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Abstract: We test for racial differences in crime victimization between whites and Afro-descendants in the form of thefts, robberies, sexual and physical assaults and police aggressions in Brazil. We explore the presence of skin color tone bias in victimization by the police. *Methods* With a novel dataset produced by the Ministry of Justice of Brazil in 2012, we use 6 different logit regression models to estimate marginal effects. We found that the probabilities of thefts and verbal aggressions by the police, even after controlling for all the considered individual and community variables, are higher for Afro-descendants. African descent women are more likely to be victims of theft and physical aggression by the police, while white women are more likely to be robbed. In the case of men, Afro-descendants have higher probabilities of being victims of thefts, robberies and verbal aggressions by the police. Regarding skin color bias, the probability of verbal and physical victimization by the police is higher for darker skin individuals. Because of its strategic importance to citizen security policy-making, further race-based data collection is needed, as well as research on the effectiveness of police targeting practices.

Keywords: Victimization, race, racial profiling.

JEL Codes: C35, K42, J15.

Introduction

Brazil has had a relatively steady annual homicide rate of about 25 per 100,000 residents in recent years, quite similar to that recorded in the Latin America and the Caribbean (LAC) Region.[1] However, with 50,674 homicides in 2014, Brazil was the country with the highest absolute number

of murders in the Region (UNODC, 2014). Beyond the direct effects on victims and their families, crime and violence inflict widespread costs, generates a climate of insecurity and diminishes economic growth, representing a major challenge for development. For instance, the estimated cost of violence is 3.14% of GDP (Jaitman, 2017). African descendants have been presenting higher rates of victimization than the rest of the population. The share of Afro-descendants among homicide victims has increased from 59% in 2001 to 72% in 2011, according to the *Mapa da Violência*[2] (see Table A1).[3] Assessing and quantifying racial differences, as well as shedding light on the risk factors and drivers of crime and violent victimization among different population groups is of great importance for policy makers due to the urgent need to design and implement strategies aimed at ensuring human security for all.

Racial differences in victimization have been poorly studied in economics. Criminology researchers have devoted far more attention to this area than economists, and the latter have focused mainly on explaining ethnic groups' involvement in criminal activities as offenders or on evaluating the costs and benefits of antisocial behavior (Becker, 1968, Sellins, 1938; Merton, 1938; Shaw and McKays, 1942; Blau and Blaus, 1982). Race and skin color have shown to be important factors related to violent victimization (Soares, 2011). Theories coincide that there are several channels through which race and victimization are associated. For instance, although some groups might be less attractive as targets of robbery and theft because of their lower socio-economic condition, they might be easier targets and more likely to be victimized because of their residential segregation in areas with low levels of security. In Brazil, more recently, an increasing number of studies have analyzed the factors associated with the economic returns on crime, mainly in the form of homicide rates (De Araujo Junior and Fajnzylber, 2001; Mendonca, 2001; Menezes et al., 2013). Regarding aggressions by the police, the few studies we found focus on lethal violence and

are not disaggregated by assault types (Mitchell and Wood, 1999), or rely on data collected by police.

The aim of this paper is to assess whether there are significant differences in the probabilities of victimization between whites and African descendants[4] in Brazil. It represents an empirical effort that incorporates several theoretical frameworks (Hindelang et al., 1978; Cohen and Felson, 1979; Eitle et al., 2002) and contributes therefore to the victimization literature nationally and internationally, by addressing three central questions. The first main question is whether African descendants are more likely to be victims of property crime, sexual and physical assault, and aggression by the police. The second question is whether there are racial differences for women and men, and if victimization of each race/gender group is driven by the same explanatory variables. The third question is whether there are skin color biases in police aggressions.

For this purpose, we use micro data from the National Secretariat of Public Safety (SENASP)[5] survey, a crime victimization survey representative at national level where respondents are asked about their victimization experiences and their self-identified race. The sample is of 78,008 individuals and the data was gathered between June 2010 and October 2012. The survey collected several risk factors and types of victimization that allows for a comprehensive analysis. In this paper, we will focus on robbery and theft of goods, physical and sexual assaults, and verbal and physical aggressions by the police. The link between race and victimization will be examined separately for the six violence categories to take into consideration the diverse nature and to allow for the analysis of risk factors for each one (Cohen et al., 1981). In the set of police aggressions, we further disaggregate the African descendant race group to test for skin color bias. Given the lack of detailed information on the race of the offenders and the dynamics of the police-

citizen interactions that result in aggressions, we recognize that the analysis is limited in its ability to fully explain the determinants of victimization.

Overall, the results of this analysis provide evidence that racial groups are unequally victimized, and higher rates are among African descendants in all types of incidents. Darker skin individuals are the most likely to be victimized by the police, which indicates some degree of race profiling by skin color. Consistent with previous research, we found that victimization is explained by individual characteristics, as well as community-level risk factors. To the extent that this analysis can identify and quantify key determinants of victimization in Brazil, results may help policymakers to design comprehensive police programs and policy interventions.

The remainder of this paper proceeds as follows. Section 2 reviews victimization literature and the economic contributions on the assessment of victimization in Brazil. Section 3 describes the data used in the empirical analysis. Section 4 presents the empirical results and Section 5 concludes.

Theoretical background

The individual-level correlates of victimization have formed the basis of the Lifestyle Exposure Theory (Hindelang et al., 1978), and the Routine Activities Theory (Cohen and Felson, 1979). These theories use a situational approach that explains how lifestyles and routine activities create opportunities for victimization. Hindelang et al. (1978) theorized that the individual's demographic characteristics influence lifestyle, which in turn increase the exposure to victimization. The "principle of homogamy" by Hindelang et al. (1978) states that people are more likely to be victimized when they are in contact with members of groups containing potential offenders. Cohen

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and Felson (1979) formulated the routine activities theory to explain changes in murder, rape, and burglary in the US. This approach centers on how opportunities for crimes are related to the nature of routine social interaction and suggests that certain dimensions of social stratification, such as income and race, are associated with victimization, causing inequality in likelihoods of victimization. Stratification is measured by several risk factors, which are exposure, guardianship, proximity, and attractiveness. *Exposure* is related to how accessible are the respondents in high-crime-risk environments. *Target attractiveness* is the "desirability of a person or property to potential offenders, as well as the perceived inertia (the weight and size) of a target" (Cohen and Felson, 1979, pg. 591). Potential offenders are not as likely to victimize an individual if that individual has higher levels of *guardianship*, usually measured by the household composition[6]. *Proximity* refers to the distance between victims and areas with potential offenders, and it is expected that the closer individuals reside to criminal groups, the greater is the risk of victimization (Meier and Miethe, 1993)[7]. Routine activities theory suggests that the convergence in time and space of a motivated offender, a suitable target, and the absence of a guardian creates the opportunities for crimes to occur, whereas the lack of any one of these concepts decreases criminal opportunities.[8]

There is consistent empirical evidence suggesting the significant role of demography in the explanation of victimization. Among the demographic correlates of victimization, race and ethnicity are of relevance (Catalano, 2005; Lauritsen and Heimer, 2010). Scholars point to the fact that ethnic minorities are more likely than whites to be unemployed and to live in segregated and crime-ridden areas, and that some socio-economic conditions are better predictors of risks (Phillips, 2002; Like-Haislip and Miofsky, 2011). Piquet and Fajnzylber (2001) look at the metropolitan region of Rio de Janeiro and Sao Paulo and found that the poorest individuals have

higher risks of being violently victimized and lower risks of being victims of economically motivated crimes. Beato et al. (2004) show that instrumental victimization is tied to habits and characteristics of the neighborhood. For some categories of property crime, they find that the likelihood of victimization is higher for whites than for African descendants. According to the authors, results confirm the hypothesis that white people have more access to education and higher incomes, making them more attractive than African descendants. Peixoto et al. (2007) found that the most important variables to explain victimization (aggression, robbery, theft, burglary, and auto theft) are the proximity between the victim and the offender and the attractiveness of the victim. Gomez and Paz (2008) show that burglary/larceny victimization is explained by the city's population characteristics, such as income, age, gender, race and education. Race was statistically significant in the basic model specification but not in the others, in which education and housing variables were added. Results of Madalozzo and Furtado (2011) suggest that the demographic characteristics, economic conditions, and personal habits have a relevant impact on the probability of victimization (burglary, vehicle theft and assault), however, the race variable shows no significant effect on any outcome measured. Moura and Silveira-Neto (2015)'s evidenced that a long commuting time for individuals living in the Brazilian Metropolitan Regions increases the probability of being victim of robbery[9]. As individual characteristics, they consider, among others, age, gender, race, education and family income, obtaining a significant (low) impact of race on theft.

