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Trajectories of Sensation Seeking Among Puerto-Rican Children and Youth

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Abstract

Objective—To document the natural course of sensation seeking from childhood to adolescence, characterize distinct sensation-seeking trajectories, and examine how these trajectories vary according to selected predictors.

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Method—Data were obtained from the Boricua Youth Study, a longitudinal study of 2,491 children and adolescents of Puerto Rican background (three assessments from 2000 to 2004). First, age-specific sensation-seeking levels were characterized. Then, age-adjusted residuals were analyzed using growth mixture models (GMM).

Results—On average, sensation seeking was stable in childhood (ages 5–10) and increased during adolescence (ages 11–17). Mean scores of sensation seeking were higher in the South Bronx vs. Puerto Rico and among males vs. females. Four classes of sensation-seeking trajectories were observed: most study participants had age-expected sensation-seeking trajectories following the average for their age (“normative,” 43.8%); others (37.2%) remained consistently lower than the expected average for their age (“low” sensation seeking); some (12.0%) had an “accelerated” sensation-seeking trajectory, increasing at a faster rate than expected, while a minority (7.0%) had a decreasing sensation-seeking trajectory that started high but decreased, reaching scores slightly higher than the age-average sensation-seeking scores (“stabilizers”). Site (South Bronx vs. Puerto Rico) and gender were predictors of membership in a specific class of sensation-seeking trajectory.

Conclusion—It is important to take a developmental approach when examining sensation seeking and to consider gender and the social environment when trying to understand how sensation seeking evolves during childhood and adolescence.

Keywords

Sensation Seeking; Puerto Rico; Trajectories; Children; Adolescence

INTRODUCTION

Sensation seeking is defined as “the need for varied, novel and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experiences”.^{1,2} Sensation seeking has been consistently associated with risk-taking behaviors, such as alcohol and drug use, gambling and problem gambling, suicide, and sexual risk behaviors,^{3–6} as well as with an interest in stimulating but lower-risk activities (i.e., arts, group sports, debate clubs).¹ Much of the research has focused on the relationship between sensation seeking as a predictor of different outcomes,^{1, 7–9} yet little is known about the developmental course of sensation seeking^{10–12} among young children. One potential reason for this gap in knowledge is that sensation seeking has been traditionally considered a personality trait, despite growing evidence that it can be modified.¹³

Studies examining sensation-seeking trajectories among US children and adolescents (e.g., 9–14 at baseline) show linear increases in sensation seeking over time,^{10–12, 14–16} and gradual declines among those about 17–24 years old.¹⁴ To date, no study has investigated sensation-seeking trajectories starting before age 9. Certain children already display more disinhibited patterns of behaviors than others early in life,^{17, 18} and some of them may also be more prone to novel and complex experiences. Therefore, it is important to investigate whether distinct trajectories of sensation seeking exist in childhood. Another understudied question is the existence of individual heterogeneity in the trajectories of sensation seeking, that is, different types of trajectories that may be followed by substantial proportions of

individuals. Rather, most investigations have focused exclusively on the average trajectory of sensation seeking^{11, 12, 15, 16} and not on heterogeneity in trajectories.¹⁴ In our study, we aim to assess whether distinct sensation seeking trajectories exist among children and adolescents. Understanding individual heterogeneity is important when planning risk-taking prevention efforts.

Little is known about predictors of sensation seeking. Thus, for the purpose of this study, we selected likely predictors of sensation seeking, specifically, gender, maternal education, parental psychopathology, and sociocultural context. Gender has been associated with differences in sensation seeking in most cross-sectional and longitudinal studies. Men usually have higher sensation-seeking scores as compared to women,^{1, 10, 15, 19, 20} with the exception of a study that showed no gender differences.¹² In addition, it is possible that sensation seeking is influenced by factors related to future development of psychopathology, such as maternal education and parental psychopathology.^{21–24} Arnett⁷ has also argued that the sociocultural environment is crucial for how sensation seeking is expressed and evolves in adolescence: adolescents who live in more permissive environments (i.e., those in which engaging in risk-taking behaviors is more socially acceptable and those that may have less clear sets of rules and responsibilities for youth) will, on average, have higher sensation-seeking scores compared to those living in less permissive environments.⁷ However, no study has investigated the development of sensation seeking in a sample of children and adolescents from the same ethnic group growing up in two very different socio-cultural contexts, where the levels of exposure to risk (such as traumatic events and discrimination) differ. Identifying the role of these likely predictors of sensation-seeking trajectories in childhood and adolescence could help characterize individual variation in sensation seeking across time from childhood to adolescence and help identify mechanisms through which sensation seeking can be modified by the implementation of interventions.¹³

