

## Age, class and race discrimination: their interactions and associations with mental health among Brazilian university students

Discriminação de idade, classe e raça: suas interações e associações com saúde mental em estudantes universitários brasileiros

La discriminación por edad, raza y clase social: sus interacciones y asociaciones con la salud mental en los estudiantes universitarios brasileños

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### Abstract

*Although research on discrimination and health has progressed significantly, it has tended to focus on racial discrimination and US populations. This study explored different types of discrimination, their interactions and associations with common mental disorders among Brazilian university students, in Rio de Janeiro in 2010. Associations between discrimination and common mental disorders were examined using multiple logistic regression models, adjusted for confounders. Interactions between discrimination and socio-demographics were tested. Discrimination attributed to age, class and skin color/race were the most frequently reported. In a fully adjusted model, discrimination attributed to skin color/race and class were both independently associated with increased odds of common mental disorders. The simultaneous reporting of skin color/race, class and age discrimination was associated with the highest odds ratio. No significant interactions were found. Skin color/race and class discrimination were important, but their simultaneous reporting, in conjunction with age discrimination, were associated with the highest occurrence of common mental disorders.*

*Prejudice; Mental Health; Epidemiologic Studies*

### Resumo

*Embora a pesquisa sobre discriminação e saúde tenha progredido expressivamente, ela tem enfatizado a discriminação racial em populações dos Estados Unidos. Este trabalho explorou diferentes tipos de discriminação, suas interações e associações com transtornos mentais comuns em universitários do Rio de Janeiro, Brasil, em 2010. Associações entre discriminação e transtornos mentais comuns foram examinadas com regressão logística, ajustando-se para confundidores. Interações entre discriminação e características sociodemográficas foram examinadas. Discriminação por idade, classe e cor/raça foram as mais frequentemente relatadas. No modelo totalmente ajustado, discriminação atribuída à cor/raça e classe foram ambas associadas com odds aumentadas de transtornos mentais comuns. O relato simultâneo de discriminação por raça/cor, classe e idade esteve associado com a maior razão de odds. Não foram observadas interações estatisticamente significativas. As discriminações de classe e raça/cor foram importantes, mas seu relato simultâneo, em conjunto com a discriminação por idade, esteve associado com a maior ocorrência de transtornos mentais comuns.*

*Preconceito; Saúde Mental; Estudos Epidemiológicos*

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## Introduction

More than a century of scientific interest in the question of discrimination has resulted in numerous attempts at defining and conceptualizing it, as well as developing techniques to measure it<sup>1</sup>. From a theoretical viewpoint, discrimination is now regarded, according to most recent social psychology accounts, as “*an individual behavior that creates, maintains, or reinforces advantage for some groups and their members over other groups and their members*”<sup>2</sup> (p. 10). In the field of public health, in which studies were primarily devised to assess effects of discrimination on health, the literature from the 1990s onwards was generally successful in addressing the following two major research questions: (a) how specific health-related outcomes (e.g. blood pressure<sup>3</sup>) were related to discrimination; and (b) which persistent and often unjust racial health differentials were, at least partially, attributable to race-related discriminatory experiences<sup>4</sup>.

Among several health outcomes, mental health conditions have inspired substantial theoretical reflection and empirical scrutiny, as regards their association with discrimination<sup>5</sup>. A growing body of research has shown that mental health outcomes are the most consistently associated with discriminatory experiences. A literature review by Williams et al.<sup>6</sup> revealed that 80% (n = 20) of the original studies assessing the link between racial discrimination and stress showed a positive association between these two constructs. Similar conclusions were drawn by ensuing systematic and meta-analytic reviews; Paradies<sup>7</sup> and Pascoe & Smart-Richman<sup>8</sup> observed direct relations between higher reports of racial discrimination and adverse mental health outcomes in 72% (n = 148), as well as general discrimination and negative mental health status in 69% (n = 345) of the reviewed associations, respectively. Williams & Mohammed<sup>9</sup> confirmed the consistency of these associations with racial discrimination in an additional literature review.

Research has also demonstrated that the association between depression and discrimination can be moderated by sex<sup>10</sup> or ethnic identity<sup>11</sup>, and that anxiety/depressive symptomatology could represent intervening factors in the causal pathway that connects discrimination to adverse health-related behaviors, such as substance use<sup>12</sup>. Furthermore, in some studies, discrimination has been prospectively associated with adverse mental health outcomes<sup>12,13</sup>, minimizing the possibility of reverse causality (i.e. mental health disorders leading to actual or perceived discrimination).