Justus et al. (2015) find evidence that income has a positive nonlinear effect on the number of times an individual suffers property crimes victimization, confirming the results of Carvalho and Lavor (2008) for theft and robbery. However, income has a negative nonlinear effect on physical assault. Their findings indicate that crime increases on average if a person is male, older,

lives in urban area, studies or works, is highly educated, works for many hours a week and has a higher income. On the other hand, a person is less likely to suffer repeated theft if he/she is white or Asian. Moura and Silveira-Neto (2015) use a multilevel approach to capture the effects of the urban contextual variables on the probability of robbery in Brazilian cities. The results suggest that factors regarding social context, such as proportion of cities' recent migrants or female-headed households, affect victimization. Moreover, more educated and married individuals have a higher chance of being victimized. After controlling for other individual characteristics, race does not affect the likelihood of becoming a robbery victim[10].

Other analysis show that some ethnic groups are subjected to increased social control, and that these racial differences are based on stereotypes held by police that depicts black men as violent (Peck, 2016; Graham and Lowery 2004)[11]. In the case of the Brazilian police, there is evidence of racial bias in the use of lethal force (Cano, 1999; 2010; Lemgruber et al., 2003). Opportunities for any prejudice are favored by weak institutional controls and by a general climate of impunity related to those agents who committed abuses and acts of violence[12]. Mitchell and Wood (1999) analyze the 1988 PNAD and find that African descendants are more likely to be assaulted than whites. These results are stronger in the case of assaults by police, even after controlling for urban status, age, and income. Results from the CESEC survey for 2003 in Rio show that the proportion of African descendants among those who said the police stopped them in the public space is higher than the corresponding share of these racial groups in the population (Ramos and Musumeci, 2005). Cano (2010) tests the existence of racial bias in the use of lethal force by police in São Paulo and Rio de Janeiro, and finds that the proportion of African descendants among fatal victims is greater than that of their respective share in the population. Moreover, the risk of being killed is higher for blacks than for whites.

Methodology

We use micro data from the National Secretariat of Public Security (SENASP) survey, which is a victimization survey conducted in 27 Brazilian states. The sample is of 78,008 individuals and the data was gathered between June 2010 and October 2012. It is representative of the adult population (aged 16 and over) in 346 municipalities. Offenses covered in this study are robbery and theft of goods, physical and sexual assaults, and physical and verbal abuses committed by the military and civilian police. Respondents were asked if they were victims of robbery and theft of goods, sexual offenses, and physical aggression in the last 12 months[13]. Police abuses do not refer to the 12 months preceding the survey, but to an indefinite period. The dependent variables would take the value of 1 if the individual was a victim of the crime and 0 otherwise. Physical violence includes hitting, hitting with an object, stabbing and beating, and it is measured by a dichotomous variable that indicates whether the respondent experienced at least one form of physical violence (0=non-victim; 1=victim). Abuses by police are measured by a dichotomous variable that indicates if the person experienced violence committed by civilian or military police (0=non-victim; 1=victim).

As control variables, we consider: a dummy variable for race, which assumes value 1 for African descendants (black "preto", brown "pardo", and light skin "moreno") and 0 for whites[14]; *age,* which is coded into five age groups (1=16-24, 2=25-34, 3=35-44, 4=45-59, 5 for individuals aged 60 and over); a dummy variable for gender (*male*) that takes value 1 for males and 0 for females; a dummy variable for marital status (*unmarried*), coded 1 for single (never married) and 0 for the following categories of marital status: married, consensual union, officially/not officially separated and widower; education level (*edu*) that takes value 1 for the category of unschooled and

incomplete primary education, 2 for complete primary education and incomplete high school, 3 for complete high school and incomplete university, and 4 for the complete university and postgraduate studies category. We consider quintiles of the monthly household income (*fincome*) and the number of children aged less than 16 years living at home (*young*). Moreover, we control for the dummy *nightout*, which assumes 1 if the respondent normally spent time outside home during the hours 18.00 and 24.00, and 0 otherwise. As proxies of the proximity to high crime areas, we included a dummy that takes value 1 if the respondent is living in a capital (*capital*)[15], and dummies for signaling the deterioration of the neighborhood. These are i) abandoned houses and buildings, ii) abandoned cars, iii) garbage, iv) gun shooting, v) unpleasant smells and vi) loud, music and screaming. These indicators are assumed to increase the likelihood of victimization[16]. *Livecity* is a variable equal to 1 if the respondent has always lived in the same city, and equal to 0 otherwise. We also control for the per capita Gross Domestic Product (GDP) measured at state level.

For the analysis, we used 6 models specifications, following the literature. Model 1 is the basic model specification with the race dummy as the only explanatory variable. Model 2 adds the household income quintiles. Model 3 introduces the educational level of the respondent. Model 4 includes age, sex, the *nightout* behavioral variable, family size, marital status and an interaction variable of age and sex. Model 5 considers the measures of neighborhood deterioration and the variable indicating whether the respondent has always lived in the same city. Model 6 incorporates a dummy for capital cities and the state-level per capita GDP. White population was used as the reference group for the analysis. We weighted all estimates to account for the sampling design. All models included robust standard errors clustered at municipal level. The data processing was performed using Stata 13.

The probability of individual victimization is estimated by

$$\Pr(y_{ihn} = 1 \mid x_{ihn}, z_{hn}, c_n) = f(x_{ihn}, z_{hn}, c_c, e_{ijn}),$$

where y_{ihn} indicates whether an individual i, member of family h, and who resides in neighborhood n, was a victim of crime. x_{ihn} is a vector of the observable individual characteristics (race, education, age, gender, marital status, *nightout* and *livecity* dummy variables). z_{hn} denotes the vector of the household characteristics (income, number of children), and c_n is the vector of the deterioration measures and the others neighborhood/community exogenous characteristics. e_{ijn} is the individual error term.

Table 1 summarizes all variables, for whites and African descendants. Most adults in the sample were not victimized. However, the data reveals preliminary evidence of higher prevalence of instrumental and violent victimization among African descendants. All the variables presented statistically significant racial differences, except for the gender variable. The racial differences were also statistically strong for women and men.

