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Subconscious Racism and Sucrose: Measuring the Effects of Self-Regulatory Depletion on the Implicit Association Test

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This study investigated the effect of self-regulatory depletion on the racial Implicit Association Test (IAT). Undergraduate psychology students ($N = 29$) at Eastern Kentucky University participated for class credit. The participants were randomly assigned to a depletion no sucrose, depletion sucrose, or non depletion condition; depletion was manipulated using the Stroop task. The participants in the sucrose condition were asked to consume a sucrose drink, which increased their blood glucose level, and consequently, the availability of glucose to the brain. All participants completed three explicit measures of racism, dominance, and authoritarianism, along with the racial IAT. The data revealed that explicit measures of racism and dominance were significantly higher for depleted participants, and that sucrose ingestion reduced this effect. Conditions were not significantly different as measured by the IAT. A significant relationship between Stroop trials and IAT performance, however, was revealed. Implications for these results are discussed.

Keywords: IAT, race, self-regulation, implicit bias, depletion

La présente étude analyse les effets de la détérioration de la capacité d'autorégulation sur le test d'association implicite (TAI) racial. Des étudiants de premier cycle de psychologie ($N = 29$) de l'Université de l'Est du Kentucky ont participé à l'étude en échange de crédits de cours. Les participants étaient répartis au hasard dans les conditions de détérioration sans sucrose, de détérioration avec sucrose, et sans détérioration. L'effet de détérioration était manipulé à l'aide de la tâche de Stroop. Dans la condition avec sucrose, les participants devaient boire un breuvage avec sucrose qui augmentait leur niveau de glucose sanguin et conséquemment, la disponibilité du glucose pour le cerveau. Tous les participants complétaient le TAI racial ainsi que trois mesures explicites de racisme, dominance et autoritarisme. Les données ont révélé que les mesures explicites de racisme et de dominance étaient significativement plus élevées pour les participants chez qui l'autorégulation était détériorée, et que l'ingestion de sucrose réduisait cet effet. Les trois conditions n'étaient pas significativement différentes lorsque mesurées par le TAI. Une relation significative a cependant été trouvée entre les essais Stroop et la performance au TAI. Les implications de ces résultats sont discutées.

Mots-clés : TAI, race, auto-régulation, biais implicite, réduction

Intergroup bias is a very real issue in society. Even though most people would agree that expressing bias on the basis of race is wrong, these stigmas can still exist subconsciously (implicitly), and develop in children at a very young age. By age six, children have already developed detectable implicit bias towards certain social groups (Baron & Banaji, 2006). In fact, by age five (but even as young as four) North American middle-class children have developed a concept of race commensurable to that of adults (Allport, 1954; Hirschfeld, 1996, 2001). However, even though North American children begin to reveal negative attitudes towards out-group members (through self-report measures) by age three, these explicit attitudes begin declining by age seven, and disappear by age twelve (Aboud, 1988). Even though explicit expressions of these attitudes disappear by age twelve, the magnitude of implicit racial bias does not decrease relative to any age (Baron & Banaji, 2006).

Goff, Eberhardt, Williams, and Jackson (2008) demonstrated the salience of implicit racial bias among Caucasians using implicit priming. Participants in their study were primed with Caucasian faces, African American faces, or a neutral line drawing on a

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computer screen. They were then shown an ambiguous image of an ape that became clearer, frame by frame, over time. When primed with brief images of African American faces, participants required less frames to identify ambiguous images of apes. Conversely, participants required more frames to identify ambiguous images of apes when primed with Caucasian faces. In subsequent studies, the same researchers demonstrated that Caucasians primed with images of apes became more sensitive, in terms of attention, to African American faces (Goff et al., 2008). These results were not correlated to explicit measures of racial prejudice (Goff et al., 2008). The researchers suggested that these results indicate that African Americans are implicitly associated with apes in the minds of Caucasians. They went on to state that this association was akin to an implicit belief among Caucasians that African Americans are less evolved, and that the implicit association of African Americans and apes has a very strong dehumanizing effect (Goff et al., 2008). The fact that the results were not correlated with explicit measures of racial prejudice, however, indicates that the implicit attitudes of the participants were self-regulated.