Knowledge in these areas will help inform interventions to encourage children and adolescents with high sensation-seeking levels to engage in stimulating activities unlikely to have negative consequences.¹ Additionally, understanding how sensation seeking varies across different subgroups (e.g., socio-demographic factors) can help identify and reduce potential disparities in the sensation-seeking/risk-taking paradigm. The current study addresses the gaps in the literature by capitalizing on a large prospective cohort study of Puerto Rican youth growing up in two socio-cultural contexts (Puerto Rico and the US), including respondents as young as age 5, to examine the longitudinal trajectories of sensation seeking. Specifically, the aims of these analyses are to: (1) document the natural course of sensation seeking from early childhood to early adolescence (from ages 5 to 13) by socio-cultural context (Puerto Rico and the US) and time (i.e., three waves from 2000 to 2004); (2) to characterize groups of individuals with distinct trajectories of sensation seeking; and (3) to examine how sensation-seeking trajectories (i.e., subgroups of respondents characterized by different patterns of changes in sensation seeking) vary according to socio-demographic factors, maternal education, and parental psychopathology.

METHOD

Sample

The present study was based on the Boricua Youth Study, a longitudinal study of children and adolescents of Puerto Rican background, which conducted three yearly assessments from the summer of 2000 to the fall of 2004. A total of 2,491 Puerto Rican (PR) children aged 5 to 13 years old were recruited at baseline in the South Bronx (SBx), New York (n=1,138) and in the standard metropolitan area of San Juan and Caguas, Puerto Rico (n=1,353). Even though all children were recruited at ages 5 to 13, a few (n=100 interviewed at age 14 and 7 at age 15) were interviewed a year or more after recruitment. Each sample was a multistage probability sample of households of the target population, weighted to represent the populations of Puerto Rican children in the two socio-cultural contexts. The study sampled up to 3 children from each household, randomly selecting 3 children in households with more than 3 children. All children in the study had to be of Puerto Rican background, defined as having at least one primary caretaker being of Puerto Rican background. Details about the study sampling, design, and procedures can be obtained elsewhere.^{25, 26} In brief, there were 1,526 eligible children in Puerto Rico and 1,414 in the South Bronx. Out of these, 11.5% of the children selected to be study participants in Puerto Rico and 19.5% of those selected to participate in the South Bronx refused or were unavailable to participate in the study.^{25, 26}

Procedures

Participants (caretakers and children) were interviewed in their homes in their preferred language (English or Spanish) by trained lay interviewers. Attrition rates across waves were low. Only 8.2% of the sample was not interviewed at wave 2, and 12.2% at wave 3. Retention rates were higher in PR than in NY at wave 2 (93.8% vs. 89.4%) and wave 3 (89.6% vs. 85.6%). Missing data analyses that took into account the complex survey design tested whether missing status at the two follow-ups were predicted by six socio-demographic measures collected at the first wave. Only one significant difference emerged: children living in the South Bronx were less likely to participate at waves 2 and 3 (89% of children in Puerto Rico participated in all waves vs. 83% of those in the South Bronx [$p < .05$]).

Measures

Outcome: Sensation seeking—Sensation seeking was measured by an abbreviated ten-item scale derived from Russo's sensation-seeking scale,²⁷ a shorter version of Zuckerman's sensation-seeking scale.²⁸ Seven of these selected items are from Zuckerman's thrill-and-adventure-seeking factor and three from the social disinhibition subscale. The structure of Russo's scale was adapted for children as young as five years old: for each item, they were given two choices of behaviors and asked to identify which one was more like them (e.g., item 1: "You don't like to do dangerous things" OR "Sometimes you like to do things that are a little scary"; item 2: "Riding very fast and doing tricks on a skateboard is scary" OR "You think that riding very fast and doing tricks on a skateboard are fun"). Cronbach alpha of this scale in this sample was 0.72. Two respondents out of the 2,491 had missing values on sensation seeking in all three waves and were excluded from the analyses. We assessed

whether the scale was comparable across different ages, i.e., whether or not any items exhibited differential item functioning (DIF). Following standard methodology for assessing DIF, we fit a single-factor multiple indicator multiple cause (MIMIC) model of all 10 sensation-seeking items with age as a predictor in Mplus and tested modification indices of direct effects from age to specific items.²⁹ There were no items that showed moderate or large effect size for DIF (all standardized direct effects <0.15).³⁰ Hence, the sensation-seeking scale measures the trait consistently (i.e., is comparable) across different ages.

