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**Determinants of substance use amongst Brazilians residing in the UK: the role of acculturation**

Short running title: Determinants of substance use amongst Brazilian residents in the UK

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## **ABSTRACT**

**Introduction and Aims:** Evidence suggests that patterns of substance use are changing amongst some members of migrant groups in the UK. This study explored the extent to which residing in the UK has an impact on substance use behaviours amongst Brazilian migrants.

**Design and Methods:** A mixed methods approach was adopted comparing Brazilians residing in the UK (n=164) and Brazilians residing in Brazil (n=161) age 27.82(SD = 5.65) average. Participants' socio-demographic characteristics, resilience, personality traits, drinking motives, psychological distress, frequency of alcohol intake, smoking and other drugs used (Brazil and UK), acculturation outcomes and length of residence (UK) were explored. Six in-depth interviews were conducted with Brazilian residents in the UK and analysed using thematic analysis. **Results:** Participants from the UK reported higher prevalence of substance use, however, significant country differences were only found in binge drinking and poly drug use. While in Brazil substance use was associated with being male, no religious practices, having resided in another country and higher scores in drinking for social motives and sensation seeking; in the UK it was associated with elementary occupations, higher scores in drinking for social and enhancement motives, threat to cultural identity and lower length of residence in the UK. Interview data suggested that living in the UK was stressful. **Conclusions:** Country differences in patterns of substance use were associated with changes resulting from the migratory process to the UK. The stresses associated with the process of acculturation presents a promising path for addressing substance use problems in migrant populations.

**Key words:** substance use, acculturation, Brazilian migrants, mixed methods study

## **INTRODUCTION**

Research on increased patterns of substance use among migrants in the UK has long been dominated by the conceptualisation that substances are used as a means of dealing, and coping with, adversities imposed by social and economic stressors associated with the migratory process[1,2,3]. However, it remains largely unknown the extent to which the process of acculturation (the cultural modification of an individual and/or group by adapting to or adopting the attitudes, social norms, and behaviours of another culture) to British culture affects the substance use behaviours of these individuals. In the face of such a lack of understanding, it is difficult to provide explanations about whether the increase of substance use in migrant populations is related to the values and norms within their home culture, the interplay of variables between home and receiving cultures, or attendant upon having a migrant status. In this study, we explored how the relation between pre-existing psychosocial factors, and those which arise through the process of acculturation affect patterns of substance use amongst Brazilians residing in the UK.

According to the 2011 Census [4,5,6], there were 52,148 Brazilians residing in the UK, however, based on passport renewals and Home Office applications, the British and Brazilian authorities estimate that this figure is closer 118,000[7]. A recent socio-demographic study of the Brazilian community in the UK indicated that the majority of Brazilian migrants were residing in England (68.8% in London); 65% were women; nearly 50% aged between 30-39; 58% were graduates/post-graduates, 67% were in a stable relationship, 45% reported to have at least one child, and 64% had been resident in the UK for more than 5 years[8]. It was also reported in this study[8] the range of reasons for leaving Brazil included searching for opportunities such as study and work, cultural enrichment, life experience, and to make enough money to eventually return to Brazil. 77% of the participants

reported to have known someone that was residing in the UK prior to emigrating from Brazil and from this, 35% reported that this person was a family relative[8]. Brazilian residents comprise the largest sub-group of Latino communities in the UK (followed by Colombians, Peruvians, Ecuadorians, and Bolivians)[9]. It is estimated that there are 1,000,000 Latinos living in London alone[9] and yet despite this significant presence there have not, to date, been any studies exploring patterns of substance use in the Brazilian community or in any other Latino ethnic group in the UK.

In addition, the actual social formations of new migratory groups taking up residence in the UK since the 1990s have been neglected in the substance use literature. Similar to Brazilians in the UK, migrants from these groups (e.g., Polish, Chinese, Somalians, Colombians) tend to be more transient, more socially stratified, have less organised communities, are more connected with their home countries, have multiple cultural affiliations, and have a differential range of rights to remain in the UK as determined by their visas status[10,11]. In the case of Brazilians, for example, it is estimated that 56% of those residing in the UK hold an European passport, 11% have a 'Residence Visa', 11% have a 'Working Visa', 8% have a 'Student Visa', and 5% have no visa[8]. As very little research has been carried out to outline how individuals from these new migratory groups acculturate to Britain, there is limited information available on the impact of acculturation on patterns of substance use amongst these groups.

Overall, theorising about acculturation and substance use has concentrated largely on two particular approaches influenced especially by North American studies –*acculturation stress* and *assimilation approach*[12,13,14]. Briefly, the acculturation stress approach suggests that substances are used by migrants as a coping mechanism for dealing with the stress that emerges from the acculturative process. The impact of this stress has been hypothesised to be

most intense in those who do not feel accepted into the new society as a consequence of high exposure to discrimination, poverty and restricted economic opportunities, language barriers, family separation, other forms of social isolation, and loss of social status[13,15]. With respect to the assimilation approach, the view is that substance use patterns among migrants converge with the host culture as they become more integrated into these new social environments. Individuals who move from places with relatively low rates of substance use to those with relatively higher rates are at risk of increasing their intake[16]. Evidence suggests that the prevalence of substance use between the UK and Brazil varies. In 2010, for example, 2.6% of the adult population in Brazil used cannabis and 0.7% used cocaine compared to 6.8% of the adult population in England and Wales using cannabis and 2.2% using cocaine[17]. Prevalence of alcohol use between countries indicates that in 2012 as many as 50% of the Brazilian population were abstinent[18] whereas 58% of the British population got drunk at least once a week[19]. It could be argued therefore that migrants coming from countries with low rates of substance use and who do not feel accepted in the UK may be among those at greater risk for substance use problems.