In some cases, implicit racial bias can affect decision making. Kam (2007), for example, demonstrated the effect of implicit racial bias in political candidate selection. For the most part, one's political party is the greatest predictor for candidate selection, but without this information race becomes a powerful deciding factor (Kam, 2007). Participants in this experiment were divided into two conditions: party cue and no party cue. All of the participants read about three candidates for a political office – half of the participants were informed of each candidate's political party affiliation. After choosing a candidate, the participants all completed a measure of implicit racial bias. When given information about candidates that included their party affiliation, individuals vote on a relatively even scale among similar candidates. But without this information, participants with a negative racial bias towards a specific race voted for a candidate of that race, whereas if they had a positive racial bias towards a specific race, they were more likely to vote for a candidate of that race than any other candidate (Kam, 2007).

Generally, implicit bias is a poor predictor of explicit behavior (Blanton, Jaccard, Klick, Mellers, & Mitchell, 2009). However, racial biases seem to surface when other critical information is not present. It is within these situations when we lack information or have little time to think about our actions that we fall back on our implicit attitudes. Using acquired information to override an automatic response is a process of self-regulation, and when we cannot properly self-regulate, automatic racial stereotyping is more likely to occur.

Measuring Implicit Bias

Understanding the development of racial bias is critically important, given the essential role intergroup attitudes and relations play throughout life. When explicit measures are used to evaluate racial bias, individuals may not reveal their true attitudes or preferences because of social desirability (Berinsky, 2004). In order to accurately measure racial bias without the effects of socially desirable responding, it is necessary to have a valid measure of the implicit attitudes that bypasses explicit control. The Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) has been established as a credible tool for the measurement of implicit attitudes.

The IAT measures the strength of implicit (automatic) associations for two categories, and quantifies implicit bias towards one category or another (Greenwald, Nosek, & Banaji, 2003). Bias is quantified using response latency, which is the time in milliseconds from task onset to participant response (Greenwald et al., 2003). An individual taking the IAT is asked to classify positive and negative words, along with another class of items, into good and bad categories. In the case of the racial IAT, this other class is African American and Caucasian facial images. Race can be classified neither as good nor bad, and a racially unbiased participant would require an equal amount of time to classify either race to either category (Greenwald et al., 1998). However, if a participant is biased in favor of a specific race, it will take longer to classify that race as bad, which would associate that race with the negative words (Greenwald et al., 1998). Furthermore, if a participant is negatively biased toward a specific race, it will take longer for them to classify that race as good, which associates that race with positive words (Greenwald et al., 1998).

The underlying assumption of the IAT is that responses will be facilitated when categories that are closely related for a particular participant (e.g., African

American faces and positive words) share a response, as compared to when they do not (Lane, Banaji, Nosek, & Greenwald, 2007). Thus, facilitation leads to faster and more accurate responding (Lane et al., 2007). The D score (the resulting calculation of bias) is the difference in average response latency between the IAT's two combined tasks (Race+Good, Race+Bad), divided by an inclusive standard deviation of response latencies in the two combined tasks (Lane et al., 2007). Therefore, D can be considered an equal weight average of two ratios, each one representing the latency difference (in the case of the racial IAT) of one racial group. In the current study, a D score above zero represents bias in favor of Caucasians, and a D score below zero represents bias in favor of African Americans. The farther from zero the D score is, the stronger the bias it represents.

The IAT shows a high resistance to "fake" positive attitudes originating in the motivation to control prejudiced behavior (social desirability), but seems to have very little predictive power over individual behavior, meaning that those who show highly prejudiced implicit attitudes may not exhibit explicitly prejudiced behavior (Blanton et al., 2009). This result is to be expected, as implicit attitudes go beyond a person's explicit behavior. However, one limitation of the IAT is that it shows variation in retest trials (Banse, Seise, & Zerbes, 2001). Given that the IAT also shows high internal validity, this variance may point to a changing factor in the individual (Banse et al., 2001). It is possible that this changing factor may be explainable through a type of explicit control (i.e., self-regulation).

Self-Regulatory Depletion

Volition, the ability to chose, is the defining factor of self-regulation (Baumeister, Bratslavsky, Muraven, & Tice, 1998). Making decisions, taking responsibility, both initiating and inhibiting behavior, making plans, and carrying plans out can all be considered self-regulatory acts (Baumeister et al., 1998). The control of aggression (Dewall, Baumeister, Stillman, & Gailliot, 2007; Stucke & Baumeister, 2006) control of racial stereotyping (Govorun & Payne, 2006), persistence and ability to perform cognitive tasks (Schmeichel, Baumeister, & Vohs, 2003; Vohs et al., 2008), and resistance to depression (Vohs & Baumeister, 2000) are all linked to self-regulation.