Despite a growing number of studies on discrimination and mental health, several limitations have to be noted. First, a number of authors<sup>10,14,15</sup> acknowledge a paucity of investigations examining internalized discrimination, intra-group, institutional, and structural discrimination and how these may interact with interpersonal discrimination to produce unfavorable (mental) health outcomes. Moreover, to some extent, the assessment of discriminatory experiences in these studies has not relied upon either comprehensive conceptualizations of discrimination<sup>16</sup> or previously psychometrically validated instruments<sup>7</sup>. As such, some of these studies failed to assess the intensity and frequency of discrimination, as well as its attribution to class, gender, age etc. The body of research, to date, has been almost entirely restricted to racial discrimination and to populations from the USA, specifically racial, ethnic, such as African-Americans, Latinos, Indigenous, as well as lesbian, gay, bisexual and transgender peoples<sup>14,17</sup>.

For instance, to the best of the authors' knowledge, there are only two published investigations on the mental health effects of discrimination in Brazil<sup>18,19</sup>. This country is often highlighted for the complexity and distinguishing aspects of its social relationships<sup>20</sup>, and has recently experienced a renewed interest in the social impacts of discrimination. Interestingly, recent Brazilian scholarship has been influenced by pioneering work, carried out by Hasenbalg<sup>21</sup>, who contends that there is a specific intense and pernicious racial discrimination in Brazil, and that general racial inequalities cannot be regarded as residual effects of the slavery era, but as the result of new types of discrimination, with different forms of manifestation, especially in the post-slavery period.

One of the authors that investigates the specific forms through which racial discrimination manifests itself, Sansone<sup>22</sup>, posits power relations as guided by race in some areas of life and not in others. The author labels *hard areas* as those in which racial discrimination is more likely to be expressed, and *soft areas* those where race is not relevant to the organization of social processes and to the form of interpersonal relations. The hard areas encompass the labor market, emotional-sexual relationships, and contact with the police, while soft areas include leisure activities, circles of friends, spaces for religious expression and other similar areas.

The conditions under which discrimination occur may be even more multifaceted, if one is to consider the contextual, fluid and ambiguous process of racial classification observed in Brazil. Guimarães<sup>23</sup> cites Thales de Azevedo and Mar-

vin Harris as being among the first authors who identified the whitening process in the Brazilian racial classification system. Given the identification of groups of color with characteristics of class and social status, there would be a tendency of higher-status blacks and browns to be socially accepted as white. So, depending on the context, as well as on the social characteristics acquired by or ascribed to a potential victim, discrimination may manifest itself or not. Indeed, recent Brazilian academic and political discussions on the issue have been polarized over the relative importance of different types of discrimination, as well as over the construction of the field of "health of the black population" <sup>24</sup>. Such discussions have been expressively prolific, resulting in the publication of important papers and documents, emphasizing racial inequalities in health, their antecedents and consequences <sup>25,26</sup>.

The present investigation addresses some of the aforementioned research gaps, producing information outside the USA, and assessing discriminatory experiences in terms of their multiple potential attributions and contexts. The work was also devised to expand upon preliminary Brazilian research on discrimination and mental health, which was limited to the exclusive assessment of racial discrimination <sup>18,19</sup>. Evaluation of multiple types of discrimination and their relations with health outcomes may shed light on different mechanisms by which discrimination harms health, clarify the relative importance of each type in distinct sociocultural contexts, and allow for the assessment of effective policies against, for example, homophobia, sexism, and racism. In sum, such an investigation may enable a deeper understanding of discrimination as a social phenomenon, including how it manifests itself and how it can be counteracted. The objective of this study was to explore experiences of discrimination, their reported attributions, contexts of occurrence, interactions and associations with common mental disorders.