Correlates of Sensation seeking—We examined correlates (all measured at wave 1) of different sensation-seeking trajectories that had been consistently identified in prior studies as relevant for sensation seeking or as relevant for other possibly related outcomes in the study sample: study site (Puerto Rico and South Bronx), gender (male, female), maternal education (less than high school, high school, at least some college education), family socioeconomic status (household classified by information on income/number of household residents as above or below the US federal poverty guidelines), and parental psychopathology (any psychological or emotional problem defined based on the Family Psychiatric History Screen for Epidemiologic Studies scale)³¹.

Statistical Analysis

The three annual waves of data collected across a wide age range (5–13 years old at wave 1 to 8–17 at wave 3) represent an accelerated longitudinal design³² that provides the opportunity to 1) estimate mean sensation-seeking levels across the ages of 5–17, and 2) characterize different individual-level development in sensation seeking benchmarked by age-specific means. We first characterized age-specific sensation-seeking levels by modeling and plotting mean sensation seeking as a function of categorical age (5 to 17), site (Bronx or Puerto Rico), and gender. Sensation seeking means and 95% CIs were estimated from a linear mixed effects model with fixed effect for age, gender, site, and all two- and three-way interactions, including a random intercept to control for repeated measures within individuals across the three waves. Mean contrasts were tested between gender, site, and each age category. A subsequent piecewise linear model of continuous age was fitted to test differential slopes across ages 5–10 and 11–17, and to test whether differential slopes could be moderated by site or gender.

To examine individual-level heterogeneity in the development of sensation seeking, we used age-adjusted sensation-seeking scores based on the residuals from a linear regression with sensation seeking as the outcome, and categorical age, wave, and the interaction of age and wave as predictors. Age-adjusted sensation-seeking scores provide a meaningful way of characterizing within-individual development while controlling for age-specific trends. An advantage of this method based on residuals is its flexibility in controlling for age without needing to specify an oversimplified functional form for the population-age trend (e.g. linear, quadratic). Specifically, the individual-level age-adjusted sensation-seeking score represents how an individual differs at each wave from what her/his expected level of sensation seeking would be for her/his age. A score of 0 indicates the individual is average for her/his age, whereas positive (negative) values indicate higher (lower) sensation seeking for her/his age. Age-adjusted sensation-seeking scores were then analyzed using growth

mixture models (GMMs).³³ GMMs were used to determine whether there were distinct patterns of sensation-seeking trajectories and to empirically classify individuals into those latent classes. GMMs with one, two, three, four, and five classes were estimated using full information maximum likelihood that includes all individuals with at least one sensation-seeking score. Determination of the optimal number of classes relied primarily on the Bayesian Information Criterion (BIC), which balances model fit and parsimony³⁴ and has been demonstrated to show good performance determining the optimal number of classes in mixture models.³⁵ The sample-size-adjusted BIC and entropy were considered, as well. Slopes and intercepts of the sensation-seeking trajectories were allowed to vary between classes in each model. The KNOWNCLASS option in Mplus was used to test whether a model that allowed trajectories to differ by gender fit the data better than a model that constrained the trajectory classes to be the same for males and females. Associations between the estimated classes and socio-demographic covariates were tested using the 3-step auxiliary variable option in Mplus.³⁶ All analyses incorporated sampling weights. The GMM incorporated the sampling clusters (primary sampling units) and strata and constrained all variance estimates to be positive. A sensitivity analysis of the GMM was conducted using family as the clustering unit instead of the primary sampling units. All analyses were conducted in Mplus 7.3. Level of significance was set at $p < .01$ to take into account multiple comparisons.

RESULTS

Sample characteristics have already been described elsewhere.²⁵ Briefly, 54.4% of the wave-1 sample was based in Puerto Rico, 51.6% were male, and 50.1% were age 10–13 at baseline. Figure 1 shows sensation seeking mean scores and 95% CIs by age, gender, and site. Mean scores of sensation seeking were higher in the South Bronx as compared to Puerto Rico ($\chi^2(1) = 28.76, p < .0001$) and among males compared to females ($\chi^2(1) = 75.28, df=1, p < .0001$).

Tests comparing mean sensation seeking across each age category from 5 to 10 years old found no significant differences. The first incremental age to show a significant mean increase in sensation seeking was from 10 to 11 years old ($t(df)=3.12, p = .002$), and each additional age from 12–17 had significantly higher mean than at 10 years old. In addition, we examined a model treating age as continuous with a change point in the slope of sensation seeking at age 11. In all groups, mean sensation-seeking scores remained relatively stable until age 11 (slope = 0.06, $\chi^2(1) = 3.13, df=1, p = 0.08$), at which point mean sensation-seeking scores started increasing in all groups (slope=0.59, $\chi^2(1)=55.93, df=1, p < .0001$). These slopes did not differ significantly by site or gender.