This critical process of self-regulation is dependent on a task-general resource, which has been referred to as mental strength (Muraven & Baumeister, 2000), and likened to willpower (Baumeister et al., 1998). A multitude of studies have shown that this self-regulatory resource is depletable, and that when this resource is depleted, one's ability to perform subsequent acts of self-regulation is reduced (Baumeister et al., 1998; Baumeister, Muraven, & Tice, 2000; Baumeister, Vohs, & Tice, 2007; DeWall et al., 2007; Finkel, DeWall, Slotter, Oaten, & Foshie, 2009; Gailliot et al., 2007; Govorun & Payne, 2006; Legault, Green-Demers, & Eadie, 2009; Muraven & Baumeister, 2000; Muraven, Tice, & Baumeister, 1998; Neshat-Doost, Dalgleish, & Golden, 2008; Schmeichel et al., 2003; Shamosh & Gray, 2007; Stucke & Baumeister, 2006; Vohs et al., 2008).

A clear link has been revealed between this depletable resource and blood glucose (Baumeister et al., 2007; Gailliot et al., 2007). Performing self-regulation by focusing attention, controlling emotions, regulating prejudiced attitudes, and completing the Stroop task all lowered participants' blood glucose levels. Consuming sucrose, however, returns blood glucose to the normal level. This is significant because when blood glucose is replenished, self-regulatory ability is also replenished (Baumeister et al., 2007; Gailliot et al., 2007).

Self-Regulation and the IAT

Racially biased individuals are required to override dominant prejudiced responses on the race IAT, which requires effort and manifests in elevated response latencies on prejudiced-incongruent trials (Legault et al., 2009). Legault et al. (2009) have demonstrated that participants who are minimally motivated to self-regulate racial bias demonstrate higher levels of implicit bias (as measured by the racial IAT) when depleted of self-regulatory resources. It is the hypothesis of the current research that a main effect of depletion can be demonstrated, independent of participants' level of motivation. Additionally, it is hypothesized that ingesting a sucrose drink will replenish blood glucose, thus restoring self-regulatory ability and erasing the effects that self-regulatory depletion have on the IAT. This effect would suggest that deficiencies in the test-retest validity of the IAT may come from varying levels of depletion (blood glucose levels).

Method

Participants

Data was collected in individual testing sessions from 29 undergraduates at Eastern Kentucky University, who participated in return for course credit. By way of random assignment, participants were each placed in one of three conditions: depletion no sucrose (n = 12), depletion sucrose (n = 9), and non depletion (n = 8). Of the final sample, 21 individuals were Caucasian, 3 African American, and 5 identified as other. Because of the nature of the research, it is important to note that none of the participants reported themselves as diabetic when asked.

Materials

Stroop task. The Stroop task demonstrates that people identify the color that a word is printed in more slowly when color and word are incongruent, rather than when color and word are congruent (Stroop, 1935). This is because word recognition has become an automatic process. We cannot help but to automatically make a meaningful connection to a word when we read it – an effect known as Semantic Activation (Niemi, Vauras, & Von Wright, 1980). The task itself is conducted by showing the participant the written name of a color, and asking them to respond as quickly as possible by saying the color that the word is printed in. A modified version of the task was used in the current study using software found at http://wwnorton.com/college/psych/zaps/. Incongruent word-color combinations have been found to be depleting of self-regulatory resources (Wallace & Baumeister, 2002), and served the same function in the current work. Forty trials, half congruent and half incongruent, were administered.

Racial IAT. The IAT (Greenwald et al., 1998) was administered using free software (http://www.millisecond.com). In the first half of the measure, participants are asked to place African American faces and negative words together, while placing Caucasian faces and positive words together. In the second half, participants make the opposite associations. During each individual trial a word or facial image appeared in the center of the screen. The participants responded using the E key or I key, depending on which association group the item belonged with (e.g., African American/Good words, Caucasian/Bad words). The D score, or the measure of the participants' response latency, was recorded immediately after the task was completed. This score is what indicates the level of the participants' implicit bias. The resulting number itself can be thought of in similar terms to a correlation coefficient – a greater distance from zero in either direction indicates a stronger effect. In terms of the Racial IAT, a negative result indicates African American preference and a positive result indicates a Caucasian preference.