## Methods

This cross-sectional analysis was carried out among undergraduate students, enrolled at a public university in the city of Rio de Janeiro (Southeastern Brazil), between April and May 2010. Data were drawn from a research project that included the development and psychometric assessment of a new instrument on self-reported personally mediated experiences with discrimination <sup>27</sup>. We enrolled 424 participants, based on sample size recommendations for instrument development, which suggested a num-

ber between 300 and 500 <sup>28,29</sup>. Students were recruited in a way to maximize variability of specific characteristics; they were selected from the schools or departments of communication, engineering, history, physical education, psychology and biology, since a socio-demographic survey carried out by the university registration office indicated that these groups presented a high diversity of socioeconomic backgrounds and skin color/race.

Four cognitive interviewing sessions were carried out with preliminary versions of the questionnaire, involving 10 undergraduate students. A pilot study was also conducted with 15 students. Self-administered questionnaires were completed in the classrooms, during regular university hours. Midterm and end-term examination periods were avoided, during the fieldwork. The series of items in the self-administered questionnaire elicited information on the research constructs/variables detailed below.

Self-reported lifetime experiences of interpersonal discrimination, the main exposure, was assessed using a standardized instrument, which was developed considering Brazilian specificities <sup>27,30</sup>. The instrument includes 18 items about explicit incidents of negative differential treatments (Table 1), with the following answer options "none", "rarely", "several times" and "always". Respondents providing any positive response to these items were then asked three additional subitems. The first was "*When this happened to you, what was/were the reason/s for you to be treated that way?*", with a set of possible reasons (e.g. class, skin color/race, age, among others), which could be indicated individually or simultaneously. The second sub-item was "*On those occasions, did you feel any discomfort?*" (no/a little/fairly/a lot). The third sub-item was "*Still on those occasions, did you feel discriminated against?*" (yes/no). In this sample, internal consistency of the instrument was 0.8, and test-retest reliability was higher than 0.5 for 14 out of the 18 items across a 15-day period. Construct validity was supported by the instrument score being statistically higher among socially disadvantaged groups and positively correlated with adverse health behaviors and conditions <sup>27</sup>.

Common mental disorders were assessed with a 12-item, brief version of the *General Health Questionnaire* <sup>31</sup>, adapted for use with Brazilian populations <sup>32</sup>. This scale investigates the occurrence of common mental disorders, during the previous two weeks, exemplified in the following items: "*Have you recently been able to concentrate on whatever you are doing?*" and "*Have you recently lost much sleep over worry?*". Responses to each of the items were assessed using four-point

Table 1

Items used in the instrument for assessing discrimination in English (free translation). Rio de Janeiro, Brazil, 2010.

Item	Specific situation of differential treatment
1	Have you ever been mistaken for an employee of an establishment, when you were actually a customer? For instance, mistaken for a salesperson, clerk or waiter?
2	While at stores, restaurants or snack bars, have you ever been treated in an inferior manner compared to other customers?
3	While at government agencies, such as registry offices, traffic departments, water, electricity, sewage companies or other, have you ever been treated in an inferior manner compared to other people?
4	Have you ever been watched, chased or arrested by policemen or security guards without being given a reason for such? Think that it might have happened at stores, banks, in the street, parties or in public places, among others.
5	Have you ever been physically assaulted by policemen, security guards, unknown people or even acquaintances without giving reasons for that?
6	Have you ever been treated as if you were unintelligent or unable to perform any activity at school or college? Consider current (college) and past (school) situations in which you were treated like this by teachers or friends, even when you were able or sufficiently intelligent to perform these activities.
7	Have you ever been treated as if you were unintelligent or unable to perform any duties at the workplace? Consider the situations in which you were treated like this by colleagues, superiors and customers, even when you were able to perform these duties.
8	Have you ever been evaluated in exams or other academic activities at school or college in an unfair manner compared to your colleagues?
9	Have you ever been evaluated in an unfair manner compared to your colleagues at the workplace?
10	While trying to date somebody, have you ever been treated with contempt, without being given reasons for that? Consider only situations in which you were treated worse compared to others that also tried to date the same person.
11	Has a family member of someone with whom you had an intimate relationship rejected you or tried to force you to stop your relationship with him/her?
12	Have you ever been treated in an inferior manner by your parents, uncles/aunts, cousins or grandparents compared to other relatives?
13	Have you ever been called names which you didn't like or which were pejorative? Think that this might have happened in the street, buses, shopping malls, banks, stores, parties, schools, workplaces or other public places.
14	Have you ever been excluded or left out by a group of school or college friends? Think that this might have happened recently (college) or in the past (school) while engaging in sports, attending classes, working in groups, at parties, meetings or other encounters with friends.
15	Have you ever been excluded or left out by your coworkers? Think that this might have happened while working in teams, meetings, congresses, events or parties and informal meetings.
16	Have you ever been excluded or left out by people in your neighborhood? Think that this might have happened in neighborhood meetings or parties, or other social events.
17	Have you ever taken part in a recruitment process for a job in which you were rejected despite seemingly having the best qualifications among all candidates?
18	While visiting health centers, hospitals or other health services, have you ever been treated in an inferior manner compared to other people?