Table 1 Summary statistics

	Total Sample							Women							Men						
	White			Afro descendant			Afro - White	White			Afro descendant			Afro - White	White			Afro descendant			Afro - White
Variable	Obs.	x̄	SD	Obs.	x̄	SD		Obs.	x̄	SD	Obs.	x̄	SD		Obs.	x̄	SD	Obs.	x̄	SD	
Theft	35736	0.09	0.28	40028	0.11	0.31	0.020***	20368	0.09	0.28	22833	0.10	0.31	0.016***	15368	0.09	0.28	17195	0.11	0.32	0.026***
Robbery	35736	0.02	0.16	40028	0.03	0.18	0.010***	20368	0.02	0.15	22833	0.03	0.17	0.008***	15368	0.03	0.16	17195	0.04	0.19	0.012***
Sexual offense	35736	0.01	0.07	40028	0.01	0.09	0.002***	20368	0.01	0.08	22833	0.01	0.09	0.002*	15368	0.00	0.06	17195	0.01	0.08	0.002*
Physical aggress	35736	0.02	0.14	40028	0.03	0.16	0.008***	20368	0.02	0.13	22833	0.03	0.16	0.009***	15368	0.02	0.15	17195	0.03	0.17	0.007***
Verbal by police	35732	0.05	0.22	40024	0.06	0.25	0.016***	20366	0.02	0.14	22830	0.03	0.16	0.006***	15366	0.09	0.28	17194	0.11	0.32	0.029***
Physical by police	35732	0.03	0.16	40024	0.04	0.19	0.012***	20366	0.01	0.08	22830	0.01	0.10	0.005***	15366	0.05	0.23	17194	0.08	0.27	0.023***
Household income (5)	33266	2.93	1.30	38699	2.37	1.21	-0.557***	19141	2.80	1.30	22137	2.22	1.18	-0.576***	14125	3.10	1.29	16562	2.57	1.22	-0.535***
Educ. level (4)	35716	2.26	1.07	40009	1.99	0.98	-0.270***	20353	2.22	1.09	22819	1.98	0.99	-0.245***	15363	2.30	1.05	17190	2.00	0.96	-0.303***
Age (5)	35736	3.26	1.39	40028	2.98	1.37	-0.282***	20368	3.33	1.38	22833	3.02	1.37	-0.314***	15368	3.17	1.40	17195	2.94	1.38	-0.239***
Male	35736	0.43	0.50	40028	0.43	0.50	-0.001	20368	0.00	0.00	22833	0.00	0.00	0.000	15368	1.00	0.00	17195	1.00	0.00	0.000
Nightout	35722	0.15	0.36	40010	0.17	0.38	0.022***	20363	0.12	0.33	22826	0.14	0.34	0.015***	15359	0.18	0.39	17184	0.21	0.41	0.030***
No. children <16 years old	14818	1.60	0.86	21545	1.78	1.04	0.183***	8917	1.62	0.88	13189	1.79	1.04	0.174***	5901	1.57	0.84	8356	1.76	1.04	0.197***
Unmarried	35729	0.24	0.43	40026	0.28	0.45	0.041***	20364	0.22	0.41	22832	0.27	0.44	0.048***	15365	0.27	0.45	17194	0.31	0.46	0.031***
Abandoned houses	35239	0.15	0.36	39597	0.17	0.38	0.023***	20061	0.15	0.35	22583	0.17	0.37	0.021***	15178	0.16	0.36	17014	0.18	0.39	0.025***
Abandoned cars	35400	0.06	0.24	39682	0.07	0.26	0.009***	20152	0.06	0.23	22624	0.06	0.25	0.009***	15248	0.07	0.25	17058	0.08	0.27	0.010***
Garbage	35436	0.33	0.47	39765	0.40	0.49	0.066***	20198	0.32	0.47	22666	0.38	0.48	0.053***	15238	0.35	0.48	17099	0.43	0.50	0.085***
Gun shots	35475	0.25	0.44	39775	0.30	0.46	0.047***	20217	0.27	0.44	22701	0.31	0.46	0.045***	15258	0.24	0.43	17074	0.29	0.45	0.049***
Unpleasant smells	35606	0.30	0.46	39898	0.37	0.48	0.077***	20302	0.32	0.47	22774	0.40	0.49	0.079***	15304	0.27	0.44	17124	0.35	0.48	0.076***
Loud music and screaming	35607	0.40	0.49	39911	0.44	0.50	0.042***	20307	0.40	0.49	22772	0.44	0.50	0.045***	15300	0.39	0.49	17139	0.43	0.50	0.039***
Always in the same city	35731	0.48	0.50	40022	0.52	0.50	0.039***	20364	0.47	0.50	22830	0.51	0.50	0.041***	15367	0.49	0.50	17192	0.52	0.50	0.036***
Living in capital city	35736	0.20	0.40	40028	0.24	0.43	0.043***	20368	0.21	0.41	22833	0.24	0.43	0.036***	15368	0.19	0.39	17195	0.24	0.43	0.053***
State level per capita GDP (4)	35736	3.30	0.97	40028	2.60	1.14	-0.705***	20368	3.30	0.97	22833	2.59	1.14	-0.713***	15368	3.31	0.97	17195	2.61	1.14	-0.694***

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Source: SENASP 2012. Number of categories in parenthesis.

Results

Table A2 shows the predicted marginal effects of victimization for each crime in the six model specifications comparing whites and Afro descendants' probabilities. Table A3 shows the marginal effects estimates of victimization for the complete set of explanatory variables used in Model 6. Table A4 presents the conditional marginal effects of race for women and men estimated by Models 4, 5 and 6. Table A5 presents the marginal effects for the complete set of explanatory variables estimated by the model 6 for all the sub-groups of race and gender. For this last table, we ran separate logit regressions for white men, afro descendant men, white women and afro descendant women, for each crime analyzed.[17] [18]

Thefts. [19] There is statistically strong evidence of differences in theft victimization between whites and Afro descendants even after controlling for community level variables (Table A2). An Afro descendant faces a probability 1.2 percentage points higher than a white individual of suffering theft (model 6). The theft victimization is explained mostly by income, age and state level per capita GDP (Table A3). The probability of victimization increases as the household income increases. Compared to the bottom income quintile, there is no difference in the second quintile. But for the middle, fourth and fifth quintile, the wealthier ones, the probability is 1.4, 2.3 and 4.1 percentage points higher, respectively. Older people are less likely to suffer a theft. Compared to the 16-24 years old group, the probability decreases by 2.4 percentage points in the 25-34 group, by 2.7 percentage points in the 35-44 group, by 4.1 percentage points in the 45-59 group and by 5.5 percentage points in the 60 or older group. There is a negative relation between theft victimization and state level per capita GDP. No difference was found between male and female

victimization. An increase of one standard deviation in the number of children under 16 years old is associated with an increase of 0.9 percentage points in the victimization probability. As expected, community-level risk factors probed to have a positive and statistically significant relation with the theft victimization probability.

Conditional marginal effects suggest that Afro descendant women are about 1.4 (model 4) and 1.2 (model 5) percentage points more likely to suffer theft than white women (Table A4). When controlling for all the considered variables (model 6), no difference is found. Key significant determinants of Afro descendant women victimization are household income (higher probability for wealthier quintiles), age (lower probability for older people) and the number of children under 16 years old (higher probability for every 1-standard-desviation increase) (Table A5). In the case of white women, key significant determinants of victimization are household income (also higher probability for wealthier quintiles) and state level per capita GDP (increasing lower probability for individuals in wealthier neighborhoods).

Among men, the probability of theft victimization is higher for Afro descendants than for whites, even after controlling for all individual and community characteristics considered. The difference is about 2.8 (model 4) and 2.1 (model 6) percentage points (Table A4). This is twice the size as in the case of women. The victimization of Afro descendant men is mostly determined by age (increasing lower probability for older people) and state level per capita GDP (increasing lower probability for individuals in wealthier neighborhoods) (Table A5). For white men, the only statistically significant variable at individual level is the dummy for the 45-59 years old group. This means that theft affects white men equally, regardless of socioeconomic individual characteristics.

Robberies. Results suggest that Afro descendants are about 0.9 (models 2-3) and 0.5 (model 4) percentage points more likely to suffer a robbery when controlling for individual characteristics (Table A2). Nevertheless, no statistically strong difference was found between Afro descendants and whites in the robbery victimization probability when controlling for both individual and community characteristics (models 5 and 6). Among the considered variables, state level per capita GDP presented the highest contribution (Table A3). The higher the per capita GDP the lower the probability of victimization. Up to incomplete university, education is positively associated with robbery victimization. Older people face lower probabilities. At the community level only three variables resulted statistically significant. Those are the dummies for abandoned cars (increase of 0.7 percentage point), gun shootings (increase of 0.9 percentage point) and living in a capital city (increase of 2.4 percentage points).

When controlling for all individual and community variables considered in the extended model (model 6) results suggest that white women are more likely to be robbed than Afro descendant women, by 0.6 percentage points (Table A4). No difference is found in any other of the restricted models. Afro descendant men are 0.9 (models 4-5) percentage points more likely to suffer a robbery than white men when controlling for individual and some community characteristics (Table A4). No difference is found in the extended model (model 6).

Sexual offense. When only considering race as independent variable, there is a sexual offense prevalence slightly higher, by 0.2 percentage points, for Afro descendants than for whites (model 1) (Table A2). No statistically strong difference was found between whites and Afro descendants' probabilities when controlling for individual nor community characteristics. Unmarried women, those 34 years old or younger and those that spend night hours outside home face the highest

probability of suffering a sexual offense (Table A3). At the community level, the only statistically significant variables were the dummies for abandoned houses (increase of 0.5 percentage points), garbage and living in a capital city (both with an increase of 0.3 percentage points). No statistical racial difference was found among women or among men (Table A4). The magnitude and interpretation of these results must take into consideration the small number of observations on reported sexual offenses in the survey (see Table 1). This might be due to hesitation of the respondents to reveal if they had suffered this kind of violence[20].

Physical aggression. There is a difference of about 0.5 (model 1) and 0.3 (model 2) percentage points in the physical aggression victimization probability between Afro descendants and whites in the reduced models (Table A2). No statistically strong difference was found between Afro descendants and whites' probabilities after including other individual and community characteristics. There is a significant and increasing negative relation between physical aggression victimization and both education level and age. An increase of one standard deviation in the number of children under 16 years old is associated with an increase of 0.4 percentage points in the victimization probability. Never married individuals face a probability 1.6 percentage points higher.

There is a positive and statistically strong relation between physical aggression victimization and some neighborhood characteristics. The presence of abandoned cars is associated with an increase of 1.1 percentage point. Individuals residing in neighborhoods with garbage, gun shootings and laud music and screaming face a probability 0.6, 0.8 and 0.7 percentage points higher, respectively. Those individuals living in a capital city are 1.5 percentage points more

likely to suffer a physical aggression. No statistical racial difference was found by gender (Table A4).