In this study we explored the extent to which residing in the UK impacts on substance use behaviours amongst Brazilian migrants by comparing patterns of substance use among Brazilian residents in the UK and in their home country. The aim was to specifically identify whether the prevalence of substance use was higher in Brazilians residing in the UK than those residing in Brazil. Risk factors for substance were also explored across countries to ascertain possible psychosocial factors influencing substance use that might be associated with pre-existing factors and those which might have arisen through the process of acculturation to the UK. Previous research suggests that particular personality traits are associated with specific types of substance use[20,21] and that negative affect, lower levels of resilience, and drinking for coping motives are closely related to higher risk of substance

use[22,23,24]. We hypothesised that factors associated with substance use in Brazil would also apply to Brazilian participants in the UK. However, we predicted that the relationships may vary in terms of significance and, in the case of participants in the UK, this relationship may be influenced by acculturative outcomes (e.g., acculturative strategies, stresses, and length of residence).

## **METHODS**

A mixed methods cross sectional design was adopted in a cross-national research sample comparing Brazilian participants residing in the UK and Brazilian participants residing in Brazil.

### **Procedure:**

Approval to conduct this study was granted by the Ethics Committees of the Department of Psychology at the University of Roehampton and Universidade Federal do Rio Grande do Sul in Brazil. A total of 325 Brazilian participants aged 18 or older were recruited between April and November 2013; 164 in the UK and 161 in Brazil. Participation in the study was entirely voluntary and written informed consent was obtained from participants before they took part in the study. In the UK participants were recruited through establishments in the Brazilian community in London (e.g., Churches, associations responsible for providing assistance to Brazilian migrants in the UK such as Casa do Brasil em Londres, and Brazilian online forums). In Brazil, participants were recruited in the city of Porto Alegre with the help of the Centre of Psychological Research on Vulnerable Populations (CEP-Rua) from the Universidade Federal do Rio Grande do Sul (UFRGS) in associations where CEP-Rua conduct their research. For the quantitative study, participants completed a survey that was available in either printed or electronic form, which took approximately 30 minutes to

complete. A subgroup of 6 participants from the UK sample who completed the survey and who consented to be contacted were invited to take part in semi-structured interviews focusing on their perceptions of cultural and psychological changes resulting from the acculturative process. This subsample was selected on the basis of substance use frequency emerging from the survey and was stratified to include differences in age, gender and type of substance use in order to generate a range of perspectives and experiences. The interviews combined questions about reasons and cultural influences for substance use, views about differences in patterns of substance use between Brazil and the UK, and the experience of being a Brazilian migrant in the UK. These interviews lasted approximately 45 minutes for each participant.

### **Measures:**

Detailed information about all instruments used in this study is presented in Table S1 (see supplementary online information). Information about gender, age, religious practice, occupation, whether the participant ever resided in another country apart from Brazil and the UK, age at arrival in the UK and the number of years of residence in the UK were recorded.

*Substance use:* A list of substances (e.g., alcohol, cannabis, cocaine, benzodiazepines) was used as a screening tool to measure the number of occasions participants had used substances in the past 30 days[25]. Substance use variables were defined as: regular drinking (more than one drink per week); smoking (more than one cigarette per week); drug use (consuming any other drug apart from tobacco and alcohol on average at least once a month); and poly drug use (the use of more than one illicit drug in the past 30 days). A question related to the specific quantity of alcohol usually consumed by the participants when going out, was also included. Binge drinking was defined for women as 4 or more drinks when going out and for men as 5 or more drinks[26].



*Drinking Motives:* The Drinking Motives Questionnaire Revised – Brazilian Version (DMQ-R)[27], assessed four motivations for drinking: social, enhancement, coping, and conformity. Scores were calculated for each subscale separately.

*Personality traits:* The Substance Use Risk Profile Scale – Brazilian Version (SURPS)[28], was used to assess four personality dimensions: hopelessness/introversion, anxiety sensitivity, impulsivity, and sensation seeking. Scores were calculated for each subscale separately.

*Resilience:* The Brazilian adaptation of the Resilience Scale (RS:14)[29] was adopted to assess levels of resilience. Total score was calculated.

*Positive and negative affect:* The Positive and Negative Affect Schedule (PANAS)[30] was selected to assess two mood states, with PA representing the extent to which an individual experiences pleasurable engagement with the environment and NA being characterised by subjective distress and unpleasant engagement.

*Acculturative Strategies:* The Acculturation, Habits, and Interests Multicultural Scale for Adolescents (AHIMSA) was selected[31] measuring the fourfold model of acculturation: integration, assimilation, separation and marginalisation.

*Acculturative Stress:* Five distinct factors related to acculturative stress were measured by the Multidimensional Acculturative Stress Scale (MASS)[32]. These factors were discrimination, threat to cultural identity, lack of opportunities for occupational and financial mobility, homesickness, and language barrier. Scores were calculated for each subscale separately.

