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**MARIA INÊS
LOPES FERREIRA**

**O PAPEL DA RUMINAÇÃO E DO CONTROLO
PROATIVO NA REDUÇÃO DO VIÉS RACIAL
IMPLÍCITO**



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**MARIA INÊS
LOPES FERREIRA**

**LINKING RUMINATION AND PROACTIVE CONTROL
IN REDUCING IMPLICIT RACIAL BIAS**

Dissertação apresentada à Universidade de Aveiro para cumprimento dos requisitos necessários à obtenção do grau de Mestre em Psicologia da Saúde e Reabilitação Neuropsicológica, realizada sob a orientação científica da Doutora Catarina Rosa, Investigadora Doutorada (Nível 1) do Departamento de Educação e Psicologia da Universidade de Aveiro

Dedico este trabalho à minha avó.
Ensinaste-me a ser criança, menina e mulher.

o júri

Presidente

Professora Doutora Anabela Maria Sousa Pereira
Professora Associada C/ Agregação da Universidade de Aveiro

Arguente Principal

Doutora Raquel Beleza Pereira da Silva
Professora Auxiliar da Faculdade de Economia da Universidade de Coimbra

Orientadora

Doutora Catarina Pires da Rosa
Investigadora Doutorada (nível 1) da Universidade de Aveiro

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palavras-chave

viés racial implícito, Teste de Associação Implícita Breve, Tarefa de Identificação de Armas, manipulação de intenções, ruminação, brooding, controlo proativo

resumo

O viés racial implícito continua a ser um tema de destaque na investigação em Psicologia considerando o seu impacto individual e social. Intervenções para reduzir vieses, como a implementação de intenções contra estereotípicas (*cued proactive control*), têm sido eficazes. A ruminação é uma consequência negativa decorrente da consciência da sua própria discrepância entre as atitudes explícitas e implícitas. No entanto, a literatura sobre as teorias sociocognitivas da ruminação é inconsistente. Um dos principais objetivos deste estudo foi aprofundar o conhecimento sobre o papel da ruminação no desempenho cognitivo, particularmente num paradigma racial implícito. Um procedimento bem-sucedido na redução do viés implícito – manipulação de intenção – foi replicado, e a versão breve do Teste de Associação Implícita (BIAT) foi usada como medida pré e pós-manipulação do viés implícito. Uma amostra de 104 participantes foi aleatoriamente distribuída em dois grupos na Tarefa de Identificação de Armas (WIT): grupo experimental (manipulação de intenção – pensar “seguro” quando encontrar uma face Negra) e grupo controlo (pensar “rápido” quando encontrar uma face Negra). O humor e a ruminação estado foram avaliados no final da experiência. Os resultados do BIAT evidenciaram uma diminuição significativamente maior dos tempos de resposta (TR) no grupo controlo do que no grupo experimental, da pré para a pós-manipulação. Os resultados do desempenho na WIT revelaram que os participantes do grupo experimental (manipulação de intenção) cometeram menos erros estereotípicos e mais erros contra estereotípicos do que o grupo de controlo. Adicionalmente, os participantes com pontuações mais elevadas de *brooding* evidenciaram uma maior proporção de erros contra estereotípicos e uma menor proporção de erros estereotípicos. Este estudo corrobora a literatura prévia sobre a eficácia da redução do viés racial implícito através do controlo proativo, bem como apresenta evidências inovadoras relativamente à interação entre o controlo proativo e o *brooding* ruminativo. Dada a natureza exploratória deste estudo, novas investigações devem ser realizadas.

keywords

implicit racial bias, Brief Implicit Association Test, Weapon Identification Task, intention manipulation, rumination, brooding, proactive control

abstract

Implicit racial bias continues to be a central research topic in psychology given its individual and social impact. Interventions designed to reduce bias, namely, the implementation of counter stereotypical intentions (cued proactive control), have shown to be effective. Rumination has been documented as a negative output arising from one's awareness of the discrepancy between explicit and implicit attitudes. However, the literature is inconsistent regarding the social-cognitive theories of rumination. One of the main goals of this study was to deepen our knowledge about the role of rumination on cognitive performance, particularly on an implicit racial paradigm. A common successful procedure in reducing implicit bias – intention manipulation - was replicated, and the Brief Implicit Association Test (BIAT) was used as a pre- and post-manipulation measure of implicit bias. A sample of 104 participants were randomly distributed to two groups in a Weapon Identification Task (WIT) performance: experimental group (intention manipulation - think “safe” when seeing a Black face) and control group (think “quick” when seeing a Black face). Mood and state rumination were assessed at the end of the experiment. The BIAT data evidenced a significantly greater decrease in response time (RT) in the control group, than in the experimental group, from pre- to post-manipulation. The WIT performance data revealed that the participants in the experimental group (intention manipulation) made fewer stereotypical errors and more counter stereotypical errors than the control group. Furthermore, participants with higher brooding presented a significantly higher proportion of counter stereotypical errors and a lower proportion of stereotypical ones. This study seems to reinforce previous findings on the effectiveness of reducing implicit racial bias through proactive control activation, as well as provides initial evidence for the interaction between proactive control and brooding rumination. Given the exploratory nature of this study, further research must be carried out.

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Introduction

Implicit social cognition has been a central research topic for the last three decades and lively debates about the role of automatic and controlled processes in attitudes, social judgment and decision-making, goal pursuit, prejudice, and stereotyping have emerged. Racial attitudes have always been a challenge for researchers since the sensitivity of the topic can lead subjects not to honestly report their attitudes (social desirability). One of the most consensual definitions of attitude is given by Eagly and Chaiken (1993) "a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour" (p. 1). According to this definition, beliefs and thoughts, feelings and emotions, intentions and overt behaviour do not need to be consciously experienced by the attitude holder. The fact that racial bias can be manifested automatically in the unconscious mind was a major discovery in intergroup research since it explains why individuals who consciously reject prejudice nevertheless show evidence of bias in their non-deliberative behaviours (priming methods, see Fazio et al., 1995). Implicit racial biases are automatic associations with social groups and are considered biases since different associations are linked via social stereotypes to different groups (Fazio & Olson, 2003). For instance, when evaluating a social group such as Black people, attitudes can have a cognitive dimension and be expressed through stereotypes, an affective dimension expressed through prejudice, and a behavioural dimension manifested by discriminatory actions. Several studies have been developed to assess the strength and nature of implicit bias, being the Implicit Association Test (IAT; Greenwald et al. 1998) the most used measure. Implicit bias was initially theorized as an unobservable structure in our mind (e.g., an association in memory) driving behaviour in an unconscious manner (Amodio & Mendoza, 2010). This initial perspective encouraged the idea that implicit bias was a stable entity difficult to change and control (Sukhera et al., 2018). Recent findings instigated a re-examination of these core beliefs and led the groundwork for a new way of studying context effects on indirect measures, as well as for a new wave of research towards the real-life forms of prejudice that are ingrained in society. There is a growing interest in finding ways to reduce the implicit bias expressed in real dyadic intergroup social interactions in significant areas of life (FitzGerald et al., 2019), such as health care, law enforcement, employment, criminal justice, and education. To make promising directions towards this goal, it is critical to understand how prejudice influences our perception, emotions, and decisions, and how it can be regulated in our minds (Amodio & Cikara, 2021). This study intended to address this challenge,

implementing an experimental paradigm focused on counter stereotypical intentions to disentangle the nature of implicit bias, targeting proactive control and rumination.

Implicit Bias as a Behavioural Phenomenon and “Culture in Mind”

Considering recent research (De Houwer, 2019; Hinton, 2017; Vuletich & Payne, 2019), implicit bias can be conceptualized from a behavioural perspective. In other words, it can be seen as something that people do rather than something that people possess. Specifically, implicit bias can be defined as implicit group-based behaviour, that is behaviour influenced by implicit cues that operate as an indicator of the social group to which others (vs. we) belong. The influence of these social cues is considered to occur quickly, effortlessly, unintentionally, unconsciously, or in a way that is difficult to control (De Houwer et al., 2009).

Given this, measures of implicit bias can be viewed as examples of behaviour that is automatically influenced by cues representative of the social group of others (vs. mine), rather than measures that assess latent mental constructs. For instance, arguing that the performance on a race IAT is an instance of implicit racial bias implies that this performance (namely, differences in response time [RT] of distinct blocks) is automatically influenced by the racial cues of the stimuli presented on the screen. In this light, an IAT performance is conceived as an implicit group-based behaviour under well-controlled conditions (De Houwer, 2019).