Verbal aggression by the police. There is statistically strong evidence of difference in the probability of suffering verbal aggression by the police between whites and Afro descendants even after controlling for community level variables. An Afro descendant faces a probability 1.1 percentage points higher than a white individual (Table A2). Overall, the victimization of verbal aggression by the police is mostly explained by gender and age (Table A3). Males are 10.7 percentage points more likely to be victimized than females. Older people are less likely to become a victim. An increase of one standard deviation in the number of children under 16 years old is associated with an increase of 0.5 percentage points in the victimization probability. Most of the community-level risk factors have a positive and statistically significant relation with the victimization probability. The probability is higher for individual residing in neighborhoods with abandoned cars (2.7 percentage points), garbage (1.1 percentage point), gun shootings (1.9 percentage points), unpleasant smells (2 percentage points) and laud music and screaming (1.9 percentage points). Living in a capital city increases the probability by 1.9 percentage points.

No statistical racial difference was found among women (Table A4). Results suggest that the probability of being verbally assaulted by the police is higher for Afro descendant men than for white men, even after controlling for all considered variables. The estimated difference is of 2 percentage points (model 6). For both race groups age is negatively related to the probability of victimization (Table A5). Among Afro descendants, the probability increases for those living in neighborhoods with gun shooting and laud music and screaming, as well as for those who have

always lived in the same city. For white men, living in a capital city is associated with higher probability of being verbally assaulted by the police.

Physical aggression by the police. Afro descendants are about 1.5 (model 1) and 1.3 (model 3) percentage points more likely to suffer physical aggression by the police than white individuals, when only controlling for income and education (Table A2). No statistically strong difference was found after controlling for other individual and community level characteristics. There is a significant negative relation between physical aggression victimization and both education level and age (Table A3). Males are 8.8 percentage points more likely to be victimized than females. An increase of one standard deviation in the number of children under 16 years old is associated with an increase of 0.4 percentage points in the victimization probability. All the community characteristics considered in the analysis are positively associated with an increase in the probability of being physical aggressed by the police.

Afro descendant women are 0.4 percentage points more likely to be physically aggressed by the police than white women, for all the three models' specifications (Models 4, 5 and 6) (Table A4). Among Afro descendants, those that spend night hours outside home are less likely to be victimized, while those with more children under 16 years old, living in neighborhoods with abandoned houses or in a capital city face higher probability (Table A5). Among whites, older women are less likely to be physically assaulted by the police. No statistical racial difference was found among men.

Conclusions

We estimated the differences in the victimization probability between racial groups in Brazil with microdata from the SENASP survey for 2012. We also analyzed racial differences for women and for men. Overall, we found evidence that the African descendant individuals are more likely to be victimized than white individuals. Our results support both the Routine Activity Theory (Cohen et al., 1981) and the Social Disorganization Theory (Shaw and McKay, 1942), and confirm that victimization is explained both by individual-level indicators and by community-level risk factors.

The racial difference for thefts and verbal aggressions by the police is statistically significant even after controlling for all individual and community characteristics considered. For robberies, there is a racial difference when controlling by individual-level characteristics but not when including community variables. In the case of physical aggressions by the police, there is a significant difference when controlling only for socioeconomic individual-level characteristics. The racial difference in the physical aggression victimization is statistically significant when controlling only for household income. The weakest evidence, but still statistically significant, was in the case of sexual offenses. Racial differences were found only when no control was included in the model specification other than the race variable. In general, racial differences in victimization narrows as we expand the models' specification, suggesting a remaining challenge for future research on deepening the understanding of community factors that produce higher African descendant individuals' victimization.

Overall, we found that crime and police assault victimization declines with age. Results suggest that better socioeconomic individual status (household income and education) increases the probability of property crime victimization (thefts and robberies). On the contrary, a negative relation was found between socioeconomic individual characteristics and the rest of the crimes. This pattern is consistent with Justus et al. (2015), Carvalho and Lavor (2008) and Piquet and

Fajnzylber (2001). Moura and Silveira-Neto (2015) found similar results regarding education and robbery. Significant gender differences were found in sexual offenses and aggressions by police. Women are more likely to be sexually assaulted and less likely to be verbally or physically aggressed by the police than men. Spending night hours outside home and never being married also increased the victimization probability. We found a positive and significant relation between victimization and the number of children under 16 years old, consistent with the findings in Smith and Jarjoura (1989) and Gaviria and Pàges (2002). Community-level risk factors were found to be positive correlated with victimization, consistent with Beato et al. (2004). We found mixed results regarding state-level wealth. We found a strong and increasing negative relation between this variable and property crime victimization. Nevertheless, we also found that individuals in wealthier states are more likely of suffering verbal and physical aggression by the police.

In a further set of analyses, we attempted to test the hypothesis that there might also be racial difference in the victimization among women and among men. We found statistically strong evidence even after controlling for community characteristics. Conditional marginal effects suggest that Afro descendant women are more likely to suffer theft and physical aggression by the police. We also found that white women are slightly, but significantly, more likely to be robbed. In the case of men, Afro descendants have higher probabilities of suffering thefts, robberies and verbal aggressions by the police. The heterogeneity in the victimization determinants by race and gender must be taken into consideration in the design of interventions to reduce crime and police violence.

We explored the presence of skin color bias in aggressions by the police running the models by race sub-samples, comparing two skin color at a time. Results suggest that, even when controlling for all the considered individual level characteristics, verbal and physical victimization

probability is statistically different for all three racial groups and increasingly higher for darker skin tone individuals (Table A6). When incorporating community characteristics, we found that blacks are more likely to be verbally aggressed than whites, but no difference was found in the remaining combination of skin colors. This pattern confirms existing theories of ethnic and minority discrimination in the use of police force (Machado and Noronha, 2002; Stults and Baumer, 2007; Smith and Holmes, 2014; Eitle et al., 2002; Jacobs et al., 2005). This highlights the potential to improve police-citizen relations and the need for more empirical research on the topic. Interventions to reduce theses identified bias might include trainings to improve police officers' ability to interact efficiently and build trust with the communities. Data collection is needed to be stablished as a routinely process to improve police management and the monitoring of discriminatory practices. It should include data regarding time-space characteristics of the police-citizen interaction (which are generally only available in large administrative datasets), the presence of a weapon and other officers and citizens, the person who established the contact and if the suspect resisted the police approach (McCluskey and Terrill, 2005; Paoline and Terrill, 2007). Some authors argue that relevant professional expertise, socioeconomic and demographic characteristics should also be analyzed, such as the police officer length of service, race, gender, and education (Riksheim and Chermak, 1993).

Appendix

Table A1 Homicide Rates by Race

	Total				Youth (15 - 29 years)			
Year	white	black	brown	Afro-descendants*	white	black	brown	Afro-descendants*
2001	19.735	4.393	23.622	28.015	9.864	2.525	13.836	16.361
2002	19.846	4.429	25.227	29.656	10.072	2.598	14.902	17.499
2003	19.700	5.011	26.067	31.079	10.067	2.977	15.326	18.303
2004	17.883	4.459	25.815	30.274	8.869	2.656	15.382	18.038
2005	16.360	4.084	26.952	31.036	7.984	2.418	15.845	18.263
2006	16.432	4.229	28.259	32.488	7.884	2.439	16.405	18.844
2007	14.908	4.186	28.416	32.601	7.165	2.443	16.409	18.852
2008	15.263	4.118	30.496	34.614	7.184	2.391	17.795	20.185
2009	15.378	4.103	31.751	35.854	7.216	2.299	18.215	20.514
2010	14.645	4.324	33.111	37.435	6.746	2.365	18.785	21.150
2011	14.435	4.398	33.150	37.549	6.540	2.349	18.503	20.852
Δ% -	-53,4	0,2	80,3	67,7	-67,1	-13,9	67,1	54,6

Source: SIM/SVS/MS

*Note: *Sum of Black and Brown individuals*

Figure A1 Victims of police aggressions
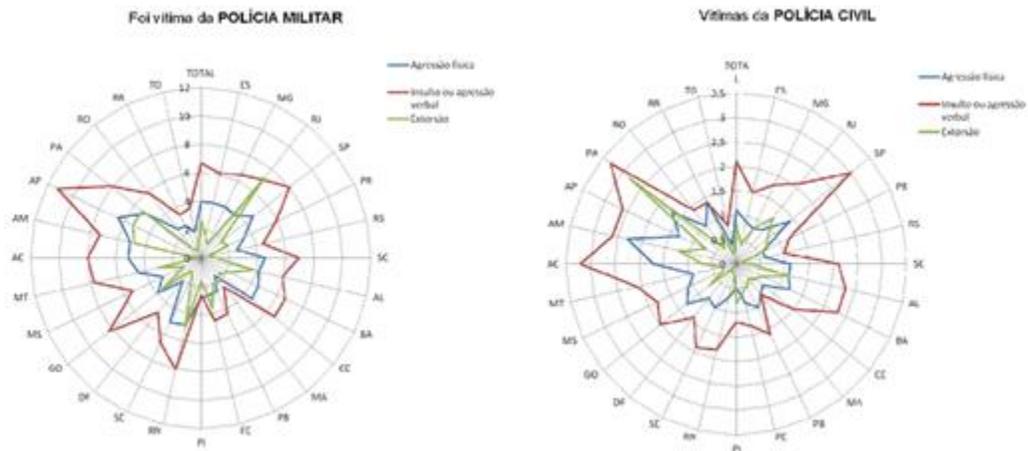
Source: SENASP (2012).

