

Experiences of Discrimination and Skin Color Among Women in Urban Brazil: A Latent Class Analysis

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Abstract

Experiences of discrimination are an important aspect of women's life in Brazil, especially Black women. The Experiences of Discrimination scale (EOD) is often used for assessing discrimination in epidemiological studies, although divergent cutoff points have been used to characterize the exposure. We used latent class analysis (LCA) and logistic regression to identify and characterize subgroups of women exposed to discrimination and compared with a cutoff-based assignment of subgroups. One thousand two-hundred and four women living in Salvador, Brazil, responded to the EOD. We selected models with two latent classes, highly and lowly exposed. The classes differed in self-reported skin color and education level, revealing that darker skinned (odds ratio [OR] = 11.3, 95% confidence interval [CI: 1.54, 82.7]) and more educated (OR = 2.09, 95% CI [1.17, 3.72]) women were more likely to be classified into the highly exposed class. Comparing with

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LCA, the use of cutoff points overestimated the reporting of discrimination. Researchers should consider the use of more accurate measures of discrimination in order to identify the most vulnerable individuals so that prevention efforts could be better targeted.

Keywords

racial discrimination, Brazil, latent classes, women, Experiences of Discrimination Scale

Discrimination is a process by which members of a social group are treated differently and especially unfairly because of belonging to that group (Krieger, 1999). It is considered a powerful psychosocial stressor that contributes to the highest rates of psychological distress found among socially disadvantaged populations (Williams & Mohammed, 2009). Such discrimination experiences are not randomly distributed. They are related to the position of people in the social structure, which also defines their access to resources and strategies that can be useful for dealing with stress (Harrell, 2000). Sources of stress can be interpersonal or collective and it can emerge from status-related social roles, as gender, social class, and others. From this framework, women's location is at the intersection of disadvantaged gender, racial and class statuses, and oppressions associated with each of these disadvantaged statuses combine to produce linked forms of injustice (Perry et al., 2013).

Unequal treatment of members of different groups is a common practice in many parts of the world and remains in multiple contexts of Brazilian society. Even though Brazil appears to be racially tolerant and harmonious, social relationships are marked by racism, with subordinate groups occupying distinct social roles. Currently, Blacks, the poor, and women are the main target of unfair treatment (Macinko et al., 2012), with dark-skinned people reporting discrimination more frequently than light-skinned peers (Travassos et al., 2011).

Many studies have highlighted the role of skin color as a predictor of perceived discrimination (Canache et al., 2014; Keith et al., 2017; Klonoff & Landrine, 2000). Such studies have shown that, among Blacks, those with darker skin tend to perceive more discrimination than their lighter skin counterpart, but, in addition, such experiences tend to be more subjectively stressful for dark-skinned Blacks than for other Blacks (Perreira & Telles, 2014). Hierarchies of skin color persist in their effects on Black women. Research has shown that lighter skin, as it relates to beauty, operates as social capital

for women, giving privileges in education, income, and even marital status (Hunter, 2002; Keith, 2009; Monk, 2015).

Socioeconomic disparities across skin tone and gender are also pronounced in the Brazilian context (Baumgarten et al., 2018; Gonçalves et al., 2012; Layton & Smith, 2017; Marcondes et al., 2013; Ribeiro, 2006; Salardi, 2016; Telles, 2004; Turatti & Moretti-Pires, 2017). Layton and Smith (2017) evidenced that Brazilian women, especially those with darker skin, may face discrimination based on their race, but they are also the predominant target of gender discrimination, and their race makes them likely targets of economic discrimination. Negative stereotypes of the competence, power, and status of women, especially dark-skinned, justify discriminatory attitudes, usually subtle or covert, but which explain the disadvantages experienced by Black women (Telles, 2004). For instance, Brazilian women have less participation in the labor market and occupy positions of lower prestige and remuneration than men. Specially, Afro-Brazilian women are overrepresented in domestic work and in functions that reinforce their role as caretaker (Marcondes et al., 2013). Data from the Brazilian Institute of Geography and Statistics have shown that the position of women in the Brazilian society has improved in 10 years, but inequalities in relation to men have remained high (Instituto Brasileiro de Geografia e Estatística [IBGE], 2018). Regarding their occupational level, in 2016, Brazilian women dedicated more time to domestic work and child care than men. In comparison with men, a higher percentage of the women worked part-time, and they continued to earn roughly three quarters of what men have earned. These inequalities are most pronounced for Afro-Brazilian women and in the North and Northeast regions. Persistence of this gender gap may be explained by occupational segregation and salary discrimination of women in the labor market (Salardi, 2016). Even with women surpassing men in the educational indicators, the percentage of men graduated from colleges is higher than of women (IBGE, 2018). Frequently Brazilian women face explicit discrimination in the workplace (Turatti & Moretti-Pires, 2017) and in the access of health care. Baumgarten et al. (2018) found that discrimination in health services due to physical appearance was higher for poor women than for men, suggesting that women are more discriminated than men when they do not follow social stereotypes of beauty (Gonçalves et al., 2012).