A common debate upon implicit social cognition lies in the following question: automatically activated associations (measured with indirect measures) reflect personal attitudes or are simply a product of the cultural environment? Uhlmann and colleagues (2012a, 2012b), for example, have argued that such associations reflect the influence of broader cultural attitudes (e.g., widespread prejudice against Black Americans) rather than a person’s own attitudes. That is, the negative implicit attitudes toward a particular social group are an unavoidable by-product of the existence of racial categories in each culture. People conform to perceived cultural attitudes (norms) unless they intentionally annul these influences and replace them in accordance with individuals’ attitudes. To summarize, the nature of implicit bias is based on associations concerning the information that circulates within the person’s culture and this phenomenon is known as “culture in mind” (Hinton, 2017).

In this study, this context-based view was adopted, assuming that implicit bias is transient and can change as often as the context changes. This environmental change can

be intentionally triggered by two forms of intervention: (a) a short-term intervention to enhance control, such as cueing decision-makers to think about counter stereotypical thoughts to reduce unintended bias in decision-making process (Lai et al., 2016); and (b) a long-term intervention, such as changing people's social environment (e.g., to remove environmental cues of inequality to diminish implicit bias) (Vuletich & Payne, 2019).

Take Action on Implicit Racial Bias: Behaviour Change Through Intention Implementation

At a broader level, interventions may consider the institutional impact of race on factors such as health, education, and employment, and take initiative to abolish social disparities through public awareness campaigns and policies. However, in most individual-level interactions - when negotiating a contract, interviewing a job candidate, or simply asking for help in an unknown city - such large-scale strategies are not applicable. According to Amodio and Swencionis (2018), the most effective way to respond without prejudice in these situations is to prevent race from influencing one's behaviour, using cognitive control.

Several interventions have been designed with the aim of producing change in implicit biases. A recent meta-analysis conducted by Forscher and co-authors (2019), evidenced that contrary to interventions that induce threat, affirmation, or specific moods/emotions, procedures that associate sets of concepts, invoke goals or motivations, or tax mental resources were more successful in introducing changes in implicit bias. These findings are in line with the results from a systematic review (FitzGerald et al., 2019), in which exposure to counter stereotypical examples was considered a promising procedure to reduce implicit prejudice in real-life contexts. Despite its effectiveness, the underlying process remains unclear: (a) is there a reduction in the automatic activation of stereotypes, (b) is there an increase in the amount of attention or concentration (controlled thinking) used during tasks, or (c) both (Stewart & Payne, 2008).

Stewart and Payne (2008) experiments revealed that implementing intentions to think counter stereotypically can reduce automatic race bias, even in cognitive overload. Specifically, automatic stereotyping was reduced when participants were instructed to think 'safe' when they saw a Black face on a WIT (Payne, 2001) or to think the word 'good' when they encountered a Black face on an IAT. This effect was argued as being a result from a change in automatic stereotyping, not a cognitive control increase, as would be expected if participants paid more attention to the task. More recently, Amodio and

Swencionis (2018) argued precisely the opposite, the reduction of weapon bias, prejudice and stereotyping reflected changes in controlled processing, but not in automatic associations. These authors have proposed an alternative strategy to reduce expressions of implicit bias - proactive control, which is “a mode of self-regulation that enhances goal-relevant processing and behaviour and, as a consequence, limits the affordance for goal-irrelevant factors, such as unintended implicit biases, to influence responses” (p. 269). This suggestion introduced a new conceptualization of prejudice and implicit bias in contexts where race is explicitly irrelevant to a person’s primary task goal - for example, categorizing words in an experimental task. From this perspective, implicit bias represents a goal-irrelevant distractor, that is, an unwanted influence on behaviour that can influence one’s intentional response. In particular, the implementation intentions can be represented as a form of cued proactive control, in which a prespecified cue triggers a controlled response strategy. In other words, an expected cue that engages proactive control.

Implicit Racial Paradigm and Rumination

Several authors point out that one’s awareness of the discrepancy between our explicit and implicit attitudes may result in rumination (e.g., Phillips & Hine, 2016; Watkins & Roberts, 2020). Rumination is a maladaptive emotional regulation strategy, described as a pathological mechanism of repetitive thinking focused on the causes and consequences of one’s negative emotions, experiences and mood. Moreover, this maladaptive self-regulatory process has been identified as a transdiagnostic pathological process that predisposes the emergence, maintenance and recurrence of depression, anxiety, other emotional disorders (Aldao et al., 2010; Nolen-Hoeksema, 2004), mood symptoms and negative self-views (Nolen-Hoeksema et al., 2008). Rumination has been linked to a specific inability to disengage from self-referring negative information. People may become actively engaged in a maladaptive ruminative cycle, which in turn augments negative mood and prevents them from solving their problems, intensifying the ruminative cycle (Koster et al., 2011).

Prominent models of rumination [Control Theory, (Martin & Tesser, 1996); Response Styles Theory, (Nolen-Hoeksema, 2004); and more recently H-EX-A-GO-N model, (Watkins & Roberts, 2020)] describe both state and trait rumination as being maladaptive for both affect and goal-directed behaviour. This is particularly the case for brooding rumination, which produces a sustained, but unproductive focus of attention on

negative outcomes and their associated feelings. In contrast, reflection is proposed to be more adaptive in nature because it taps the tendency to deliberately “reflect” on concrete means for problem-solving (Treyner et al., 2003). Thus, categorical distinctions in ruminative style have shown both adaptive and maladaptive effects on cognition (e.g., Bernblum & Mor, 2010; Daches et al., 2010). However, literature is not consistent regarding the role of rumination on cognitive processes and performance. People with high trait rumination are found to recruit executive functions (i.e., monitoring, shifting, and updating the content of working memory) to support goal-directed behaviour (Whitmer & Gotlib, 2013; Richeson & Shelton, 2003), even on a cognitively demanding experience. On the other hand, people with high trait rumination are described to present inhibitory deficits (Cohen et al., 2015). In addition, Altamirano and colleagues (2010) have pointed out that the characteristic mental inflexibility found in trait rumination can be advantageous when successful performance requires active goal maintenance despite distracting stimuli. More recently, trait rumination was distinguished as both adaptive and maladaptive for general problem solving, based upon the degree of trait expression (inverted U shape expression) (Hubbard et al., 2015).

This study aimed to contribute to the extensive research on social cognition on how prejudice influences our perception, emotions, and decisions, and how it can be regulated in our minds. Given the inconsistencies found in the literature, this study had the following objectives: a) to replicate a counterconditioning procedure (intention manipulation) in order to evaluate its effectiveness in reducing implicit bias on a Portuguese sample; b) to assess possible carry-over effects of implicit bias reduction with an IAT application pre- and post-manipulation; c) to explore the role of brooding rumination on cognitive performance, particularly on an implicit racial paradigm.

Method

Participants

The sample of this study was composed of 104 participants. This study was developed according to the General Data Protection Regulation and its National Enforcement Law, and it was approved by the Ethics and Deontology Council (EDC) of the University of Aveiro (Parecer n. ° 20-2-CED/2021). Data from five participants were removed due to a high error rate (above 25%) in the BIAT. Therefore, the final sample included 99 participants (67 females, $M = 24.20$, $SD = 7.26$). All participants were over 18 years old, Caucasian, and reported no current psychopathological diagnosis and not

taking anxiolytic or antidepressant medication, at the moment (inclusion criteria). Participants were randomly assigned to one of two experimental groups. Participants in the two groups did not differ in demographic characteristics ($\chi^2_{\text{Sex}} (1) = 0.62, p = .429$; $\chi^2_{\text{RegionResidence}} (6) = 8.20, p = .224$; $\chi^2_{\text{EducationalDegree}} (5) = 5.62, p = .346$; $\chi^2_{\text{Occupation}} (3) = 1.29, p = .732$). No significant differences were found in brooding trait rumination ($U (N_{\text{Experimental}} = 49, N_{\text{Control}} = 50) = 984.00, p = .091$), reflection trait rumination ($U (N_{\text{Experimental}} = 49, N_{\text{Control}} = 50) = 1138.00, p = .542$), explicit racial attitude ($U (N_{\text{Experimental}} = 49, N_{\text{Control}} = 50) = 1090.00, p = .337$), and mood, particularly, sadness ($U (N_{\text{Experimental}} = 49, N_{\text{Control}} = 50) = 1189.00, p = .804$) and joviality ($U (N_{\text{Experimental}} = 49, N_{\text{Control}} = 50) = 1010.50, p = .134$). Descriptive statistics are shown below in the Table 1.

