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EMPIRICAL RESEARCH

Childhood Adversity and Early Initiation of Alcohol Use in Two Representative Samples of Puerto Rican Youth

María A. Ramos-Olazagasti[1] · Héctor R. Bird[1] · Glorisa J. Canino[2] · Cristiane S. Duarte[1]

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Abstract Early alcohol use is associated with multiple negative outcomes later in life, including substance use disorders. Identification of factors related to this very early risk indicator can help inform early prevention efforts. This study prospectively examined the relationship between childhood adversities and early initiation of alcohol use (by age 14) among Puerto Rican youth, the Latino subgroup at highest risk for alcohol use disorders in adulthood. The data come from the Boricua Youth Study, a longitudinal study of Puerto Rican youth in two sites (South Bronx, New York, and the standard metropolitan area of San Juan, Puerto Rico). We focus on youth who were ages 10 and older at Wave 1 [$M_{\text{age at Wave 1}}$ (SE) = 11.64(0.05), $N = 1259$, 48.85 % females]. Twelve childhood adversities were measured at Wave 1 and include 10 adverse childhood experiences commonly studied and two additional ones (exposure to violence and discrimination) that were deemed relevant for this study's population. Early initiation of alcohol use was determined based on youth report at Waves 1 through 3 (each wave 1 year apart). Cox proportional hazards models showed that, when considered individually, adversities reflecting child maltreatment, parental maladjustment, and sociocultural stressors were related to early initiation of alcohol use. Significant gender interactions were identified for parental emotional problems and exposure to violence, with associations found among girls only. Adversities often co-occurred, and when they were considered jointly, physical and emotional abuse, parental antisocial personality, and exposure to violence had independent associations with early alcohol use, with a stronger influence of exposure to violence in girls compared to boys. The accumulation of adversities, regardless of the specific type of exposure, increased the risk for starting to drink at a young age in a linear way. The associations between childhood adversities and early alcohol use were generally consistent across sociocultural contexts, in spite of differences in the prevalence of exposure to adversity. Our findings highlight the importance of targeting multiple adversities and expanding the notion of adversity to capture the experiences of specific groups more adequately.

Keywords Alcohol use initiation · Childhood adversities · Puerto Rican · Latinos · Cumulative risk · Gender differences

Introduction

Prevention efforts to reduce alcohol use disorders will be most successful if focused on very early indicators of future risk. Early initiation of alcohol use, defined as drinking alcohol by age 14, has been identified as a risk factor for multiple problems later in life, including alcohol use disorders (e.g., DeWit et al. 2000), use of illicit drugs (Kandel et al. 1992), sexual risk behaviors (Stueve and O'Donnell 2005), and criminality (Ellickson et al. 2003). Alcohol use problems are not equally distributed among racial/ethnic groups. Hispanics in particular start drinking earlier than other racial/ethnic groups (Centers for Disease Control and

✉ María A. Ramos-Olazagasti
maramos@nyspi.columbia.edu

[1] New York State Psychiatric Institute-Columbia University, 1051 Riverside Dr., Unit #43, New York, NY 10032, USA

[2] Behavioral Sciences Research Institute University of Puerto Rico Medical Sciences Campus, PO Box 365067, San Juan PR 00936-5067, USA

Prevention 2013; Chen and Jacobson 2012). Among Hispanic adults, Puerto Ricans have the highest rates of alcohol use disorders (Alegria et al. 2008). Identifying risk factors for early alcohol use among Puerto Rican youth can help inform early detection and prevention of alcohol use and other problems in this high-risk population. This study aimed to test the association between exposure to childhood adversity and early initiation of alcohol use among Puerto Rican youth living in two sociocultural contexts (South Bronx (SB), New York, and the metropolitan area of Puerto Rico (PR)), and to examine whether associations differed by gender and sociocultural context.

Adversity Exposure and Early Alcohol Use

Engagement in risk behaviors like early alcohol use among minority populations should be understood within the context of exposure to adversity and social disadvantage. Racial/ethnic minorities often experience poverty and minority-related stressors that influence their mental health and can disrupt family dynamics (Kiser and Black 2005; Mistry et al. 2002; Murry et al. 2001). Specifically, childhood adversities—traditionally conceptualized as experiences of child maltreatment, family dysfunction, and parental loss—are elevated among ethnic minorities (Sledjeski et al. 2009; Vaughn et al. 2015; Mersky 2013). A large body of work has linked exposure to these adversities, particularly child maltreatment, to a range of negative health outcomes in childhood and adulthood, including substance use problems such as heavy drinking, substance use disorder, and marrying an alcoholic (Dube et al. 2002; Evans 2013; Kessler et al. 1997; Kristman-Valente and Wells 2013; McLaughlin et al. 2012; Pilowsky et al. 2009). However, relatively little is known about their influence on the beginnings of problematic alcohol use, particularly early initiation of alcohol use. Adversities specifically linked to early alcohol use include loss of a parent (Rothman et al. 2008; Dube et al. 2006), child maltreatment (Rothman et al. 2008; Dube et al. 2006; Hamburger et al. 2008), domestic violence (Dube et al. 2006), parental substance use (Rothman et al. 2008; Dube et al. 2006), parental psychopathology (Dube et al. 2006; Rothman et al. 2008), and parental criminality (Dube et al. 2006).

Most studies examining how childhood adversities relate to different outcomes have been conducted in predominantly White samples. In these studies, the definition of exposure to adversity is typically constrained to disruptions in the family context. However, there is a growing recognition that specific groups who are overrepresented in disadvantaged environments (e.g., ethnic/racial minorities, those living in poverty) experience additional adversities outside of the family environment that are not typically considered within the adverse childhood experience (ACE) framework (Cronholm et al. 2015; Finkelhor 2013). For example, two studies that have aimed to expand the definition of childhood adversity to capture a broader range of experiences representative of more diverse groups identified exposure to violence as the most prevalent adversity reported (Cronholm et al. 2015; Finkelhor 2013). One of the studies also assessed experiences of discrimination and found this to be the second most prevalent adversity reported (Cronholm et al. 2015). These experiences are not typically included when childhood adversities are examined in samples comprised of mostly White individuals, even though they might be related to increased risk taking. There is some evidence that these experiences represent an important dimension of ethnic/racial minority exposure to adversity, being more strongly associated with problem behaviors than the conventional childhood adversities (Finkelhor 2013). Both exposure to violence and experiences of discrimination have been associated with externalizing and internalizing problems in general, as well as substance use, in diverse samples (Davis 2016; Fagan et al. 2013; Gilbert and Zemore 2016; Ramos-Olazagasti et al. 2013; Rivera et al. 2011; Schwartz et al. 2015; Unger et al. 2014). However, their relative influence in light of other, co-occurring adversities is unknown.

Childhood adversities tend to co-occur (Dong et al. 2004), particularly among disadvantaged populations (Mersky 2013), yet they are often examined in isolation. For example, several studies have focused on the relationship between childhood maltreatment and substance use problems, but without considering additional adversities that children might experience inside or outside the household (Kristman-Valente and Wells 2013; Miller and Mancuso 2004). This approach fails to capture the constellation of adverse experiences that children are exposed to, whether specific adversities represent unique risks above and beyond the presence of co-occurring adversities, and how experiencing multiple risks influences health outcomes. Some argue that the accumulation of adversities may be more important than any specific risk in leading to problem behavior (Rutter 1979; Sameroff et al. 1998). Two studies provide support for the relationship between the accumulation of childhood adversities and early alcohol use (Dube et al. 2006; Rothman et al. 2008). Both studies found a dose-response association: as the number of childhood adversities increased, so did the probability of drinking by age 14.

Even though previous studies support the notion that childhood adversities may influence the very early stages of the development of problematic alcohol use, these studies, along with most of the extant research on childhood adversities, are limited by their reliance on retrospective reports of both childhood adversities and outcomes, sometimes spanning a 20-year recall period, which can

compromise the accuracy of the reports (Della Femina et al. 1990; Parra et al. 2003). Bias in retrospective reports of age of onset of substance use increases with age and is larger for those with earlier onsets (Parra et al. 2003). Additionally, studies that retrospectively measure childhood adversities and the outcome are unable to shed light on the direction of the association between variables. This is problematic because reverse associations between childhood adversities and deviant outcomes are possible: children's behaviors can influence parenting behaviors (e.g., physical punishment) (Pardini et al. 2008) and deviant children might seek environments where exposure to adversity (e.g., violence) is high. Additionally, most studies have assumed a linear relationship between the accumulation of childhood adversities and maladaptive outcomes, where each additional adversity is related to a higher probability of having negative outcomes. However, marked increases in the risk for negative outcomes at critical levels of exposure to risks (e.g., two and four or more adversities) have been suggested (Rutter 1979). Alternatively, prior adversities could desensitize individuals to the effect of subsequent stressors (Gerard and Buehler 1999). Both alternatives suggest nonlinear associations that have rarely been tested.