Likert scales; negative items presented response options ranging from "1 – absolutely not" to "4 – much more than usual"; while positive ones, from "1 – much more than usual" to "4 – much less than usual". Participants positively scoring three or more items were regarded as showing common mental disorders. Internal consistency of the instrument was 0.8 in the present study.

Socioeconomic status was measured with the Brazilian National Wealth Score<sup>33</sup>. This is an indicator of wealth, based on the ownership of 12 household assets and the schooling of the household head. This score was developed to allow the classification of populations, according to both national and local reference distributions. The score was categorized into quintiles.

Participants' sex (male/female), age (divided into groups of 18-19, 20-21, and 22-35 years), course attended, time since admission to the university (1-4, 5-8 and 9-12 semesters), and type of admission to the university were also assessed. Access to this university is through a selection exam, where 45% of the places are quotas reserved for students self-reported as black, brown or indigenous, who come from public schools, have disabilities, or are children of policemen, firefighters, security agents or prison administration officers killed or disabled in service.

Skin color/race (based on the five categories used by the Brazilian Institute of Geography and Statistics, and subsequently regrouped into "white" and "black/brown", due to the low

frequency of “yellow” and “indigenous” participants) was included in the analysis. In Brazil, skin color/race assignment is largely based on a combination of physical characteristics, such as skin color, nose and lip shape and hair type – the physical traits of blacks and browns are generally socially devalued<sup>20</sup>. There is also a close relationship between socioeconomic position and skin color/race in Brazil, such that socially rising browns or blacks may self-identify – and be socially accepted – as whites<sup>20,23</sup>.

Data were subjected to double-entry data checking using EpiData v.3.1 (Epidata Association, Odense, Denmark), with automatic checks for consistency and range. The database was later converted to Stata v.11.2 (Stata Corp., College Station, USA) format for data cleaning and statistical analysis. First, the univariate distributions of each of the above mentioned socio-demographic variables were examined, and the prevalence of common mental disorders by these socio-demographics was estimated. Then, the three most frequently reported reasons for experiences of discrimination were analyzed by socio-demographic characteristics. Statistically significant differences were examined using Chi-square test for heterogeneity or trend, where appropriate, in all the above mentioned comparisons.

The associations between different types of discrimination and common mental disorders were assessed through multiple logistic regression models, with estimation of odds ratios (OR) and 95% confidence intervals (95%CI). Exposure to discrimination took into account the potential attributions, their interpretation as discriminatory, and the frequency with which the incident was reported (“none”, “rarely”, “several times” and “always”), so that graded relationships with the outcome could be examined. However, given that no such gradients were observed, the discrimination variable (which could theoretically vary between 0 and 54 for each of the reported attributions, as a result of multiplication of frequency categories [0, 1, 2 and 3] by the 18 items)<sup>27</sup> was categorized as 0 for those who were “not discriminated against”, 1 for those “discriminated against due to other reasons”, 2 for “skin color/race discrimination”, 3 for “class discrimination”, 4 for “age discrimination”, 5 for “skin color/race/class, skin color/race/age or age/class discrimination”, and 6 for “skin color/race, class and age discrimination, simultaneously”, given that these combinations were the most frequently reported. The reference category in all analyses consisted of those participants who were “not discriminated against”, i.e. those reporting no exposure to differential treatments or those who were treated differently, but did not attribute these experi-

ences to discrimination<sup>27</sup>, given that preliminary analysis revealed no significant differences between these two groups. P-values were estimated with Wald tests for heterogeneity or trend, where appropriate.