Table 1

Summary of Characteristic Scores for Control and Experimental Groups

Questionnaire	Group					
	Experimental (age = 25 years, F/M = 35/14)			Control (age = 24 years, F/M = 32/18)		
	Mdn	IQR	Range	Mdn	IQR	Range
RRS						
Brooding	2.40	0.80	2.40	2.20	0.75	2.80
Reflection	2.75	1.00	2.75	2.50	1.19	2.75
MNABP	0.00	0.99	81.38	0.00	1.91	41.99
1_PANAS-X						
Sadness	19.65	38.64	93.84	19.18	34.91	81.27
Joviality	38.87	31.43	91.29	43.56	30.41	97.17

Note: F/M = number of female and male participants; IQR = interquartile range; Mdn = median; MNABP = Measure of Negative Attitude towards Black People; RRS = Ruminative Response Scale; 1_PANAS-X = first application of the Positive and Negative Affect Scale – 10 items.

Materials

Brief Implicit Association Test (BIAT; adapted from Sriram & Greenwald, 2009)

The BIAT is a measure of implicit racial attitudes. In this test, participants are instructed to respond, as quickly and accurately as possible, to a task of sorting words and images into categories. The stimuli are comprised of four categories: 1) “Black faces”; 2)

“White faces”; 3) “Good”; and 4) “Bad”. The test is composed of five sequential blocks (block 1 - 16 training trials with animal pictures and blocks 2, 3, 4 and 5 - 20 critical trials in each block). The stimuli of the first block, used in this study, were six pictures of animals (three mammals and three birds) from a Portuguese animal images database (Possidónio et al., 2019) and six words (three positive: “paz”, “prazer” e “riso”, and three negative: “horrível”, “mal” e “horroroso”) from the current Portuguese online IAT (Neto et al., 2007). The remaining blocks (four category-only warm-up trials, and then 16 category-attribute alternating trials) were composed by eight words (four positive: “alegria”, “amor”, “feliz” and “maravilhoso”, and four negative: “agonia”, “terrível”, “malvado” and “falhanço”) from Neto and co-authors (2007) study, as well as eight race stimuli (4 × 3 cm black-and-white photographs of four Black and four White faces) commonly used in race IAT tasks (Xu et al., 2020). Each critical block trial had two focal categories that appeared at the top of the screen (e.g., block 2 - “Good and Black faces”, block 3 - “Good and White faces”, block 4 - “Good and Black faces”, and block 5 - “Good and White faces”). The “Good” category was focal in every block and was combined with the two types of faces, whereas the “Bad” category remained non-focal in every block. When conceptually congruent categories are combined (such as “Good” and “White faces”), people tend to respond quicker, compared to when incongruent ones are paired (such as “Good” and “Black faces”). Response slowing is caused by an experience of response conflict, resulting in a less strong implicit association between the categories.

Weapon Identification Task (WIT; translated from Stewart & Payne, 2008; Payne, 2001)

The WIT is a sequential priming paradigm, in which pairs of images are sequentially presented: the primes (first image) are black-and-white photographs of African American and Caucasian male faces, whereas the objects (second image) are images of guns and tools. The exact same images (faces and tools) of the original procedure were used in this study (provided by the authors). In this task, the face is only a warning that the object will appear next. Participants have to correctly identify which object is presented, pressing a specific key if they saw a "gun" or a "tool". The task was composed of 32 practice trials and 192 critical trials. The misidentification of guns as tools after a White prime is considered a stereotypical error, whereas the misidentification of tools as guns after a White prime is a counter stereotypical error. Considering a Black prime, a stereotypical error is made when the participant misidentifies a tool as a gun,

whereas a counter stereotypical error occurs when the participant misidentifies a gun as a tool.

Self- Report Measures

Sociodemographic Questionnaire

Participants were asked to answer a sociodemographic questionnaire (Appendix A), to gather the strictly necessary information for the purposes of the study. Specifically, participants were asked to indicate their sex, age, region of residence, educational degree, and occupation.

Ruminative Responses Scale (RRS-10) - Short Version of 10 items

The reduced version of RRS (Treyner et al., 2003; Portuguese version of Dinis et al., 2011) aims to assess trait rumination through a scale of 10 items. The participant is asked to indicate what he/she generally does when feeling sad or depressed, rating each item on a scale from 0 (almost never) to 3 (almost always). This scale evaluates two types of rumination: five items assess “reflection” (Portuguese version cut-off point: $M = 2.10$; $SD = 0.61$) and the remaining five “brooding” (Portuguese version cut-off point: $M = 2.26$; $SD = 0.61$). Regarding the internal consistency, the validation study for the Portuguese population obtained a Cronbach’s α of .75 for the reflection subscale and .76 for the brooding subscale.

Measure of Negative Attitude towards Black People (MNABP)

The original scale is composed of two items that assess the favourability attributed to Portuguese ($M = 3.87$) and to Black people ($M = 3.16$) through a Likert scale (1 – “Not favourable” to 5 – “Very favourable”) (Vala et al., 1999). For the purpose of this study, “Portuguese” was replaced by “White people”. Furthermore, the Likert scale was replaced by a Visual Analogical Scale (VAS) to allow for a more intuitive and accurate decision reasoning response. This is an intergroup favouritism measure, meaning that positive values indicate a more favourable attitude towards White/Black people in comparison negative values that mean the opposite (index range from -4 to 4). Vala and co-authors (1999) results indicate a tendency of Caucasians to make a significantly more positive appraisal towards the ingroup (White people) as compared to the outgroup (Black people).

Positive and Negative Affect Scale (adaptation of PANAS-X)

PANAS-X (Watson & Clark, 1999; short Portuguese version Galinha et al., 2014) is a scale that measures mood through positive and negative affect scales. Participants are asked to indicate to what extent they felt each feeling and emotion, at that moment, through a Likert scale that ranged from “Very slightly or not at all” (1) to “Extremely” (5). The short-form of the Portuguese version of the PANAS (10 feelings and emotions) holds good psychometric properties presenting a Cronbach’s α of .86 for the positive affect and a Cronbach’s α of .89 for the negative affect (Galinha & Pais-Ribeiro, 2005; Galinha et al., 2014). In this study, an adapted version composed of three positive emotions from the joviality subscale (happy, excited, enthusiastic) and three negative ones from the sadness subscale (sad, downhearted, blue) was used. Participants were asked to indicate to what extent they felt each feeling and emotion, at that moment, through a VAS that ranged from “Very slightly or not at all” (0) to “Extremely” (100).

State Rumination Measure

The state rumination assessment procedure developed by Cohen and co-authors (2015) was replicated in this study. Participants were given four minutes to recall a recent upsetting personal event. Subsequently, to assess the degree to which they currently ruminated about the recalled event, they indicated their agreement to 10 rumination-related sentences modified from the RRS (Nolen-Hoeksema & Morrow, 1991), through a VAS ranging from “Highly agree” (0) to “Highly disagree” (100). For the purpose of the present study and considering the online format of this experiment, a single item measure was applied “Right now, I think about the reasons that I, and not others, tend to respond the way I did”.

Procedure

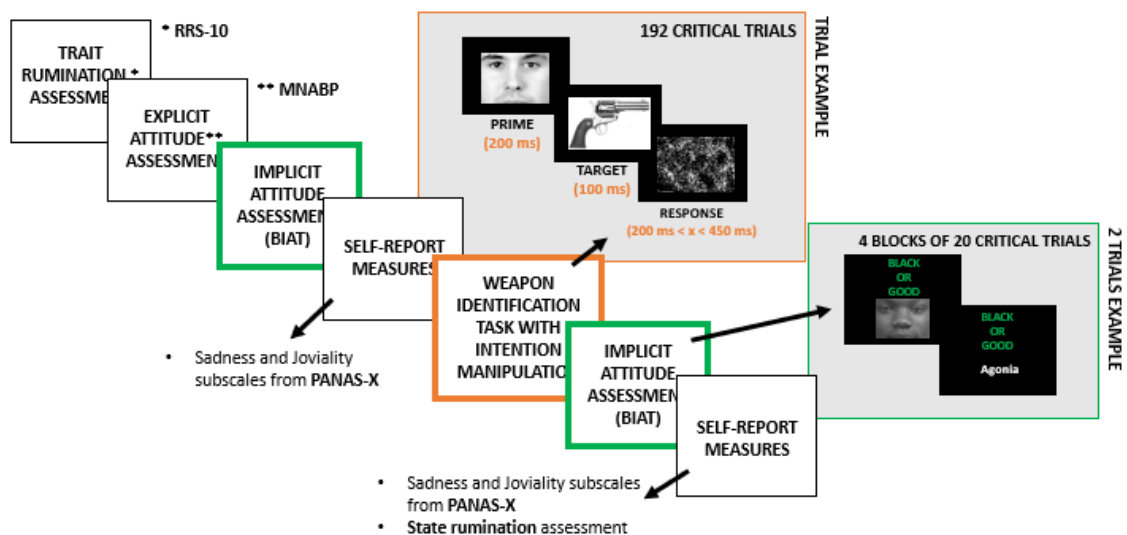
Data Collection

Recruitment was carried out through social media platforms (e.g., Instagram, Facebook, LinkedIn) and institutional e-mails. Data collection was performed in two online platforms: FormsUA and Pavlovia. First, participants that met the inclusion criteria (Appendix B) were required to read and give their informed consent (Appendix C). Then, they filled out the sociodemographic questionnaire and the trait rumination measure

