64) = -3.00$, $p < .005$, relatively high-bias participants (1 SD above the mean) showed the opposite pattern – greater depletion after suppressing negative expressions compared to positive expressions, $\beta = .63$, $t(64) = 2.88$, $p = .005$. Indeed, relatively high-bias individuals (at 1 SD above the mean) showed no evidence of cognitive depletion (i.e., the Stroop interference score was not significantly greater than zero) after being instructed to suppress positive expressions, $p = .11$.

Friendliness judgments

No main effect of Condition or Suppression Condition × Implicit Bias interactions were found for observers' ratings of the confederates' friendliness or confederates' self-perceived friendliness, thus, we focus on effects for participants' judgments of the confederate.³

As in the Stroop analyses, significant Suppression Condition × Implicit Bias interactions were again obtained when comparing the positive emotion suppression to the negative suppression and control group (see Table 2). Also, no moderating effect of implicit bias was found when comparing the negative suppression and the control group, $p = .67$.

Fig. 3 shows participants' ratings of the confederates' friendliness as a function of participants' level of implicit bias and suppression instructions. Partially mirroring the pattern for Stroop performance, relatively low implicitly-biased participants (1 SD below the mean) judged the confederate as less friendly in the positive suppression condition compared to the negative suppression, $\beta = .42$, $t(74) = 2.10$, $p = .04$, and control group, $\beta = .40$, $t(74) = 2.07$, $p = .04$, and demonstrated no difference in their assessments of the confederate's friendliness in the negative suppression compared to the control condition, $p = .91$. In contrast, participants relatively high on implicit bias (1 SD above the mean) showed no difference in their judgments of the confederate's friendliness in the positive

³ When confederates' self-perceived friendliness and observers' ratings were included as covariates, all reported Suppression Condition × Implicit Bias interactions for Stroop performance and for ratings of the confederate's friendliness remained significant, $ps < .03$, suggesting that participants' impressions were independent of the confederates' or observers' assessments.

suppression condition compared to either of the other two conditions (vs. negative suppression, $p = .16$; vs. control instructions, $p = .20$).

Supplementary analyses

Although conceived as separate outcomes, we explored the potential mediating roles of Stroop interference and self-reported task difficulty on participants' impressions of the confederate using Hayes' (2013) PROCESS macro for estimating indirect effects using bootstrapping procedures. When included simultaneously in the regression model with implicit bias, the two previously described condition contrasts, and their interactions, task difficulty and Stroop performance both failed to predict participants' judgments, $ps = .77$ and $.47$, respectively, and the indirect effects for each potential mediator were not significantly different from zero, as evidenced by 95% bias-corrected bootstrap confidence intervals that included zero (task difficulty: $-.196$ to $.097$; Stroop performance: $-.348$ to $.057$), suggesting that the emotion suppression effects on Stroop interference, self-reported task difficulty, and participants' subsequent impressions emerged independently.

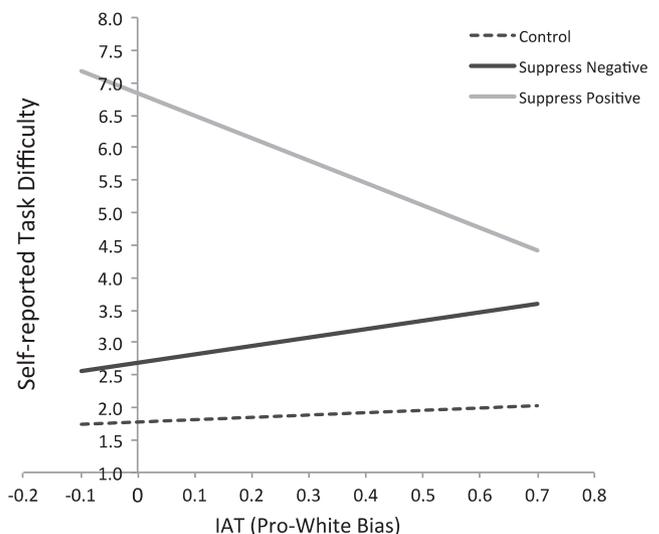


Fig. 1. Reported difficulty complying with experimenter instructions as a function of the suppression condition and participants' level of implicit racial bias (IAT). Scale ranges from 1 to 9; higher scores indicate greater reported difficulty.