Subgroups of Sensation-Seeking Trajectories

Model comparison statistics (Table 1) for the growth mixture models of age-adjusted sensation-seeking scores were better for the 4-class model than for the models with 1, 2, 3, or 5 distinct trajectory classes. A 4-class model that constrained the trajectories to be the same across gender fit the data better than one that allowed them to be different. Table 2 presents the estimates and tests for the intercept and slope associated with each class, the

estimate of the variability of the random effect around each coefficient in each class, and the marginal probability of being in each class for the 4-class model. A GMM that accounted for the clustering of siblings within families produced virtually the same results as the model that accounted for clustering within primary sampling units.

In the 4-class GMM of sensation-seeking trajectories (Figure 2), we identified one class that included 43.8% (n=1,089) of the youth (Class 1, the “normative” in this sample): in this class, the youths’ age-adjusted sensation-seeking scores remained near zero across all three waves, indicating that their sensation seeking increased (or stayed the same) as expected for youth of the same age. Another class comprised 37.2% (n=927) of the youth (Class 2, the “low sensation seeking”): in this class, individuals had age-adjusted sensation-seeking scores that were about two points lower than the average across all three waves as they aged. A third class represented 12.0% (n=299) of the sample (Class 3, the “accelerated”): in this class, individuals had below-average sensation-seeking scores at wave 1 that increased faster than expected with age, resulting in their having average (i.e., near zero) age-adjusted sensation seeking by wave 3. Finally, a fourth class, representing 7.0% of the sample (n=174), was comprised of individuals who started the trajectory at wave 1 with high age-adjusted sensation-seeking scores (more than 4 points above average) and decreased across waves but still remained higher than average for their age (Class 4, the “stabilizers”). GMM provides a probability for each person to be in a particular class; the higher these probabilities are, the more confidence we have in the assignment of persons to clusters. Individuals identified to be in the “normative” class have average probability of 83.9% to be in that class, those in the “low” class had average of 76.7% to be in that class, those in the “accelerated” class had 74.7% probability to be in that class, and those in the “stabilizer” class had 84.0% average probability to be in that class.

Adjusted Analysis of Predictors of Classes of Sensation-Seeking Trajectories

We then explored potential baseline predictors of sensation-seeking class membership (Table 3) in models adjusted by all covariates selected. Those in the “low” class of sensation seeking trajectories were less likely to live in the South Bronx (vs. Puerto Rico, adjusted odds ratio, AOR [95% CI]: 0.45[0.31, 0.67]), but more likely to be females than males (AOR[95% CI]: 3.63 [2.54, 5.20]) compared to those in the “normative” class. Respondents in the “accelerated” class of sensation-seeking trajectory were less likely to live in the South Bronx (vs. Puerto Rico, AOR[95% CI]:0.52[0.32,0.82]) as compared to those in the “normative” class. In the “stabilizers” class of sensation-seeking trajectory, however, respondents were more likely to be males than females compared to those in the sample “normative” class (AOR[95% CI]: 0.41[0.22, 0.77]). There were no other statistically significant differences in predictors of trajectories at the $p < .01$ level.

DISCUSSION

This study examined the natural course of sensation seeking from early childhood to adolescence by sociocultural context (Puerto Rico and the US) over time, characterized groups of individuals with distinct sensation-seeking trajectories, and examined how sensation-seeking trajectories varied by subgroups. There were three essential findings.

First, among children of Puerto Rican background ages 5–13, over the course of 3 years, sensation seeking was stable from ages 5–10 and increased from ages 11–17. Second, four different classes of sensation-seeking trajectories were observed from ages 5–17: most children had age-expected increasing sensation-seeking trajectories, some starting off from medium levels and increasing as expected with age (“normative” across childhood and adolescence, 43.8%); others (37.2%) starting at low sensation-seeking levels and increasing as expected with age (“low”); some (12.0%) had an “accelerated” sensation-seeking trajectory, starting with average–low sensation-seeking scores and increasing faster than expected with age, while a minority (7.0%) had a decreasing sensation-seeking trajectory that started high but decreased, reaching scores slightly higher than the average age sensation-seeking scores (“stabilizers”). Third, site and gender were the only predictors of membership in a specific class of sensation-seeking trajectory. Specifically, as compared to the “normative” class of sensation-seeking trajectory, those living in the South Bronx (vs. Puerto Rico) were less likely to belong to the “low” and “accelerated” classes (vs. the “normative” class); males were less likely than females to be in the “low” class of sensation-seeking trajectory and were more likely to be in the “stabilizer” class of sensation-seeking trajectory, versus the “normative” class.