(RRS-10). At that moment, participants were asked to insert an identification code, composed of the last four digits of the Taxpayer Identification Number (NIF) that, for confidentiality issues, would identify them on the next step. Participants then assessed a new link to perform an online experience designed on PsychoPy3 and ran online on Pavlovia platform. Participants started out by filling out the racial explicit measure (MNABP). Next, they performed the racial implicit procedure (BIAT). In this task, participants were instructed to respond as quickly and accurately as possible to the task of classifying words and images into categories. Stimuli from one of the four categories appeared at the centre of the screen, and the participant had to press the “I” key if the stimulus belonged to one of the two focal categories, or the “E” key if the stimulus was categorised as one of the two non-focal categories. If the participant made an error, a red "X" appeared below the stimulus and the trial continued until the correct key was pressed. The procedure was composed of five sequential blocks, summing a total of 96 trials (see Figure 1). The order of the pairs of critical blocks (2 and 4, and 3 and 5) was counterbalanced between participants to prevent order effects. After completing the BIAT, participants filled out the two subscales from PANAS-X.

Figure 1

Schematic Representation of the Study's Procedure



Next, participants were randomly assigned to one of two groups in the WIT task (Stewart & Payne, 2008). The experimental group (counterconditioning condition or intention manipulation) was instructed to think the word “safe” whenever they saw a

Black face, whereas participants in the control group were asked to think the word “quick” whenever they saw a Black face. Pairs of images were sequentially presented, a face for 200ms and an object for 100ms. Participants were instructed to press the “A” key if they saw a "gun" or the “F” key if they saw a "tool". If the participants took less than 200ms or more than 450ms to give an answer, they were warned with a written message to wait for the second image or to respond more quickly, respectively. Immediately after completing the WIT, participants performed the BIAT again. The participation ended with two self-report questionnaires: joviality and sadness subscales from PANAS-X and a one-item measure of state rumination.

Data Analysis

Analyses were performed using the jamovi computer software, version 1.6. The statistical level of significance was set at $p < .05$ for all analyses. The BIAT performance data were analysed through response latencies (i.e., RT). Data from the WIT were analysed regarding the proportion of errors (the misidentification of guns as tools and of tools as guns).

Results

Response Time Analysis (BIAT)

Considering the non-normal data distribution, RT data were log transformed to conduct inferential analysis. However, as the direction of effects remained the same, the descriptive results are presented without transformation for a more intuitive analysis. A mixed three-way ANOVA was performed with BIAT performance moment (pre- vs. post-intentions manipulation) and condition (White-Good or congruent vs. Black-Good or incongruent) as within-subjects factors, group as a between-subjects factor (control vs. experimental) and RT (ms) as a dependent variable.

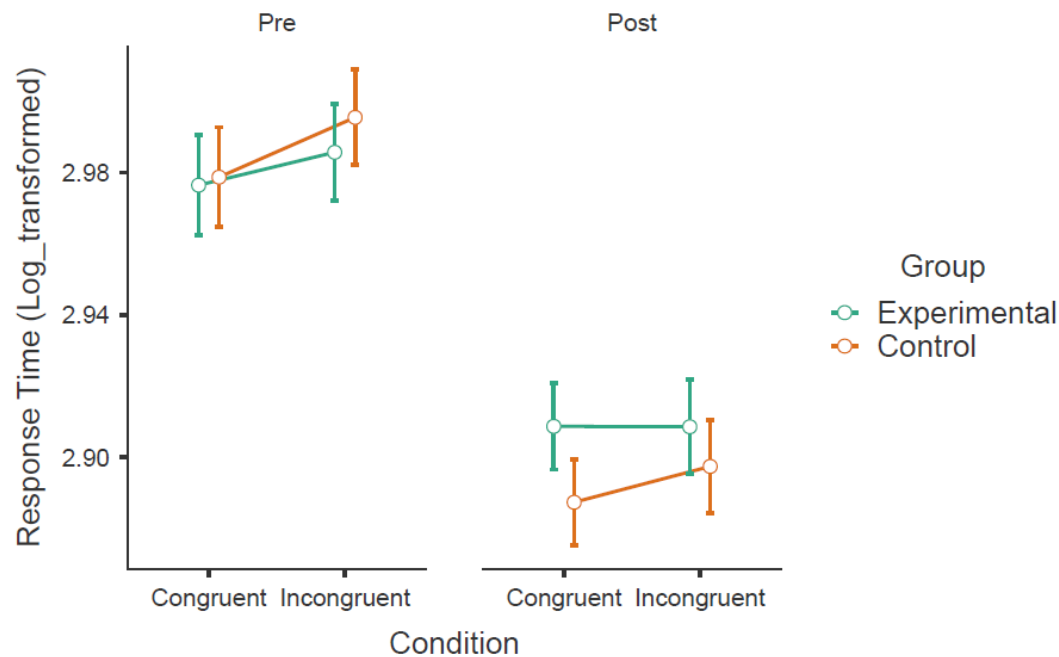
ANOVA results revealed a main effect of BIAT performance moment ($F(1,97) = 389.12, p < .001, \eta^2_G = 0.171$), that is, a decrease in RT from pre- to post-manipulation is observed ($M_{Pre} = 2.98, SE_{Pre} = 0.01; M_{Post} = 2.90, SE_{Post} = 0.01$). Moreover, a significant interaction effect BIAT performance moment*group was found ($F(1,97) = 6.90, p = .010, \eta^2_G = 0.004$), which is descriptively associated with a greater decrease in RT in the control group ($M_{Pre} = 2.99, SE_{Pre} = 0.01; M_{Post} = 2.89, SE_{Post} = 0.01$) than in the experimental group ($M_{Pre} = 2.98, SE_{Pre} = 0.01; M_{Post} = 2.91, SE_{Post} = 0.01$).

No other significant results were observed: main effect of condition ($F(1,97) = 2.67, p = .106, \eta^2_G = 0.002$); main effect of group ($F(1,97) = 0.09, p = .764, \eta^2_G < 0.001$); interaction condition*group ($F(1,97) = 0.65, p = .423, \eta^2_G < 0.001$); interaction condition* BIAT performance moment ($F(1,97) = 1.30, p = .257, \eta^2_G < 0.001$); and interaction condition* BIAT performance moment*group ($F(1,97) = 0.04, p = .852, \eta^2_G < 0.001$). Despite not having reached statistical significance, given the conceptual interest, some descriptive results should be highlighted. The control group revealed the same pattern on the pre- and post-manipulation BIAT, showing higher RT on the incongruent condition (i.e., Black-Good) and lower RT on the congruent one (i.e., White-Good). In the experimental group, although the change in pattern is not significant, a smaller difference between RT on the congruent condition and RT on the incongruent condition was observed in post-manipulation (as illustrated in Figure 2).

Considering the conceptual importance of trait rumination (brooding) for the present study, this variable was included in the previous ANOVA model as a covariate (ANCOVA). No main effect of brooding ($F(1,96) = 0.15, p = .701, \eta^2_G = 0.001$) was found and no major changes were obtained in other main effects and interactions.

Figure 2

Responses Times from the Study Groups per Condition and Moment



Note. Congruent condition = White – Good blocks; Incongruent condition = Black – Good blocks; Pre = pre-manipulation moment; Post = post-manipulation moment.