Explicit measures. All participants completed three explicit measures; these were the Modern Racism Scale (MRS; McConahay, 1986), the Right Wing Authoritarianism (RWA; Altemeyer, 1996) measure, and the Social Dominance Orientation scale (SDO; Pratto, Sidanius, Stallworth, & Malle, 1994). The RWA is a twenty item scale measuring three dimensions: submissiveness to authority figures, conventionalism, and a propensity to engage in aggression sanctioned by authority figures (Altemeyer, 1996). Participants responded to items on a nine point Likert-type scale, ranging from -4 (*very strongly disagree*) to 4 (*very strongly agree*). Social Dominance Orientation (SDO) is a 16-item scale measuring preference for inequality (Pratto et al., 1994). Responses were given on the SDO using a seven point Likert-type scale, ranging from 1 (*very negative*) to 7 (*very positive*). The Modern Racism Scale (MRS) is a seven item scale measuring beliefs about race-relations in the United States of America. All specific racial references concern African Americans (McConahay, 1986). Participants responded to the MRS on a five point Likert-type scale, ranging from -2 (*disagree strongly*) to 2 (*agree strongly*). All three measures were administered via computer, as a Microsoft word file, in the lab.

Reliability analysis produced alpha scores of .85, .87, and .62 for the SDO, RWA, and MRS respectively, when all conditions were calculated together (N = 29). Alpha scores were .66, .66, and .34 in the Depletion No Sucrose condition (n = 12), .73, .92, and .35 in the Depletion Sucrose condition (n = 9), and .66, .66, and .34 in the Non Depletion condition (n = 8) for the SDO, RWA, and MRS respectively. The small number of participants in each condition significantly lowered the reliability of the measures when separated and analyzed by condition, which is to be expected. This analysis was conducted to examine

any effect the conditions may have had on the reliability of the measures, and it was discovered that the Depletion Sucrose condition had higher reliability than the other two conditions.

Manipulation check and demographics. In an attempt to check the manipulation of depletion, participants were asked to report their level of mental fatigue on a ten point, Likert-type scale. They were also asked to report their gender and race.

Sucrose drink. Self regulation relies on glucose as a limited energy source (Gailliot et al., 2007). Acts of self regulation reduce blood glucose levels, and low levels of blood glucose predict poor performance on self regulation tasks (Gailliot et al., 2007). In the current study, blood glucose was manipulated by asking the participants to drink Kool-Aid containing sucrose sweetener. Following previous research (Gailliot et al., 2007), each participant in the "Sucrose" condition consumed 39 grams (140 calories) of sucrose in order to replenish their blood glucose. This was balanced by giving the "No Sucrose" condition Kool-aid sweetened with Splenda, which contains no calories and does not affect blood glucose (Gailliot et al., 2007). Twelve minutes was allotted for the complete metabolizing of the sucrose based on precedent set in previous research (Baumeister et al., 2007; Gailliot et al., 2007).

Procedure

Participants were randomly assigned to their respective groups prior to participation. These included Depletion Sucrose, Depletion No Sucrose, and No Depletion conditions. Each participant was interviewed individually. Depletion participants began by completing the Stroop task, and were then asked to drink a glass of Kool-Aid which was sweetened with sugar or Splenda depending on their condition. In order to allow the sugar to metabolize, participants then completed the three explicit measures, manipulation check, and demographic questions. This process took approximately twelve minutes in all sessions. The participants then completed the racial IAT. Non-depleted participants only completed the explicit measures, manipulation check, demographics, and the racial IAT.

Results

Measures of Depletion

The ten point Likert-type measure of fatigue was not found to be significantly different between conditions ($F(2, 26) = .70$, $p = .52$), as measured by ANOVA. Regression analysis, however, revealed a significant positive correlation between Fatigue and Stroop task latencies ($r = .71$, $p = .02$). In other words, fifty percent of the variance in Fatigue can be accounted for by the Depleting task ($R^2 = .50$). This means that participants who were more fatigued (depleted) took longer in completing each trial of the Stroop task, which was expected, and supports the design of the experiment.