### **Translation of materials and adaptation of the scales**

The PANAS, AHIMSA, and MASS scales were adapted to the Portuguese language for the purpose of this study. The adaptation process involved translating the scales from English to

Portuguese, back-translating from Portuguese to English and conducting confirmatory factor analyses to explore the factorial structure of the scales.

In-depth interviews and the first stage of qualitative data coding were conducted in Portuguese. Key extracts selected for further analysis were translated into English. The translation was conducted by the principal researcher who is a bilingual (Portuguese-English) speaker and cross-checked and revised by another Portuguese-English speaker.

### **Analysis**

Descriptive statistics were performed providing frequencies and percentages for categorical data and means and standard deviations for continuous data. Differences between countries were measured by *t*- and chi-square tests.

Two sets of logistic regression (enter method) were conducted to explore factors associated with substance use. In the first, socio-demographic and psychological variables measured in both samples were entered as predictors and explored across countries. Motives for drinking were included in the models predicting smoking, drug and poly drug use as preliminary analyses indicated that those who drink are more likely to use the predicted substances. In the second set, acculturative variables, age at arrival in the UK and length of residence in the UK were added to the analysis in the migrate sample only. Negative affect (Brazil and the UK) and marginalisation (the UK only) were not included in any model due to multicollinearity with other independent variables

Data for the qualitative analysis were transcribed, and then organised and coded using NVivo by the principal researcher. A thematic analysis was used for the purposes of identifying salient themes to arise in relation to the quantitative data[33]. Interview quotes were selected to illustrate the core themes.

## RESULTS

### Quantitative study

- *Sample characteristics (Table 1)*

Participants from the UK reported to be older than participants from Brazil. While, more participants from the UK sample reported working in manual occupations and having lived in another country, more participants from the Brazil sample reported practicing a religious. Participants in Brazil presented higher levels of resilience than those in the UK, whereas participants in the UK reported higher levels of impulsivity than those in Brazil. High levels of integration and separation acculturative strategies as well as stresses caused by discrimination, homesickness and threat to cultural identity were reported in the UK sample.

- *Substance use (Table 1)*

The percentage of participants who reported using substances in the UK sample was 87.8% (144/164) compared to 84.5% (136/161) in the Brazil sample. Overall, participants from the UK sample reported higher prevalence across all the substance use variables than those from Brazil. However, significant country associations were only found in binge drinking and poly drug use. Those in the UK were more inclined towards binge drinking and poly drug use than those from Brazil.

- *Risk factors for substance use in Brazilians in Brazil (Table 2)*

Male participants from the Brazil sample were almost six times more likely than female participants to drink regularly (OR 5.92, 95% CI 1.60-21.86). Drinking for social motives was a risk factor for both regular and binge drinking. Reports of no religious practices and high scores on drinking for conformity reasons were also identified as risk factors for binge drinking. Smoking was shown to be strongly associated with having lived in another country

apart from Brazil and also high sensation seeking scores. Drug and poly drug use in the Brazil sample were not significantly associated with any of the variables included in the models.

- *Risk factors for substance use in Brazilians in the UK (Tables 2 and 3)*

High scores in drinking for enhancement purposes were associated with regular drinking among Brazilians in the UK and was also was a risk factor for smoking. High scores in drinking for social motives was a risk factor for binge drinking. Those participants reporting poly drug use were four times more likely than those who had not to work in elementary occupations (OR 4.20, 95%CI 1.12-15.72). In the models in which acculturative variables were entered, drug use was associated with high threat to cultural identity scores and low length of residence in the UK.

#### *Qualitative Study (Table 4)*

Results from the qualitative study illustrate some of the quantitative findings from the perspective of the lived-experience of participants. First, there is limited evidence that Brazilian residents in the UK integrated well into British society, and additionally, living in the UK was generally described as being ‘stressful’. This stress however, was not directly linked to the socioeconomic constraints associated with being a migrant, but to psychological conflicts resulting from ambiguities over ‘cultural identification’. Participants expressed the view that the excessive use of drugs appeared to be a “UK norm” which might have influenced their behaviour. There were some indications that the British drug-taking culture had influenced their behaviour, as well as the adoption of drinking styles such as binge drinking.

## DISCUSSION

Overall, Brazilian participants in the UK tend to use substances slightly more often, when compared to their Brazilian counterparts. Specifically, our results suggest that residing in the UK might be associated with greater risk for binge drinking and poly drug use as a significantly higher proportion of participants in the UK had reported using these substances.

The examination of risk factors suggests that both assimilation and stress acculturative approaches might have contributed to the higher prevalence of substance use among Brazilians in the UK. For example, in the Brazilian sample residing in Brazil engagement in regular drinking was associated with male participants primarily, while a similar effect was not found in the UK sample. It is possible that attitudes towards gender might be changing for the Brazilians residing in the UK under the acculturation process as seen in other migratory groups[34,35]. In the case of drinking, for example, it might be that Brazilian women in the UK are starting to reject proscriptive views towards females drinking present in Brazil in the face of a more permissive British culture in this respect. Both regular and binge drinking behaviours were significantly predicted by social motives in Brazil. Yet in the UK, regular drinking was driven by enhancement motives, while binge drinking was predicted by social motives. Thus, it seems that there is a generally positive expectation regarding alcohol consumption in the Brazilian culture[27], however, whilst in Brazil this is associated with external motives (e.g. drinking to celebrate a special moment with a friend), in the UK, drinking is typically externally motivated when it involves binge drinking. It appears from this that the use of alcohol takes on different meanings for Brazilians in the UK and for those residing in Brazil. It might well be that for Brazilians in the UK rapid consumption of large quantities of alcohol has a social element and is associated with being with others. If this is the case, it is possible that Brazilians in the UK are being influenced by British attitudes