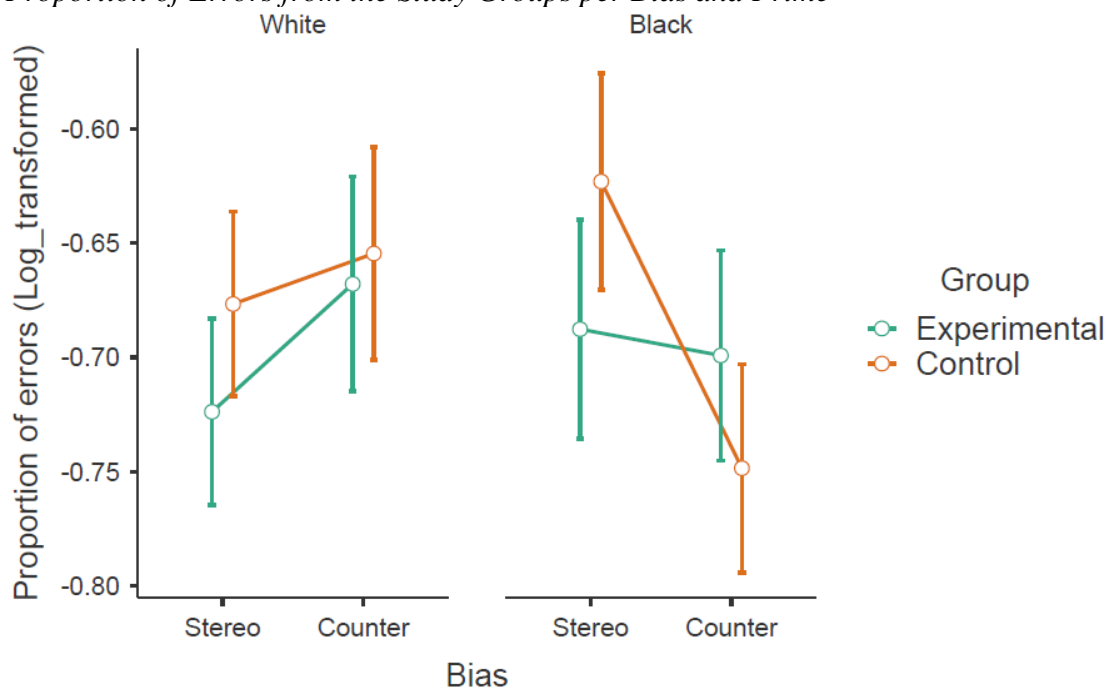
Proportion of Errors Analysis (WIT)

The dependent measure of interest was the proportion of errors, meaning the misidentification of guns as tools and of tools as guns in the WIT. Considering the non-normal data distribution, the proportion of errors was log transformed to conduct inferential analysis. As mentioned in the previous analysis, as the direction of effects remained the same, for a more intuitive analysis, the descriptive results are presented without transformation. A 2 group (experimental vs. control) \times 2 race prime (White vs. Black) \times 2 bias (stereotypical vs. counter stereotypical) mixed ANOVA was performed, with prime and bias as repeated measures, and group as a between-subjects factor.

ANOVA results showed a significant interaction race prime*bias ($F(1,91) = 4.44$, $p = .038$, $\eta^2_G = 0.008$), that is, participants made more stereotypical errors after a Black prime ($M_{\text{Black}} = -0.66$, $SE_{\text{Black}} = 0.03$) than a White one ($M_{\text{White}} = -0.70$, $SE_{\text{White}} = 0.03$) and made more counter stereotypical errors after seeing a White face ($M_{\text{White}} = -0.66$, $SE_{\text{White}} = 0.03$) than a Black one ($M_{\text{Black}} = -0.72$, $SE_{\text{Black}} = 0.03$) (Figure 3).

Figure 3

Proportion of Errors from the Study Groups per Bias and Prime



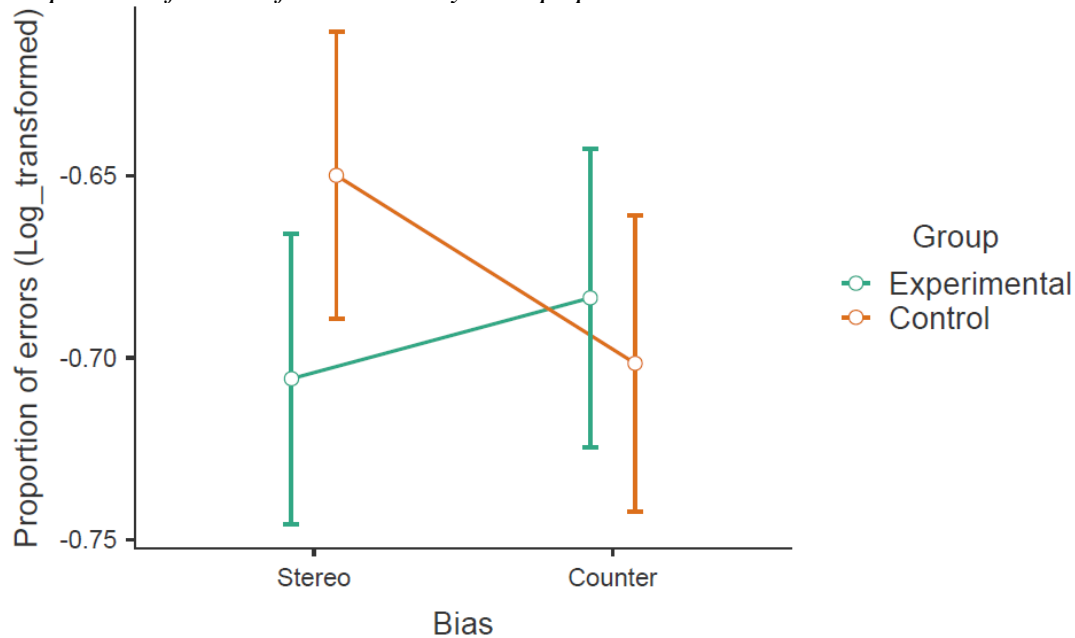
Note. Stereo bias = stereotypical bias; Counter bias = counter stereotypical bias; White = white prime; Black = black prime.

A significant interaction bias*group ($F(1,91) = 4.22$, $p = .043$, $\eta^2_G = 0.004$) was also found, meaning that regardless of the prime, the experimental group made more

counter stereotypical errors and less stereotypical errors ($M_{\text{Counter}} = -0.68$, $SE_{\text{Counter}} = 0.04$; $M_{\text{Stereo}} = -0.71$, $SE_{\text{Stereo}} = 0.04$) than the control group ($M_{\text{Counter}} = -0.70$, $SE_{\text{Counter}} = 0.04$; $M_{\text{Stereo}} = -0.65$, $SE_{\text{Stereo}} = 0.04$), as shown in the graphical representation of Figure 4.

Figure 4

Proportion of Errors from the Study Groups per Bias



Note. Stereo bias = stereotypical bias; Counter bias = counter stereotypical bias.

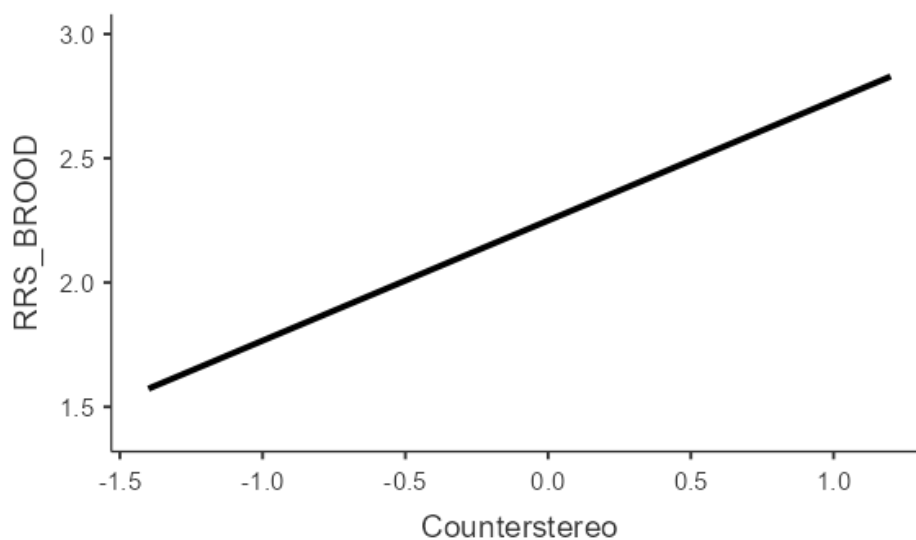
No other significant results were found: main effect of race prime ($F(1,91) = 0.39$, $p = .534$, $\eta^2_G < 0.001$); main effect of bias ($F(1,91) = 0.67$, $p = .415$, $\eta^2_G < 0.001$); main effect of group ($F(1,91) = 0.12$, $p = .727$, $\eta^2_G = 0.001$); interaction race prime*group ($F(1,91) = 0.64$, $p = .428$, $\eta^2_G < 0.001$); and interaction race prime*bias*group ($F(1,91) = 0.62$, $p = .435$, $\eta^2_G = 0.001$).