Researchers who addressed discrimination in Brazil have used different scales (Bastos et al., 2014; Macinko et al., 2012; Pavão et al., 2012; Santana et al., 2007). One of them, used in the present study, is the Experiences of Discrimination scale (EOD; Krieger et al., 2005), an instrument widely used to estimate the effects of discrimination on health (e.g., Borrell et al., 2006; Broman et al., 2000; J. W. Collins et al., 2004; Krieger et al., 2011; Pavão et al., 2012).

However, such studies employed different cutoff points to identify individuals exposed to discrimination and therefore at greater risk of developing health or behavioral problems. In a Brazilian study, the authors used an index variable created by comprising the overall score by summing the responses of each item (Pavão et al., 2012). They administered the EOD to a national sample of 3,863 Brazilian adults finding that, for individuals with any experience of racial discrimination, the chance of having a worse perception about their health increased about 1.37 times. Based on previous research, the index was subsequently recoded as a dichotomous variable: no discrimination versus any experience of discrimination (Borrell et al., 2006). One study used the average of such score (Peters, 2004), while other examined the presence of discrimination in each domain separately (Broman et al., 2000), or still used several of these strategies simultaneously to assess whether the results were consistent in terms of magnitude and direction for different subgroups (Borrell et al., 2006; Peters, 2004). Finally, some researchers calculated the sums of positive responses and used 0, 1, or >1 cut-points (Dole et al., 2004), while others considered the presence of discrimination when the answer was positive in one or more domains versus none, using three or more domains versus none to estimate differences in the intensity of the exposure (Lespinasse et al., 2004).

Thus, there has been a great divergence in the criteria used to identify the level of exposure to discrimination, and in many cases, the authors do not explain the arguments by which such criteria were chosen. The choice of cutoff points is usually arbitrary. Researchers may assume that people are equivalent among the groups and the exposure is fixed over time (Solberg & Olweus, 2003). One disadvantage of this approach is that all variables are equally weighted and perhaps it is assumed that they are interchangeable (Collins & Lanza, 2010). The exposure to two risk factors is also assumed to be the same regardless of how highly related they are (Lanza et al., 2010).

Although prevalence rates and effect measures from studies using different criteria are often compared, rarely such studies (Loomis & Kromhout, 2004; Solberg & Olweus, 2003) give attention to the classification of the exposure condition. An essential step in the characterization of exposure is to obtain valid estimates that discriminate between those who suffer exposure and those who do not. Discrimination, like other complex social phenomena, is not measured directly, but from a set of indicator variables for which a “gold standard” does not exist. The use of imperfect reference standards may often lead to misclassification of the exposure in a substantial portion of participants and, for instance, may bias estimates of prevalence.

Latent class analysis (LCA) is considered to overcome these limitations by classifying individuals according to the probability of having a similar

response pattern, using less arbitrary criteria to estimate the belonging of an individual to a group. The model allows to cluster individuals into meaningful homogeneous subgroups from an array of observed variables representing characteristics or behaviors, based on the assumption that there are underlying “latent classes” within the data. With LCA, the latent variable is used to determine if the individual belongs to a particular class, and to reduce the data, identifying subgroups on the basis of the intersection of multiple observed characteristics. Furthermore, assumptions of traditional models, such as the normal distribution or complete data for all indicators, are not required in LCA, reducing the level of possible bias (Collins & Lanza, 2010).

Given this context, we sought to identify groups of individuals with different levels of racial discrimination in a population of Brazilian women using LCA. Sociodemographic characteristics were included to examine their role in determining the class membership. Second, we compared the resulting distribution of women, assigned to a discrimination class according to LCA, to a group assignment based on cutoff scores as used by Pavão et al. (2012) with another Brazilian population using the same scale, in order to assess the validity of this criterion.

The Brazilian Context

Brazil is a country with a highly multiethnic admixed population resulting from the interaction between European, African, and Amerindian populations. According to the 2010 census, more than 50% of the individuals declared themselves as Brown or Black denoting some African origin. For a long time, Brazil has been described as a racial democracy, a popular belief that holds that racism is minimal or nonexistent in Brazilian society. This ideology has been based on the history of racial miscegenation and intermarriage, which led to fluid systems of racial classification and friendly, integrated relations across color lines (Travassos & Williams, 2004). Unlike the United States, racial measurement in Brazil relies on skin color as the indicator of race, becoming an ambiguous system in which the skin color categories are not static, reflecting the influence of the context and the social class (Travassos & Williams, 2004). It is known that wealthier people with dark phenotypes tend to classify themselves and be classified by others in lighter categories (Telles, 2004).

Caldwell (2007) has pointed out that the ideology of racial democracy has influenced the social construction of Black women’s identities and has been used to create differential citizenship categories based on prevailing gender and racial hierarchies. One central element of the national project of

miscegenation is the appropriation of Black women bodies as sexualized *mulatas* and asexual domestic workers. Implications of such historical and structural process become visible in adversities that Black women face when trying to find employment and with their struggle to redefine beauty ideals. Caldwell (2007) also highlights the key place occupied by the Black movement organizations for producing counterhegemonic racial and gender discourses and for assuming new politicized Black subjectivities.