Gender, Adversity Exposure, and Alcohol Use

Despite there being clear gender differences in alcohol use disorders later in adulthood (Haberstick et al. 2014; Nolen-Hoeksema and Hilt 2006), the degree to which boys and girls differ in their vulnerability to early alcohol use following exposure to childhood adversity remains largely unknown. This dearth of knowledge on the role of gender in the relationship between exposure to adversity and alcohol use in general is partly due to studies having inadequate sample sizes to test for gender differences, studies focusing exclusively on one gender, or the failure to test for gender differences even when it was possible to do so (Kristman-Valente and Wells 2013). However, there are reasons to believe that there may be gender differences in how youth react to exposure to adversity. On the one hand, girls and boys cope with stressors differently, with girls relying on avoidance coping strategies more often than boys (Matud 2004). This type of coping strategy is associated with increased alcohol use (Feil and Hasking 2008). On the other hand, girls tend to have a stronger emotional response to family and interpersonal stressors than boys (Oldehinkel and Bouma 2011). There is evidence that child maltreatment, maternal depression, and marital discord are more strongly related to internalizing problems in girls than boys (Davies and Lindsay 2004; Goodman et al. 2011; Maschi et al. 2008; Tolin and Foa 2006), which may also place them at increased risk of engaging in risk behaviors like alcohol use (Nolen-Hoeksema 2004). Family processes that protect youth from engaging in risk behaviors (e.g., monitoring, supervision, social support) are likely to be disrupted as a result of childhood adversities. However, the impact of these disruptions on future risk might vary by gender. For example, Marshal and Chassin (2000) found that parental support and consistency in discipline mitigated the negative influence of peer pressure to use substances in girls but not boys. A greater sensitivity to interpersonal stressors in girls has also been identified in individuals' biological responses to stress, specifically in the hypothalamic–pituitary–adrenal axis, with greater cortisol responses as a result of exposure to social stressors in girls (Westling et al. 2008).

The few studies that have tested whether the relationship between childhood adversities and substance use outcomes in general is moderated by gender have generated mixed results (for a review on child maltreatment specifically, see Kristman-Valente and Wells 2013). When gender differences are found, they generally indicate stronger associations between different forms of adversity and substance use outcomes in females than males (e.g., Lansford et al. 2010; Pirkola et al. 2005; Widom et al. 1995, 2006, 2007). Of note, some of these conclusions have been inferred by results from analyses examining associations separately for each gender, but without formal tests for significance, which limits our interpretation of the findings. Furthermore, some studies combine alcohol and drugs, and to our knowledge, only one study has examined this question specifically for early alcohol use (defined as occurring before age 13) in a school-based sample of adolescents (Hamburger et al. 2008). The study examined gender differences in how domestic violence, physical abuse, and sexual abuse related to early alcohol use and found no difference, but the cross-sectional analyses were restricted to adolescents who had ever had alcohol, limiting the generalizability of the findings. Identifying whether there are gender differences in how exposure to adversity is related to the timing of early adolescents' initiation of alcohol use will help inform prevention interventions that focus on early indicators of future risk for alcohol use problems.

Sociocultural Context

It is unknown whether the relationship between childhood adversities and health outcomes in general, and early alcohol use in particular, is uniform across sociocultural contexts. It is possible that the influence of exposure to adversity on individual outcomes might vary depending on how prevalent exposure to adversity is. According to relative deprivation models (Wood 1989), individuals have a need to compare themselves to others in their surroundings, suggesting that their reactivity to childhood adversities might vary depending on how common exposure to

adversities is in their environment. For example, in a study conducted by Gerard and Buehler (2004), the authors found stronger associations between a cumulative risk index and youth's internalizing and externalizing symptoms in White youth than Black youth, who experienced more adversity than White youth. Even within the same ethnic/racial group, the prevalence of exposure to adversity can vary by sociocultural context. Individuals in contexts where they belong to the minority group experience more adversity than those in contexts where they belong to the dominant group (e.g., Ramos-Olazagasti et al. 2013; Sledjeski et al. 2009). The relative importance of specific adversities might also vary by sociocultural context. As previously stated, certain adversities might be particularly relevant in some contexts, like discrimination and exposure to violence for those living in contexts where they are part of the minority group. Lastly, sociocultural contexts may also vary in the resources available to help youth cope with stressful events, creating different propensities for engaging in risky behavior.

The meaning and consequences of early alcohol use might also vary by sociocultural context. Social norms, motives, and regulations around drinking behavior, as well as the accessibility of alcohol, vary by context (Kuntsche et al. 2006). Such differences might influence how likely early alcohol use is to occur and how it is perceived in society. For example, social norms around drinking in places like PR do not sanction alcohol use as it is considered an acceptable behavior, particularly among males, and it is culturally embedded into social activities (Canino et al. 1992). Interestingly, different drinking patterns of substance use onset have been observed between Puerto Rican youth living in the island and Hispanic youth in the United States, with higher rates of alcohol use in PR, but lower rates of tobacco and illicit drug use, when compared to Hispanics in the United States (Maldonado-Molina et al. 2007). To our knowledge, no study has assessed whether the association between childhood adversities and alcohol use and misuse within the same ethnic group varies depending on the sociocultural context within which adversities occur.

The Current Study

Early initiation of alcohol use represents an early risk indicator for future problems, including alcohol use disorder (de Wit 2009). Exposure to adverse childhood experiences has been implicated in the development of alcohol use problems later in life, but their influence on the beginnings of problematic alcohol use has been less studied. In the present study, we examine the association between exposure to childhood adversity and early initiation of alcohol use (by the age of 14) among Puerto Rican youth, a high-risk group for alcohol use disorder. Data are from a longitudinal study of Puerto Rican youth in two sociocultural contexts (PR and the SB). The two sociocultural contexts differ in the legal drinking age—in PR, the minimum drinking age is 18, whereas in New York alcohol consumption under the age of 21 is considered illegal—which might influence how deviant early drinking is considered in each sociocultural context. Sociocultural differences in the acceptability of alcohol use might influence the extent to which early alcohol use is a reflection of early risk following exposure to stressful and potentially traumatic experiences, or merely a socially accepted behavior. This study's two-site design allows us to compare whether associations between childhood adversities and early initiation of alcohol use are similar across two sociocultural contexts that differ in the prevalence of exposure to adversity, social norms around alcohol use, and patterns of substance use.

This study addresses several limitations of past research on childhood adversities. Unlike most studies that have relied on long, retrospective recall of both childhood adversities and outcome, this study tests the relationship between childhood adversities and early initiation of alcohol use prospectively. We test alternative specifications of multiple and cumulative risks to examine the relative influence of specific childhood adversities on early alcohol use above and beyond the presence of other, co-occurring, adversities, and the shape of the association between the accumulation of childhood adversities and early alcohol use. We also test whether the association between childhood adversities and early alcohol use varies by gender and sociocultural context. We expected childhood adversities to be individually and independently associated with early alcohol use, above and beyond the presence of other adversities (Hypothesis 1). Past research has suggested a dose-response association between the accumulation of childhood adversities and negative outcomes. Thus, we hypothesized that the accumulation of childhood adversities would be linearly related to early alcohol use (Hypothesis 2); however, we test for curvilinear effects because alternative model specifications indicating a spike in risk or desensitization after critical levels of risk have been suggested, but not formally tested. Limited evidence exists regarding gender differences in how childhood adversities relate to alcohol use behavior, but what is available suggests stronger associations in females. We hypothesized that if gender differences were found in the associations between childhood adversities and early alcohol use, stronger associations would be found in girls (Hypothesis 3). We explored whether associations were consistent across two sociocultural contexts, but did not advance any hypotheses about the direction of the differences as there are conceptual reasons suggesting that there may be differences, but these may go in either direction.

Two articles using the same data set have identified predictors of initiation of alcohol use in a subset of the sample (those who had never had alcohol at Wave 1). One focused on depressive symptoms (Wu et al. 2006) and another on trauma and post-traumatic stress disorder symptoms (Wu et al. 2010). Our study adds to the previous articles by focusing on the timing of initiation of alcohol use, specifically, *early* (by age 14) initiation, a strong indicator of future risk (DeWit et al. 2000), by considering childhood adversities in the context of multiple and cumulative risks, and by examining the role of gender and sociocultural context in these associations.

Methods

Sample

The Boricua Youth Study is a longitudinal study of Puerto Rican children living in the South Bronx, New York, and in the Standard Metropolitan Area of San Juan and Caguas, PR. The study design and procedures are detailed elsewhere (Bird et al. 2006, 2007). Briefly, each sample is a multistage probability sample representative of the target areas according to the 1990 Census. Household eligibility criteria were: presence of a child aged 5 through 13 years at enumeration and the child and at least one parent identifying as Puerto Rican. Up to three children per household were randomly selected to participate in the study. Children with severe developmental delays and those who had not lived in the household in the past 9 months were ineligible to participate. A primary caretaker (89 % were biological mothers) and children were assessed yearly for 3 years between 2000 and 2004. Retention rates at the third assessment were very high (85.6 % in SB and 89.7 % in PR) (Bird et al. 2007). The current study focuses on children who were 10–13 years old at Wave 1 ($N = 1271$), for whom detailed data on substance use was collected. Eleven participants were dropped because their reported age at first drink was too young to be considered reliable (<7 years). The resulting sample size was 1259 youth (48.85 % females; 46.70 % from SB; $M_{\text{age at Wave 1}}$ (SE) = 11.64 (0.05)). Across the two sites, 67.63% of the sample had income levels that were at or below the federal poverty line. Among children in the SB, 35.26 % were living in households where both parents were born in PR or another Latin American country, 30.16 % had at least one parent who was born in the United States, and 34.58 % had two parents who were US-born. The majority of the children in the SB were born in the US (87.19 %).