Considering the conceptual relevance of trait rumination (brooding) for the present study, this variable was included in the previous ANOVA model as a covariate (ANCOVA). Interestingly, a main effect of brooding was found ($F(1,90) = 5.29$, $p = .024$, $\eta^2_G = 0.040$), meaning that, participants with higher brooding, independently of all other factors, tended to present higher proportion of errors. Additionally, the inclusion of brooding in the previous model dropped the interaction race prime*bias ($F(1,90) = 0.14$, $p = .706$, $\eta^2_G < 0.001$), changed the statistical meaning from significant to almost significant of the interaction bias*group ($F(1,90) = 3.27$, $p = .074$, $\eta^2_G = 0.003$), and changed the statistical meaning from non-significant to marginally significant of main

effect of bias ($F(1,90) = 3.89, p = .052, \eta^2_G = 0.040$). In fact, and possibly explaining previous changes, an almost significant interaction of bias * brooding ($F(1,90) = 3.31, p = .072, \eta^2_G = 0.003$) was observed. A general linear modelling revealed that this interaction was explained by the fact that the impact of brooding on errors (a linear positive relationship) was only achieved for counter stereotypical bias ($F(1,90) = 7.00, p = .010, \eta^2_p = 0.072$). This way, participants with higher brooding tended to present higher proportion of counter stereotypical errors (Figure 5). No significant effect was found for stereotypical bias ($F(1,90) = 1.41, p = .238, \eta^2_p = 0.024$), but despite the non-significance, it is worth mentioning that a negative relationship with brooding was observed. No other significant changes were found between this ANCOVA and the previously reported ANOVA.

Figure 5

Relationship between Brooding Rumination and Counter Stereotypical Bias in the Two Groups



Note. RRS_BROOD = brooding subscale from the RRS-10; Counterstereo = counter stereotypical bias.

Post-Manipulation State Measures

Post-manipulation measures intended to explore differences in state measures of mood and rumination between the control and the experimental groups. Significant results were found for the PANAS-X Joviality subscale ($U(N_{\text{Experimental}} = 49, N_{\text{Control}} = 50) = 846.50, p = .008$). Descriptively, the control group had a higher score on this subscale

($Mdn_{Control} = 46.53$, $IQR_{Control} = 26.034$) compared to the experimental group ($Mdn_{Experimental} = 32.75$, $IQR_{Experimental} = 34.23$). Also, significant results were found for state rumination ($U(N_{Experimental} = 49, N_{Control} = 50) = 919.50$, $p = .033$), evidencing that the experimental group reported higher scores in comparison to the control group ($Mdn_{Experimental} = 47.46$, $IQR_{Experimental} = 42.48$; $Mdn_{Control} = 34.97$, $IQR_{Control} = 45.86$).

No significant group differences were found for the Sadness' subscale of PANAS-X ($U(N_{Experimental} = 49, N_{Control} = 50) = 1068.00$, $p = .273$).

Discussion

After decades of attempts to eliminate implicit associations regarding racial groups, racial categorization is still ingrained in the culture's mindset and still manages to build social hierarchies upon nationality and skin colour. Several research interventions to weaken implicit associations have been proposed over the years. Interventions designed to directly reduce the source of bias (e.g., asking participants to consider egalitarian values) have shown to be short-lived and ineffective (FitzGerald et al., 2019; Forscher et al., 2019), since many societal forces reinforce racist associations in the mind. The implementation of counter stereotypical intentions, however, has been found to be effective. Thus, the aim of the present study was to replicate a procedure that was successful in reducing implicit bias, using the BIAT as a pre- and post-manipulation measure of implicit bias decrease. Furthermore, the other main goal was to deepen our knowledge about the role of rumination, namely brooding, on implicit racial paradigm.

Results from the BIAT revealed a RT decrease from pre- to post-manipulation. This result has been documented in the literature, the first performance of an implicit task is known to evidence more polarized results (i.e., greater difference from zero) than the second or subsequent implicit task's completions (Greenwald et al., 2003; Lai et al., 2016). In an attempt to explain this difference, Greenwald and colleagues (2019) suggested that the subsequent task(s) could be perceived as less difficult than the first one (i.e., learning effect). Furthermore, our results revealed a significant greater RT decrease in the control group from pre- to post-manipulation, relative to the experimental group. That is, participants who received the "think quick" instruction took, on average, less time to respond in the post-manipulation BIAT than the "think safe" group. These results are in line with Amodio and Swencionis's (2018) theory and research on proactive control since a high interference manipulation (i.e., a counter stereotypical one) is expected to delay responses. The overall slower performance (i.e., congruent and incongruent blocks)

suggests that the intention to think “safe” when seeing a Black face motivated a more vigilant and careful behaviour (Stewart & Payne, 2008). That is, although unintentionally, people seem to have translated the instructed relationship between the “Black” and “safe” on the WIT, to the subsequent BIAT performance (De Houwer, 2014). Thus, our results might reflect a general semantic priming effect or a carry-over effect since proactive control was probably enhanced by the subsequent exposure to racial cues in the BIAT (Devine et al., 2012).

Still regarding the BIAT performance, a general response slowing on stereotype-incongruent blocks and a speed-up response on congruent ones in the control group was observed. This result is consistent with previous findings (Hilgard et al., 2015; Mierke & Klauer, 2003) pointing out that stereotype incompatible trials create an experience of interference, therefore, slowing down RT on incongruent blocks. Interestingly and despite the non-significant interaction, the experimental group did not follow this pattern, being evident a smaller difference between RT on the congruent condition and RT on the incongruent condition in post-manipulation BIAT. This result indicates that the “think safe” instruction led to a slight decrease in favourability towards Whites compared to the control group. Hence, this finding seems to suggest that the counter stereotypical intention has influenced implicit behaviour in the BIAT, specifically towards the reduction of implicit racial bias. Particularly, the counter stereotypical manipulation seemed to act as a kind of proactive control (i.e., cued proactive control) towards a nonbiased behaviour, as proposed by Amodio and Swencionis (2018).

Considering the WIT proportion of errors analysis, a significant interaction between race prime and bias (stereotypical or counter stereotypical errors) was found, indicating that participants made more stereotypical errors after a Black prime. This result is in accordance with the literature referring that a high interference content task is more demanding (Stewart & Payne, 2008; Payne, 2001). Curiously, participants made more counter stereotypical errors after seeing a White face than a Black one. This result may be related to the recent literature on interracial interactions, and even with recent social events regarding hate crimes ideologically motivated. White people’s motivation to respond without prejudice (Plant & Devine, 1998) may arise from the notion that Black people want to be respected and the concern about showing this respect or, on the other hand, it may arise from their own concerns about appearing prejudiced in interracial interactions (LaCosse & Plant, 2020). To our knowledge, this was the first study to put into perspective the counter stereotypical consequences of acting against prejudice (to

answer without prejudice). White people seem to consider less disrespectful or dangerous to attribute such concepts to their own race. Future studies should be carried out to further explore this idea, given the scarce research on counter stereotypical bias.

A significant interaction between bias and group was also found. Participants that received the “safe” instruction, made less stereotypical errors after a Black priming than the participants from the control group. This result supports previous literature (e.g., Stewart & Payne, 2008), as the observed decrease in the accessibility of the stereotype corroborates the interesting possibility that lateral inhibition or negative priming is the mechanism by which counter stereotypical implementation works. Lateral inhibition refers to the unintentional disruption or inhibition of thoughts when those thoughts have been either previously ignored or when one focuses on different thoughts (Tipper, 2001). Our findings seem to be explained by stereotypical thought inhibition. In line with previous explanations on how proactive control influences implicit behaviour, it is also possible that the intention manipulation may have enhanced a goal-directed behaviour (i.e., answer without bias), restricting stereotypical biased behaviour (Amodio & Swencionis, 2018). Furthermore, our study corroborates the extensive literature on how the cognitive control activation seems to trigger a less biased behaviour (e.g., Amodio et al., 2008; Bartholow et al., 2006; Correll et al., 2006).