Covariates, i.e. potential confounding factors, included in these models were sex, age, socioeconomic status, skin color/race, time since admission to the university, and type of admission to the university. All variables were maintained in the adjusted regression model, irrespective of their statistical significance. Interactions between discrimination and socio-demographics were examined. Statistical significance was taken to be 5% or less, using two-tailed tests.

This study was approved by two Institutional Review Boards, one from the Federal University of Pelotas, and the other from the State University of Rio de Janeiro. Participation at each stage of the study was voluntary and all respondents signed an informed consent form.

## Results

Nobody refused to take part in the study, and the maximum percentage of missing values in the database was 4% (n = 16), which was observed for the variable “socioeconomic status”. Table 2 shows that two thirds of the participants were in the first and second years of study. Over 40% of the students were enrolled as undergraduate students of psychology and biology. Approximately 60% of them were female, between the ages of 18 and 21. About half of the students self-classified as white, 30% as brown, and 15% as black. The global prevalence of common mental disorders was 37%, with no significant variation across socio-demographic strata, except for skin color/race and time since admission to the university – black respondents showed a prevalence of 52% for common mental disorders, and students in the highest category of semesters since admission to the university, 48%.

Discrimination attributed to age, class, and skin color/race were the most frequently reported (Table 3). Roughly a quarter of all participants attributed their discriminatory experiences to other reasons, including “the way one dresses”, “place of residence”, “type or specific behavior/habit”, and “due to specific moral values”. Almost 23% of the respondents indicated no exposure to discrimination. According to Table 3, female, quota, poorer and black/brown students were more likely to report specific types of discrimination. Females were more likely to report discrimination due to all examined reasons, except age. Quota students were more likely to report skin

Table 2

Socio-demographic characteristics of the students in the sample and strata-specific estimates of common mental disorders. Rio de Janeiro, Brazil, 2010.

Characteristic	Distribution		Prevalence of common mental disorders	
	n	%	%	p-value *
Undergraduate course				0.428
Communication	62	14.6	45.2	
Engineering	66	15.6	34.8	
History	47	11.1	31.9	
Physical education	65	15.3	30.8	
Psychology	90	21.2	43.3	
Biology	94	22.2	38.3	
Time since admission to the university (semesters) **				0.005
1-4	278	65.7	25.0	
5-8	119	28.1	38.6	
9-12	26	6.2	48.3	
Sex **				0.051
Female	248	58.6	32.6	
Male	175	41.4	41.9	
Age group (years) **				0.288
18-19	107	25.5	32.7	
20-21	148	35.3	39.9	
22-35	164	39.1	39.6	
Skin color/race **				0.089
White	216	51.4	37.0	
Brown	134	31.9	32.8	
Black	64	15.2	51.6	
Yellow	2	0.5	-	
Indigenous	4	1.0	-	
University admission through quotas **,***				0.769
Yes	183	43.5	38.8	
No	238	56.5	37.4	
Socioeconomic status (quintiles)				0.153
1 <sup>st</sup> (poorest)	83	20.3	39.8	
2 <sup>nd</sup>	81	19.9	43.2	
3 <sup>rd</sup>	81	19.9	42.0	
4 <sup>th</sup>	82	20.0	31.7	
5 <sup>th</sup> (richest)	81	19.9	33.3	
<b>Total</b>	<b>424</b>	<b>100.0</b>	<b>37.4</b>	<b>-</b>

\* Chi-square test for heterogeneity or trend, where appropriate;

\*\* These variables showed between one and 16 missing values;

\*\*\* Access to the university follows a selection exam where 45% of places are reserved for students self-reported as black, brown or indigenous, who come from public schools, have disabilities, or are children of policemen, firefighters, security agents and prison administration officers killed or disabled in service.

color/race, class and the combination of skin color/race, class and age discrimination. A similar pattern was observed for respondents in the lowest quintile for socioeconomic status. Blacks/browns more frequently reported skin color/race

discrimination, and discrimination attributed to class, age and skin color/race, simultaneously.

The fully adjusted multiple logistic regression model (Table 4) indicated that all types of discrimination were significantly associated with

Table 3

Self-reported experiences of discrimination, according to perceived reasons and socio-demographic characteristics. Rio de Janeiro, Brazil, 2010.