The Current Study

The present study utilized LCA to empirically define groups of women exposed to racial discrimination in a sample of Brazilian women. Some studies that addressed discrimination in population health research have used LCA for clustering individuals into subtypes (Garnett et al., 2014; Keith et al., 2017), proving to be an efficient method to identify meaningful and homogeneous subgroups. As noted above, researchers interested in examining differences between individuals exposed to discrimination have commonly classified persons into groups based on cutoff scores. Despite its utility, this method may result in classification errors, such as false positives and false negatives that affect the ability to predict differences in psychological distress and other health problems. Additionally, inaccurate cut points also have important practical implications for estimating the prevalence of discrimination, which is essential for targeting interventions.

Given the pervasiveness of racial and gender discrimination among women in Brazil, and the fact that poor Afro-Brazilian women represent a group at particular risk for a variety of negative mental and physical health outcomes (Macinko et al., 2012; Smolen & Araújo, 2017), this study aims to accurately identify Brazilian women according to patterns of racial discrimination and to address the debate concerning classification methods.

Method

Research Design

This study is part of the Social Changes in Asthma and Allergies in Latin America (SCAALA), Salvador Program (Barreto et al., 2006), a cohort of children carried out to investigate asthma, allergic diseases and potential risk factors in children. This cross-sectional study was conducted in 2006 in the city of Salvador, the capital of the state of Bahia, located in the Northeast of Brazil, when an additional survey was conducted to investigate psychosocial factors. The city has an important history of African slavery, with 80% of its

approximately 2.7 million inhabitants Black or Brown, and racial health disparities are more pronounced there than in other regions (IBGE, 2018).

Target Population and Sample

The target population comprised children aged from 4 to 11 years and their respective caregivers. Households were selected through randomized sampling and recruited from 24 geographical micro-regions representative of the population without sanitation in Salvador, called sentinel areas (Barreto et al., 2006). The sample size was defined based on parameters related to the main objective of the SCAALA project. From the selected areas, 1,445 children and their respective caregivers were initially recruited, and standardized questionnaires were applied. Among those, 1,380 caregivers responded to the EOD and were included in the study, corresponding to a response rate of 95.5%. The respondents were mainly mothers (aged 18-57 years) of children (75%). The rest were grandparents, siblings, or relatives responsible for the child care. Exclusions were made either because the guardian was a man ($n = 54$), or because information for covariates was lacking, such as skin color (1), education ($n = 20$), income ($n = 76$), and gender ($n = 33$), which left 1,204 women to compose the final sample in this study. Among the participants of the study, 54% identified themselves as Browns, 40% as Blacks, and only 6% as Whites. The mean age of them was 33 years ($SD = 6.7$, range: 18-57 years), without differences between skin color groups. The percentage of women who reported complete middle school or higher education level was 34% for Blacks, 29% for Browns and 23% for Whites. There was no difference in the income distribution according to skin color.

Data Procedures

The data collection took place from January to November 2006 when home visits were made by a team previously trained for applying the EOD Questionnaire. The instrument consists of 18 questions applied in face-to-face interviews by a team of psychology graduate students, most mixed race women, supervised by a psychologist and trained in a standardized way (Fattore et al., 2016). The instrument was given in Portuguese after an informed consent was obtained verbally, and the participants were instructed to respond according to their experience, emphasizing that there was no right or wrong answer. The survey took an average of 1 hour to be completed and participants were not rewarded. Although this data were collected 12 years ago, national surveys performed in 2018 have shown that racial and gender

inequalities persist or have even increased during the period (IBGE, 2018). In addition, results of assignment of women according discrimination experiences obtained with LCA were compared with the assignment based on cut-off point used by Pavão et al. (2012) with another Brazilian population in the same period.

Measures

The Experiences Discrimination Scale. The EOD is an 18-item self-report instrument used to measure experiences of discrimination based on race/ethnicity or color in population health research (Krieger et al., 2005). In this study, we used the 13 items that were validated in American and Brazilian populations and make up two dimensions of the scale: Experiences of Discrimination and Concern about Discrimination. The items that were removed during the confirmatory factor analysis because of the low factor load are as follows: two items asking global questions on how often participants felt members of their racial/ethnic group and themselves personally experiencing racial discrimination, one item about filing a formal complaint because of racial discrimination, and two items asking about responses to unfair treatment.

The dimension *Experiences of Discrimination* was conceptualized as differential or unfair treatment of individuals based on self-identified race, ethnicity, or color (Krieger, 1999). It contains nine items with questions about race/color discrimination in the following settings: attending school, seeking a job, at work, seeking housing, getting medical care, being in a store or restaurant, getting credit, being on the street or in public settings, encountering the police, or being in the courts. Responses choices for each situation were “Yes” or “No.” If “Yes,” respondents asked how many times this had happened. The total number of occurrences were scored as *never*, *once*, *twice or 3 times*, and *4 or more times*, interpreted as “no discrimination,” “rarely,” “sometimes,” and “often,” respectively. These items comprised the nine observed indicators of the latent variable, called Experiences of discrimination, for the LCA. For the purpose of such analysis and due to the low frequency in some response categories, all variables were dichotomized. So, the response option *never* formed a new category indicative of *low exposure to discrimination* and responses options *once*, *twice or 3 times*, and *4 or more times*, formed another category indicative of *high exposure to racial discrimination*. The dimension *concern about discrimination* was defined as people’s fears of experiencing discrimination and their awareness of or fears about discrimination directed against other members of their family or their social group (Krieger, 1999). It asks participants if they have ever worried about

racial discrimination during the childhood and on the last year, personally and against their racial/ethnic group, and if so, the frequency of such experiences (once, 2-3 times, 4, or more times). Responses were rated as follows: 0 "no discrimination," once "rarely," 2-3 times "sometimes," and 4 or more "often." These four items formed the observed indicators of the latent variable, called *concern about discrimination*, for the LCA. The variables were also dichotomized, so, the response option "never" formed a category indicative of "low exposure to concern about discrimination" and the other responses options "some of the time" or "most of the time," formed another category indicative of high exposure to the specific class indicator.