regarding when, where and how much to drink, for example, binge drinking is often a consequence of social gatherings[36,37]. Evidence provided by the qualitative data also supports the view of the different role of alcohol in social events across countries. While in Brazil getting drunk is often seen as a consequence of a fun night out with people, in the UK it seems that consuming high levels of alcohol is a pre-requisite of enjoying a “night”.

With respect to drug use behaviours, only positive affect was associated with drug use among those participants in Brazil. However, this effect was not found in the sample in the UK. In fact none of the factors for substance use explored across both samples predicted substance use behaviours in the UK sample. It is likely, therefore, that acculturative outcomes influence these relationships. This explanation is supported by the significant effect that stressors associated with the threat to cultural identity had on drug use behaviours in Brazilian residents in the UK, as well as the role that length of residence had as a risk factor. Broadly speaking, threat to cultural identity refers to the generally unavoidable psychological distress experienced by members of the acculturating group when attempting to deal with conflicts between different systems of values, beliefs and behaviours that they are exposed to when adapting to culturally specific values and patterns of living[38,39]. Findings from the qualitative study also support the presence of this cultural conflict and suggest that the stress caused by not knowing where one belongs can occur independently of high contact with British culture. It might be that in an effort to meet their personal and social needs, Brazilian migrants choose to socialise with, and adopt cultural elements from other migrant groups who share similar experiences to them in the UK. Being relatively new to the UK was also revealed as a risk for drug use regardless of any acculturative influence. This might be explained by possible feelings of openness to new experiences associated with being in a different country that might trigger initiations of substance use. Lastly, working in elementary

occupation was the only risk factor for poly drug use in the UK sample. This finding is in line with an extensive literature showing that the stresses caused by discrimination in the labour market and economic constraints are among the influential factors for migrants drug use[1,3,40].

Despite differences in resilience and impulsivity personality traits, and similarities in introversion/hopelessness, anxiety sensitiveness, psychological distress and drinking for coping motives between participants from the UK and Brazil, none of these variables were associated with patterns of substance use. This lack of effect in both samples suggests that these factors might not have a direct impact on substance use in Brazilian populations. This can be contrasted to findings in British populations where this effect is well established[23]. However, it is possible that the relationship between these factors and substance use in Brazilians might correlate with other factors that have a strong influence on substance use.

Our results should be interpreted with caution as the cross-sectional nature of the study means that causality cannot be inferred and the power of the results might have been affected by the sample size being relative small. Another potential limitation involves generalizability of the findings. While attempts were made to try and recruit a random sample, the majority of the participants in the UK sample were recruited in the Greater London area. In addition, regional differences in Brazil were not explored in the analysis. It is important to consider that Brazil is a large country with distinctive cultural regionalism according to different geographic areas and patterns of substance use can vary across these regions[41,42]. This study was also less than optimal with respect to analysing internal migratory movements in Brazil. Over the past 50 years, Brazil has undergone an accelerated process of urbanisation leading to a shift away to a predominantly rural society to one in which more than 80% of the population now live in

urban areas[43]. This process of urbanisation has been considered a significant determinant of health in both the Brazilian and international literature[43,44]. It is possible, therefore, that observed changes in patterns of substance use in the UK sample might have been initially influenced by internal migration in Brazil, especially amongst those participants that experienced the process of urbanisation prior to migrating to the UK. In view of this, a fruitful line of further study could look into the potential effects of regionalism and urbanisation in Brazil on substance use behaviour. Findings may also shed light on the influence that other cultural and social transformations might have on migrants' lives prior to leaving their country of origin.

## **CONCLUSION**

Our study shows that there are differences in the patterns of substance use between Brazilians residing in the UK and Brazilians residing in Brazil. Further it revealed significant differences in patterns of binge drinking and poly drug use. Findings suggest that substance use among Brazilians in the UK is in part associated with British cultural values (e.g., less gender distinguished), attitudes (e.g., the role of alcohol in social gatherings), and behaviours (e.g., high consumption of alcohol per episode). More importantly, this study has highlighted the notable presence of the stressors associated with the threat to cultural identity as a predictor for substance use in Brazilian migrants. The impact of this stress on drug use can be experienced regardless of having high contact with the British culture. Being relatively new to the UK was also shown to be a risk factor for substance use. Prevention and intervention programmes should focus on addressing malleable factors such as threat to cultural identity. Planning interventions in this way, offers approaches for developing broader frameworks to



deal with substance use problems that might overcome the growing size and complexity of the current migrant populations in the UK.