Explicit Measures

Originally, the explicit measures were included in the current work as filler tasks, but analysis of these measures revealed some interesting results. The Modern Racism Scale and Social Dominance Orientation were found to be significantly different by condition ($F(2, 26) = 5.63$, $p = .01$ and $F(2, 26) = 4.35$, $p = .03$ respectively). Significance in the MRS was accounted for by higher scores in the Depletion No Sucrose condition than the Non Depleted condition ($p < .01$). This was also the case for the SDO ($p = .04$). The Depletion Sucrose condition was not found to be significantly different from either of the other conditions in either measure. Thus, depletion appears to have caused participants to be less able to control their expressions of racial bias and social dominance. Sucrose reduced this effect, but not entirely, because the sucrose would not have been completely metabolized during this time.

Stroop Task and IAT

Only Caucasian participants' results were used in the analysis of D scores in order to homogenize the theoretical direction of bias ($n = 21$). ANOVA revealed that D scores were not significantly different by condition ($F(2, 18) = .38$, $p = .69$). Regression analysis was conducted to determine the degree to which Stroop latencies predicted D score. A significant quadratic relationship was revealed ($r = .59$, $R^2 = .35$, $p = .02$) (see Figure 1). The lack of significant conditional differences may be due to confounds in the

experimental paradigm, which are discussed later. The significant correlation between Stroop and D score, however, is consistent with the hypothesis.

Discussion

The results of the manipulation check were initially troubling, since self-reports of fatigue were not different between conditions. This may be due to some confounding factor in the design of the study. However, because the depleting task significantly predicted self-reported fatigue, it can still be asserted that the depleting task was successful. Further evidence of a depletion effect was apparent in the scores on two of the explicit measures of bias. The Depletion No Sucrose condition resulted in significantly higher scores on the Modern Racism Scale and Social Dominance Orientation than the non-depleted condition, suggesting that depleted participants were less able to control the expression of their biased attitudes. The sucrose drink also had an apparent effect on participants' levels of depletion. Since the depletion sucrose condition was not significantly different than either of the other conditions relative to MRS and SDO scores, they were between both sets of scores yet indistinguishable from either the non-depleted condition or depletion no sucrose condition.

Reliability analysis of the explicit measures revealed that the ingestion of sucrose improved the reliability of all three measures. When the reliability analysis was separated by condition, all reliabilities were lowered due to the reduction in participant numbers for each individual analysis – this was not abnormal. In the case of the SDO and MRS, alphas scores for the depletion sucrose condition were still lower than overall, but higher than the other two conditions. In the case of the RWA, alpha was raised even higher than the original level. The clear indication of these results is that the ingestion of sucrose has increased the reliability of the three measures. This result merits further study.

The hypothesis of the current research was that IAT D scores would be significantly higher in the Depletion No Sucrose condition than for the Depletion Sucrose and Non Depletion conditions. It was postulated that this would suggest depletion as a cause for error in the test-retest validity of the IAT. Using ANOVA, it was concluded that the conditions were not significantly different. A significant negative correlation was found

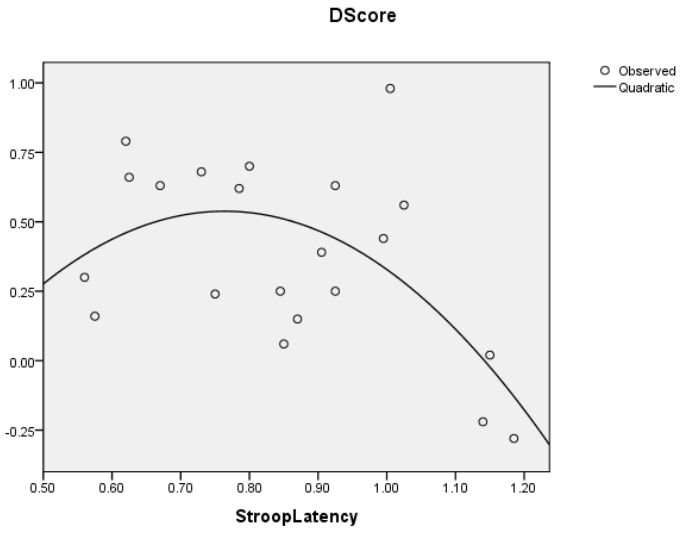

Figure 1. Quadratic regression of Stroop and D score. *Note*. This figure illustrates the quadratic regression relationship between Stroop latencies and D score.

between Stroop latencies and D score, but since Stroop latency was positively correlated to fatigue, this would indicate that higher levels of Fatigue equate lower levels of bias. D score and Fatigue, however, were not significantly correlated. This prompted further regression analysis of D score and Stroop latencies, which revealed a significant quadratic relationship between the two variables, and demonstrated a more significant relationship than the linear model. The existence of a quadratic relationship between the two variables may have reduced the ability to differentiate conditions using ANOVA, but this may also have originated from confounds in the research design. A graphic representation of this quadratic correlation is included (see Figure 1).