Socio-demographic characteristics	No discrimination reported (%)	Skin color/race discrimination (%)	Class discrimination (%)	Age discrimination (%)	Skin color/race/class, skin color/race/age or age/class discrimination (%)	Skin color/race, class and age discrimination (simultaneously - %)	Discrimination by other reasons (%)
Sex							
Male	32.8	5.9	8.8	14.6	18.7	4.0	15.2
Female	15.3	7.2	10.6	12.8	23.0	5.6	25.5
p-value *	0.002						
Age (years)							
18-19	26.5	4.9	7.8	17.7	15.7	4.8	22.6
20-21	22.7	4.3	9.9	12.1	22.0	4.2	24.8
22-35	20.8	9.4	11.3	12.0	23.9	5.6	17.0
p-value **	0.124						
Time since admission to the university (semesters)							
1-4	24.2	6.0	9.7	13.0	20.1	6.2	20.8
5-8	19.8	7.2	9.9	15.3	23.4	1.9	22.5
9-12	19.2	11.5	11.5	11.5	23.1	4.0	19.2
p-value **	0.723						
University admission through quotas							
Yes	14.8	7.4	14.2	9.1	27.3	9.6	17.6
No	29.0	5.7	6.6	17.1	16.3	1.2	24.1
p-value *	< 0.001						
Socioeconomic status (quintiles)							
1 <sup>st</sup> (poorest)	16.1	11.1	12.4	12.4	24.7	7.2	16.1
2 <sup>nd</sup>	17.7	7.6	10.1	5.1	25.3	8.9	25.3
3 <sup>rd</sup>	32.9	2.5	11.4	20.3	15.2	3.8	13.9
4 <sup>th</sup>	20.8	5.2	9.1	11.7	24.7	3.8	24.7
5 <sup>th</sup> (richest)	28.6	6.5	3.9	16.9	14.3	1.2	28.6
p-value **	0.005						
Skin color/race							
White	27.3	2.9	11.0	16.3	15.8	1.3	25.4
Black/Brown	17.0	11.2	8.5	10.1	26.6	9.0	17.6
p-value *	< 0.001						
<b>Total (n)</b>	<b>22.6 (92)</b>	<b>6.6 (27)</b>	<b>9.8 (40)</b>	<b>13.5 (55)</b>	<b>21.1 (86)</b>	<b>5.0 (20)</b>	<b>21.4 (87)</b>

\* Fisher's exact test;

\*\* Chi-square test for trend.

higher frequencies of common mental disorders, except for age discrimination. The simultaneous reporting of skin color/race, class and age discrimination was associated with the highest OR = 14.0 (95%CI: 4.3-45.4). No significant interactions between discrimination and socio-demographics were found.

Except for items 3 (to be unfairly treated at government agencies), 5 (to be physically assaulted), 8 (to be unfairly evaluated at school or college), 15 (to be excluded or left out by coworkers) and 16 (to be excluded or left out by neighbors) of the discrimination instrument, all the remaining settings or circumstances assessed

Table 4

Associations of social characteristics and discrimination with common mental disorders. Models were estimated through logistic regression, and the adjusted odds ratios presented are controlled for all other variables shown in the table. Rio de Janeiro, Brazil, 2010.

Variables	Unadjusted model		Adjusted model	
	Odds ratio	95%CI	Odds ratio	95%CI
Sex				
Male	1.0	-	1.0	-
Female	1.5	1.0-2.2	1.3	0.8-2.0
Age				
18-19	1.0	-	1.0	-
20-21	1.4	0.8-2.3	1.0	0.5-1.8
22-35	1.4	0.8-2.3	0.8	0.4-1.6
Time since admission to the university (semesters)				
1-4	1.0	-	1.0	-
5-8	2.0	1.3-3.2	2.3	1.3-3.9
9-12	1.8	0.8-4.0	1.8	0.7-4.6
University admission through quotas				
Yes	1.0	-	1.0	-
No	0.9	0.6-1.4	1.4	0.8-2.4
Socioeconomic status (quintiles)				
1 <sup>st</sup> (poorest)	1.0	-	1.0	-
2 <sup>nd</sup>	1.2	0.6-2.1	1.1	0.6-2.2
3 <sup>rd</sup>	1.1	0.6-2.0	1.3	0.6-2.6
4 <sup>th</sup>	0.7	0.4-1.3	0.7	0.3-1.4
5 <sup>th</sup> (richest)	0.8	0.4-1.4	0.8	0.4-1.7
Skin color/race				
White	1.0	-	1.0	-
Black/Brown	1.1	0.7-1.6	0.9	0.5-1.4
Discrimination				
No discrimination reported	1.0	-	1.0	-
Skin color/race discrimination	3.5	1.4-8.9	3.7	1.3-10.3
Class discrimination	4.0	1.8-9.0	4.0	1.7-9.8
Age discrimination	2.0	0.9-4.3	1.7	0.7-3.9
Skin color/race/class, skin color/race/age or age/class discrimination	5.1	2.6-10.0	5.2	2.5-11.0
Skin color/race, class and age discrimination simultaneously	10.3	3.5-30.7	14.0	4.3-45.4
Discrimination for other reasons	2.8	1.4-5.6	2.7	1.3-5.5