Overall, our study findings are concordant with previous studies that focused on adolescents and show that sensation seeking is not stable and homogeneous over time, at least during later developmental stages.^{9, 11, 12, 14–16, 37,38} Our study expands previous findings by indicating that the average sensation-seeking scores in both the South Bronx and in Puerto Rico remained relatively stable from age 5 until age 10, when they started increasing. To our knowledge, ours is the first study on classes of sensation-seeking trajectories that includes respondents as young as age 5. In addition, our findings are consistent with findings from studies showing that sensation seeking has high values in mid-adolescence.^{11, 12, 15} High sensation seeking among youth may be related to still-developing prefrontal executive function and to rapid maturation of the subcortical motivation system in adolescence.^{39–41} This could partially explain why we found stable trajectories only until age 10, when average sensation seeking started to increase. Social and family environments can influence these trajectories, with adolescents being more susceptible to influences from the environment outside their homes (i.e., school, peers)^{42, 43} than children (socialization processes are different by age). No other study has investigated the trajectory of sensation seeking prior to age 9, and the stability of average scores of sensation seeking in this age range needs to be investigated in other samples.

Our study’s main contribution is elucidating that sensation-seeking trajectories do not follow only one single pattern from childhood to adolescence; rather, there are different classes of sensation-seeking trajectories as described in our results. Our study goes above and beyond former studies^{11, 12, 14} that focused on the overall mean trajectory of sensation seeking because we examined heterogeneity in the trajectories of sensation seeking in our sample by age, site, and study wave. Investigating heterogeneity in trajectories is important to identify individual- level trajectories of sensation seeking and understand how sensation seeking evolves for different subgroups of children and adolescents. For example, we were able to determine that not all children have the same starting point and that for a small group of children, sensation seeking actually decreases as they age. Understanding how sensation

seeking evolves from childhood to adolescence for different subgroups can better help identify who the children and youth are who should be targeted when developing prevention and intervention efforts. As expected, the great majority (76.62%) of the sample belonged to the “normative” and “low-sensation-seeking” classes, in which sensation-seeking scores increased as expected with age (albeit in the “low-sensation-seeking” class, wave 1 scores were lower than in the “normative” class). However, two distinct subgroups of respondents are worth further examination. One, the 16.31% of respondents classified as being in the “accelerated” class, that is, those who had average-low sensation-seeking scores that increased faster than expected with age, and the 7.1% of the sample who started the trajectory with high sensation-seeking scores that decreased quickly with age (the “stabilizers”). Future studies are needed to investigate whether different trajectories are associated with different behavioral outcomes in adolescence and young adulthood.

Interestingly, mean scores of sensation seeking were consistently higher in the South Bronx as compared to Puerto Rico, suggesting that the socio-cultural context matters in the expression of sensation-seeking phenotypes in childhood and adolescence. When we examined specific classes of sensation-seeking trajectories, we saw that South Bronx youth are less likely to be in classes that start with low sensation-seeking levels (“low sensation seeking” and “accelerated” classes) as compared to being in the “normative” class, meaning that they had a tendency to start with higher sensation-seeking levels. This could be explained if sensation seeking could potentially be associated with, for example, migration patterns, and that children born into families of migrants would score higher in sensation seeking either because they inherited a “novelty-seeking” trait from their parents,^{44–46} or they were exposed to family environments (e.g., different parenting practices) that promoted certain behaviors.^{10, 47} As described in prior reports from this study, the characteristics of the socio-cultural and neighborhood contexts from which the samples were selected could partially explain these differences. The area sampled in Puerto Rico is more demographically heterogeneous, whereas the South Bronx is a poverty-stricken area (the poorest congressional district in the US) with a more homogeneous Puerto Rican population.²⁵ Besides poverty, children living in the South Bronx sociocultural context very frequently face environmental risks such as exposure to violence, peer delinquency, or stressful life events.^{48, 49} Moreover, this is in line with Arnett’s argument⁷ that the socio-cultural environment (i.e., peer influence, community socialization) is crucial for how sensation seeking is expressed and evolves in adolescence.