Interviews were conducted in Spanish or English in the participants' homes by trained laypersons that had at least a high school diploma. Interviews were computerized and participants had the option of switching languages at any time during the interview. To ensure privacy, parents and children were interviewed separately and privately, preferably at the same time by different interviewers. Parents provided informed consent and youth signed assent forms. The Institutional Review Boards of the New York State Psychiatric Institute and the University of Puerto Rico Medical School approved all procedures.

Measures

Early Initiation of Alcohol Use

Alcohol use was assessed at every wave through youth report to the alcohol abuse module of the Diagnostic Interview Schedule for Children, Version IV (Shaffer et al. 2000; Bravo et al. 1993) and interview questions about lifetime alcohol use. Among youth who reported having had alcohol at Wave 1, age at initiation of alcohol use was determined by their reports of age at first use. For those who reported no alcohol use at Wave 1, but reported using alcohol at Waves 2 or 3, we used the youth's age at the interview when they first reported alcohol use as their age at initiation. Early alcohol use was defined as having a full can or bottle of beer, a glass of wine or wine cooler, a shot of liquor, or a mixed drink with liquor in it, not just a sip from someone else's drink, by age 14.

Childhood Adversities

Twelve childhood adversities were assessed at Wave 1. Ten of these were part of the Adverse Childhood Experiences Study (Felitti et al. 1998; Anda et al. 1999). Two adversities (discrimination and exposure to violence) were added, given their sociocultural relevance. Adversities represent four domains: parental loss (death and divorce/separation), child maltreatment (neglect and physical, sexual, and emotional abuse), parental maladjustment (intimate-partner violence, antisocial personality, substance use problems, and emotional problems), and sociocultural stressors (discrimination and exposure to violence). Table 1 describes the childhood adversities and the criteria used to determine the presence or the absence of each adversity, which we coded as a binary variable. Parents reported on background characteristics and family psychiatric history according to the Family Psychiatric Screening Instruments for Epidemiologic Studies, which has been validated as a good screener for adult psychiatric disorders in epidemiologic studies (Lish et al. 1995). To create a probable diagnosis of antisocial personality disorder in the parent, items from the Family Psychiatric Screening Instruments for Epidemiologic Studies were combined with 20 additional items that were created for the current study based on the DSM-IV criteria

Table 1 Prevalence and co-occurrence of childhood adversities among Puerto Rican youth ($N = 1259$)

Childhood adversity	Number of items (description, risk status criterion)	Prevalence		Proportion with ≥ 2 adversities[a]		Proportion with ≥ 4 adversities[b]		No. of other childhood adversities among respondents with specific childhood adversity	
		%	(SE)	%	(SE)	%	(SE)	Mean	(SE)
Parental loss									
Death	Four items (biological mother or father are deceased)	7.53	(1.19)	79.69	(5.97)	27.21	(4.38)	2.02	(0.22)
Divorce/separation	Four items (biological mother and father are currently divorced or separated)	63.97	(2.15)	70.83	(1.88)	25.83	(2.33)	1.61	(0.08)
Maltreatment									
Neglect	Four items (left alone more than once, or ever (a) left without food, (b) did not take to doctor/hospital, or (c) parents so drunk/high that couldn't care for you)	5.24	(0.72)	92.59	(4.56)	60.70	(7.62)	2.85	(0.26)
Physical abuse	Four items (e.g., "Beat you up very hard?", ever experienced any)	13.68	(1.10)	97.78	(1.20)	52.69	(5.07)	2.79	(0.14)
Sexual abuse	Three items (e.g., "Has anyone ever tried to touch you, grab you, or kiss you in a sexual way, or has done something sexual that made you feel afraid, bad or used?", ever experienced any)	4.68	(0.81)	94.49	(3.56)	55.21	(8.87)	2.66	(0.27)
Emotional abuse	Two items (e.g., "Sworn or cursed at you?", ever experienced any more than once)	22.69	(1.44)	93.85	(2.07)	49.07	(4.46)	2.60	(0.14)
Parental maladjustment									
Intimate partner violence	One item ("Do you ever hit each other when you argue?", ever)	1.50	(0.43)	91.07	(8.51)	21.98	(7.93)	1.97	(0.24)
Antisocial personality	Twenty stem questions based on the DSM-IV + 1 item from FHE (probable or definite diagnosis any parental figure)	16.52	(1.45)	97.11	(1.45)	57.86	(3.94)	2.95	(0.14)
Substance use problems	Two items (any parental figure has ever had, or been thought to have a (a) drinking or (b) drug problem)	14.27	(1.25)	96.62	(1.52)	61.59	(4.44)	3.01	(0.15)
Emotional problems	Three items (any parental figure has ever: (a) had, (b) been seen by a health professional for, or (c) received medication for, a serious mental illness, emotional problem, or nervous breakdown?)	25.44	(1.89)	90.57	(1.98)	41.14	(3.37)	2.37	(0.11)
Sociocultural stressors									
Discrimination	Five items (e.g., "Other people have treated you badly because of your race, your skin color or where you come from", ever experienced any)	26.00	(1.47)	88.61	(2.22)	32.56	(3.99)	2.14	(0.14)
Exposure to violence	Ten items (e.g., "Being chased by gangs or individuals", any happened to self)	16.58	(1.25)	95.53	(1.68)	43.74	(4.66)	2.52	(0.13)

DSM Diagnostic and Statistical Manual of Mental Disorders *FHE* Family Psychiatric Screening Instruments for Epidemiologic Studies

for diagnosing antisocial personality disorder. Traditionally, only parental involvement in the criminal justice system is considered to indicate the presence of this type of adversity, however, we believe that this measure is a more comprehensive indicator of parental deviance and less susceptible to racial/ethnic biases in "stop and frisk" practices. Youth reported on experiences of neglect, physical abuse, and emotional abuse using a child-adapted version of the Parent–Child Conflict Tactics Scale (Straus et al. 1998), which has been used in large, epidemiologic studies (Goodman et al. 1998), and whose internal consistency in the current sample has been documented elsewhere ($\alpha = .67$) (Feldman et al. 2010). Youth also reported on experiences of sexual victimization by responding to items from the Sexual Victimization Scale developed by Finkelhor and Dziuba-Leatherman (1994). For all experiences of maltreatment, youth indicated the frequency in which they experienced the different events (range, 0 = never happened, 3 = more than 5 times). Exposure to violence was assessed through youth's report of witnessing, being a victim, or knowing someone exposed to several violent acts (Raia 1995; Richters and Martinez 1993). Discrimination was also assessed through youth's report of unfair treatment due to their race, skin color, where they come from, language/accent, and social class (0 = rarely or never, 1 = sometimes or often), using items derived from the Hispanic Stress Inventory, a culturally appropriate measure of psychosocial stress with high internal consistency and test-retest reliability (Cervantes et al. 1991). The childhood adversity index sums the number of childhood adversities reported (range 0–12).

Data Analytic Strategy

Cox proportional hazards models were used to test associations between childhood adversities measured at Wave 1 and time to first alcohol use through age 14. We censored observations for youth who started using alcohol after age 14, those who had not had any alcohol by their last wave of assessment, and those who had not yet turned 14 by the end of the study and had not started to drink alcohol.

We first tested the association of childhood adversities with early alcohol use in the entire sample, and then stratified by gender to identify possible differential associations. We tested each childhood adversity in a different model to understand how individual risks predicted early alcohol use, adjusting for gender, sociocultural context (site), age, and poverty (partially adjusted analyses). To test whether gender and sociocultural context moderated the association between childhood adversities and early alcohol use, we created gender × childhood adversity and site × childhood adversity interaction terms and added these to the models. For descriptive purposes, we also present analyses on childhood adversities and early alcohol use stratified by gender. We examined the association between an individual childhood adversity and early alcohol use, above and beyond the presence of other adversities, in a fully adjusted model. In the interest of parsimony, we only included main effects and interaction terms that reached significance ($p < .05$) in the partially adjusted models. We tested the association between the accumulation of adversities and early alcohol use in two ways: one treating the childhood adversities as a categorical variable, and one treating it as a continuous variable that could be squared to test the shape of the association between the childhood adversity index and early alcohol use.

Analyses were conducted in SAS 9.4 according to their survey procedures to take into account the study's complex design (clustering of households within primary sampling units) (Mukhopadhyay 2010). Variances that take into account the nested structure of the data were estimated using the Taylor series linearization method. Analyses also incorporate design weights that adjust for the differential probability of selection into the study and differences in the age and gender distributions between the 1990 and the 2000 Census.