The nine-item version was validated with working class African American and Latino Americans. Scale reliability for the EOD scores was adequate (Cronbach's alpha above .74), and confirmed by the test-retest reliability carried out between 2 and 4 weeks after the initial survey (equals to .70; 95% CI [0.61, 0.76]). Structural equation modeling determined whether various discrimination measures tapped into a single construct of self-reported racial discrimination, providing an excellent fit to the data (comparative fit index = .966; root mean square error of approximation [RMSEA] = .069) and a high correlation between the EOD and a single construct of self-reported racial discrimination ($r = .79$). It was also significantly associated with psychological distress (b coefficients were .71, 95% CI [0.40, 1.02] for Blacks; .84, 95% CI [0.52, 1.16] for Latino; and .93, 95% CI [0.54, 1.32] for White participants; (Krieger et al., 2005).

For this study, discrimination measures were obtained from the Brazilian version of the EOD that included the nine-item version plus the four worry questions. The psychometric properties of this version were evaluated in this population (Fattore et al., 2016). Confirmatory factor analysis was performed testing a two-factor model: "Experiences of discrimination" and "Concern about discrimination," which reflected, respectively, interpersonal and collective forms of discrimination. Such analysis showed high-factor loads (values greater than .70) and satisfactory goodness of fit, verified by the comparative fit index (.963), nonformed fit index (.955), and RMSEA (.046). The RMSEA 90% CI provided additional support to evaluate model fit (90% CI [.040, .052]). Composite reliability, a measure of internal consistency, was high for both factors ($f1 = .92$, $f2 = .90$) as well as the average variance extracted ($f1 = .58$, $f2 = .70$) corroborating the convergent validity of both constructs. The respective square root of average variance extracted ($f1 = .76$, $f2 = .83$) was greater than the factor correlation (.442) confirming the factor-based discriminant validity (Reichenheim et al., 2014).

Sociodemographic variables. Sociodemographic characteristics were obtained from the SCAALA questionnaires. For this study, the main exposure variable was the respondents' self-reported skin color using the Brazilian census categories (as) White (chosen as the reference group for presenting the lowest frequency of discrimination), Brown, and Black. Respondent's age was measured in whole years at the moment of the survey. Measures of socioeconomic status were the family income and educational level. Family income was collected from the number of minimum monthly wage (MMW) earned by the head of the family and grouped into three categories corresponding to family incomes below one MMW, more than one and less than two MMW, and more than two MMW (the reference group). Mean MMW at the study time was US\$ 123 ($SD = US\$ 102$). Educational level was obtained from the maximum level of schooling completed at the time of the interview according to Brazilian school system: up to elementary school (reference group), middle school, and high school or higher. All sociodemographic variables except age were coded with dummy variables—0 or 1, with each category only compared against the reference group.

Data Analysis

First, descriptive analyses were carried out to characterize the study population according to skin color using the chi-square test to evaluate bivariate associations with 5% significance level. Next, the latent variables Experiences of Discrimination and Concern about Discrimination were introduced into separate latent models to identify clusters of women with similar discrimination profiles. The model selection involved the Bayesian Information Criteria (BIC; Schwarz, 1978) and Akaike Information Criteria (AIC; Akaike, 1974). They were used to compare the models in terms of balance between adjustments and parsimony, with lower scores indicating a better model fitting (L. M. Collins & Lanza, 2010). To determine the appropriate number of classes, the interpretation of the model was also taken into account; that is, whether subgroups identified by LCA were distinct from each other so that the observed response patterns showed logical meaning from a theoretical point of view. Other criteria for selecting the right number of classes were achieved through the likelihood ratio test of Vuong-Lo-Mendell-Rubin (LMR-LRT; Nylund et al., 2007) and the Bootstrap Likelihood Ratio Test (BLRT; Nylund et al., 2007). These tests compare the improvement in model fit between adjacent class models (i.e., comparing models with k classes with those with $k-1$ classes) and provide a p value that can be used to determine whether there is a

statistically significant improvement in the fit with the inclusion of one additional class. The classification uncertainty of latent classes was evaluated by using the Entropy index, a measure that estimates the ability of a mixture model to provide well separated clusters (Celeux & Soromenho, 1996). Values greater than 0.70 are considered appropriate, indicating that latent classes are highly discriminated (L. M. Collins & Lanza, 2010). The standardized residuals were evaluated to identify violation of the conditional independence assumption; within a latent class, observed indicators are expected to be independent (L. M. Collins & Lanza, 2010). When the standardized residuals were significantly high, the variables involved were grouped considering the frequency distribution and the theoretical meaning of the indicators. Thus, the variables “discrimination at school” and “in public setting” were grouped into a single indicator considering “no discrimination” when the individual did not report discrimination in any of the indicators, and “some discrimination” when they reported discrimination in at least one of them. In the same way, the items discrimination “getting credit, bank loans, or a mortgage” and “by the police or in the court” were combined into a unique indicator considering that they typically refers to discriminatory policies or practices carried out by state or non-state institutions. Items related to concerns about the unfair treatment to themselves and to the group in the past were also grouped. In all cases, the redefinition of variables improved the model fit. After the latent classes were defined, a series of binary logistic regressions were run to examine the relationship between the latent class variables and selected covariates. This approach allowed us to examine, for instance, whether Black, older or poorest women were more likely to be in the class that reported more discrimination.