Table A2. Marginal effects of victimization (Afro-descendants vs. whites)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Thefts	0.0175***	0.0225***	0.0233***	0.0203***	0.0184***	0.0119**
	(0.00338)	(0.00306)	(0.00307)	(0.00438)	(0.00466)	(0.00522)
Robberies	0.00663	0.00874***	0.00902***	0.00542*	0.00508	-0.00316
	(0.00431)	(0.00312)	(0.00304)	(0.00324)	(0.00314)	(0.00235)
Sexual Offense	0.00160*	0.00115	0.00120	0.000215	-0.000778	-0.000761
	(0.000868)	(0.000899)	(0.000887)	(0.00133)	(0.00154)	(0.00150)
Physical Aggression	0.00542***	0.00324*	0.00291	0.000744	-0.000452	-0.00215
	(0.00179)	(0.00180)	(0.00181)	(0.00265)	(0.00281)	(0.00268)
Verbal Aggression by Police	0.0192***	0.0201***	0.0200***	0.0102*	0.00829	0.0108*
	(0.00264)	(0.00266)	(0.00265)	(0.00525)	(0.00529)	(0.00578)
Physical Aggression by Police	0.0149***	0.0138***	0.0132***	0.00485	0.00393	0.00450
	(0.00199)	(0.00224)	(0.00221)	(0.00455)	(0.00448)	(0.00485)
Race	X	X	X	X	X	X
Household income (5 groups)		X	X	X	X	X
Education level (4 groups)			X	X	X	X
Age (5 groups)				X	X	X
Male				X	X	X
Night out				X	X	X
Number of children under 16 years old				X	X	X
Unmarried				X	X	X
Abandoned houses					X	X
Abandoned cars					X	X
Garbage					X	X
Gun shots					X	X
Unpleasant smells					X	X
Loud music and screaming					X	X
Always lived in the same city					X	X
Living in capital city						X
State level per capita GDP (4 groups)						X
Race*Male				X	X	X

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A3. Marginal effects of victimization: Model 6.

Variable	Thefts	Robberies	Sexual offense	Physical aggression	Verbal aggression by police	Physical aggression by police
			Afro descendant vs white			
Afro-descendant (=1)	0.0119**	-0.00316	-0.000761	-0.00215	0.0108*	0.00450
	(0.00522)	(0.00235)	(0.00150)	(0.00268)	(0.00578)	(0.00485)
Quintile 2 (=1)	0.00508	0.00431	-0.00546**	-0.00398	-0.0132**	-0.00930
	(0.00559)	(0.00303)	(0.00246)	(0.00304)	(0.00603)	(0.00578)
Quintile 3 (=1)	0.0139**	0.00415	-0.00560*	-0.00746**	-0.0107*	-0.00939*
	(0.00668)	(0.00345)	(0.00291)	(0.00379)	(0.00633)	(0.00487)
Quintile 4 (=1)	0.0229***	0.00902*	-0.000465	-0.00592	-0.0158**	-0.0126**
	(0.00791)	(0.00502)	(0.00302)	(0.00456)	(0.00748)	(0.00561)
Quintile 5 (=1)	0.0409***	-0.00347	-0.00493	-0.00237	-0.00914	-0.0116
	(0.0114)	(0.00444)	(0.00326)	(0.00653)	(0.00678)	(0.00712)
Education 2 (=1)	0.00859	0.00721*	0.000687	-0.00724*	-0.000924	-0.0171***
	(0.00577)	(0.00370)	(0.00168)	(0.00402)	(0.00746)	(0.00631)
Education 3 (=1)	0.0115*	0.0122***	0.00282	-0.0120***	-0.00621	-0.0282***
	(0.00602)	(0.00325)	(0.00189)	(0.00326)	(0.00682)	(0.00653)
Education 4 (=1)	0.0179	0.00585	0.000931	-0.0219***	0.00848	-0.0238**
	(0.0109)	(0.00605)	(0.00299)	(0.00584)	(0.0147)	(0.0117)
Age 2 (=1)	-0.0235***	-0.0129***	-0.00431	-0.0133***	-0.0101	-0.0112*
	(0.00609)	(0.00430)	(0.00290)	(0.00463)	(0.00648)	(0.00625)
Age 3 (=1)	-0.0266***	-0.0115**	-0.00780***	-0.0235***	-0.0366***	-0.0397***
	(0.00653)	(0.00506)	(0.00256)	(0.00377)	(0.00728)	(0.00602)
Age 4 (=1)	-0.0405***	-0.0213***	-0.00994***	-0.0285***	-0.0583***	-0.0533***
	(0.00731)	(0.00497)	(0.00265)	(0.00386)	(0.00638)	(0.00538)
Age 5 (=1)	-0.0545***	-0.0264***	-0.0110***	-0.0374***	-0.0829***	-0.0667***
	(0.00866)	(0.00444)	(0.00288)	(0.00381)	(0.00692)	(0.00656)
Male (=1)	-0.00331	0.00413	-0.00488***	0.00188	0.107***	0.0883***
	(0.00461)	(0.00322)	(0.00127)	(0.00242)	(0.00540)	(0.00456)
Night out (=1)	0.0158***	0.0120***	0.00536**	0.00328	0.0101*	0.00248
	(0.00474)	(0.00359)	(0.00263)	(0.00338)	(0.00538)	(0.00361)
No. children < 16	0.00861***	-0.000578	0.000369	0.00350***	0.00510**	0.00421***
	(0.00209)	(0.00129)	(0.000646)	(0.00119)	(0.00224)	(0.00136)
Unmarried (=1)	-0.00221	0.00927**	0.00326*	0.0159***	-0.00228	-0.00536
	(0.00569)	(0.00413)	(0.00189)	(0.00330)	(0.00592)	(0.00445)
Abandoned house (=1)	0.0138**	-0.000434	0.00461**	0.00568	0.00786	0.00874**
	(0.00571)	(0.00283)	(0.00226)	(0.00358)	(0.00531)	(0.00389)
Abandoned car (=1)	0.0200*	0.00678*	0.00208	0.0109*	0.0270***	0.0124***
	(0.0104)	(0.00368)	(0.00285)	(0.00561)	(0.00707)	(0.00427)
Garbage (=1)	0.00960*	-0.000797	0.00284**	0.00553*	0.0111***	0.0102***
	(0.00517)	(0.00281)	(0.00120)	(0.00319)	(0.00362)	(0.00377)
Gun shooting (=1)	0.0106***	0.00905***	0.00461***	0.00802***	0.0194***	0.0146***
	(0.00407)	(0.00325)	(0.00144)	(0.00247)	(0.00495)	(0.00354)
Unpleasant smells (=1)	0.0157***	0.00470	0.000125	0.00426	0.0202***	0.00715**
	(0.00580)	(0.00397)	(0.00117)	(0.00284)	(0.00472)	(0.00328)
Noise (=1)	0.0116*	0.00461	0.00220	0.00679**	0.0188***	0.0121***
	(0.00608)	(0.00322)	(0.00147)	(0.00281)	(0.00324)	(0.00351)
Always lived same city (=1)	-0.00675	-0.00139	-0.00184	0.000603	0.00642	0.00641*
	(0.00447)	(0.00228)	(0.00116)	(0.00257)	(0.00445)	(0.00353)

Living in capital city (=1)	0.0105*	0.0239***	0.00296**	0.0148***	0.0194***	0.0186***
	(0.00622)	(0.00417)	(0.00150)	(0.00276)	(0.00516)	(0.00415)
State-level GDP 2 (=1)	-0.0236**	-0.0211**	0.00223	-0.00751*	0.000220	0.00323
	(0.0110)	(0.00847)	(0.00205)	(0.00429)	(0.00669)	(0.00449)
State-level GDP 3 (=1)	-0.0296***	-0.0399***	0.000950	-0.00564	0.00968	0.00173
	(0.0100)	(0.00787)	(0.00180)	(0.00445)	(0.00682)	(0.00460)
State-level GDP 4 (=1)	-0.0444***	-0.0441***	0.00262	-0.00660	0.0248***	0.0142***
	(0.00951)	(0.00721)	(0.00182)	(0.00408)	(0.00714)	(0.00446)
Observations	34,242	34,242	34,242	34,242	34,238	34,238