Results

Prevalence and Co-Occurrence of Childhood Adversities

Table 1 shows the weighted prevalence of childhood adversities and their co-occurrence with other adversities. The most prevalent childhood adversities were parental divorce/separation (64.0 %), discrimination (26.0 %), and parental emotional problems (25.4 %). Adversities were highly prevalent among these groups of Puerto Rican youth ($M(SE) = 2.13(0.06)$), and in most cases, they did not occur in isolation (see Table 4): only 12.93 % experienced no adversity, 58.52 % experienced at least two adversities, and 18.22 % experienced four adversities or more. The last column in Table 1 shows the mean number of additional childhood adversities that children experienced for each childhood adversity. Parental substance use problems and antisocial personality in particular, tended to co-occur with three other adversities, on average.

Figure 1 shows the distribution of the childhood adversity index by gender and sociocultural context. Girls [$M(SE) = 2.10(0.08)$] and boys [$M(SE) = 2.16(0.08)$] did not differ in the mean number of childhood adversities experienced ($t = 0.56$, $p = .57$), but boys were more likely to experience neglect (6.85 % vs. 3.67 %, $\chi^2 = 4.19$, $p < .05$), physical abuse (17.85 % vs. 9.57 %, $\chi^2 = 7.81$, $p < .01$), and exposure to violence (20.46 % vs. 12.77 %, $\chi^2 = 9.83$, $p < .01$) whereas girls were more likely to be in households with a parent who had antisocial personality (19.03 % vs.

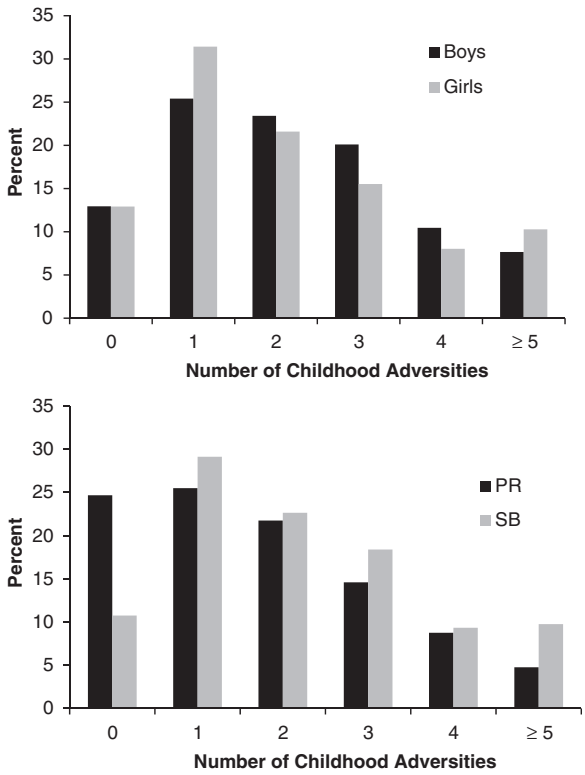

Fig. 1 Number of childhood adversities by gender and sociocultural context. *SB* South Bronx, *PR* Puerto Rico

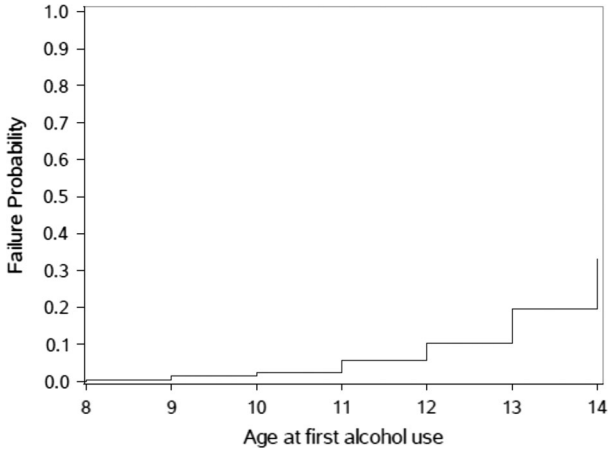

Fig. 2 Cumulative risk for starting to drink alcohol by age 14. *Note*: There were no significant differences by gender (Hazard Ratio = 0.98 [0.71;1.36]) or sociocultural context in the hazard for early alcohol use (Hazard Ratio = 0.94[0.73;1.21])

14.03 %, $\chi^2 = 3.77$, $p = .05$) and to experience discrimination (29.48 % vs. 22.45 %, $\chi^2 = 4.96$, $p < .05$). Youth in SB experienced more adversities [M(SE) = 2.20(0.07)] than those in PR [M(SD) = 1.74(0.07)] ($t = 4.95$, $p < .001$). Parental death (8.17 % vs. 4.10 %), parental divorce/separation (68.27 % vs. 41.83 %), physical abuse (14.29 % vs. 10.46 %), and emotional abuse (25.25 % vs. 8.99 %) were more prevalent in SB (p's < .05).

Early Initiation of Alcohol Use

Figure 2 shows the Kaplan–Meier estimate of the inverse of the survival function (the failure function), or the probability of starting to drink at each age, through age 14. The probability of starting to drink by age 14 was 33.11 %. Early alcohol use did not differ significantly by gender (Hazard Ratio = 0.98[0.71;1.36]) or sociocultural context (Hazard Ratio = 0.94[0.73;1.21]).

Specific Childhood Adversities and Early Initiation of Alcohol Use

Individual Childhood Adversities

Partially adjusted models (adjusted by gender, sociocultural context, age, and poverty) in Table 2 show the associations between childhood adversities and early alcohol use when examined separately. Results are shown in the entire sample, and stratified by gender. Overall, physical and emotional abuse, parental antisocial personality, parental substance use problems, and exposure to violence were positively associated with early alcohol use, with emotional abuse having the strongest association with early alcohol use, increasing its risk by 139 %. In addition, among girls, those who reported experiences of neglect and whose parents had emotional problems experienced a 3.07 and 1.72 higher risk of early alcohol use than those who did not report these adversities. In boys, only physical abuse, emotional abuse, and parental antisocial personality increased the hazard of early alcohol use by 91%, 110% and 95 %, respectively. Even though effect sizes for all childhood adversities were larger in girls than boys, there were only two significant interactions between gender and specific childhood adversities detected: with emotional problems and exposure to violence.

There was only one significant interaction between sociocultural context and childhood adversities, with sexual abuse (Hazard Ratio = 0.35[0.15;0.85], $p < .05$), which was positively associated with early alcohol use in PR only (Hazard Ratio = 3.37[2.07;5.50], $p < .001$).

Multiple Childhood Adversities

Fully adjusted analyses were conducted in the entire sample and included childhood adversities that had a significant main effect or interaction effect in the partially adjusted models (Table 3). Physical abuse, emotional abuse, and parental antisocial personality continued to be significantly related to early alcohol use, above and

Table 2 Partially adjusted survival models predicting early initiation of alcohol use from childhood adversities

Childhood adversity	Main effects entire sample		Main effects girls		Main effects boys		Significant interactions with gender	
	Hazard Ratio [CI]	*p*	Hazard Ratio [CI]	*p*	Hazard Ratio [CI]	*p*	Hazard Ratio [CI]	*p*
Parental loss								
Death	1.20 [0.71;2.01]	.49	0.76 [0.36;1.61]	.48	1.80 [0.93;3.47]	.08	0.41 [0.15;1.13]	.08
Divorce/separation	1.10 [0.82;1.48]	.51	1.29 [0.79;2.12]	.31	0.97 [0.64;1.48]	.89	1.28 [0.65;2.52]	.48
Maltreatment								
Neglect	1.52 [0.84;2.74]	.17	3.07 [1.21;7.78]	.02	1.16 [0.54;2.49]	.71	2.20 [0.65;7.46]	.20
Physical abuse	2.11 [1.46;3.04]	<.0001	2.77 [1.82;4.23]	<.0001	1.91 [1.19;3.06]	.01	1.45 [0.82;2.59]	.20
Sexual abuse	1.44 [0.77;2.68]	.25	1.77 [0.85;3.71]	.13	1.23 [0.52;2.93]	.64	1.47 [0.47;4.60]	.51
Emotional abuse	2.39 [1.84;3.12]	<.0001	2.70 [1.81;4.04]	<.0001	2.10 [1.37;3.24]	.001	1.38 [0.75;2.55]	.31
Parental maladjustment								
Intimate-partner violence	1.42 [0.52;3.92]	.50	1.84 [0.51;6.72]	.35	1.03 [0.33;3.24]	.96	1.92 [0.31;11.72]	.48
Antisocial personality	2.09 [1.49;2.95]	<.0001	2.22 [1.37;3.58]	.001	1.95 [1.18;3.23]	.009	1.15 [0.57;2.30]	.69
Substance use problems	1.55 [1.07;2.25]	.02	1.81 [1.10;2.98]	.02	1.38 [0.80;2.38]	.25	1.30 [0.62;2.71]	.49
Emotional problems	1.22 [0.92;1.61]	.17	1.72 [1.11;2.66]	.02	0.89 [0.57;1.38]	.59	1.93 [1.01;3.69]	.05
Sociocultural stressors								
Discrimination	1.19 [0.85;1.68]	.32	1.14 [0.70;1.86]	.59	1.17 [0.69;1.96]	.56	1.01 [0.50;2.07]	.97
Exposure to violence	1.64 [1.16;2.33]	.006	2.63 [1.68;4.14]	<.0001	1.06 [0.68;1.66]	.80	2.67 [1.48;4.82]	.001