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**Table S1. Description of questionnaires used in the quantitative study**

<b>Domain</b>	<b>Questionnaire</b>	<b>Purpose</b>	<b>Number of items</b>	<b>Timeframe</b>	<b>Psychometric properties from original study</b>	<b>Psychometric properties for the Brazilian version<sup>1</sup></b>
<b>Substance Use</b>	Frequency of substance use[25]	To assess the frequency of substance use. The following substance use variables were defined based on frequency: regular drinking (more than one drink per week); (smoking more than one cigarette per week); drug use (consuming any drug (apart from tobacco and alcohol) on average at least once a month; and poly drug use (the use of more than one illicit drug in the past 30 days).	Alcoholic drinks, tobacco, cannabis, cocaine, amphetamines, ecstasy, inhalants, sedatives, hallucinogens, opiates, BZP, other drug (specify)	Participants are asked to indicate how often in the past 30 days they used substances (never, once a week, more than once, almost every day)	n/a	n/a
	One question about specific quantity of alcohol that is usually consumed when going out	To assess binge drinking	1	Past 30 days	n/a	n/a

Domain	Questionnaire	Purpose	Number of items	Timeframe	Psychometric properties from original study	Psychometric properties for the Brazilian version <sup>1</sup>
<b>Drinking Motives</b>	Drinking Motives Questionnaire Revised – Brazilian Version [27]	To assess reasons that motivate participants to drink alcoholic beverages	19-item scale comprised of four motive dimensions: social (5-item), enhancement (5-item), coping (4-item), and conformity (5-item)	Participants are asked to think of all the times they drink and to rate on a 5 point Likert-type scale (from 1 “Almost Never/Never” to 5 “Almost always/always”) how often they drink for each reason	Cronbach's alpha of 0.85 for enhancement, 0.75 for social, 0.79 for conformity, and 0.87 for coping	Cronbach's alpha of 0.85 for social, 0.75 for conformity, 0.79 for coping, and 0.87 for enhancement
<b>Personality traits</b>	Substance Use Risk Profile Scale – Brazilian Version (SURPS) [28]	To assess four personality traits that are shown to be related to specific patterns of substance use [25]	23-item scale comprised of four subscales: hopelessness (5-item), anxiety sensitiveness (4-item), impulsivity (4-item) and sensation seeking (6-item)	Participants are asked to report whether they agree or disagree with statements using a 4 point Likert-type scale (from 1 “strongly disagree” to 4 “strongly agree”)	Cronbach's alpha of 0.75 for hopelessness, 0.80 for anxiety sensitiveness, 0.67 for impulsivity, and 0.72 for sensation seeking	Cronbach's alpha of 0.77 for hopelessness, 0.76 for anxiety sensitiveness, 0.69 for impulsivity, and 0.70 for sensation seeking
<b>Resilience</b>	Resilience Scale (RS:14) – Brazilian version [29]	To assess resilience status	14-item scale	Participants are asked to state whether they agree or disagree with statements using a 7-point Likert-type scale (responses ranging from 1 “strongly disagree” to 7 “strongly agree”).	Cronbach's alpha of 0.82	Cronbach's alpha of 0.89
<b>Mood</b>	The Positive and Negative Affect	To assess two mood dimensions, the	20-item scale assessing positive	Participants are asked to rate (from 1 never to 10	Cronbach's alpha of 0.88 for Positive	Cronbach's alpha of 0.86 for



Domain	Questionnaire	Purpose	Number of items	Timeframe	Psychometric properties from original study	Psychometric properties for the Brazilian version <sup>1</sup>
	Schedule (PANAS) [30]	positive (PA) and negative (NA) affect.	affect (10-item) and negative affect (10-item)	most all the time) the extent to which they have experienced a particular emotion in the past 30 days	Affect and 0.87for Negative Affect	Positive Affect and 0.83for Negative Affect
<b>Acculturation</b>	Acculturation, Habits, and Interests Multicultural Scale for Adolescents (AHIMSA) was selected [31]	To assess four acculturative strategies: acculturation, assimilation, separation, and marginalisation	8 item scale	Participants are asked to indicate which country (Brazil, Britain, both countries or neither country) better represents them in the statements	Cronbach's alpha of 0.70	Cronbach's alpha of 0.69
	Multidimension al Acculturative Stress Scale (MASS) [32]	To assess five distinct factors related to acculturative stress: discrimination, threat to cultural identity, lack of opportunities for occupational and financial mobility, homesickness, and language barrier	24-item scales distributed into 5 subscales	Each item is rated on a 4-point Likert-type scale that ranges from 1 (Disagree) to 4 (Agree). A higher score reflects a greater likelihood of the presence of a particular domain of acculturative stress.	Cronbach's alpha of 0.85 for discrimination, 0.56 for threat Cultural identity, 0.81 for lack of opportunity, 0.54 for homesickness, 0.84 for language-barrier	Cronbach's alpha of 0.75 for discrimination, 0.75 for threat Cultural identity, 0.86 for lack of opportunity, 0.66 for homesickness and 0.74 for language barrier

<sup>1</sup> Psychometric properties for the Brazilian version of PANAS, AHIMSA, and MASS were explored in the present study (non-published).