We also compared the distribution of women classified as exposed by LCA with the classification based on the cutoff point as used in another Brazilian population with the same scale (Pavão et al., 2012). Our purpose was to compare the assignment of individuals with the high discrimination group done in the two studies, as well as their classification methods. In the study conducted by Pavão et al. (2012), individuals were classified in the following categories: “lack of discrimination,” which includes individuals who responded “never” in all domains; and “discrimination,” which includes those who reported “yes” in at least one domain. We also assessed the reliability of results obtained with both forms of classification using the global percentage of agreement and the Kappa index, which indicates the proportion of agreement beyond that expected by chance. LCA was implemented using *Mplus* 6 (Muthén & Muthén, 1998-2011). Other analyses were conducted using STATA software, version 11.0.

Table 1. Frequency of Experiences of Discrimination Scale in a Sample of Brazilian Women.

	White (n = 73)	Brown (n = 652)	Black (n = 479)	Chi- square <i>p</i>
Experiences of discrimination				
At school, on the street, or public settings (n = 129)	4.11	9.20	13.78	.008
Getting a job (n = 102)	1.37	5.67	13.36	<.001
Getting service in a store or restaurant (n = 67)	1.37	2.76	10.02	<.001
At work (n = 83)	2.74	4.75	10.44	<.001
Getting housing (n = 13)	—	0.31	2.30	.004
Getting medical care (n = 60)	1.37	3.83	7.10	.015
From the police; getting credit (n = 25)	—	2.30	2.09	.109
Concerns About Discrimination				
Worried, when a child or teenager, about herself or her own group (n = 498)	27.40	38.34	47.60	.001
Worried on the last year about her own group (n = 463)	23.29	35.74	44.47	.001
Worried on the last year about herself (n = 349)	15.07	26.99	33.82	.001

Results

Descriptive Analysis

Our final analytic sample consisted of 1,204 women who responded to the EOD; only 0.2% of them gave incomplete responses on some items, which were replaced for the average of the participant. Table 1 summarizes the prevalence of the indicator variables according to skin color. Descriptive statistics for the Experiences of Discrimination yielded higher prevalence for discrimination attending school or public settings, seeking a job, at work, being in a store or restaurant, and getting medical care. Prevalence was lower for discrimination seeking housing, encountering the police or being in the courts, and getting credit. In almost all domains, the EOD values were highest for the Black group as shown by the chi-square tests for skin color (Black, Brown, and White) and discrimination at various settings: school, the street, or public settings ($\chi^2 = 9.58, p = .008$); job ($\chi^2 = 26.09, p \leq .001$); service in a store or restaurant ($\chi^2 = 30.29, p \leq .001$); work ($\chi^2 = 15.98, p \leq .001$); housing ($\chi^2 = 11.08, p = .004$); medical care ($\chi^2 = 8.35, p = .109$).

Table 2. Statistical Criteria for Evaluation of 1 to 3 Latent Class Solutions for Experiences of Discrimination and Concerns About Discrimination.

Models	Class	AIC	BIC	LMR-LRT	BLRT	Entropy
Experiences of Discrimination	1	3517.644	3553.298			
	2	2977.931	3054.332	0.0001	0.0001	0.913
	3	2964.309	3081.457	0.0003	0.0001	0.971
Concerns About Discrimination	1	4693.005	4708.285			
	2	3943.198	3978.852	0.0001	0.0001	0.816
	3	3951.198	4007.225	0.4930	1.0000	0.838

Note: $N = 1,204$. AIC = Akaike Information Criteria; BIC = Bayesian Information Criteria; LMR-LRT = Lo-Mendell-Rubin likelihood ratio test p value; BLRT = Bootstrap Likelihood Ratio Test p value.

In relation to Concerns About Discrimination, nearly 45% of the Black women expressed concerns about unfair treatment regarding themselves and their peers, both in the past and in the year before the interview, while less than 40% of Brown women reported some degree of concern and an even lower percentage of White women (27%). As expected, the distribution of the variables showed differences statistically significant between skin color and level of worry based on time and focus: (a) worried when a child or teenager, about herself or her own group ($\chi^2 = 16.00, p < .001$), (b) skin color and worried on the last year about her own group ($\chi^2 = 16.44, p \leq .001$), and (c) skin color and worried on the last year about herself ($\chi^2 = 13.56, p = .001$)

LCA of EOD Scores

Considering the two-dimensional structure of the EOD, two latent class models were fit to the data on (a) Experiences of Discrimination and (b) Concerns About Discrimination separately. Table 2 summarizes the results of three successive LCA performed to decide the optimal number of latent classes for each factor, with the statistical criteria used to evaluate the quality of the latent class solution. For Experiences of Discrimination the best model was the two-class model as judged by the lowest BIC. According to the LMR-LRT and the BLRT, two classes would not be enough. However, the three-class model failed to distinguish subgroups in a theoretically meaningful way. To achieve balance between statistical criteria and substantive meaning, we chose the two-class solution, which was well fitted and showed higher class-specific separation and intragroup homogeneity, facilitating the interpretation of results. For Concerns About Discrimination, both the BIC and AIC suggested that the two-class model provided the best fit. Moreover, the

Table 3. Class Prevalence and Item-response Probabilities on Two-class Models for Experiences of Discrimination and Concerns About Discrimination.