Notes: Each childhood adversity was tested in a separate model, adjusting for age, site, and poverty. Analyses in the entire sample also adjust for gender

Table 3 Mutually adjusted survival models predicting early initiation of alcohol use from childhood adversities

	Hazard Ratio [CI]	*p*
Maltreatment		
Physical abuse	1.68 [1.16;2.44]	.01
Sexual abuse	2.16 [1.15;4.07]	.02
Sexual abuse * SB	0.42 [0.16;1.06]	.07
Emotional abuse	1.77 [1.34;2.35]	.0001
Parental maladjustment		
Parental antisocial personality	1.66 [1.07;2.57]	.02
Parental substance use problems	1.00 [0.62;1.61]	.99
Parental emotional problems	0.88 [0.56;1.39]	.61
Parental emotional problems * girl	1.43 [0.75;2.71]	.27
Sociocultural stress		
Exposure to violence	0.83 [0.51;1.34]	.45
Exposure to violence * girl	2.55 [1.39;4.68]	.003

Notes: Analyses adjust for age, site, gender, and poverty

beyond the presence of co-occurring childhood adversities, with small to medium effect sizes showing increases in risk of 60%, 78%, and 66 %, respectively. The interaction between exposure to violence and gender also remained significant (Hazard Ratio = 2.55[1.39;4.69], $p < .01$). Stratified analyses by gender indicated that in girls, exposure to violence increased the risk for early alcohol use by 105 % (Hazard Ratio = 2.05[1.27;3.30], $p < .01$), but there was no association in boys (Hazard Ratio = 0.88 [0.53;1.44], $p = .61$).

Childhood Adversity Index and Early Initiation of Alcohol Use

Table 4 shows the association between the number of adversities reported and early initiation of alcohol use. When considered categorically, experiencing four or five or more adversities was associated with increases in the likelihood of starting to use alcohol early. Even though in stratified analyses these associations were significant in girls only, interactions between the number of childhood adversities and gender were not significant. When considered as a continuous measure, we found a dose-response association between the number of childhood adversities and early initiation of alcohol use in both girls and boys. Overall, with each adversity reported, the estimated hazard for early alcohol use increased by 28 %. We tested a quadratic model to evaluate whether there was a curvilinear relationship between the number of childhood adversities and early alcohol use, but the quadratic effect was not significant for either gender. The association between the childhood adversity index and early alcohol use did not vary by sociocultural context (Hazard Ratio = 1.10[0.97;1.25], $p = .12$).

Table 4 Association between the accumulation of childhood adversities and early initiation of alcohol use

	Prevalence	Entire sample ($N = 1259$)		Girls ($n = 615$)		Boys ($n = 644$)		Interaction with gender	
	% (SE) or Mean (SE)	Hazard Ratio [CI]	p	Hazard Ratio [CI]	p	Hazard Ratio [CI]	p	Hazard Ratio [CI]	p
Childhood adversity index (categorical)									
0 (Ref.)	12.93 (1.12)	–		–		–			
1	28.55 (1.59)	1.12 [0.69;1.84]	.64	1.70 [0.70;4.13]	.24	0.78 [0.41;1.49]	.45	2.11 [0.67;6.58]	0.20
2	22.50 (1.52)	1.44 [0.84;2.47]	.18	1.75 [0.70;4.40]	.23	1.26 [0.62;2.54]	.52	1.40 [0.43;4.59]	0.58
3	17.80 (1.25)	1.72 [0.97;3.05]	.07	2.09 [0.77;5.66]	.15	1.54 [0.79;3.02]	.21	1.33 [0.43;4.14]	0.62
4	9.24 (0.78)	2.78 [1.63;4.74]	.001	5.03 [1.99;12.71]	.001	1.79 [0.94;3.39]	.07	2.91 [0.94;9.01]	0.06
5 or more	8.98 (1.12)	3.28 [1.98;5.44]	.0001	4.99 [2.20;11.28]	.0001	2.11 [0.91;4.89]	.08	2.39 [0.70;8.14]	0.16
Childhood adversity index	2.13 (0.06)	1.28 [1.19;1.37]	.0001	1.31 [1.21;1.43]	.0001	1.22 [1.06;1.41]	.005	1.09 [0.92;1.29]	0.34
Childhood adversity index squared	–	1.02 [0.98;1.05]	.46	1.00 [0.95;1.05]	.92	1.02 [0.94;1.11]	.65	–	–

Notes: Models are adjusted for age, gender, site, and poverty

Sensitivity Analyses

We conducted several sensitivity analyses to test the robustness of our findings. First, because families in the SB might differ systematically from those in PR, it could be argued that tests of sociocultural differences in how childhood adversities relate to outcome are the result of sampling biases that distinguish families that migrated from those who remained in the island. To examine if this was the case, we carried additional analyses on the final model that included multiple childhood adversities, controlling for propensity scores that were created to adjust for self-selection into place of residence. Results were essentially the same as those reported in this article (all available upon request). Second, our analyses eliminated 11 participants whose reported age of onset of alcohol use was before the age of 8 as these were considered to be unreliable. We reran the final model only excluding participants who reported extremely low ages of onset (less than 5 years old, $n = 2$). The overall pattern of results remained the same, but the interaction between sexual abuse and sociocultural context remained significant in these analyses, and the association between parental antisocial personality and early alcohol use dropped in significance to a trend ($p = .056$). Third, our data allowed us to obtain a more comprehensive measure of parental antisocial behaviors and deviance than the indicator that is typically used in the conventional childhood adversities (parental incarceration). This measure has the advantage that it is less susceptible to known racial/ethnic biases in "stop-and-frisk" (e.g., Gelman et al. 2007) and in that it captures other forms of antisocial behaviors, but it compromises our ability to compare our findings to what others have found. Thus, we repeated the analyses using a variable that only reflects involvement in the criminal justice system (ever been arrested, put in jail, or convicted of a crime other than drunk driving) and found similar results, with an even larger effect size (Hazard Ratio = 1.93[1.18;3.15], $p < .01$).

Discussion

Even though the long-term negative sequelae of exposure to childhood adversities, traditionally conceptualized as experiences of maltreatment, parental loss, and family dysfunction, including an increased risk for alcohol abuse in adulthood (Dube et al. 2002), has been well established (Felitti et al. 1998), knowledge about their influence on very early and preventable risk behaviors like early initiation of alcohol use is limited. Additionally, shortcomings of past work include a focus on predominantly White samples that do not capture the diverse experiences of other groups and reliance on retrospective recall over long periods of time. Even though childhood adversities tend to co-occur, most

research has examined childhood adversities individually, obscuring their relative contribution above and beyond the presence of other adversities. The question of whether the negative influence of exposure to adversity is uniform across genders and sociocultural contexts also remains largely unknown. This study aimed to address these limitations by conducting a prospective analysis aimed at informing alcohol prevention models by testing the relationship between childhood adversities and early (by age 14) initiation of alcohol use among Puerto Rican youth, a high-risk group for the future development of alcohol use disorder. Data came from the Boricua Youth Study, a longitudinal study of Puerto Rican youth in two sociocultural contexts (South Bronx, New York, and the standard metropolitan area of Puerto Rico). We examined different models of multiple and cumulative risk in order to capture the co-occurrence of adverse experiences. Analyses tested for gender differences to clarify whether risk processes for early alcohol use are similar for boys and girls. We expanded the conventional definition of childhood adversity in order to capture additional sources of adversity experienced by groups living in minority or disadvantaged contexts, and explored whether associations differ by sociocultural context.

Experiencing multiple adversities was common in the two groups of Puerto Rican youth. The proportion of children that reported any childhood adversity was very high (87 %), and childhood adversities tended to co-occur. On average, youth who reported an adversity also reported two to three additional ones, and nearly one in five youth reported more than three childhood adversities. The prevalence of each childhood adversity was elevated compared to the general population in the United States (McLaughlin et al. 2012; Child Trends 2013, 2016), even though our sample was younger than other studies reporting prevalence rates of childhood adversities. There were only two exceptions: family violence (2 % vs. 8 %), which was measured through a single item addressing intimate-partner violence in our study, and parental antisocial personality/criminality (14 % vs. 26 %). Of note, the prevalence of different forms of maltreatment (emotional abuse, physical abuse, and neglect) in our sample was two to three times the prevalence among youth in the United States. We should note, however, that differences in data collection methods make it difficult to conclude whether differences are related to how childhood adversities were measured, real differences in exposure to adversity, or other factors that might affect reporting.