Table 1. Demographic, Psychological, and Acculturative Variables: Comparison by Country

<b>Variables</b>	<b>Total sample N = 325 (%)</b>	<b>Brazil sample N = 161 (%)</b>	<b>UK sample N = 164 (%)</b>
<i>Demographics</i>			
Age Mean (SD)	27.82 (5.86)	<b>26.93 (5.72)</b>	<b>28.69 (5.86)*</b>
Female	193 (59.4%)	103(64.0%)	90 (54.9%)
Practices a religion	110 (34.3%)	<b>45 (71.7%)</b>	<b>65 (59.9%)*</b>
Elementary occupations*	72 (29.3%)	<b>17 (15.9%)</b>	<b>55 (39.6%)**</b>
Lived another country apart from Brazil and the UK	88 (27.1%)	<b>24 (14.9%)</b>	<b>64 (39.0%)**</b>
Age at the time of arrival in the UK <sup>1</sup>			22.33 (5.71)
Years of residence in the UK <sup>1</sup>			6.47 (4.39)
<i>Substance use</i>			
Regular drinking	120 (36.9%)	56 (34.8%)	64 (39.0%)
Binge drinking	121 (37.2%)	<b>52 (32.3%)</b>	<b>69 (42.1%)*</b>
Smoking	62 (19.1%)	26(16.1%)	36(22.0%)
Drug use	82 (25.2%)	37(23.0%)	51(31.1%)
Poly-substance use	36 (11.1%)	<b>10 (6.2%)</b>	<b>26 (15.9%)*</b>
Non substance use <sup>†</sup>	45 (13.8%)	25(15.5%)	20(12.2%)
<i>Psychological</i>			
	<b>Mean (SD)</b>	<b>Mean (SD)</b>	<b>Mean (SD)</b>
Resilience	74.64 (12.34)	<b>77.61 (10.19)</b>	<b>71.71 (13.54)**</b>
Personality traits			
Introversion/ Hopelessness	11.99 (2.95)	11.92 (2.84)	12.04 (3.06)
Anxiety Sensitiveness	11.43 (3.06)	11.37 (2.96)	11.50 (3.17)
Sensation Seeking	12.87 (3.23)	12.73 (3.36)	13.02 (3.10)
Impulsivity	11.40 (2.71)	<b>11.03 (2.57)</b>	<b>11.77 (2.81)*</b>
Positive Affect	22.88 (7.38)	23.19 (7.42)	22.58 (7.36)
Negative Affect	37.06 (7.34)	36.81 (7.42)	37.32 (7.28)
Drinking Motives			
Conformity	6.53 (2.88)	6.27 ( 2.44)	6.78 (3.24)
Social	13.92 (6.67)	14.30 (6.70)	13.55 (6.64)
Coping	10.25 (5.23)	10.43 (5.13)	10.08 (5.33)

Enhancement	13.29 (6.49)	13.86 (6.50)	12.74 (6.45)
<hr/>			
<i>Acculturation</i> <sup>1</sup>			<b>Mean (SD)</b>
<hr/>			
Acculturative Strategies			
Integration			3.32 (2.22)
Assimilation			1.36 (1.75)
Separation			2.69 (2.69)
Marginalisation			0.66 (1.05)
Acculturative Stress			
Discrimination			13.03 (5.00)
Treat to Cultural Identity			9.77 (3.35)
Lack of Opportunities			10.88 (4.28)
Home Sickness			12.44 (2.42)
Language Barriers			4.75 (2.25)
<hr/>			

\* p<. 05, \*\*p<.001

\* Elementary occupations, i.e., cleaner, deliveries, kitchen porters.

<sup>1</sup> Brazilians in the UK only

<sup>†</sup> Non substance use = no drug use, smoking and/or less than 1 drink per week

Table 2. Risk Factors for Substance Use in Brazilians in Brazil and Brazilian Immigrants in the UK: Odds Ratio (95% CI)

	Regular Drinking	Binge Drinking	Smoking	Drug Use	Poly Drug Use
<b>Gender (Female = 0)</b>					
Brazil	<b>5.92*(1.60 21.89)</b>	2.56 (0.55, 11.77)	1.45 (0.40, 5.19)	1.87 (0.54, 6.42)	0.78 (0.08, 7.76)
UK	1.17 (0.46, 2.95)	1.18 (0.48, 2.87)	1.20 (0.43, 3.12)	1.55 (0.60, 4.05)	1.64 (0.52, 5.20)
<b>Age</b>					
Brazil	1.08(0.96, 1.22)	1.08 (0.94, 1.25)	1.05(0.93, 1.18)	1.07 (0.94, 1.21)	1.14 (0.93, 1.41)
UK	1.01(0.92, 1.10)	1.00 (0.92, 1.09)	1.05 (0.95, 1.17)	1.05 (0.95, 1.15)	0.98 (0.87, 1.11)
<b>Practices a religion</b>					
Brazil	0.45 (0.11, 1.74)	<b>0.06*(0.01, 0.41)</b>	1.58 (0.40, 6.29)	1.34 (0.36, 4.97)	0.34 (0.20, 5.77)
UK	0.51 (0.19, 1.38)	1.30 (0.50, 3.37)	1.21(0.41, 3.55)	0.48 (0.16, 1.44)	0.70 (0.18, 2.73)
<b>Elementary occupations*</b>					
Brazil	0.52 (0.08, 3.18)	0.88 (0.13, 6.13)	1.67 (0.32, 8.64)	1.35 (0.26, 6.90)	5.06 (0.38, 66.70)
UK	1.03 (0.38, 2.84)	2.12 (0.84, 5.35)	1.769 (0.57, 4.97)	1.13 (0.39, 3.27)	<b>4.20*(1.12, 15.72)</b>
<b>Lived in another country apart from Brazil and the UK</b>					
Brazil	0.22 (0.05, 1.18)	0.22 (0.04, 1.19)	<b>4.10* (1.03, 16.42)</b>	1.06 (0.24, 4.57)	0.45 (0.03, 6.71)
UK	0.56 (0.21, 1.48)	0.83 (0.33, 2.10)	0.52 (0.18, 1.56)	0.85 (0.32, 2.30)	1.86 (0.51, 6.84)
<b>Resilience</b>					
Brazil	1.08 (0.99, 1.16)	0.94 (0.85, 1.03)	1.01 (0.93, 1.09)	0.96 (0.90, 1.03)	1.01(0.67, 1.53)
UK	1.01 (0.98, 1.05)	1.00 (0.97, 1.04)	1.01 (0.96, 1.05)	0.97 (0.92, 1.10)	1.01 (0.96, 1.06)
<b>Introversion/hopelessness</b>					
Brazil	1.24 (0.94, 1.63)	1.33 (0.93, 1.90)	1.04 (0.81, 1.34)	0.92 (0.72, 1.17)	1.01 (0.67, 1.53)
UK	1.11 (0.93, 1.33)	1.10 (0.91, 1.31)	1.19 (0.97, 1.46)	0.85 (0.70, 1.04)	1.11 (0.89, 1.40)
<b>Anxiety Sensitiveness</b>					
Brazil	1.02 (0.83, 1.26)	1.00 (0.79, 1.28)	0.96 (0.78, 1.18)	0.97 (0.80, 1.19)	1.03 (0.72, 1.48)
UK	0.99 (0.84, 1.17)	0.90 (0.76, 1.05)	1.02 (0.84, 1.23)	1.12 (0.93, 1.33)	0.98 (0.79, 1.22)