Analysis using the superior fit of the quadratic model reports that Stroop latency was accountable for thirty-five percent of the variance in D score, and this is a strong predictive relationship. If scores on a depleting task can predict thirty-five percent of the variance in D scores, self-regulation can also account for a certain amount of differentiation in test-retest trials. Further, since individuals maintain an average level of blood glucose, and thus an average ability to self-regulate, they would most likely also maintain an average D score.

Limitations

The current research had some clear limitations. First and foremost, the sample of participants used was very small. Also, the initial level of blood glucose participants began with was not controlled for. In other studies, participants were instructed not to eat for three hours before the study, and blood glucose level was also directly measured (Baumeister et al., 2007; Gailliot et al., 2007). A measure of social desirability to determine participants' likelihood to restrain biased attitudes would have also improved the quality of the study.

Another limitation was present in the design of the conditions. The experiment was initially designed to be 2X2, containing four conditions: depletion sucrose, depletion no sucrose, non-depletion sucrose, and non-depletion no sucrose. Because of constraints on the time limit allotted to complete the research, the non-depletion sucrose condition was eliminated. The resulting design designated depletion as a constant condition and the sucrose drink as the manipulation. Since previous research demonstrated that sucrose successfully reduces depletion, the depletion no sucrose condition became experimental and the depletion sucrose condition remained as the "control". To validate the effect of sucrose ingestion on depletion, the non-depleted condition remained as a comparison to the depletion sucrose condition – in theory the two should be basically equivalent. Regardless of the reasoning, however, the design is unbalanced, and thus opens the possibility for confounds, even if the predicted differences were apparent in the analysis of the explicit measures of bias.

Additionally, a comparison between the test-retest variation of self-regulatory ability measures, explicit racial bias measures, and racial IAT D scores should be conducted. This analysis could determine the extent to which self regulation, explicit bias control, and racial IAT D scores are truly correlated. It would have also been beneficial to measure participants' level of motivation to respond in a socially desirable manner, as well as an analysis measuring the strength of the correlation between D score and Stroop latency by condition. Again, a much larger sample would have been needed to strengthen the results of the study in any meaningful way.

Implications and Conclusion

The contribution of the present research is that it provides preliminary evidence of a relationship between self-regulatory ability and IAT D scores, which may be influencing test-retest variation. Understanding the degree to which a person's D score will vary based on their self-regulatory ability will increase the effectiveness of implicit attitude measurement, thus supplying more effective tools to study implicit intergroup bias. Improvements upon the design of this study are critical, and should be included in future studies in order to validate the results presently generated.

Further implications concern essentialism, otherwise known as the belief that all members of a group possess the same qualities. Individuals who essentialize race are less likely to show emotional concern for racial injustice, and are less likely to develop friendships with people of other races (Williams & Eberhardt, 2008). Essentialist beliefs, which includes the entitativity (the abstraction of individuals from situational circumstances) of race, have been repeatedly associated with increased stereotype endorsement (Bastian & Haslam, 2006; Spencer-Rodgers, Hamilton, & Sherman, 2007), increased attention to stereotype consistent information (Bastian & Haslam, 2007), and the increased justification of social inequalities (Verkuyten, 2003). Additionally, the current research implies that the entitativity of individuals expressing essentialist beliefs is fallacious. The situation of self-regulatory depletion can lead to the expression of implicit essentialism (implicit racial bias) which would normally be self-regulated. It is critical to the development of intergroup relations that we understand many types of bias can escape the realm of conscious control.

Controlling implicit racial bias requires both the motivation and ability to self-regulate. While the essentialism of groups exists, even subconsciously, we must be aware of the limitations of the human mind. Accepting and becoming tolerant of our own shortcomings, the common weaknesses that we all share, will be the only way to further positive relations with, and the integration of, different groups.