When examined independently, we found that childhood adversities reflecting child maltreatment (physical and emotional abuse, neglect), parental maladjustment (antisocial personality, substance use problems, and emotional problems), and sociocultural stressors (exposure to violence) were associated with early alcohol use. Analyses stratified by gender indicated that associations with neglect, parental substance use problems, parental emotional problems, and exposure to violence were only present in girls, although significant interactions with gender were only identified for parental emotional problems and youth's exposure to violence. A lack of significance in the interaction terms could reflect lack of power due to low cell counts; future studies should continue to examine this question to improve our clarity regarding gender differences in how childhood adversities relate to early alcohol use. In analyses that examined each childhood adversity independently, emotional abuse had the strongest association with early alcohol use. This finding is noteworthy given that emotional abuse is often, yet mistakenly, considered to be less harmful than other, more visible, types of abuse (e.g., physical abuse) and is more inconsistently reported than other forms of abuse (Hamarman et al. 2002; Kaplan et al. 1999). Better strategies to identify and intervene in cases of emotional abuse may be warranted.

Because adversities tended to co-occur, we examined different models of multiple and cumulative risks. We found evidence for the unique influence of specific risks even in the presence of other childhood adversities, as well as the cumulative effect that exposure to multiple childhood adversities has on early alcohol use, irrespective of the type of adversity reported. When considered jointly, physical abuse, emotional abuse, parental antisocial personality, and exposure to violence independently predicted early alcohol use; the association of exposure to violence was only significant in girls. Other studies had identified, albeit retrospectively, associations between maltreatment (Dube et al. 2006; Hamburger et al. 2008; Rothman et al. 2008) and parental incarceration with early alcohol use (Dube et al. 2006). Our prospective analyses highlight the importance of these exposures for the initiation of alcohol use, independent of other, correlated adversities. We also found that exposure to violence was prevalent and strongly related to early alcohol use in girls. It is possible that youth exposed to violence use alcohol as a coping mechanism or that those who are in violent environments have greater access to substances and are surrounded by more deviant peers that reinforce negative behaviors (Hong et al. 2014). Importantly, exposure to violence is a dimension of childhood adversity that is often excluded from this literature. Its relevance for early alcohol use in this study suggests that the concept of adversity should be expanded to represent more adequately the ethnic minority experience (Cronholm et al. 2015).

Consistent with the cumulative risk theory (Rutter 1979; Sameroff et al. 1998), we found that as the number of childhood adversities increased, so did the risk for early alcohol use in both boys and girls, regardless of the specific

type of risk reported. However, in contexts where exposure to adversity was very high, experiencing one to three childhood adversities did not increase the risk for early alcohol use significantly. This finding is consistent with relative deprivation models suggesting that individuals undergo self-evaluation processes based on those around them. Unfavorable responses are expected to occur when individuals are in situations of greater disadvantage than those they are drawing comparisons from. Thus, experiencing some adversity in a context where exposure to adversity is not rare might not increase the risk for deviant behavior in a significant way. Other studies have found associations between the number of childhood adversities and early initiation of alcohol use (retrospectively reported), and even single exposures increased the risk for early alcohol use (Rothman et al. 2008; Dube et al. 2006). Overall, we found evidence for a linear association between the accumulation of childhood adversities and early alcohol use, whereby every additional childhood adversity reported increased the likelihood of early alcohol use. We did not find evidence of desensitization (decrease in risk after a certain level) or a distinct spike in risk at a critical level of exposure, as previously suggested (e.g., Rutter 1979; Gerard and Buehler 1999), however our results suggest that there are reasons to be particularly concerned in situations of high accumulation of childhood adversities.

We did not observe gender differences in early alcohol use. However, our findings suggest that young girls might be particularly vulnerable to experiences of childhood adversity. Past studies on gender differences in the relationship between childhood adversities and substance use problems have reported mixed results, but when differences were found, associations tended to be stronger among girls (Pirkola et al. 2005; Widom et al. 2007). To our knowledge, we are the first to test and find indicators that there are gender differences in how specific childhood adversities relate to early alcohol use, a very early indicator of risk for substance use problems and other deviant behaviors. A greater susceptibility to the negative consequences of childhood adversities among girls might reflect gender differences in how youth cope with stress (Cooper 1994; Rothman et al. 2008). Girls tend to use avoidant coping mechanisms that are associated with the use of alcohol (Feil and Hasking 2008; Matud 2004). Gender differences may also be related to girls showing a greater emotional sensitivity to environmental stressors than boys and biological stress responses showing elevations in cortisol levels following exposure to social stressors in girls (Davies and Lindsay 2004; Goodman et al. 2011; Maschi et al. 2008; Oldehinkel and Bouma 2011; Tolin and Foa 2006). A greater vulnerability to maternal emotional problems in girls had been identified for internalizing problems (Goodman et al. 2011), and here, we found that it was extended to early engagement in risk behaviors, specifically the initiation of alcohol use. Interestingly, even though boys were more likely to be exposed to violence than girls, the association between exposure to violence and early alcohol use was only significant among girls. Our measure of exposure to violence combined reports of being a victim of, and witnessing, violence. Others have found that boys are only vulnerable to exposure to violence when they are victimized, whereas girls are equally affected by witnessing or being a victim of violence (Foster et al. 2004), which also supports a greater sensitivity to interpersonal stressors in girls.

Past studies have not directly examined how different sociocultural contexts might be the source of stressors themselves and how the relationship between adversities and maladaptive behaviors might differ depending on the sociocultural context. In our sample, sociocultural stressors (i.e., exposure to violence and discrimination) were prevalent, and youth living in a high-risk context where they were part of an ethnic minority group (Puerto Ricans living in the South Bronx) reported more adversities than those living in a context were they were the majority group (Puerto Ricans living in PR). Early alcohol use, as defined in this study, implies drinking by the time children are in 9th grade in both contexts, but in the South Bronx, it means consuming alcohol at least 7 years before the legal drinking age, and in PR, 4 years before the legal drinking age. In spite of these differences, the prevalence of early alcohol use did not vary by sociocultural context, and was similar to the prevalence of lifetime alcohol use among 14-year-olds in the United States (Center for Behavioral Health Statistics and Quality 2014). Moreover, associations between childhood adversities and early alcohol use were similar across the two study sites, suggesting that the risks associated with childhood exposure to adversity may be generalizable across different sociocultural contexts, despite differences in the prevalence of adversity in the two contexts. This is consistent with Kessler et al.'s (2010) finding that the association between childhood adversities and first onset of psychiatric disorders was similar across high-income, medium-income, and low-income countries, but is inconsistent with relative deprivation models that would suggest weaker associations in contexts where exposure to adversity was more common (Gerard and Buehler 2004; Wood 1989). The one exception was sexual abuse, which was associated with early alcohol use only in PR. This finding is not easy to interpret, due to the low prevalence of sexual abuse and the fact that this adversity rarely occurred in isolation (average 2.7 other childhood adversities occurred among sexually abused children). Considering that underreporting of child maltreatment is higher in PR than in the United States (Ishida et al. 2013), it is possible that sexual abuse in PR has more severe consequences due to a lower likelihood of

being identified and intervened upon, placing children on a negative trajectory leading up to engagement in high-risk behaviors.

Unlike previous studies that have relied on retrospective recall of both childhood adversities and age at first alcohol consumption, our study allowed us to examine the association of childhood adversities and early alcohol use prospectively, and without relying on long recall periods. However, for those participants who reported having experienced adversities and also reported alcohol use at Wave 1, we cannot establish definitively that the adversities preceded the outcome. Reverse directionality is unlikely for some adversities (e.g., parental maladjustment), but is possible for maltreatment and exposure to violence. Youth who use alcohol at a young age might seek environments characterized by high exposure to violence. Likewise, engagement in deviant behavior like alcohol use at a young age might strain parent–child relationships and increase the likelihood of being maltreated. Other limitations include our inability to examine the severity, persistence, and timing of childhood adversities. We also cannot rule out third variable explanations and cannot establish that childhood adversities are related to early alcohol use above and beyond an overall propensity for risk-taking behaviors.

Our findings contain implications for research and have the potential to impact program development and clinical practice. Youth who experienced one adversity, on average experienced two to three additional adversities. Parental antisocial personality and substance use specifically tended to co-occur with multiple adversities. The high level of adversity co-occurrence suggests that analyses focusing on single adversities will likely simplify the experiences that children are exposed to and might overestimate how individual childhood adversities relate to outcomes. Our findings also suggest that girls and boys may not respond to all adversities the same way. This finding needs replication, but if gender differences do exist, findings would suggest different vulnerabilities for boys and girls in the very early stages of problematic alcohol use. Thus, comprehensive, gender-specific interventions targeting multiple environments like family-level programs to improve family dynamics and reduce child maltreatment, treatment for parental psychiatric disorders, and community-level interventions to reduce exposure to violence may be warranted to produce a significant change in youth's lives. The strong association between multiple exposures and early alcohol use suggest that interventions should target families where exposure to adversity is concentrated. At the individual level, practitioners should consider that risk behaviors in disadvantaged populations occur within the context of exposure to multiple adversities at different levels, including contexts outside the home environment that may be even more relevant than family risks. Addressing these and other stressful experiences associated with their relative social disadvantage might contribute to the development of more successful intervention strategies.