<b>Sensation Seeking</b>					
Brazil	1.01 (0.83, 1.23)	1.11 (0.87, 1.42)	<b>1.22* (1.00, 1.49)</b>	1.10 (0.92, 1.32)	1.17 (0.85, 1.59)
UK	1.02 (0.85, 1.20)	1.05 (0.90, 1.11)	0.87 (0.71, 1.06)	1.12 (0.93, 1.33)	1.10 (0.89, 1.41)
<b>Impulsivity</b>					
Brazil	1.02(0.78, 1.33)	0.80 (0.59, 1.08)	1.00 (0.79, 1.27)	0.90 (0.71 1.15)	0.96 (0.60, 1.54)
UK	1.10 (0.92, 1.33)	1.00 (0.84, 1.19)	1.16 (0.94, 1.43)	10.94 (0. 76, 1.15)	0.97 (0.76, 1.24)
<b>Positive Affect</b>					
Brazil	0.98 (0.90, 1.07)	1.06 (0.96, 1.17)	0.98 (0.90, 1.07)	<b>1.10* (1.01, 1.20)</b>	1.11 (0.92, 1.33)
UK	1.02 (0.597, 1.10)	1.04 (0.97, 1.11)	0.93(0.86, 1.01)	1.01 (0.93, 1.10)	0.97 (0.88, 1.07)
<b>Drinking Motives: Conformity</b>					
Brazil	0.82 (0.64, 1.05)	<b>0.70*(0.50, 0.98)</b>	1.01 (0.79, 1.30)	1.19 (0.94, 1.51)	0.90 (0.59, 1.38)
UK	1.04 (0.90, 1.20)	0.93 (0.81, 1.07)	0.99 (0.85, 1.16)	1.09 (0.94, 1.27)	0.97 (0.81, 1.16)
<b>Drinking Motives: Social</b>					
Brazil	<b>1.28* (1.04, 1.56)</b>	<b>1.41* (1.17, 1.78)</b>	1.07 (0.90, 1.26)	0.98 (0.84, 1.16)	1.15 (0.86, 1.54)
UK	1.04 (0.90, 1.19)	<b>1.17* (1.01, 1.35)</b>	<b>0.80* (0.67, 0.96)</b>	1.11 (0.95, 1.31)	1.06 (0.88, 1.28)
<b>Drinking Motives: Coping</b>					
Brazil	1.11 (0.94, 1.33)	1.20 (0.90, 1.48)	1.15 (0.96, 1.37)	0.94(0.80, 1.11)	1.01 (0.78, 1.31)
UK	0.95 (0.82, 1.01)	0.95 (0.82, 1.10)	0.92 (0.78, 1.08)	1.03 (0.89, 1.20)	1.06 (0.89, 1.26)
<b>Drinking Motives: Enhancement</b>					
Brazil	0.92(0.75, 1.14)	0.98 (0.80, 1.21)	0.93 (0.77, 1.11)	1.12 (0.95, 1.32)	0.63 (0.67, 1.27)
UK	<b>1.21* (1.02, 1.44)</b>	1.07 (0.90, 1.26)	<b>1.54* (0.95, 1.16)</b>	1.07 (0.90, 1.27)	1.10 (0.88, 1.37)
<b>R<sup>2</sup>*</b>					
Brazil	0.49	0.66	0.27	0.26	0.34
UK	0.54	0.39	0.34	0.42	0.36
<b>Model Fit*</b>					
Brazil	0.513	0.20	0.225	0.533	0.838
UK	0.306	0.598	0.144	0.100	0.760