References

Aboud, F. E. (1988). *Children and prejudice*. Cambridge, MA: Basil Blackwell.

Allport, G. (1954). *The nature of prejudice*. Cambridge, MA: Addison-Wesley.

Altemeyer, B. (1996). *The authoritarian spectre*. Cambridge, MA: Harvard University Press.

Banse, R., Seise, J., & Zerbes, N. (2001). Implicit attitudes towards homosexuality: Reliability, validity, and controllability of the IAT. *Zeitschrift für Experimentelle Psychologie, 48*, 145–160. doi:10.1026//0949-3946.48.2.145

Baron, A., & Banaji, R. (2006). The development of implicit attitudes: Evidence of race evaluations from ages 6 and 10 and adulthood. *Psychological Science, 17*, 53–58. doi: 10.1111/j.1467-9280.2005.01664.x

Bastian, B., & Haslam, N. (2006). Psychological essentialism and stereotype endorsement. *Journal of Experimental Social Psychology, 42*, 228–235. doi:10.1016/j.jesp.2005.03.003

Bastian, B., & Haslam, N. (2007). Psychological essentialism and attention allocation: Preferences for stereotype consistent versus stereotype-inconsistent information. *The Journal of Social Psychology, 147*, 531–541. doi:10.3200/SOCP.147.5.531-542

Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology, 74*, 1252–1265. doi:10.1037/0022-3514.74.5.1252

Baumeister, R. F., Muraven, M., & Tice, D. M. (2000). Ego depletion: A resource model of volition, self-regulation, and controlled processing. *Social Cognition, 18*, 130–150.

Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The strength model of self-control. *Current Directions in Psychological Science, 16*, 351–355. doi:10.1111/j.1467-8721.2007.00534.x

Blanton, H., Jaccard, J., Klick, J., Mellers, B., & Mitchell, G. (2009). Strong claims and weak evidence: Reassessing the predictive validity of the IAT. *Journal of Applied Psychology*, *94*, 567–582. doi:10.1037/a0014665

Berinsky, A. (2004). Can we talk? Self-presentation and the survey response. *Political Psychology, 25*, 643–659. doi:10.1111/j.1467-9221.2004.00391.x

Dewall, C. N., Baumeister, R. F., Stillman, T. F., & Gailliot, M. T. (2007). Violence restrained: Effects of self-regulation and its depletion on aggression. *Journal of Experimental Social Psychology, 43*, 62–76. doi:10.1016/j.jesp.2005.12.005

Finkel, E., DeWall, C., Slotter, E., Oaten, M., & Foshie, V. (2009). Self-regulatory failure and intimate partner violence perpetration. *Journal of Personality and Social Psychology, 97*, 283–499. doi:10.1037/a0015433

Gailliot, M. T., Baumeister, R. F., DeWall, C. N., Manner, J. K., Plant, E. A., Tice, D. M., … Schmeichel, B. J. (2007). Self-control relies on glucose as a limited energy source: Willpower is more than a metaphor. *Journal of Personality and Social Psychology, 92*, 325–336. doi:10.1037/0022-3514.92.2.325

Goff, P. A., Eberhardt, J., Williams, M., & Jackson, M. C. (2008). Not yet human: Implicit knowledge, historical dehumanization, and contemporary consequences. *Journal of Personality and Social Psychology, 94*, 292–306. doi:10.1037/0022-3514.94.2.292

Govorun, O., & Payne, B. K. (2006). Ego-depletion and prejudice: Separating automatic and controlled components. *Social Cognition*, *24*, 111–136. doi:10.1521/soco.2006.24.2.111

Greenwald, A., McGhee, D., & Schwartz, J. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology, 74*, 1464–1480. doi:10.1037/0022-3514.74.6.1464

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. doi: 10.1037/0022-3514.85.2.197

Hirschfeld, L. A. (1996). *Race in the making: Cognition, culture, and the child's construction of human kinds*. Cambridge, MA: MIT Press.

Hirschfeld, L. A. (2001). On a folk theory of society: Children, evolution, and mental representations of social groups. *Personality and Social Psychology Review*, *5*, 107–117.