95%CI: 95% confidence intervals.

were significantly associated with higher odds of common mental disorders. Among the relevant items, the most frequently reported and statistically significant discrimination attributions were pair-wise combinations of skin color/race/class/age, as well as each of these attributions in isolation (results not shown).

## Discussion

This study, which is without parallel among previous investigations, showed that (1) discrimination attributed to skin color/race and class were both independently associated with a four-fold increase in the odds of common mental disorders; and that (2) the simultaneous reporting of skin color/race, class and age discrimination was associated with the highest odds ratio. The results revealed that the methodological strategy

adopted to assess explicit discriminatory experiences has a direct bearing on the results of published investigations. When different types of discrimination are conjointly measured, it may be possible to evaluate the relative importance of each one with regard to the health outcome in question, as well as to detect high magnitudes of association between discrimination and mental health. This is significant, given that the literature on discrimination and (mental) health has emphasized unfair treatments attributed to race<sup>5,34</sup>. Even though a recent literature review has shown that many types of discrimination are harmful to health<sup>8</sup>, other authors indicate that it is problematic to consider self-reported racial discrimination as synonymous with unfair treatment without attribution<sup>35</sup>.

In addition to allowing the examination of health effects of different types of discrimination, a broader approach to discriminatory experiences enables the assessment of theoretically relevant interactions, such as the one we observed in the present analysis, involving age, class, and skin color/race. The results of the present investigation lend credence to the hypothesis that discriminatory experiences with multiple attributions are potentially more harmful to health than those attributed to a single motivation<sup>30</sup>.

Previous research has demonstrated the importance of distinct discriminatory attributions to the variability of health-related outcomes. Pioneering work, carried out by Ren et al.<sup>36</sup>, showed that the simultaneous reporting of race and class discrimination was directly associated with depression, especially among black participants. An additional investigation revealed that, when controlled for each other in multivariable models, gender and class (but not race) discrimination were positively associated with depressive symptomatology<sup>37</sup>. Similarly, Seaton et al.<sup>38</sup> reported that discrimination attribution effects varied, according to the studied outcomes: while the association between discrimination and psychological well-being did not vary according to attribution, depressive symptomatology was particularly related to discriminatory experiences linked to physical appearance. Chae et al.<sup>39</sup> observed that race discrimination was more strongly associated with serious psychological distress than was non-racial discrimination.

The previous Brazilian studies on the subject found that skin color/race discrimination was directly associated with depression<sup>18,19</sup>. However, given that the assessment instruments utilized in the studies inherently attributed discrimination to skin color/race, it was not possible to assess the association between distinct types of discrimination as well as their interactions in a

research context outside the USA. In light of these results, we assume the hypothesis – that discriminatory experiences with multiple attributions are potentially more harmful to health – is likely to be sensitive to the outcome under evaluation and/or to the population group in question. As such, further research is warranted on this topic.

Overall, the results of the present study also partially support Schmitt & Branscombe's<sup>40</sup> assertion that it is the perception of an individual as a victim of discrimination that negatively affects his/her well-being. This assertion is also being examined in emerging research on implicit measures of individuals as targets of discrimination<sup>35</sup>. Our findings, however, do not necessarily contradict alternative theories postulating that attributions to discrimination may have self-protective effects<sup>41</sup>. It is possible that attributing differential treatment experiences to discrimination may be self-protective for other health-related outcomes, and in specific interaction contexts. In fact, this contention needs to be systematically addressed in future studies using both explicit and implicit measures, as well as assessment of social desirability bias<sup>35</sup>.