Table 3. Acculturative Risk Factors for Substance Use in Brazilian Migrants in the UK: Odds Ratio (95% CI)

	Regular drinking	Binge Drinking	Smoking	Drug Use	Poly Drug use
Integration	0.95 (0.69, 1.32)	1.10 (0.78, 1.55)	0.99 (0.68, 1.45)	0.99 (0.69, 1.41)	1.43 (0.83, 2.47)
Assimilation	1.05 (0.74, 1.48)	1.30 (0.90, 1.88)	1.17 (0.79, 1.72)	0.95 (0.65, 1.39)	1.33 (0.75, 2.36)
Separation	0.90 (0.65, 1.24)	1.07 (0.76, 1.55)	0.83 (0.57, 1.20)	1.00 (0.71, 1.41)	1.36 (0.80, 2.3-)
Discrimination	0.98(0.90, 1.06)	1.00 (0.92, 1.08)	1.01 (0.92, 1.11)	0.99 (0.91, 1.08)	1.01 (0.92, 1.12)
Threat to cultural identity	1.05 (0.95, 1.17)	0.95 (0.85, 1.06)	1.06 (0.94, 1.20)	<b>1.20* (1.06, 1.35)</b>	1.11 (0.96, 1.29)
Lack opportunities	1.02 (0.93, 1.12)	1.07 (0.98, 1.78)	1.07 (0.95, 1.20)	0.99 (0.89, 1.09)	1.08 (0.95, 1.23)
Homesickness	0.96 (0.84, 1.12)	1.18 (0.99, 1.38)	1.10 (0.92, 1.31)	1.06(0.90, 1.24)	1.14 (0.91, 1.43)
Language barriers	0.98 (0.83, 1.15)	0.94 (0.78, 1.12)	0.99 ((0.81, 1.20)	1.12 (0.93, 1.34)	1.11 (0.87, 1.40)
Length of residence in the UK	0.97 (0.89, 1.05)	0.97 (0.90, 1.06)	1.03 (0.94, 1.13)	<b>0.89* (0.80, 0.99)</b>	0.89 (0.78, 1.01)
Age at arrival in the UK	0.97 (0.91, 1.03)	0.95 (0.89, 1.01)	1.01 (0.94, 1.09)	0.98 (0.92, 1.05)	0.92 (0.84, 1.01)
R <sup>2</sup>	0.05	0.10 0.120	0.12	0.14	0.16
Model Fit	0.617		0.762	0.109	0.454

Table 4. Themes, description and quotes from the qualitative interviews with substance use Brazilian participants residing in the UK.

Themes	Description	Participants Quote
<b>1. Lack of integration in British society</b>	This theme captures participants' feeling of detachment, alienation, and frustration with British society. It also describes the difficult that participants have in understanding the way alcohol is used to socialise in the UK.	<p><i>"This place here is for English people. Any other race in here is just like me. Our lives are completely different from an English person when it comes to rights or when it comes to quality of services available"</i> (ID.1 female, 24 years old)</p> <p><i>"I don't usually like British people. I do hold some kind of racism against British people. I know it is horrible for me to say that as I live in England, but I don't like them. I think I hold certain feelings of anger related to them. I think they are very empty people. For them going out means drinking and getting involved in a fight. This does not fit into my style"</i> (ID.3, male, 31 years old)</p>
<b>2. Conflicts related to cultural identification</b>	This theme illustrates the distress associated with the ongoing conflict of having to deal with different cultural affiliations. While there is no indication that substance use is employed as a form of coping and/or self-medication in the face of such distress, all participants experienced similar psychological effects in response to the conflict related to cultural identification.	<p><i>"I suffer a lot with this roller coaster of feelings. Each new phase is an emotional roller coaster. It is always the same story: to where should I go and what should I do? As I told you, I am experiencing identity crisis at this moment because I don't know where is home. When I am in Brazil I miss here. When I'm here I wish to go to Brazil. I already thought about moving to Italy or to the US. I live in this constant emotional roller coaster... This brings agony because I do not know what's going to happen in the next ten years. We do make plans and go to sleep with this plan, but then we wake up with another plan. It is difficult"</i> (ID.3, male, 31 years old).</p> <p><i>"I used to live like this in the past: From the main door to inside of my house I lived in Brazil and from outside of my house door I lived in England. Today I see this: I live in England, I do not live in Brazil."</i></p>

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*Brazil is my country, my heart is Brazilian but my home is here today, I live in here” (ID.2, male, 29 years old)*

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**3. UK influence on substance use behaviour**

This theme describes the adoption of a new drinking style and the role that alcohol has in social events in the UK. It also illustrates the normative belief that a drug-taking culture prevails in the UK.

*“In Brazil, a party starts late and finishes late. Then, for example, you will start drinking little by little, keep talking and interacting. I think ‘getting drunk’ is a consequence of having a great night out. Here is different, it seems that you have to drink a lot. This might be because here you drink fast as places do close too early and you do not realize it. If I think about the intensity with which I drink a pint, and the speed that I do it, I can see that I did not drink like that when I arrived here. So things have changed a bit. This may be a British footprint that I adopted”(ID.1, male, 26 years old)*

*“This is because of the British culture. This is a culture that uses a lot of drugs, more synthetic drugs, and when you want to interact with a culture you usually do what the culture is showing you” (ID.6, female, 30 years old)*

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