Indicators of discrimination			
Prevalence	Overall (%)	Higher exposed (%)	Lower exposed (%)
Experiences of Discrimination			
At school, on the street or in public settings	10.7	48.0	6.6
Getting hired or getting a job	8.5	75.7	1.1
Getting services	5.6	50.5	0.6
At work	6.7	45.1	2.7
Getting housing	1.1	8.9	0.2
Getting medical care	4.5	28.7	2.4
From the police or in the courts, getting credit	2.1	14.8	0.7
Concerns About Discrimination			
Worried as a child or teenager about herself or her own group	41.4	70.3	22.6
Worried in the last year about her own group	38.5	90.0	5.1
Worried in the last year about herself	30.0	71.7	1.3

Note: N = 1,204.

LMR-LRT and BLRT rejected the hypothesis that an additional third class would be required. Consequently, the final solution resulted in a more parsimonious and meaningful profile as compared with the previous construct. The local independence assumption was assessed by bivariate residuals among latent class indicators, which were smaller than 2 in both two-class solution models (results not shown).

Table 3 shows the probabilities of response for the indicator variables for each latent class. The “highly exposed to racial discrimination” class (8.5%) comprised women who had high probability of endorsing the discrimination items, ranging from 75.7% for “getting a job” to 28.7% for “getting medical care,” with lower item-class probabilities for those indicators less prevalent in this population, such as “getting housing” (8.9%) and “from the police, getting credit” (14.8%). Regarding concerns about discrimination, the highly exposed class represented 42% of the sample, and it was composed by women who exhibited high probability to worry about discrimination in the past (70.3%), as well as in the year of the interview regarding their own group (90.0%) and themselves (71.7%). In contrast, women in the lowly exposed group showed a profile with high frequency of negative response to all questions.

Table 4. Frequency of Latent Class Membership According to Sociodemographic Variables.

Variables	Higher exposed to experiences of discrimination (%)	Higher exposed to concerns about discrimination (%)
Skin color		
White	1.4	27.4
Brown	5.5	39.6
Black	13.6	47.6
Educational level		
Up to elementary school	6.5	36.7
Middle school	6.6	42.9
High school or higher	12.7	44.3
Family income		
>2 MMW	9.2	42.2
>1 MMW and ≤2 MMW	6.9	45.8
≤1 MMW	9.1	39.8
Age (<i>M</i> , <i>SD</i>)	32.6 (5.9)	33.6 (6.9)

Note: *N* = 1,204. MMW = minimum monthly wage.

Descriptors of Latent Class Membership

Table 4 presents the sociodemographic profile of latent class membership. Among Black women, 13.6% expressed feeling very exposed to racial discrimination, while 5.5% of Brown and 1.4% of White women belonged to the exposed group. A total of 12.7% of women with high educational level reported experiences of discrimination, in comparison with 6.6% of those with less education. There was no difference in age or income between the groups. In relation to concern about discrimination, Black women predominated in the highly exposed group while there was no difference in age, income, and education between exposed and unexposed group.

Finally, sociodemographic indicators (skin color, age, family income, and educational level) were included in the logistic regression model, with the latent class as the outcome variable. Results are presented in Table 5 and showed that skin color was the main descriptor of class membership, with women identified as Black being more likely to report experiences of discrimination compared with Whites ($OR = 11.3$, 95% CI [1.54, 82.7]), as well as those with higher education ($OR = 2.09$, 95% CI [1.17, 3.72]) compared with those with less formal education. Similarly, Black and Brown women were more likely to worry about racial issues than Whites

Table 5. OR [95% CI] of Latent Class Membership Compared With Women in the Low Discrimination Class Among Relevant Descriptors.

Variables	Experiences of discrimination, OR [95% CI]	Concern about discrimination, OR [95% CI]
Skin color		
White	1	1
Brown	4.20 [0.57, 31.1]	1.73 [1.01, 2.97]
Black	11.30 [1.54, 82.7]	2.40 [1.39, 4.15]
Educational level		
Up to elementary school	1	1
Middle school	1.02 [0.56, 1.84]	1.29 [0.95, 1.74]
High school or higher	2.09 [1.17, 3.72]	1.36 [0.98, 1.89]
Family income		
>2 MMW	1	1
>1 MMW and ≤2 MMW	0.73 [0.39, 1.36]	1.15 [0.82, 1.63]
≤1 MMW	0.98 [0.57, 1.70]	0.90 [0.65, 1.24]
Age	0.98 [0.95, 1.01]	0.99 [0.97, 1.01]

Note: N = 1,204. OR = odds ratio; CI = confidence interval; MMW = minimum monthly wage.