This study expanded the definition of exposure to adversity by adding experiences of exposure to violence and discrimination, both of which were prevalent and conventionally not considered in this body of work. Even though discrimination was not related to the beginnings of problematic alcohol use, exposure to violence was uniquely associated with early alcohol use, with strong associations found in girls specifically. This finding suggests that the way childhood adversity is typically conceptualized does not fully capture the experience of certain groups and that future research needs to continue to expand this definition to reflect the reality of specific, disadvantaged, groups more adequately (Cronholm et al. 2015; Finkelhor 2013). Particular adversities and contexts might be more relevant for certain groups than others. Traditionally, the family environment has been the target of interventions aimed at addressing childhood adversities. Adverse experiences occurring outside of the family context might be particularly relevant to youths living in precarious environments. Our research highlights the importance of exposure to violence outside of the family environment as a target for this group, above and beyond family processes that might lead to early alcohol use.

Conclusion

This study contributes to our understanding of the developmental pathway to alcohol use in Puerto Rican youth in two sociocultural contexts (SB and PR), a group at high risk for alcohol use disorder later in life. Exposure to childhood adversity was highly prevanent among Puetro Rican youth, particularly those living in the SB, a context in which they belong to the minority group. Our prospective analyses showed that exposure to conventional (maltreatment, parental maladjustment) and socioculturally relevant (exposure to violence) adversities in childhood was associated with early initiation of alcohol use. The findings highlight the importance of expanding conventional definitions of exposure to adversity to capture the experiences of diverse groups more appropriately. Girls were more sensitive to specific adversities than boys. If replicated, findings would be consistent with research indicating different risk processes for alcohol use in boys and girls (Nolen-Hoeksema 2004; Schulte et al. 2009). While the two sociocultural contexts differed in the prevalence of exposure to adversity, risk processes were similar in the two sites.

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Authors' Contributions MRO conceptualized the study, designed and performed the statistical analyses, interpreted the data, and drafted the manuscript; HB and GC conceived the design of the study, acquired the data, contributed to the interpretation of the data, and critically reviewed and edited the manuscript. CD contributed to the conceptualization of the study, analysis plan, interpretation of the data, and made substantial contributions to the editing of the manuscript. All authors read and approved the final manuscript.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. We obtained approval for all study procedures from the New York State Psychiatric Institute and the University of Puerto Rico Medical School.

Informed Consent Parents signed informed consent and children signed assent forms.

References

Alegria, M., Canino, G., Shrout, P. E., Woo, M., Duan, N., & Vila, D., et al. (2008). Prevalence of mental illness in immigrant and non-immigrant U.S. Latino groups. *American Journal of Psychiatry*, *165*(3), 359–369. doi:10.1176/appi.ajp.2007.07040704.

Anda, R. F., Croft, J. B., Felitti, V. J., Nordenberg, D., Giles, W. H., & Williamson, D. F., et al. (1999). Adverse childhood experiences and smoking during adolescence and adulthood. *Journal of the American Medical Association*, *282*(17), 1652–1658.

Bird, H. R., Canino, G. J., Davies, M., Duarte, C. S., Febo, V., & Ramirez, R., et al. (2006). A study of disruptive behavior disorders in Puerto Rican youth: I. Background, design, and survey methods. *Journal of the American Academy of Child and Adolescent Psychiatry*, *45*(9), 1032–1041.

Bird, H. R., Shrout, P. E., Davies, M., Canino, G., Duarte, C. S., & Shen, S., et al. (2007). Longitudinal development of antisocial behaviors in young and early adolescent Puerto Rican children at two sites. *Journal of the American Academy of Child and Adolescent Psychiatry*, *46*(1), 5–14. doi:10.1097/01.chi.0000242243.23044.ac.

Bravo, M., Woodbury-Farina, M., Canino, G. J., & Rubio-Stipec, M. (1993). The Spanish translation and cultural adaptation of the diagnostic interview schedule for children (DISC) in Puerto Rico. *Culture, Medicine, and Psychiatry*, *17*(3), 329–344.

Canino, G., Burnam, A., & Caetano, R. (1992). The prevalence of alcohol abuse and/or dependence in two Hispanic communities. In J. E. Helzer, & G. Canino (Eds.), *Alcoholiam-North America, Europe, and Asia: A coordinated analyses of population from ten regions* (pp. 131–158). New York: Oxford University Press.

Center for Behavioral Health Statistics and Quality (2014). 2013 national survey on drug use and health: Detailed tables. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Centers for Disease Control and Prevention (2013). Youth online: High school YRBS. Retrieved from http://nccd.cdc.gov/YouthOnline/App/Results.aspx?. Accessed 1 May 2015.

Cervantes, R. C., Padilla, A. M., & Salgado de Snyder, N. (1991). The Hispanic stress inventory: A culturally relevant approach to psychosocial assessment. *Psychological Assessment*, *3*(3), 438–447.

Chen, P., & Jacobson, K. C. (2012). Developmental trajectories of substance use from early adolescence to young adulthood: Gender and racial/ethnic differences. *Journal of Adolescent Health*, *50*(2), 154–163. doi:10.1016/j.jadohealth.2011.05.013.

Child Trends (2013). Adverse experiences. Retrieved from http://www.childtrends.org/?indicators=adverse-experiences. Accessed 1 July 2016.

Child Trends (2016). Children's Exposure to Violence. Available at: http://www.childtrends.org/?indicators=childrens-exposure-to-violence

Cooper, M. L. (1994). Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychological Assessment*, *6*(2), 117–128. doi:10.1037/1040-3590.6.2.117.

Cronholm, P. F., Forke, C. M., Wade, R., Bair-Merritt, M. H., Davis, M., & Harkins-Schwarz, M., et al. (2015). Adverse childhood experiences: Expanding the concept of adversity. *American Journal of Preventive Medicine*, *49*(3), 354–361. doi:10.1016/j.amepre.2015.02.001.

Davies, P. T., & Lindsay, L. L. (2004). Interparental conflict and adolescent adjustment: Why does gender moderate early adolescent vulnerability? *Journal of Family Psychology*, *18*(1), 160–170.

Davis, A. (2016). The longitudinal associations between discrimination, depressive symptoms, and prosocial behaviors in U.S. Latino/a recent immigrant adolescents. *Journal of Youth and Adolescence*, *45*(3), 457–470. doi:10.1007/s10964-015-0394-x.

DeWit, D. J., Adlaf, E. M., Offord, D. R., & Ogborne, A. C. (2000). Age at first alcohol use: A risk factor for the development of alcohol disorders. *American Journal of Psychiatry*, *157*(5), 745–750.

Della Femina, D., Yeager, C. A., & Lewis, D. O. (1990). Child abuse: Adolescent records vs. adult recall. *Child Abuse and Neglect*, *14*(2), 227–231.

Dong, M., Anda, R. F., Felitti, V. J., Dube, S. R., Williamson, D. F., & Thompson, T. J., et al. (2004). The interrelatedness of multiple forms of childhood abuse, neglect, and household dysfunction. *Child Abuse and Neglect*, *28*(7), 771–784. doi:10.1016/j.chiabu.2004.01.008.

Dube, S. R., Anda, R. F., Felitti, V., Edwards, V. J., & Croft, J. B. (2002). Adverse childhood experiences and personal alcohol abuse as an adult. *Addictive Behaviors*, *27*(5), 713–725. doi:10.1016/S0306-4603(01)00204-0.

Dube, S. R., Miller, J. W., Brown, D. W., Giles, W. H., Felitti, V. J., & Dong, M., et al. (2006). Adverse childhood experiences and the association with ever using alcohol and initiating alcohol use during adolescence. *Journal of Adolescent Health*, *38*(4), 444.e1–444.e10.

Ellickson, P. L., Tucker, J. S., & Klein, D. J. (2003). Ten-year prospective study of public health problems associated with early drinking. *Pediatrics*, *111*(5), 949–955.

Evans, G. W. (2013). Cumulative risk and child development. *Psychological Bulletin*, *139*(6), 1342–1396. doi:10.1037/a0031808.

Fagan, A. A., Wright, E. M., & Pinchevsky, G. M. (2013). The protective effects of neighborhood collective efficacy on adolescent substance use and violence following exposure to violence. *Journal of Youth and Adolescence*, *43*(9), 1498–1512. doi:10.1007/s10964-013-0049-8.

Feil, J., & Hasking, P. (2008). The relationship between personality, coping strategies and alcohol use. *Addiction Research and Theory*, *16*(5), 526–537.

Feldman, J. M., Ortega, A. N., Koinis-Mitchell, D., Kuo, A. A., & Canino, G. (2010). Child and family psychiatric and psychological factors associated with child physical health problems: Results from the Boricua youth study. *Journal of Nervous and Mental Disease*, *198*(4), 272–279.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., & Edwards, V., et al. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: the adverse childhood experiences (ACE) study. *American Journal of Preventive Medicine*, *14*(4), 245–258.

Finkelhor, D. (2013). Improving the adverse childhood experiences study scale. *Journal of American Medical Association Pediatrics*, *167*(1), 70. doi:10.1001/jamapediatrics.2013.420.

Finkelhor, D., & Dziuba-Leatherman, J. (1994). Children as victims of violence: A national survey. *Pediatrics*, *94*(4), 413–420.