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A4. Conditional marginal effects of victimization by gender

	Women			Men		
	Model 4	Model 5	Model 6	Model 4	Model 5	Model 6
Thefts	0.0143**	0.0119*	0.00530	0.0281***	0.0271***	0.0206***
	(0.00676)	(0.00700)	(0.00748)	(0.00646)	(0.00664)	(0.00685)
Robberies	0.00289	0.00222	-0.00552*	0.00877**	0.00884**	-0.000062
	(0.00375)	(0.00368)	(0.00317)	(0.00417)	(0.00411)	(0.00355)
Sexual Offense	0.000761	-0.000858	-0.000806	-0.000506	-0.000674	-0.000701
	(0.00184)	(0.00191)	(0.00191)	(0.00213)	(0.00217)	(0.00213)
Physical Aggression	0.000786	-0.000872	-0.00236	0.000688	0.000098	-0.00188
	(0.00314)	(0.00327)	(0.00301)	(0.00393)	(0.00390)	(0.00402)
Verbal Aggression by Police	0.00389	0.00238	0.00376	0.0184**	0.0161*	0.0200**
	(0.00395)	(0.00398)	(0.00408)	(0.00920)	(0.00926)	(0.0101)
Physical Aggression by Police	0.00433**	0.00406*	0.00428*	0.00553	0.00377	0.00479
	(0.00208)	(0.00212)	(0.00223)	(0.00925)	(0.00906)	(0.00970)

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A5. Marginal effects of victimization by gender: Model 6

VARIABLES	Theft				Robbery			
	Woman		Man		Woman		Man	
	White	Afro	White	Afro	White	Afro	White	Afro
Quintile 2 (=1)	-0.001	0.009	-0.008	0.003	0.006	0.005	-0.004	0.003
	(0.012)	(0.009)	(0.020)	(0.016)	(0.006)	(0.004)	(0.010)	(0.007)
Quintile 3 (=1)	0.019	0.013	-0.007	0.015	0.001	0.007	-0.009	0.008
	(0.013)	(0.011)	(0.022)	(0.016)	(0.007)	(0.005)	(0.011)	(0.009)
Quintile 4 (=1)	0.044***	0.028**	0.004	0.001	0.012	0.016**	0.004	-0.004
	(0.017)	(0.013)	(0.023)	(0.017)	(0.011)	(0.008)	(0.015)	(0.010)
Quintile 5 (=1)	0.040**	0.051*	0.035	0.032	0.007	0.000	-0.009	-0.022**
	(0.017)	(0.029)	(0.022)	(0.029)	(0.009)	(0.009)	(0.012)	(0.009)
Education 2 (=1)	0.027**	0.002	0.019	-0.001	0.013	0.009	0.002	0.006
	(0.012)	(0.010)	(0.016)	(0.012)	(0.009)	(0.006)	(0.010)	(0.008)
Education 3 (=1)	0.018	0.016	0.011	0.005	0.022***	0.018***	-0.002	0.008
	(0.011)	(0.011)	(0.016)	(0.011)	(0.007)	(0.005)	(0.012)	(0.009)
Education 4 (=1)	0.023	0.035	0.005	0.008	0.007	0.016	-0.011	0.014
	(0.015)	(0.022)	(0.019)	(0.029)	(0.008)	(0.011)	(0.014)	(0.016)
Age 2 (=1)	-0.035**	-0.010	-0.030	-0.042**	-0.006	-0.006	-0.035*	-0.019**
	(0.016)	(0.010)	(0.023)	(0.019)	(0.010)	(0.006)	(0.021)	(0.008)
Age 3 (=1)	-0.017	-0.023**	-0.026	-0.057***	-0.009	-0.007	-0.036	-0.007
	(0.014)	(0.011)	(0.025)	(0.017)	(0.011)	(0.008)	(0.023)	(0.011)
Age 4 (=1)	-0.025	-0.030**	-0.045*	-0.076***	-0.017	-0.019**	-0.048**	-0.014
	(0.016)	(0.013)	(0.024)	(0.020)	(0.012)	(0.008)	(0.020)	(0.009)
Age 5 (=1)	-0.056***	-0.044***	-0.023	-0.101***	-0.022**	-0.015*	-0.052**	-0.030**
	(0.017)	(0.016)	(0.031)	(0.022)	(0.010)	(0.009)	(0.022)	(0.012)
Night out (=1)	0.008	0.026***	-0.004	0.021*	0.006	0.015**	0.004	0.018**
	(0.011)	(0.009)	(0.012)	(0.012)	(0.008)	(0.006)	(0.008)	(0.009)
No. children < 16	0.010**	0.009***	0.005	0.009**	-0.001	0.001	-0.004	-0.002
	(0.004)	(0.003)	(0.005)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)
Unmarried (=1)	0.015	0.006	-0.014	-0.031***	0.013*	0.011**	-0.012	0.016*
	(0.014)	(0.010)	(0.021)	(0.012)	(0.007)	(0.005)	(0.011)	(0.009)
Abandoned house (=1)	0.016	0.014	0.008	0.013	0.006	-0.005	0.010	-0.008
	(0.012)	(0.012)	(0.013)	(0.014)	(0.007)	(0.004)	(0.010)	(0.006)
Abandoned car (=1)	0.035*	0.025	0.003	0.019	0.003	0.006	0.012	0.006
	(0.018)	(0.017)	(0.016)	(0.021)	(0.009)	(0.010)	(0.016)	(0.009)
Garbage (=1)	0.018	0.009	0.017	0.001	-0.004	0.000	-0.001	0.001
	(0.011)	(0.010)	(0.013)	(0.010)	(0.008)	(0.004)	(0.008)	(0.006)
Gun shooting (=1)	0.006	0.002	0.027**	0.014	0.010	0.004	0.006	0.016***
	(0.010)	(0.008)	(0.012)	(0.010)	(0.007)	(0.004)	(0.009)	(0.006)
Unpleasant smells (=1)	-0.004	0.023**	0.021*	0.018*	-0.002	0.005	0.004	0.012*
	(0.010)	(0.009)	(0.011)	(0.010)	(0.006)	(0.006)	(0.008)	(0.006)
Noise (=1)	0.001	0.012	0.005	0.023**	0.002	0.001	0.010	0.009
	(0.011)	(0.009)	(0.011)	(0.011)	(0.006)	(0.004)	(0.007)	(0.007)
Always lived same city (=1)	-0.023**	-0.002	-0.004	0.000	-0.005	-0.002	0.007	-0.004
	(0.009)	(0.009)	(0.011)	(0.009)	(0.005)	(0.004)	(0.006)	(0.006)
Living in capital city (=1)	0.015	0.010	-0.001	0.012	0.022***	0.027***	0.015**	0.026***
	(0.009)	(0.010)	(0.011)	(0.010)	(0.006)	(0.007)	(0.007)	(0.007)
State-level GDP 2 (=1)	-0.033*	-0.013	-0.032	-0.030**	-0.020**	-0.022**	-0.007	-0.020*
	(0.017)	(0.016)	(0.023)	(0.015)	(0.010)	(0.010)	(0.017)	(0.010)
State-level GDP 3 (=1)	-0.049***	-0.006	-0.060***	-0.036**	-0.037***	-0.043***	-0.031**	-0.033***
	(0.015)	(0.013)	(0.019)	(0.015)	(0.010)	(0.011)	(0.015)	(0.010)
State-level GDP 4 (=1)	-0.060***	-0.023*	-0.063***	-0.058***	-0.034***	-0.042***	-0.041***	-0.048***
	(0.014)	(0.014)	(0.018)	(0.013)	(0.010)	(0.009)	(0.014)	(0.010)
Observations	8,274	12,619	5,386	7,963	8,274	12,619	5,386	7,963

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

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Table A5. Marginal effects of victimization by gender: Model 6 (cont.)