(OR for Black = 2.40, 95% CI [1.39, 4.15]; OR for Brown = 1.73, 95% CI [1.01, 2.97]). Age, income, and education did not predict greater concerns about racial issues.

Comparison of Classification Methods

Table 6 shows the results of the analysis of agreement between subgroups defined by LCA and by the cutoff point. When comparing the two approaches, we observed the following pattern: all individuals classified as highly exposed according to LCA were also classified as highly exposed by the cutoff point of the score for both Experience of Discrimination and Concerns about Discrimination. However, the agreement was smaller for subgroups with lower levels of exposure than for those with higher levels, with certain tendency to false positives. Thus, 14% of women defined as *Lowly exposed* to racial discrimination according to LCA were labeled as *Highly exposed* by the cutoff score. The percentage of false positives was higher for Concerns about Discrimination, reaching a value of 23.5%. Nevertheless, the overall agreement was high for both dimensions. Following the standards for strength proposed by Landis and Koch (1977),

Table 6. Agreement Between the Classifications Derived by Latent Class Analysis (LCA) and by the Use of Cutoff Scores for Experiences of Discrimination and Concerns About Discrimination.

Subgroups derived by LCA	Subgroups derived by cutoff score		Overall % of agreement	Kappa
	High	Low		
Experiences of discrimination			86.9	0.50
High	102 (100.0)	0		
Low	158 (14.3)	944 (85.7)		
Concerns about discrimination			86.4	0.73*
High	506 (100.0)	0		
Low	164 (23.5)	534 (76.5)		

Note: $N = 1,204$.

* $p < .001$.

the Kappa values were moderate for Experience of Discrimination (.41-.60) and substantial for Concerns about Discrimination (.61-.80), being statistically significant for the latter.

Discussion

Our primary goal was to use the LCA to classify groups of women according to their experiences of racial discrimination based on their response patterns to the EOD, with the purpose of identifying more accurate levels of discrimination. We compared differences between latent classes on several demographic attributes included to examine their role in determining class membership, with special consideration on the darker skin tone, phenotype widely stigmatized in Brazilian society. We found two distinct latent classes: highly and lowly exposed to racial discrimination and to concerns about discrimination, which represented 8.5% and 42.0%, respectively. As we expected, skin tone was positively associated with racial discrimination, with Black women reporting more unfair treatment and concern about discrimination than those with lighter skin.

The probability of belonging to the high discrimination class found in our study was considerably lower when compared with that obtained by Pavão et al. (2012), who used the same instrument with Brazilian adults and found a frequency of 22% of adults reporting experiences of discrimination using the traditional approach. Based on these results, we decided to apply the same cutoff point to our sample in order to test the difference

between both approaches. We found a similar pattern with 21.6% of women in the discrimination group (data not shown). This result shows that, compared with LCA, the use of such a cutoff point overestimates the prevalence of discrimination in this population. How can these differences be interpreted? First, we can argue that the use of too inclusive classification criteria will produce more sensitive but less specific estimates (Solberg & Olweus, 2003). The large group of false positives may lead to conceptual difficulties in identifying the exposed group and, therefore, in the recognition of a health risk. On the other hand, the use of more specific but less sensitive estimates, such as those produced with LCA, may cause that some respondents' discrimination experiences remain undetected. Second, the use of predetermined cutoffs implies some assumptions about the nature of discrimination that might be inappropriate. By assigning the same value to all the items, it also gives the same meaning, so that experiencing discrimination at work or when looking for a job acquires the same significance as reporting discrimination when buying a house or asking for a loan. Furthermore, such an approach does not take into account the low prevalence of discrimination in specific domains, for example, discrimination when getting housing or credit, which was not frequent in our sample. Rather, LCA differs from conventional approaches in that groups are not defined a priori but directly from a set of variables using statistical criteria to select the classes (Collins & Lanza, 2010). Unlike classical approaches, LCA can identify quantitative and qualitative differences between groups. For example, in the context of discrimination, LCA was able to assess the prevalence of the different attributes of discrimination and bullying and to examine how they jointly occur (Garnett et al., 2014), as well as to investigate the effect of phenotype on everyday experiences of discrimination among African Americans (Keith et al., 2017).

The current study also replicated Pavão et al. (2012) and Macinko et al. (2012) findings that dark-skinned people tend to report more unfair treatment, showing a clear skin-tone gradient on self-reported discrimination. In addition, more educated women were more likely to be in the highly exposed discrimination group, which is consistent with other Brazilian studies that indicate that the perception of racial discrimination becomes stronger as one goes upward in the class hierarchy (Ribeiro, 2006). Also, we expanded previous findings by accounting for other sources of racism-related stress as collective or group-level experiences, which involve perceptions of discrimination toward someone's group regardless of direct personal experience (Harrell, 2000). Although discrimination is mainly targeted against the Black community, the frequency at which people reported concerns about racial injustice was remarkably high, and not restricted to Black women, but

also to Brown, showing that racial discrimination is a problem that permeates the society as a whole.