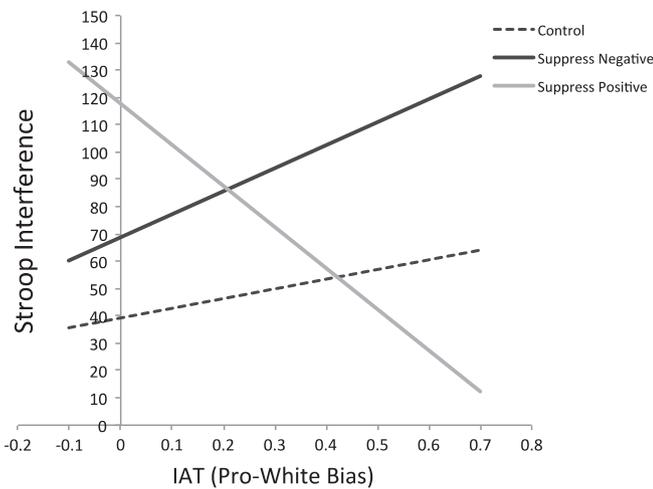


Fig. 2. Predicted Stroop interference (in milliseconds) as a function of the suppression condition and participants' level of implicit bias (IAT). Larger values indicate poorer performance or greater cognitive depletion.

Discussion

Whereas previous research has suggested that discrepancies in implicit racial attitudes and regulatory goals (attitude–goal mismatch) may fuel mistrust in intergroup interactions (Hebl & Dovidio, 2005), our findings suggest mismatches may also contribute to well-documented cognitive depletion effects (Richeson & Shelton, 2007). Specifically, we found that both high and low-implicitly biased Whites showed evidence of cognitive depletion after interracial interaction, but as a function of oppositely-valenced self-regulation prompts: Whereas high implicitly-biased Whites showed impaired performance when instructed to suppress negative versus positive emotional expressions during an interracial interaction, low implicitly-biased Whites showed the opposite pattern. The present research also reveals a potential interpersonal cost of emotion regulation under conditions of attitude–regulatory goal mismatch. Consistent with and extending previous findings (Frable et al., 1990; Shelton et al., 2005), implicit attitude–goal mismatch was associated with more negative impressions of a Black confederate, despite no corresponding differences in observers' impressions of the confederates across experimental conditions.

Collectively, these findings complement neuroscientific work suggesting a direct relationship between conflict monitoring that detects discrepancies between attitudes and self-regulatory goals and social evaluation, whereby situational cues (e.g., an interaction partner) associated with cognitive discrepancies are encoded as aversive (Botvinick, 2007; Kool, McGuire, Rosen, & Botvinick, 2010). Our findings are also consistent with current theorizing on the role of implicit–explicit attitude correspondence in social judgment (Gawronski, Strack, & Bodenhausen, 2009) and suggest that one reason why low attitudinal correspondence (e.g., negative implicit racial attitudes and positive explicit racial attitudes) may be associated with more negative interracial judgments may be due to the regulatory demands attitudinal inconsistencies evoke. Our research further indicates that it is the mismatch between implicit attitudes and the nature of regulatory efforts per se that is critical: Even Whites with relatively low levels of implicit bias may show similar deficits in cognitive functioning after interracial interaction as those previously reported for high implicitly-biased Whites if their regulatory goals conflict with their more positive implicit attitudes (e.g., when attempting to inhibit positive emotional expressions). In contrast, Whites who were relatively high on implicit bias (1 SD above the mean) showed no evidence of cognitive depletion when instructed to suppress positive expressions, suggesting the possibility that these individuals may

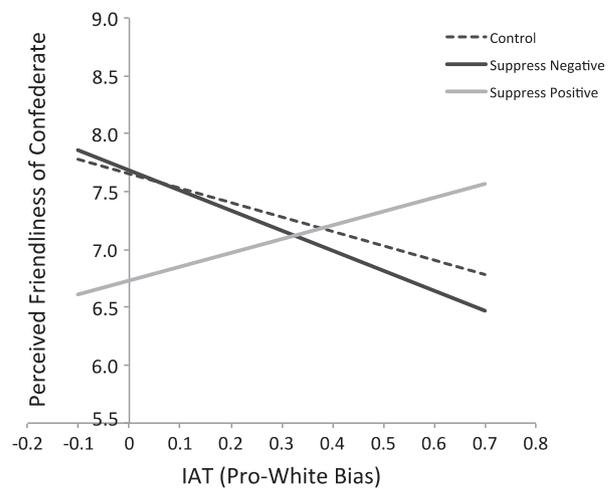


Fig. 3. Confederate friendliness rating as a function of the suppression condition and participants' implicit bias (IAT). Values range from 1 to 9; higher scores indicate greater perceived friendliness.

not show cognitive deficits in interracial contexts in which the inhibition of positive emotional expressions may be justified (e.g., in situations that call for modesty).

In the present study, we used a standard instructional procedure shown in previous research to successfully induce expressive suppression (Butler et al., 2003, 2007; Gross, 1998), however, we caution that other self-regulation goals (e.g., stereotype suppression; Vorauer, 2006) may also have been activated, intentionally or unintentionally, by our manipulation. The results of observers' ratings of participants' emotional expressions and participants' self-reported emotional experiences provide some evidence that our participants attempted to comply with the specific suppression goal administered. Nevertheless, we caution that using emotion regulation instructions from previous work (Richards & Gross, 2000) does not necessarily mean that emotion regulation fully accounts for our findings. Future studies would benefit from the inclusion of additional indirect measures (e.g., physiological measures capturing affective responses; see Butler et al., 2003; also Amodio et al., 2003) to assess emotion control efforts, as well as potential contributions of both affective and cognitive forms of self-regulation (e.g., emotion versus stereotype inhibition) to executive functioning (e.g., using functional magnetic resonance imaging; McRae, Ochsner, Mauss, Gabrieli, & Gross, 2008).