VARIABLES	Sexual Offense				Physical Aggression			
	Woman		Man		Woman		Man	
	White	Afro	White	Afro	White	Afro	White	Afro
Quintile 2 (=1)	-0.005	-0.004	-0.021	-0.003	-0.008	-0.001	0.001	-0.006
	(0.006)	(0.004)	(0.013)	(0.003)	(0.006)	(0.004)	(0.008)	(0.007)
Quintile 3 (=1)	-0.007	-0.007	-0.022*	0.003	-0.011*	-0.016***	-0.004	0.003
	(0.005)	(0.005)	(0.012)	(0.004)	(0.006)	(0.006)	(0.010)	(0.009)
Quintile 4 (=1)	0.008	-0.007	-0.014	0.002	-0.008	-0.015***	-0.001	0.001
	(0.008)	(0.005)	(0.011)	(0.004)	(0.011)	(0.006)	(0.009)	(0.010)
Quintile 5 (=1)	-0.013**	-0.004	-0.018	0.009	-0.006	-0.007	0.004	-0.004
	(0.005)	(0.006)	(0.013)	(0.006)	(0.014)	(0.012)	(0.013)	(0.014)
Education 2 (=1)	0.011***	-0.004	0.002	-0.002	0.004	-0.006	-0.020*	-0.006
	(0.004)	(0.003)	(0.004)	(0.003)	(0.008)	(0.005)	(0.012)	(0.006)
Education 3 (=1)	0.008**	0.002	0.006*	-0.002	-0.001	-0.016***	-0.013	-0.012**
	(0.003)	(0.004)	(0.004)	(0.002)	(0.007)	(0.004)	(0.010)	(0.006)
Education 4 (=1)	0.003	-0.003	0.010	-0.001	-0.016**	-0.003	-0.028**	-0.033***
	(0.006)	(0.007)	(0.008)	(0.005)	(0.008)	(0.014)	(0.012)	(0.009)
Age 2 (=1)	-0.007	-0.004	-0.005	-0.004	-0.017**	-0.004	-0.029	-0.015*
	(0.006)	(0.004)	(0.006)	(0.006)	(0.007)	(0.008)	(0.023)	(0.009)
Age 3 (=1)	-0.006	-0.010**	-0.007	-0.010*	-0.020**	-0.009	-0.032	-0.044***
	(0.006)	(0.004)	(0.006)	(0.006)	(0.008)	(0.007)	(0.024)	(0.008)
Age 4 (=1)	-0.011*	-0.010**		-0.010*	-0.022**	-0.013	-0.040	-0.048***
	(0.006)	(0.005)		(0.006)	(0.009)	(0.009)	(0.025)	(0.008)
Age 5 (=1)	-0.012*	-0.011**		-0.011**	-0.032***	-0.029***	-0.052**	-0.045***
	(0.007)	(0.005)		(0.006)	(0.010)	(0.007)	(0.022)	(0.008)
Night out (=1)	0.001	0.012**	0.008	0.001	-0.001	0.005	0.006	0.002
	(0.004)	(0.006)	(0.005)	(0.002)	(0.010)	(0.005)	(0.009)	(0.005)
No. children < 16	0.003**	-0.001	0.003*	-0.003**	0.007***	0.005***	-0.002	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.006)	(0.002)
Unmarried (=1)	0.000	0.008**	0.003	-0.001	0.006	0.016***	0.021	0.014*
	(0.004)	(0.003)	(0.005)	(0.004)	(0.007)	(0.005)	(0.017)	(0.007)
Abandoned house (=1)	0.003	0.007**	0.006	0.004	0.002	0.009	0.001	0.008
	(0.004)	(0.003)	(0.008)	(0.003)	(0.010)	(0.006)	(0.007)	(0.009)
Abandoned car (=1)	-0.001	0.002	0.006	0.002	0.011	0.004	0.013	0.016
	(0.007)	(0.004)	(0.007)	(0.004)	(0.010)	(0.007)	(0.013)	(0.014)
Garbage (=1)	0.004	0.006**	-0.000	0.001	0.003	0.012**	0.006	-0.001
	(0.003)	(0.002)	(0.004)	(0.003)	(0.007)	(0.006)	(0.007)	(0.005)
Gun shooting (=1)	0.007**	0.005*	0.008	0.001	0.006	0.005	0.012**	0.009*
	(0.003)	(0.003)	(0.008)	(0.002)	(0.005)	(0.004)	(0.006)	(0.005)
Unpleasant smells (=1)	0.001	0.001	-0.000	-0.003	0.004	0.006	-0.002	0.006
	(0.002)	(0.002)	(0.005)	(0.002)	(0.006)	(0.004)	(0.006)	(0.005)
Noise (=1)	0.006***	0.004*	-0.014**	0.004**	0.011**	0.008**	0.001	0.006
	(0.002)	(0.002)	(0.006)	(0.002)	(0.005)	(0.003)	(0.007)	(0.005)
Always lived same city (=1)	-0.003	-0.001	-0.001	-0.002	0.004	0.003	-0.017**	0.005
	(0.003)	(0.003)	(0.003)	(0.002)	(0.004)	(0.004)	(0.007)	(0.006)
Living in capital city (=1)	0.008**	-0.001	0.010**	0.002	0.027***	0.017***	0.014*	0.006
	(0.003)	(0.002)	(0.005)	(0.002)	(0.004)	(0.005)	(0.008)	(0.005)
State-level GDP 2 (=1)	0.011	0.002	-0.001	-0.001	0.000	-0.006	-0.011	-0.013*
	(0.007)	(0.003)	(0.005)	(0.003)	(0.007)	(0.006)	(0.010)	(0.008)
State-level GDP 3 (=1)	0.006**	0.003	-0.001	-0.004	0.008	-0.003	-0.013	-0.010
	(0.003)	(0.003)	(0.005)	(0.003)	(0.006)	(0.007)	(0.010)	(0.009)
State-level GDP 4 (=1)	0.009***	0.005*	0.001	-0.005*	0.009*	-0.003	-0.007	-0.023***
	(0.003)	(0.003)	(0.005)	(0.003)	(0.005)	(0.005)	(0.010)	(0.007)
Observations	8,274	12,619	3,761	7,963	8,274	12,619	5,386	7,963

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A5. Marginal effects of victimization by gender: Model 6 (cont.)