Consistent with prior findings,^{1, 10, 15, 19, 20} in our study, males had higher sensation-seeking levels than females. Studies have shown that sex hormones (particularly testosterone) are associated with sensation seeking.^{50, 51} Sex differences in sensation seeking have also been explained by gender differences in culturally transmitted social norms,⁵² while evolutionary psychologists have related these sex differences to differences in selection pressure.^{52–54} Respondents in the “low-sensation-seeking” class were more likely to be female than male (class with lower sensation-seeking scores across time than the “normative” class), while respondents in the “stabilizers” class were more likely to be male than female (class with higher sensation-seeking scores across time than the “normative” class). Nevertheless, more than half of the males and 42% of the females were in the “normative” class and followed what is considered the average development for sensation seeking in childhood and

adolescence years. None of the other specific factors were significantly associated with classes of sensation-seeking trajectories in this sample. The differences by socio-cultural context that we identified, however, indicate the need to examine a wider array of potential factors to be able to understand environmental influences on sensation seeking.

Limitations are noted. First, this study assumes that respondents in both socio-cultural contexts come from the same population, and that selection factors that distinguish the two groups can be adjusted. Second, experiences of Puerto Rican youth in the South Bronx might be different from experiences of Puerto Rican youth in other parts of the US. Third, the follow-up of study respondents spanned only three years and started more than ten years ago, thus data are not available to examine the full spectrum of sensation-seeking trajectories from childhood to young adulthood, and only linear trajectories could be tested. Fourth, we had to adapt an existing measure of sensation seeking to younger children. Fifth, we relied solely on self- and parent-reported data for all of our measures; in particular, parental psychopathology was determined based on parental report of family history.

These limitations notwithstanding, this study has important clinical implications and contributions to the literature on trajectories of sensation seeking in children and youth. To our knowledge, no other study has documented the trajectories of sensation seeking in Puerto Rican youth, even though Puerto Ricans are the second largest minority group in the US and are at highest risk among all Latino subgroups for risk-taking behaviors such as substance use disorders.⁵⁵ In addition, no study to date has investigated heterogeneity in the trajectories of sensation seeking in an epidemiologic sample of children and adolescents from any racial/ethnic group. From a clinical point of view, this means that there are several different ways in which sensation seeking develops over time for different subgroups of children and adolescents. The findings of this study highlight the importance of taking a developmental approach when examining sensation seeking and considering the socio-cultural context when trying to understand how sensation seeking evolves from childhood to adolescence.

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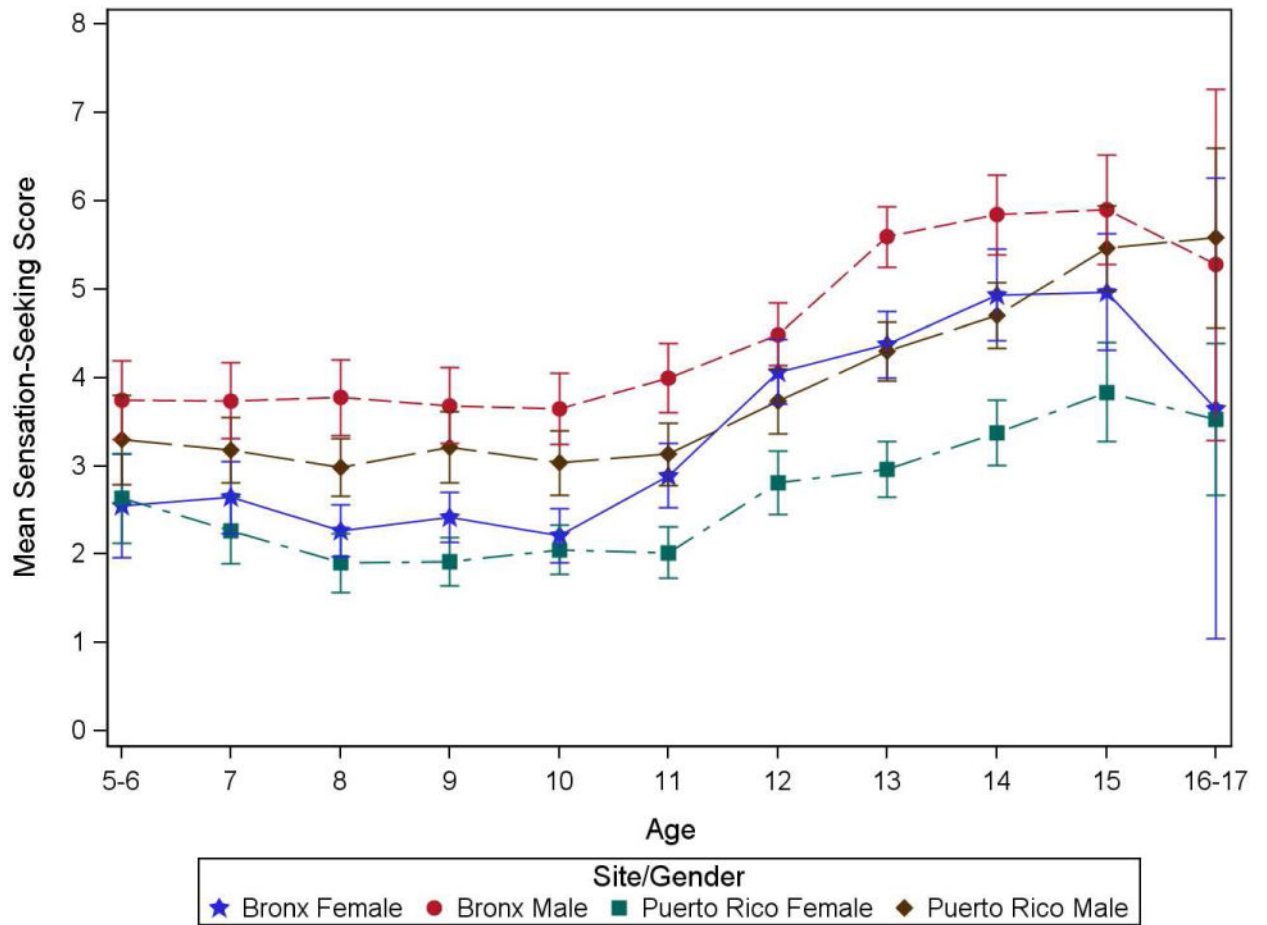