Interestingly, participants instructed to think “safe” when encountering a Black face made more counter stereotypical errors than the “think quick” group. The intentions’ implementation may have led participants to behave in a less racial biased way, but they were not necessarily more accurate in their identification of the target object. Instead, the experimental group misidentified more often a gun as tool after a Black prime and a tool as gun after a White prime. This result seems to suggest that the experimental group exhibited a general tendency to give counter stereotypical responses for both priming’s. The lack of a main effect for race prime reinforces this explanation. The intention manipulation may have enhanced a goal-directed behaviour (i.e., avoid stereotypical bias), decreasing the attentional focus on distraction stimuli (i.e., race primes). Also, we believe that reinforcing the “Black” and “safe” association might have activated a general counter stereotypical mode. Considering the large number of counter stereotypical errors, the implementation of counter stereotypical intentions might not be the more appropriate strategy for increasing people’s perception accuracy (Rees et al., 2018).

Another interesting result is related to the fact that participants with higher brooding rumination presented higher proportion of counter stereotypical errors (positive

relationship) and lower proportion of stereotypical errors (negative relationship). To explain this result, we suggest that participants with a propensity to engage in a maladaptive ruminative cycle actively tried to behave counter stereotypically without a racial focus (i.e., counter stereotypical bias on White and Black primes), resulting in an inverted biased behaviour. Thus, this could mean that participants with higher brooding recruited proactive control (executive control) as a way of effectively focus on the target (avoid stereotypical bias) filtering less important information (i.e., racial primes) and responding in a less stereotypical way (Amodio & Swencionis, 2018). This finding, is in line with the argument that when confronted with a cognitive challenge or with a cognitively demanding experience, such as a racial IAT or a real intergroup interaction, people with high trait rumination are found to recruit specific executive functions (i.e., monitoring, shifting, and updating the content of working memory) to support goal-directed behaviour (Whitmer & Gotlib, 2013; Hubbard et al., 2015; Richeson & Shelton, 2003). Moreover, the characteristic mental inflexibility found in trait rumination can be advantageous when successful performance requires active goal maintenance despite of distracting stimuli (Altamirano et al., 2010). In addition, brooding rumination might have a role in active goal maintenance, essential to support goal-directed behaviour (in this case, act in a non-biased way). In addition, we believe that this experimental paradigm pave way to future studies on the habitual nature of rumination (i.e., trait rumination). Namely, this paradigm could be especially useful on habit change research, to counter condition an alternative incompatible response to the cues that trigger the habit (Wood & Neal, 2007) might be an interesting strategy for interventions that aim to reduce trait rumination (Dickson et al., 2019). Furthermore, this study lays the groundwork for the first studies on the automatic and controlled processes of rumination (through a process dissociation procedure, commonly used in implicit racial tasks) (Watkins & Roberts, 2020).

Concerning post-manipulation state measures, the experimental group presented significant higher scores on rumination. This result seems to empirically reinforce the literature defending that intention manipulation brings into consciousness stereotypical behaviour. As people focus their attention on the discrepancy between one's desired state and the actual situation, they evidence higher rumination scores (Phillips & Hine, 2016; Watkins & Roberts, 2020). Accordingly, the control group presented significant higher scores on the Joviality PANAS-X subscale in comparison to the experimental group. In other words, at the end of the experiment the experimental group evidenced a less positive

mood. This result is totally in line with the previously developed argument regarding the effectiveness of the manipulation on bringing into consciousness stereotypical behaviour. The subsequent difficulty to act upon prejudice and the negative emotional impact of explicit and implicit self-discrepancy racial awareness can help to explain this result.

The present study has several limitations. First, our sample had an unbalanced number of males and females. In future studies aiming to include gender as a variable of interest, a more balanced distribution must be achieved. In addition, it might be relevant to explore if other factors, such as different country regions and level of proximity/intimacy with Black people, is related to the degree of discrepancy between implicit and explicit racial bias. Second, this study was conducted online and many unforeseen complications emerged: participants needed Internet connection during the entire procedure; technical problems from the Internet service on FormsUA and on Pavlovia; no guarantee that the participants filled in the inclusion criteria (e.g., being a Caucasian sample), as well as, for example, if they executed the online experiment in the same ideal conditions. Third, some of the measures used are not validated to the Portuguese population, what compromises the validity and reliability of our results. Finally, the explicit racial measure (MNABP) data seem to suggest a carry-over effect from the first to the second racial assessments (i.e., the two items), leading us to question its validity. Regarding the importance of contrasting explicit and implicit measures, finding a measure that tackles this effect might be relevant for future studies.

Conclusion

Our study supports and extends past research on the effectiveness of implementation intentions in reducing implicit bias (e.g., FitzGerald et al., 2019; Forscher et al., 2019; Stewart & Payne, 2008), as well as it corroborates recent literature on how implicit racial bias can be attenuated enhancing control, instead of changing associations in the mind (e.g., De Houwer, 2019; Hinton, 2017; Amodio & Swencionis, 2018). In other words, implicit bias can be weakened targeting one's intended behavioural response and not internal sources of bias. Afterall, the "implicit" is not fully automatic, behavioural changes can be made to, slowly, reduce racial prejudice. This view is consistent with prior theory and research suggesting that the most effective strategy to reduce implicit bias is to regulate its influence on behaviour (e.g., Amodio & Ratner, 2011; Mendoza et al., 2010). The option to use the BIAT as pre- and post-manipulation measure allowed us to realize that the "think safe" group may have carried out the strategy to think counter

stereotypically to the BIAT. This effect is a call for future studies to extend the range of this finding, namely to different stimuli and over time (longitudinal studies). Additionally, our findings corroborate previous research (Rees et al., 2018) suggesting that intentions implementation should be employed when bias reduction is the goal, but not when increased judgment accuracy is the desired outcome, since an increased number of counter stereotypical errors can have serious real-world consequences. Future studies should explore this idea given the scarce literature on counter stereotypical bias.

Even though societal change has proven to be slow and beyond each one individual's control, it does not invalidate the continuous efforts that need to be made to promote an egalitarian society with sustained changes in institutional bias (e.g., increasing positive intergroup contact, removing environmental cues of inequality, such as Confederate monuments, increasing faculty diversity at universities or in organizations leadership) (Vuletich & Payne, 2019). More recently, the Black Lives Matter movement proved to contribute to the decrease of Caucasian's implicit racial attitudes in the United States (Sawyer & Gampa, 2018). Changing personal responses to the social environment, with intention implementation, seems a promising argument to proceed. In the same line of innovative contribution, our findings seem to highlight a possible positive impact of a "good enough" degree of brooding rumination on active goal maintenance. The experimental untangle of rumination in an implicit racial paradigm performed in this study requires future studies to confirm these results and explore a possible quadratic nature of rumination.

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Appendix A**Sociodemographic Questionnaire****Questionário Sociodemográfico****SEXO:**

Masculino

Feminino

IDADE:**REGIÃO DE RESIDÊNCIA:**

Norte

Área Metropolitana do Porto

Centro

Área Metropolitana de Lisboa

Alentejo

Algarve

Região Autónoma da Madeira

Região Autónoma dos Açores

HABILITAÇÕES LITERÁRIAS:

9º ano de escolaridade

12º ano de escolaridade

Bacharelato

Licenciatura

Mestrado

Doutoramento

Outro:

PROFISSÃO:

Estudante

Profissional

Outro:

Appendix B

Inclusion Criteria

BEM-VINDO(A)!

Por favor, responda a este questionário num computador.

Esta experiência requer que a complete de uma só vez. Não poderá sair e retomá-la mais tarde. Informamos que a mesma tem uma duração estimada de 30 minutos.

No caso de habitualmente utilizar óculos/lentes de contacto para ler no computador, assegure-se de que os está a utilizar.

*Enquanto aluna do mestrado em Psicologia da Saúde e Reabilitação Neuropsicológica da Universidade de Aveiro, venho por este meio apelar à sua participação no estudo que estou a desenvolver no âmbito da minha dissertação. Primeiramente, será necessário averiguar se cumpre os critérios de inclusão para participar no estudo. Seguidamente, solicitarei o seu contributo através de uma plataforma experimental *online*. O objetivo deste estudo, que está integrado num projeto de investigação desenvolvido no Departamento de Educação e Psicologia da Universidade de Aveiro, consiste na exploração da eficácia de um procedimento experimental de tomada de decisão, que envolve o processamento de estímulos raciais e o conceito de ruminação.*

Por favor, antes de iniciar a sua participação, leia com atenção a seguinte informação.