Kam, C. D. (2007). Implicit attitudes, explicit choices: When subliminal priming predicts candidate preference. *Political Behavior, 29*, 343–367. doi:10.1007/s11109-007-9030-0

Lane, K. A., Banaji, M. R., Nosek, B. A., & Greenwald, A. G. (2007). Understanding and using the implicit association test: IV: What we know (so far) about the method. In B. Writtenbrink (Ed.), *Implicit measures of attitudes* (pp. 59–102). New York: Guilford Press.

Legault, L., Green-Demers, I., & Eadie, A. (2009). When internalization leads to automatization: The role of self-determination in automatic stereotype suppression and implicit prejudice regulation. *Motivation and Emotion, 33,* 10–24. doi:10.1007/s11031-008-9110-4

McConahay, J. B. (1986). Modern racism, ambivalence, and the Modern Racism Scale. In J. F. Dovido & S. L. Gaertnew (Eds.), *Prejudice, discrimination, and racism* (pp. 91–125), San Diego: Academic Press.

Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin, 126*, 247–259. doi:10.1037/0033-2909.126.2.247

Muraven, M., Tice, D., & Baumeister, R. F. (1998). Self-control as a limited resource: Regulatory depletion patterns. *Journal of Personality and Social Psychology, 74*, 774–789. doi:10.1037/0022-3514.74.3.774

Neshat-Doost, H., Dalgleish, T., & Golden, A. (2008). Reduced specificity of emotional autobiographical memories following self-regulation depletion. *Emotion, 8*, 731–736. doi:10.1037/a0013507

Niemi, P., Vauras, M., & Von Wright, J. (1980). Semantic activation due to synonym, antonym, and rhyme production. *Scandinavian Journal of Psychology, 21*, 103–107. doi:10.1111/j.1467-9450.1980.tb00347.x

Pratto, F., Sidanius, J., Stallworth, L. M., & Malle, B. F. (1994). Social dominance orientation : A personality variable predicting social and political attitudes. *Journal of Personality and Social Psychology, 67,* 741–763. doi: 10.1037/0022-3514.67.4.741

Schmeichel, B. J., Baumeister, R. F., & Vohs, K. D. (2003). Intellectual performance and ego depletion: Role of the self in logical reasoning and other information processing. *Journal of Personality and Social Psychology, 85,* 33–46. doi:10.1037/0022-3514.85.1.33

Shamosh, N. A., & Gray, J. R. (2007). The relation between fluid intelligence and self-regulatory depletion. *Cognition and Emotion, 21,* 1833–1843. doi:10.1080/02699930701273658

Spencer-Rodgers, J., Hamilton, D. L., & Sherman, S. J. (2007). The central role of entitativity in stereotypes of social categories and task groups. *Journal of Personality and Social Psychology, 92,* 369–388. doi:10.1037/0022-3514.92.3.369

Stroop, J. (1935). Studies of interference in serial verbal reactions. *Journal of Experimental Psychology, 18,* 643–662. doi:10.1037/h0054651

Stucke, T. S., & Baumeister, R. F. (2006). Ego depletion and aggressive behavior: Is the inhibition of aggression a limited resource? *European Journal of Social Psychology, 36,* 1–13. doi:10.1002/ejsp.285

Verkuyten, M. (2003). Discourses about ethnic group (de-)essentialism: Oppressive and progressive aspects. *British Journal of Social Psychology, 42,* 371–391. doi:10.1348/014466603322438215

Vohs, K. D., & Baumeister, R. F. (2000). Escaping the self consumes regulatory resources: A self-regulatory model of suicide. In T. Joiner (Ed.), *Suicide science: Expanding the boundaries* (pp. 33–41). New York: Kluwer Academic/Plenum Publishers.

Vohs, K. D., Baumeister, R. F., Schmeichel, B. J., Twenge, J. M., Nelson, N. M., & Tice, D. M. (2008). Making choices impairs subsequent self-control: A limited-resource account of decision making, self-regulation, and active initiative. *Journal of Personality and Social Psychology, 94*, 833–898. doi:10.1037/0022-3514.94.5.883

Wallace, H., & Baumeister, R. F. (2002). The effects of success versus failure feedback on further self-control. *Self and Identity, 1,* 35–41. doi:10.1080/152988602317232786

Williams, M. J., & Eberhardt, J. L. (2008). Biological conceptions of race and the motivation to cross racial boundaries. *Journal of Personality and Social Psychology, 94*, 1033–1047. doi:10.1037/0022-3514.94.6.1033

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