Class and skin color/race discrimination were similarly associated with mental ill-health. This finding supports long-standing data from different Brazilian sociocultural contexts, revealing the complex interplay and mutual importance of skin color/race and class in this country<sup>20,42</sup>. The somewhat higher magnitude of effect regarding class discrimination corroborates qualitative and quantitative analyses by Machado & Barcelos<sup>43</sup> who observed a slight predominance of class over racial issues, among university students from Rio de Janeiro, Brazil. According to the study participants' perspective, class was considered to be the most important source of inequalities in Brazilian society as a whole, such that socioeconomic status would be one of the most important obstacles to the reduction of racism in the Brazilian context<sup>43</sup>.

This study also advances previous research on discrimination attributions by assessing the perceived attribution(s) for each of the 18 differential treatment experiences. This is in contrast with, for example, Seaton et al.'s<sup>38</sup> and Chae et al.'s<sup>39</sup> research, which used only one attribution item. These previous studies also did not allow for reporting of multiple attributions for each incident, a drawback that was addressed in the present investigation.

However, there are some limitations that need to be considered. First, this study only dealt with personally-mediated discriminatory experiences, and not with other analytic levels<sup>44</sup>. Second, neither other stressors nor social desirabil-

ity scales were included in this study. Third, due to the low sample size, estimates were relatively imprecise. Fourth, given that no psychological control variables were included in the analysis, we could not estimate the effect of specific personality traits, such as low self-esteem, on the relation between discrimination and mental health. Individuals with low self-esteem may be particularly more likely to over report discrimination, potentially overestimating the association between discrimination and mental health outcomes. Finally, the study of university students and utilization of a cross-sectional design limits generalizability of results and prevented us from establishing temporal orderings between the exposure and the outcome, respectively. Nevertheless, previous studies have shown that mental distress at baseline did not prospectively predict reports of discrimination, minimizing the possibility of reverse causality<sup>12</sup>.

In conclusion, we suggest that the strategy adopted to assess discriminatory experiences directly influences the nature of findings from investigations on discrimination and (mental) health. When different types of differential treatment were assessed, not only skin color/race discrimination, but also class discrimination and discrimination simultaneously attributed to age, class and skin color/race were positively associated with common mental disorders. These findings indicate that a broader approach to discrimination may inspire alternative strategies to prevent it and to reduce its health effects, particularly those efforts not necessarily focused on specific types of discrimination, but on their interactions. Our findings also suggest that, given the specificities of Brazilian social relations, the interplay between traditionally investigated types of discrimination is also of fundamental concern.

## Resumen

*Pese a que la investigación sobre la discriminación y la salud ha progresado significativamente, se ha hecho más hincapié en la discriminación racial y la población de Estados Unidos. Este estudio investigó los diferentes tipos de discriminación, sus interacciones y asociaciones con trastornos mentales comunes en universitarios brasileños de Río de Janeiro, Brasil, 2010. Las asociaciones entre la discriminación y los trastornos mentales comunes fueron examinadas con modelos de regresión logística, ajustados por confundidores. Se examinaron las interacciones entre discriminación y factores sociodemográficos. La discriminación por*

*edad, clase y raza fueron las más frecuentes. En el modelo totalmente ajustado, la discriminación por raza y clase se asociaron independientemente con el aumento de trastornos mentales comunes. El reporte simultáneo de discriminación por raza, clase y edad se asoció con la mayor razón de odds. No se encontraron interacciones significativas. Discriminación de clase y raza fueron importantes, pero sus reportes, junto con la discriminación por edad, se asociaron con la mayor ocurrencia de trastornos mentales comunes.*

*Prejuicio; Salud Mental; Estudios Epidemiológicos*

## Contributors

J. L. Bastos contributed to the planning of the study, the literature review, the write-up of the first version of the article, and the statistical analysis. A. J. D. Barros participated in the planning, statistical analysis, write-up of elements of the articles and a critical revision of earlier drafts. R. K. Celeste was involved in statistical analysis, writing elements of the article, a revision of the literature and a critical revision of the study. Y. Paradies contributed to the literature review, write-up of some elements of the article, statistical analysis and a critical revision of the text. E. Faerstein collaborated in the study planning, write-up of some elements of the text, statistical analysis and a critical revision of the text.

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