A participação neste estudo implica o cumprimento do seguinte conjunto de **critérios de inclusão**:

- Ter pelo menos 18 anos de idade;
- Ser do grupo étnico caucasiano;
- Não ter, no momento presente, nenhum diagnóstico de perturbação do foro mental;
 - Não se encontrar a tomar, no momento presente, medicação ansiolítica ou antidepressiva.

Caso não cumpra um dos critérios acima mencionados, agradecemos a sua disponibilidade, mas a sua participação ficará por aqui.

Caso cumpra todos os critérios acima mencionados, por favor avance para a página seguinte.

Appendix C

Informed Consent

Rumination Room: Processamento de Estímulos Raciais e Ruminação

Objetivo:

Este estudo tem como objetivo explorar a eficácia de um procedimento experimental de tomada de decisão, que envolve o processamento de estímulos raciais e o conceito de ruminação

Duração:

A realização desta experiência demorará cerca de 30 minutos.

Procedimento:

Primeiramente, ser-lhe-á solicitado que preencha um questionário de dados sociodemográficos (sexo, idade, região de residência, habilitações literárias e profissão) e um questionário de pensamentos ruminativos, no sentido de recolher o conjunto mínimo de dados necessários para os objetivos do estudo. Todos os elementos são de resposta obrigatória. Esta fase terá uma duração total de cerca de 5 minutos. Ainda nesta primeira fase irá definir um código de identificação composto pelos 4 últimos dígitos do seu número de identificação fiscal (NIF), que o/a passará a identificar na fase seguinte.

Seguidamente será direcionado, através de um *link*, para uma plataforma online onde irá realizar a experiência. Esta experiência será disponibilizada e armazenada na plataforma *Pavlovia*. Existe um contrato estabelecido entre esta plataforma e a Universidade de Aveiro que assegura o cumprimento do RGPD relativamente aos seus dados ali inseridos. Para além disso, nesta plataforma apenas se identificará através de um código previamente indicado por si. Primeiro, ser-lhe-á solicitado que responda a 2 questões sobre conteúdos raciais, e que realize uma tarefa de categorização onde classificará palavras e imagens em grupos, o mais rápida e acertadamente possível. Após completar esta tarefa, irá preencher um breve questionário relativo ao humor. Em seguida, realizará uma tarefa de concentração e identificação de objetos. A sua participação neste estudo terminará com o preenchimento de dois questionários relativos ao humor e ao grau de ruminação. Todos os elementos são de resposta obrigatória.

Potenciais riscos e benefícios:

A participação neste estudo não acrescentará qualquer risco ou desconforto para além dos normalmente encontrados na sua rotina diária. Com a participação neste estudo estará a contribuir para aprofundar o conhecimento sobre um processo cognitivo que desempenha um papel central no desenvolvimento e manutenção de diversas condições psiquiátricas, bem como ajudará a compreender como é diferentes instruções sobre como realizar certas tarefas influenciam a presença de certos construtos psicológicos.

Confidencialidade e Anonimização:

Os dados sociodemográficos disponibilizados no primeiro link serão descarregados regularmente da plataforma forms.ua.pt diretamente para um servidor seguro da UA. Após o download dos dados da plataforma estes são apagados da mesma. Ao serem descarregados, os dados pessoais que o/a identificam serão imediatamente armazenados num ficheiro e todos os restantes dados decorrentes da sua participação no estudo noutra ficheiro. Sobre os dados pessoais será realizado um processo de pseudoanonimização, que consistirá na atribuição de um código a cada participante, que o passará a identificar.

Responsáveis pelo tratamento:

A Licenciada Maria Inês Ferreira será a responsável pelo tratamento dos dados. **Será a única** a aceder aos seus dados pessoais e com a informação necessária para proceder ao emparelhamento entre estes e os restantes dados fornecidos por si. A responsável terá acesso aos dados pessoais durante o período de realização dos estudos (até dezembro de 2021), sendo este o período de conservação dos dados. Os dados por si disponibilizados serão utilizados apenas no âmbito de trabalhos académicos e apresentações científicas, não sendo comunicados a nenhuma entidade nem transferidos para outros países.

Acesso e partilha dos dados anonimizados:

Após a finalização da dissertação de Mestrado, a responsável pretende ceder os dados, já anonimizados, ao responsável pelo projeto de investigação no qual o estudo está inserido, que está a ser desenvolvido no Departamento de Educação e Psicologia da Universidade de Aveiro. Os dados anonimizados podem também ser partilhados com revistas internacionais ao abrigo do movimento *opendata* e apresentados em apresentações públicas, congressos científicos e outras publicações. Aquando da disponibilização dos dados, sempre que possível, serão aplicados os critérios de minimização dos dados (apresentando apenas os dados relevantes para o objetivo) e de alteração dos dados (atribuição de códigos a variáveis que não afetem os resultados).

Esclarecimentos:

Caso deseje obter qualquer tipo de informação adicional ou esclarecimento poderá contactar a Licenciada Maria Inês Ferreira (mariaferreira98@ua.pt).

Natureza Voluntária e direitos de Participação:

A sua participação neste estudo é voluntária, podendo a qualquer momento desistir, sem qualquer prejuízo para si. Caso queira desistir, a meio ou no final do estudo, bastará fechar a janela do seu browser e nenhum dos seus dados será gravado. Caso pretenda, em algum momento, retirar o seu consentimento deverá enviar um email para a responsável indicando a sua pretensão.

Durante o período de conservação dos dados, tem o direito de pedir a portabilidade dos seus dados, de lhes aceder, de os retificar, de pedir a sua eliminação e de restringir o tratamento dos mesmos. Para exercer qualquer destes direitos, por favor envie um email para a responsável, esclarecendo as suas pretensões.

(Esta questão é obrigatória)

Ao selecionar **SIM** na caixa abaixo, declaro que:

- tenho 18 anos ou mais;
- li integralmente o presente consentimento informado, considerando-o explícito e concordando com o seu conteúdo;
- compreendi as condições de participação neste estudo, nomeadamente, o seu objetivo e os procedimentos implicados;
- participo de livre e espontânea vontade;
- dou o meu consentimento para o tratamento dos meus dados e para a sua apresentação, de forma completamente anónima, em trabalhos académicos, apresentações públicas, congressos científicos e publicações, no âmbito da dissertação de mestrado em Psicologia da Saúde e Reabilitação Neuropsicológica da Universidade de Aveiro da licenciada Maria Inês Ferreira, em estrita obediência ao Regulamento Geral de Proteção de Dados e da sua Lei de execução Nacional.

Ao selecionar **SIM** na caixa abaixo, declaro que:

- dou o meu consentimento para a transferência dos meus dados, já anonimizados, ao responsável pelo projeto de investigação no qual o estudo está inserido, que está a ser desenvolvido no Departamento de Educação e Psicologia da Universidade de Aveiro e para a sua partilha com revistas internacionais ao abrigo do movimento *opendata* e apresentação em apresentações públicas, congressos científicos e outras publicações, em estrita obediência ao Regulamento Geral de Proteção de Dados e da sua Lei de execução Nacional.

Ao selecionar **NÃO** na caixa abaixo, declaro que:

- tenho 18 anos ou mais;
- li integralmente o presente consentimento informado, considerando-o explícito e concordando com o seu conteúdo;
- compreendi as condições de participação neste estudo, nomeadamente, o seu objetivo e os procedimentos implicados;
- não dou o meu consentimento para o tratamento dos meus dados e para a sua apresentação, de forma completamente anónima, em trabalhos académicos, apresentações públicas, congressos científicos e publicações, no âmbito da dissertação de mestrado em Psicologia da Saúde e Reabilitação Neuropsicológica da Universidade

de Aveiro da licenciada Maria Inês Ferreira, em estrita obediência ao Regulamento Geral de Proteção de Dados e da sua Lei de execução Nacional.

Ao selecionar **NÃO** na caixa abaixo, declaro que:

- não dou o meu consentimento para a transferência dos meus dados, já anonimizados, ao responsável pelo projeto de investigação no qual o estudo está inserido, que está a ser desenvolvido no Departamento de Educação e Psicologia da Universidade de Aveiro e para a sua partilha com revistas internacionais ao abrigo do movimento *opendata* e apresentação em apresentações públicas, congressos científicos e outras publicações, em estrita obediência ao Regulamento Geral de Proteção de Dados e da sua Lei de execução Nacional.

Caso tenha optado pela opção Não, agradecemos a sua disponibilidade e a sua participação ficará por aqui.

Caso tenha optado pela opção Sim, carregue no botão "seguinte".