In this way, skin color may operate as a trigger for racial discrimination to Brazilian women. Such racism-related stress may be aggravated by gender and class discrimination, placing women in a situation of special social vulnerability (Perry et al., 2013). On one hand, they may suffer the direct effects of discrimination, in the form of episodic stress and daily hassles. Also, they are exposed to chronic strain that operates through limited opportunities and unequal access to resources (Layton & Smith, 2017). These forms of stress can adversely affect mental health causing feeling of frustration, tension, and injustice, increasing hypervigilance and engagement in high-risk behaviors (Williams & Mohammed, 2009). In addition, racial and gender discrimination may indirectly increase the risk of mental health problems, through the denial of opportunities and a systematic stratification into stressful social roles and contexts (Perry et al., 2013).

We should also mention some limitations of the present study. The data we have used were collected in 2006. Throughout this period, the situation of the Black population improved, although racial and gender inequalities persisted or even increased (IBGE, 2018). In addition, the results could be compared with the study conducted by Pavão et al. (2012), carried out in the same period. On the other hand, probably, the organization and struggle of the Black movement and of the Black feminist movement to raise awareness of the persistence of racism and inequalities could change the perception of discrimination in these women, which could be higher nowadays. Also, identification with blackness may have increased, given the rise of Black activism. Some peculiarities of discrimination in Brazil are not captured by the EOD, designed for American population. In this way, some of the domains evaluated with the EOD, such as discrimination when getting house or credit, have shown low prevalence in our population. The study population was comprised predominantly of poor urban women from the Northeast of Brazil, where Browns and Blacks were overrepresented in the sample. Other forms of discrimination could be present, such as discrimination based on social class, age, and others, which could co-occur (Bastos et al., 2014). Still the relationship between discrimination and skin color might be affected by the ambiguity of the classification system. Telles (2004) has evidenced that the use of skin color self-classification—as applied in this study—would tend to underestimate the prevalence of discrimination.

It is also necessary to consider some limitations of the latent class model. The probability of underidentification of a model is high when the sample size is small and, consequently, the contingency table—formed by crossing

all indicators of the latent class variable—is characterized by sparseness, which refers to the extent to which the average expected cell count is small (L. M. Collins & Lanza, 2010). To avoid this problem, all the indicators used in LCA were recorded in a way that resulted in meaningful categories without substantial loss of information. Another point is related to the local independence assumption, meaning that the probability of a response to each variable is conditioned by the latent class membership only (L. M. Collins & Lanza, 2010), which was found to be violated.

The implication of these findings should be understood within the Brazilian context. The fluidity of the racial classification system allows people to reclassify themselves according to the context and time, and people usually use intermediate color categories to avoid placing themselves in stigmatized colors. The process of racial identification is uncertain, and it is affected by institutional, cultural, and socioeconomic factors. For instance, affirmative policies may influence the allocation of people in specific racial categories (Muniz & Bastos, 2017). At the same time, some social groups have proclaimed the acceptance of the Black identity and African heritage (Travassos et al., 2011). Thus, women who chose to self-classify as Black may feel different from others who chose to self-declare as Brown, despite their shared features. In this line, Telles (2004) has highlighted that there is little Black consciousness among Brazilian mulattos (Brown) and higher awareness among Black Brazilians. Travassos et al. (2011) captured a gender effect using IBGE categories in a sample of Brazilian adults, showing that women tended to self-classify their skin color lighter than men. Such a preference for fair skin may be influenced by sociocultural factors, indicating different values for men and women regarding beauty ideals. As Baumgarten et al. (2018) and Gonçalves et al. (2012) showed, Brazilian women who did not follow social stereotypes of beauty reported being discriminated more than men. According to Hunter (2002), when skin color is interpreted as beauty, it may operate as a form of social capital for women, that is, as “a form of prestige related to things such as social status, reputation, and social networks” (p. 177). But colorism—the process that privileges light-skinned people over their dark-skinned counterparts—is concerned to skin tone, which is opposed to racial or ethnic identity (Harrell, 2000). In the Brazilian context, it is probable that women who identify themselves as Black may be developing own strategies to confront racism, as the sense of belonging to a group. In this line, Caldwell (2007) highlights the collective struggle of Afro-Brazilian women to redefine formal citizenship rights, affirming their blackness and femaleness identities in parallel and complementing the Black movement. As it was noted, cultural values and ethnic identity may protect against the

negative effects of discrimination, helping people to cope with the negative consequences of being part of a devalued group (Sanchez et al., 2018). In this line, Fattore et al. (2018) has shown in a sample of Brazilian women that discrimination has affected the mental health of Brown women more adversely than that of Blacks.

The main contribution of our study was to classify groups of Brazilian women exposed to experiences of racial discrimination based on their response patterns to the EOD, with special consideration of the role played by some social characteristics in determining the class membership. Applying LCA in our study allowed us to identify and characterize more consistently women highly exposed to racial discrimination, and therefore at risk of suffering mental health diseases. Experiences of discrimination are an important and daily aspect of women life in Brazil, especially Black women, for whom experiences of discrimination are even more stressful. From the perspective of an applied psychology community, these results highlight the importance of accurately identifying those groups exposed to discrimination and, therefore, at greater risk of developing psychological problems, so that prevention efforts can be better targeted.

Future research should explore the process of constructing Black identity and Black womanhood within the context of the collective struggles of Afro-Brazilian women, and the protective role of the identity affirmation on mental health. We highlight the importance of addressing the development of these multiple identities as collective process, rather than individual, because such processes occur within families and communities that influence the psychosocial development and the self-perception of its members.

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