| VARIABLES | Verbal assaults by police | | | | Physical assaults by police | | | |
| | Woman | | Man | | Woman | | Man | |
	White	Afro	White	Afro	White	Afro	White	Afro
Quintile 2 (=1)	-0.033***	-0.008	-0.025	0.008	-0.013*	-0.007	-0.034	0.008
	(0.010)	(0.010)	(0.023)	(0.011)	(0.007)	(0.005)	(0.027)	(0.011)
Quintile 3 (=1)	-0.033***	-0.023**	-0.008	0.024	-0.010	-0.015***	-0.035	0.011
	(0.012)	(0.010)	(0.020)	(0.015)	(0.009)	(0.004)	(0.022)	(0.015)
Quintile 4 (=1)	-0.025*	-0.027***	-0.044*	0.035*	-0.011	-0.003	-0.066***	0.022
	(0.014)	(0.010)	(0.023)	(0.018)	(0.009)	(0.008)	(0.025)	(0.021)
Quintile 5 (=1)	-0.021*	-0.020	-0.020	0.033	-0.009*	-0.004	-0.052**	0.008
	(0.011)	(0.013)	(0.027)	(0.028)	(0.005)	(0.008)	(0.026)	(0.020)
Education 2 (=1)	0.010	-0.005	0.002	-0.002	-0.002	-0.003	-0.041***	-0.029
	(0.008)	(0.005)	(0.020)	(0.017)	(0.004)	(0.004)	(0.016)	(0.018)
Education 3 (=1)	0.011	-0.001	-0.007	-0.024*	-0.002	-0.009**	-0.040**	-0.066***
	(0.007)	(0.007)	(0.016)	(0.014)	(0.006)	(0.004)	(0.016)	(0.014)
Education 4 (=1)	0.024*	0.024	-0.002	-0.017	0.001	-0.005	-0.038	-0.062*
	(0.014)	(0.018)	(0.025)	(0.040)	(0.006)	(0.006)	(0.025)	(0.032)
Age 2 (=1)	-0.008	-0.005	-0.016	-0.039	-0.001	0.001	-0.032	-0.034*
	(0.011)	(0.007)	(0.030)	(0.027)	(0.005)	(0.007)	(0.022)	(0.021)
Age 3 (=1)	-0.007	0.003	-0.088***	-0.107***	-0.004	-0.006	-0.092***	-0.093***
	(0.015)	(0.008)	(0.024)	(0.027)	(0.004)	(0.005)	(0.020)	(0.021)
Age 4 (=1)	-0.005	-0.015*	-0.126***	-0.139***	-0.007	-0.010**	-0.127***	-0.111***
	(0.012)	(0.008)	(0.023)	(0.020)	(0.004)	(0.005)	(0.017)	(0.019)
Age 5 (=1)	-0.024*	-0.024***	-0.173***	-0.174***	-0.010***	-0.017***	-0.141***	-0.142***
	(0.014)	(0.007)	(0.020)	(0.024)	(0.004)	(0.004)	(0.017)	(0.021)
Night out (=1)	0.006	0.006	0.017	0.014	-0.007***	-0.004	0.021*	0.006
	(0.007)	(0.007)	(0.017)	(0.011)	(0.002)	(0.004)	(0.012)	(0.010)
No. children < 16	0.006**	0.004*	0.009	0.005	0.002**	0.002	0.006	0.007*
	(0.003)	(0.002)	(0.006)	(0.006)	(0.001)	(0.001)	(0.004)	(0.004)
Unmarried (=1)	0.002	0.010	-0.026	-0.028*	0.002	0.002	-0.033**	-0.010
	(0.007)	(0.006)	(0.017)	(0.015)	(0.003)	(0.004)	(0.014)	(0.013)
Abandoned house (=1)	0.000	0.005	0.025	0.010	0.008**	0.004	0.016	0.012
	(0.009)	(0.008)	(0.015)	(0.015)	(0.004)	(0.005)	(0.015)	(0.010)
Abandoned car (=1)	0.012	0.010	0.052***	0.042*	-0.002	-0.002	0.033*	0.030*
	(0.020)	(0.007)	(0.016)	(0.022)	(0.004)	(0.004)	(0.018)	(0.015)
Garbage (=1)	0.005	0.006	0.024	0.018	0.003	0.005	0.023**	0.017
	(0.007)	(0.005)	(0.015)	(0.011)	(0.004)	(0.003)	(0.011)	(0.011)
Gun shooting (=1)	0.015**	0.011	-0.001	0.045***	0.001	0.005	-0.001	0.052***
	(0.006)	(0.008)	(0.013)	(0.013)	(0.003)	(0.003)	(0.011)	(0.013)
Unpleasant smells (=1)	-0.001	0.012**	0.037***	0.038***	0.001	0.002	0.016	0.014
	(0.009)	(0.005)	(0.014)	(0.012)	(0.003)	(0.003)	(0.010)	(0.010)
Noise (=1)	0.019***	0.014***	0.018	0.025**	0.009***	0.007**	0.022**	0.012
	(0.004)	(0.005)	(0.013)	(0.012)	(0.002)	(0.004)	(0.010)	(0.011)
Always lived same city (=1)	0.004	0.002	-0.009	0.025***	0.004	0.001	0.018**	0.008
	(0.004)	(0.005)	(0.013)	(0.008)	(0.003)	(0.003)	(0.007)	(0.009)
Living in capital city (=1)	0.018***	0.011*	0.033**	0.021	0.011***	0.000	0.053***	0.028***
	(0.006)	(0.006)	(0.017)	(0.013)	(0.003)	(0.003)	(0.016)	(0.010)
State-level GDP 2 (=1)	-0.001	0.003	-0.021	0.001	0.007	0.004	-0.019	0.007
	(0.010)	(0.007)	(0.020)	(0.017)	(0.005)	(0.003)	(0.016)	(0.014)
State-level GDP 3 (=1)	0.008	0.013**	-0.002	0.006	0.002	0.004	-0.012	0.004
	(0.008)	(0.005)	(0.019)	(0.016)	(0.003)	(0.003)	(0.015)	(0.014)
State-level GDP 4 (=1)	0.010	0.026***	0.026	0.030*	0.005*	0.007*	0.026*	0.020
	(0.007)	(0.007)	(0.019)	(0.018)	(0.003)	(0.004)	(0.015)	(0.013)
Observations	8,273	12,617	5,386	7,962	8,273	12,617	5,386	7,962

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A6. Marginal effects of victimization. Aggression by police: breakdown by race

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Verbal Aggression						
-Black vs. White	0.0326***	0.0311***	0.0307***	0.0175***	0.0137**	0.0139**
	(0.00576)	(0.00566)	(0.00561)	(0.00645)	(0.00636)	(0.00651)
-Brown and Moreno vs. White	0.0156***	0.0169***	0.0169***	0.00771	0.00636	0.00951
	(0.00262)	(0.00306)	(0.00300)	(0.00561)	(0.00560)	-0.00627
-Black vs. Brown and Moreno	0.0170***	0.0146**	0.0142**	0.0107*	0.00711	0.00499
	(0.00583)	(0.00570)	(0.00553)	(0.00586)	(0.00589)	(0.00592)
Physical Aggression						
-Black vs. White	0.0281***	0.0249***	0.0243***	0.0105*	0.00718	0.00625
	(0.00427)	(0.00432)	(0.00432)	(0.00603)	(0.00588)	(0.00638)
-Brown and Moreno vs. White	0.0113***	0.0103***	0.00979***	0.00275	0.00239	0.00342
	(0.00203)	(0.00251)	(0.00250)	(0.00455)	(0.00437)	(0.00468)
-Black vs. Brown and Moreno	0.0167***	0.0160***	0.0157***	0.00950**	0.00714	0.00601
	(0.00440)	(0.00447)	(0.00447)	(0.00471)	(0.00454)	(0.00452)

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

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Notes

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[1] In 2014, the intentional homicide rate in Brazil was 24.6 per 100,000 people. The average for LAC Region countries in the same year was 22.5. Source: World Development Indicators (World Bank, 2017). Accessed on May 31st, 2017.

[2] Map of Violence is conducted since 1998 by Waiselfisz with data from the System of Information of Mortality of the Ministry of Health.

[3] Moreover, there is considerable underreporting of race among crime perpetrators persecuted by the judicial system in Brazil. About 75% of cases registered in the Ministry of Justice (SINESP - National System of Public Safety, May 2016) do not have information on the perpetrators race.

[4] African Descendants is understood as the population who self-identifies as "preto" (dark skin), "pardo" (brown) or "moreno" (lighter brown skin).

[5] SENASP is one of the five National Secretariats of the Brazilian Ministry of Justice and Public Security.

[6] Smith and Jarjoura (1989) show that the burglary risk increases with household size. Gaviria and Pàges (2002) find that larger families have higher probabilities of being victimized. Fajnzylber et al. (2002) find a positive relationship between police guardianship and the likelihood of being robbed.

[7] Individuals living in areas with high unemployment and income inequalities are at a greater risk of victimization (Cohen et al., 1981; Bourguignon et al., 2003; Demombynes and Özler, 2005).

[8] Meier and Miethe (1993) developed the integrated theory of structural choice, which explains both offender motivation and the opportunities for victimization.

[9] Their results show that individuals with more than one hour of commuting have an overall 2.1% increase in the probability of being robbed. They also found higher probability of being robbed for women (Moura and Silveira-Neto, 2015).

[10] These results are similar to those obtained by Beato et al. (2004) for the city of Belo Horizonte, and Madalozzo and Furtado (2011) for the city of Sa˜o Paulo.

[11] The "racial threat" thesis examines whether the size of the black population is related to social control (size of the police force, arrest and incarceration rates, the non-lethal force used by police) (Stults and Baumer 2007; Smith and Holmes 2014; Eitle et al. 2002; Jacobs et al. 2005).

[12] Existing research indicates that ethnic profiling by police is a widespread form of discrimination, with important direct and damaging social effect (Shuford, 1999).

[13] Field research was conducted in two waves. 86% of interviews were realized between June 2010 and May 2011, and 14% between June and October 2012.

[14] Race is measured by self-attribution of the individual, and respondents were required to choose from several options. SENASP data are stratified by six racial/ethnic categories. About 46% consider themselves white, 33.9% brown, 10% black, 1.7% yellow, 0.8% indigenous, and 7.5% "moreno".

[15] As suggested by Cole and Gramajo (2009), a large degree of urbanization and living in a city can facilitate social interactions between criminals and would-be criminals, thus leading to a higher incidence of crimes, by decreasing the costs of committing them.

[16] The "broken windows" theory suggests that minor forms of public disorder could lead to crime and urban decay. Garbage and abandoned cars are assumed to attract offenders, who perceive from these signs that residents are not interested in taking care of the area (Kelling and Coles, 1996; Taylor, 2001).

[17] We used the complete set of variables of the Model 6, excluding only sex and race.

[18] These specifications were also estimated using PNAD data for 2009. Results were consistent with those presented in this paper.

[19] The variable theft consists of the theft of a broad range of objects that includes phone or beeper, garments (clothing or footwear), money, bicycle, CD players, mp3 players or iPods, documents, jewelry, watches, and electronics.

[20] According to Felson at al., (2006), respondents tend to under-report domestic and sexual violence because they want to protect the offender. The presence of other family members during the interview process may result in under-reporting (Conti and Pudney, 2011; Acquilino, 1993). SENASP data shows that in 50% of the sexual incidents the victim knew the offender. Overall, when asked about the identity of the aggressors, 8.1% of female victims of sexual offenses says that the perpetrator was an acquaintance, 5.6% a work colleague, 5.4% a friend, and 5.1% a spouse or partner.