Figure 1.
Mean sensation-seeking scores (range 0–10) as a function of categorical age, site, and gender (Boricua Youth Study, Waves 1–3).

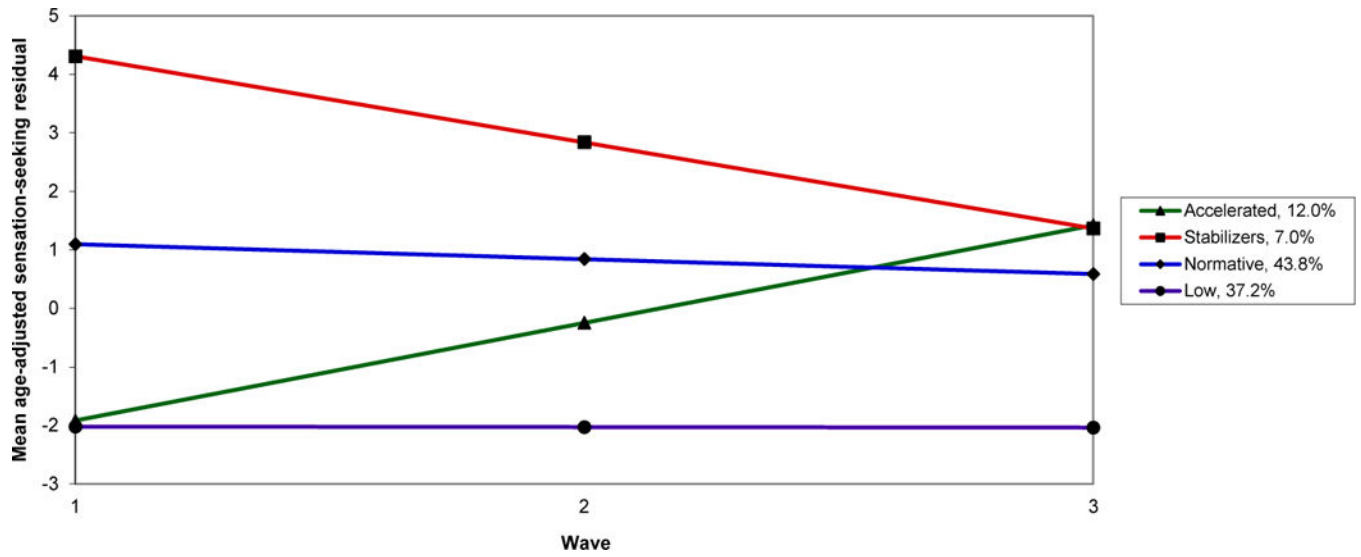


Figure 2.
Four-class growth mixture model (GMM) sensation-seeking trajectory plot for sensation-seeking scores (Boricua Youth Study, Waves 1–3).