We note that we found no evidence of mediation of friendliness judgments by Stroop interference or self-reported difficulty adhering to the task; however, ancillary analyses of observer ratings of participants' nonverbal behavior provide some evidence for a compensatory account of the effects of attitude–goal mismatch on impressions. Specifically, across experimental conditions, we found that the more positive expressive behavior that high (but not low) implicitly biased participants exhibited, the less friendly they judged the confederate during the interaction (Positive Expressivity \times IAT $t = 2.08, p < .05$). This effect remained when controlling for participants' Stroop performance, suggesting that, consistent with Frable et al. (1990) reasoning, it may be subjective judgments of effort expended relative to one's partner that contribute to negative impressions. Future research might investigate this possibility more directly by examining participants' assessments of their own and their partner's effort expended in an interaction after receiving expressive suppression instructions.

Our findings are also generally consistent with a fluency account of the effects of effortful self-regulation on impressions. The subjective ease associated with a given task has been shown to impact evaluations across a wide range of contexts and instantiations, from stock choices to furniture preferences, whereby more effortful forms of processing generally lead to more negative judgments (e.g., distrust; see

Alter & Oppenheimer, 2009). To the extent that attitude–regulatory goal mismatch reflects a more disfluent form of self-regulation, it may result in a less positive impression of an interaction partner, independent of observers' impressions of the interaction partner — a result obtained in the present study. Future research might further examine this possibility by manipulating the subjective ease (e.g., via false feedback) of the regulatory task provided to participants or altering the apparent meaning (i.e., naïve theory; Schwarz, 2004) of effortful self-regulation in the context of an interracial interaction (for example, as indicative of high or low rapport).

Although our findings for Stroop performance were generally consistent with prior research on cognitive effects after interracial contact, the present study did not include a same-race interaction comparison condition. Prior studies (Richeson & Shelton, 2003; Richeson et al., 2003; Richeson & Trawalter, 2005), have shown that White participants' implicit bias scores are positively correlated with Stroop impairment after interactions with Black, but not White, confederates; thus, the present research focused on interracial interactions. Nevertheless, based on these prior findings, we might expect Whites in same-race dyads to show similar effects on Stroop performance and friendliness judgments as participants in the present study who were relatively low on implicit bias — a hypothesis that might be examined with the inclusion of same-race dyads in future studies. Additionally, subsequent research might also consider minority group members' suppression efforts. Shelton et al. (2005) found that ethnic minority participants who were led to expect racial prejudice during an interracial interaction showed more positive behavioral engagement but liked their partner less, compared to those with no such expectation. Minorities may, thus, seek to regulate emotional expressions to manage prejudice concerns, with potentially similar consequences for their cognitive functioning and impressions of majority group members.

Conclusion

Richeson and Trawalter (2005) identified a fundamental irony of the prejudice-reduction process: Being motivated to control prejudice is critical to prejudice reduction, but potentially detrimental to cognitive functioning. The present findings suggest that this irony may be more sinister than previously considered: Whites' self-regulation efforts may not only exact a cognitive toll, but also contribute to more negative impressions of their interaction partner. These efforts may have important implications for people's interest in pursuing interracial contact. Shelton and Richeson (2005) found that whereas both majority and minority group members tend to explain their own avoidance of intergroup contact in terms of their fear of being rejected by the outgroup, they attribute the outgroups' avoidance to a lack of interest. Attitude–goal correspondence may, thus, have theoretical and practical implications for revealing conditions under which people may be more likely to avoid interracial contact.

Appendix

Interpersonal Closeness Procedure (adapted from Aron et al., 1997)

Please choose one person to read the first question out loud. After you have both answered the question (starting with the person who read the question), please move on to the next card. Remember to alternate who reads each question. Please take your time.

1. Make 3 true “we” statements each. For instance, “We are both in this room feeling ...”
2. Complete this sentence: “I wish I had someone with whom I could share ...”

3. If you were going to become a close friend with your partner, please share what would be important for him or her to know about you.
4. Share with your partner an embarrassing moment in your life.
5. Tell your partner what you like about him or her. Be very honest, saying things that you might not say to someone you've just met.
6. If you were to die this evening with no opportunity to communicate with anyone, what would you most regret not having told someone? Why haven't you told them yet?
7. Who in your life makes you most happy? Why?
8. Your house containing everything you own catches fire. After first saving your loved ones and pets, you have time to safely make a final dash to save any one item. What would it be? Why?

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