Table 1
Fit Indices of the Growth Mixture Model (GMM) for Sensation-Seeking Scores, Boricua Youth Study Waves 1–3 (N=2,489)^a

	Log-likelihood	Number of free parameters	BIC	Sample Size-Adjusted BIC	Entropy
1-class model	-15274.622	8	30611.801	30586.383	
2-class model	-15218.909	13	30539.473	30498.169	0.444
3-class model	-15169.842	18	30480.438	30423.248	0.448
4-class model	-15123.987	23	30427.825	30354.748	0.654
5-class model	-15115.065	28	30449.081	30360.118	0.640

Note: Bolding indicates best fit (i.e. smallest for Bayesian information criterion [BIC] and sample size-adjusted BIC [SSABIC], largest for entropy).

^aTwo respondents did not have information on sensation seeking.

Table 2
Intercept and Slope Estimates for the Four Classes of the Growth Mixture Model (GMM) for Sensation-Seeking Scores, Boricua Youth Study Waves 1–3.

GMM sensationseeking classes	Fixed Coefficient	SE	p Value	Variance of random effect	% in class	
Normative	Intercept	1.096	0.169	<.001	0.254	43.80
	Slope	-0.255	0.105	.015	0.737	
Low	Intercept	-2.02	0.224	<.001	0.099	37.20
	Slope	0.008	0.206	.970	0.000	
Accelerated	Intercept	-1.916	0.181	<.001	0.000	12.00
	Slope	1.668	0.512	.001	0.641	
Stabilizers	Intercept	4.306	0.419	<.001	0.208	7.00
	Slope	-1.471	0.265	<.001	1.195	

Note: SE = standard error.

Table 3

Adjusted Predictors of Classes of Sensation-Seeking Trajectories, Boricua Youth Study, Waves 1–3 ^{a,b}

	Normative (n=1089, 43.8%)				Low (n=927, 37.2%)				Accelerated (n=299, 12.0%)				Stabilizers (n=174, 7.0%)			
	n	%	AOR	p-value	n	%	AOR (95% CI)	p-value	n	%	AOR (95% CI)	p-value	n	%	AOR (95% CI)	p-value
Site																
South Bronx (n=1,136)	560	48.62	Reference		351	31.28	0.45 (0.31, 0.67)	<.0001	122	10.87	0.52 (0.32, 0.82)	.006	103	9.22	1.21 (0.70, 2.09)	.487
Puerto Rico (reference, n=1,353)	529	37.95			576	42.98			177	14.12			71	4.95		
Gender																
Female (n=1,206)	443	41.26	Reference		573	43.06	3.63 (2.54, 5.20)	<.0001	139	11.23	1.19 (0.72, 1.96)	.497	51	4.45	0.41 (0.22, 0.77)	.006
Male (reference, n=1,283)	646	52.42			354	23.55			160	11.53			123	12.5		
Maternal education																
Less than high school (n=850)	358	45.22	Reference		326	34.67	1.41 (0.73, 2.73)	.300	95	10.14	0.92 (0.44, 1.92)	.833	71	9.96	2.73 (1.17, 6.39)	.020
High School (n=1,043)	473	48.39			380	31.49	1.06 (0.60, 1.86)	.846	122	12.06	0.98 (0.50, 1.92)	.958	68	8.06	1.92 (0.74, 4.98)	.181
At least some college (reference, n=596)	248	47.91			214	34.03			80	12.98			31	5.08		
Single parent household																
Yes (n=908)	405	47.69	Reference		319	31.40	0.72 (0.46, 1.12)	.145	108	11.68	1.27 (0.75, 2.12)	.371	76	9.23	1.17 (0.70, 1.95)	.540
No (reference, n=1,569)	678	46.25			603	34.37			191	11.31			97	8.08		
Parental Psychopathology																
Yes (n=827)	372	46.81	Reference		303	33.37	1.02 (0.82, 1.26)	.885	99	11.79	1.02 (0.80, 1.31)	.858	53	8.03	0.93 (0.68, 1.27)	.642
No (reference, n=1,641)	707	46.94			617	33.03			197	11.19			120	8.84		
SES																
Below federal poverty level (n=1,712)	722	46.37	Reference		682	34.77	1.46 (0.44, 1.05)	.086	194	10.62	0.73 (0.83, 2.25)	.223	114	8.24	0.80 (0.73, 2.15)	.420
Above federal poverty level (reference, n=777)	367	48.05			245	29.95			105	12.86			60	9.13		

Note: AOR = adjusted odds ratio; SES = socioeconomic status.

^aThe sample age-corrected class is the reference category.^bModel-weighted and adjusted for sampling design and adjusted for all covariates described in the table.