Foster, J. D., Kuperminc, G. P., & Price, A. W. (2004). Gender differences in posttraumatic stress and related symptoms among inner-city minority youth exposed to community violence. *Journal of Youth and Adolescence*, *33*(1), 59–69. doi:10.1023/A:1027386430859.

Gelman, A., Fagan, J., & Kiss, A. (2007). An analysis of the New York City Police Department's "Stop-and-Frisk" policy in the context of claims of racial bias. *Journal of the American Statistical Association*, *102*(479), 813–823. doi:10.1198/016214506000001040.

Gerard, J. M., & Buehler, C. (1999). Multiple risk factors in the family environment and youth problem behaviors. Journal of Marriage and the Family, *61*, 343–361.

Gerard, J. M., & Buehler, C. (2004). Cumulative environmental risk and youth problem behavior. *Journal of Marriage and Family*, *66*(3), 702–720. doi:10.1111/j.0022-2445.2004.00048.x.

Gilbert, P. A., & Zemore, S. E. (2016). Discrimination and drinking: A systematic review of the evidence. *Social Science & Medicine*, *161*, 178–194. doi:10.1016/j.socscimed.2016.06.009.

Goodman, S. H., Hoven, C. W., Narrow, W. E., Cohen, P., Fielding, B., & Alegria, M., et al. (1998). Measurement of risk for mental disorders and competence in a psychiatric epidemiologic community survey: The National Institute of Mental Health Methods for the epidemiology of child and adolescent mental disorders (MECA) study. *Social Psychiatry and Psychiatric Epidemiology*, *33*(4), 162–173.

Goodman, S. H., Rouse, M. H., Connell, A. M., Broth, M. R., Hall, C. M., & Heyward, D. (2011). Maternal depression and child psychopathology: A meta-analytic review. *Clinical Child and Family Psychology Review*, *14*(1), 1–27.

Haberstick, B. C., Young, S. E., Zeiger, J. S., Lessem, J. M., Hewitt, J. K., & Hopfer, C. J. (2014). Prevalence and correlates of alcohol and cannabis use disorders in the United States: Results from the national longitudinal study of adolescent health. *Drug and Alcohol Dependence*, *136*, 158–161. doi:10.1016/j.drugalcdep.2013.11.022.

Hamarman, S., Pope, K. H., & Czaja, S. J. (2002). Emotional abuse in children: Variations in legal definitions and rates across the United States. *Child Maltreatment*, *7*(4), 303–311. doi:10.1177/107755902237261.

Hamburger, M. E., Leeb, R. T., & Swahn, M. H. (2008). Childhood maltreatment and early alcohol use among high-risk adolescents. *Journal of Studies on Alcohol and Drugs*, *69*(2), 291.

Hong, J. S., Huang, H., Golden, M., Upton Patton, D., & Washington, T. (2014). Are community violence-exposed youth at risk of engaging in delinquent behavior? A review and implications for residential treatment research and practice. *Residential Treatment for Children and Youth*, *31*(4), 266–283.

Ishida, K., Klevens, J., Rivera-García, B., & Mirabal, B. (2013). Child maltreatment in Puerto Rico: Findings from the 2010 National Child Abuse and Neglect Data System. *Puerto Rico Health Sciences Journal*, *32*(3), 124–131.

Kandel, D. B., Yamaguchi, K., & Chen, K. (1992). Stages of progression in drug involvement from adolescence to adulthood: Further evidence for the gateway theory. *Journal of Studies on Alcohol*, *53*(5), 447–457.

Kaplan, S. J., Pelcovitz, D., & Labruna, V. (1999). Child and adolescent abuse and neglect research: A review of the past 10 years. Part I: Physical and emotional abuse and neglect. *Journal of the American Academy of Child and Adolescent Psychiatry*, *38*(10), 1214–1222.

Kessler, R. C., Davis, C. G., & Kendler, K. S. (1997). Childhood adversity and adult psychiatric disorder in the US National Comorbidity Survey. *Psychological Medicine*, *27*(5), 1101–1119.

Kessler, R. C., McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., & Zaslavsky, A. M., et al. (2010). Childhood adversities and adult psychopathology in the WHO World Mental Health Surveys. *The British Journal of Psychiatry*, *197*(5), 378–385.

Kiser, L. J., & Black, M. M. (2005). Family processes in the midst of urban poverty: What does the trauma literature tell us? *Aggression and Violent Behavior*, *10*(6), 715–750.

Kristman-Valente, A., & Wells, E. A. (2013). The role of gender in the association between child maltreatment and substance use behavior: A systematic review of longitudinal research from 1995 to 2011. *Substance Use & Misuse*, *48*(8), 645–660. doi:10.3109/10826084.2013.800115.

Kuntsche, E., Knibbe, R., Gmel, G., & Engels, R. (2006). Who drinks and why? A review of socio-demographic, personality, and contextual issues behind the drinking motives in young people. *Addictive Behaviors*, *31*(10), 1844–1857. doi:10.1016/j.addbeh.2005.12.028.

Lansford, J. E., Dodge, K. A., Pettit, G. S., & Bates, J. E. (2010). Does physical abuse in early childhood predict substance use in adolescence and early adulthood? *Child Maltreatment*, *15*(2), 190–194.

Lish, J. D., Weissman, M. M., Adams, P. B., Hoven, C. W., & Bird, H. R. (1995). Family psychiatric screening instruments for epidemiologic studies: Pilot testing and validation. *Psychiatry Research*, *57*(2), 169–180.

Maldonado-Molina, M. M., Collins, L. M., Lanza, S. T., Prado, G., Ramirez, R., & Canino, G. (2007). Patterns of substance use onset among Hispanics in Puerto Rico and the United States. *Addictive Behaviors*, *32*(10), 2432–2437. doi:10.1016/j.addbeh.2007.04.007.

Marshal, M. P., & Chassin, L. (2000). Peer influence on adolescent alcohol use: The moderating role of parental support and discipline. *Applied Developmental Science*, *4*(2), 80–88.

Maschi, T., Morgen, K., Bradley, C., & Hatcher, S. S. (2008). Exploring gender differences on internalizing and externalizing behavior among maltreated youth: Implications for social work action. *Child and Adolescent Social Work Journal*, *25*(6), 531–547.

Matud, M. P. (2004). Gender differences in stress and coping styles. *Personality and Individual Differences*, *37*(7), 1401–1415. doi:10.1016/j.paid.2004.01.010.

McLaughlin, K. A., Greif Green, J., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2012). Childhood adversities and first onset of psychiatric disorders in a national sample of US adolescents. *Archives of General Psychiatry*, *69*(11), 1151–1160. doi:10.1001/archgenpsychiatry.2011.2277.

Mersky, J. P. (2013). Impacts of adverse childhood experiences on health, mental health, and substance use in early adulthood: A cohort study of an urban, minority sample in the U.S. *Child Abuse and Neglect*, *37*(11), 917–925. doi:10.1016/j.chiabu.2013.07.011.

Miller, B. A., & Mancuso, R. F. (2004). Connecting childhood victimization to later alcohol/drug problems: Implications for prevention. *Journal of Primary Prevention*, *25*(2), 149–169.

Mistry, R. S., Vandewater, E. A., Huston, A. C., & McLoyd, V. C. (2002). Economic well-being and children's social adjustment: The role of family process in an ethnically diverse low-income sample. *Child Development*, *73*(3), 935–951.

Mukhopadhyay, P. K. (2010). Not hazardous to your health: Proportional hazards modeling for survey data with the SURVEYPHREG procedure. In SAS global forum proceedings: Statistics and data analysis. (pp. 1–13). Seattle, WA. SAS Institute Inc.

Murry, V. M., Brown, P. A., Brody, G. H., Cutrona, C. E., & Simons, R. L. (2001). Racial discrimination as a moderator of the links among stress, maternal psychological functioning, and family relationships. *Journal of Marriage and Family*, *63*(4), 915–926.

Nolen-Hoeksema, S. (2004). Gender differences in risk factors and consequences for alcohol use and problems. *Clinical Psychology Review*, *24*(8), 981–1010. doi:10.1016/j.cpr.2004.08.003.

Nolen-Hoeksema, S., & Hilt, L. (2006). Possible contributors to the gender differences in alcohol use and problems. *Journal of General Psychology*, *133*(4), 357–374.

Oldehinkel, A. J., & Bouma, E. M. (2011). Sensitivity to the depressogenic effect of stress and HPA-axis reactivity in adolescence: A review of gender differences. *Neuroscience & Biobehavioral Reviews*, *35*(8), 1757–1770.

Pardini, D. A., Fite, P. J., & Burke, J. D. (2008). Bidirectional associations between parenting practices and conduct problems in boys from childhood to adolescence: The moderating effect of age and African-American ethnicity. *Journal of Abnormal Child Psychology*, *36*(5), 647–662. doi:10.1007/s10802-007-9162-z.

Parra, G. R., O'Neill, S. E., & Sher, K. J. (2003). Reliability of self-reported age of substance involvement onset. *Psychology of Addictive Behaviors*, *17*(3), 211–218.

Pilowsky, D. J., Keyes, K. M., & Hasin, D. S. (2009). Adverse childhood events and lifetime alcohol dependence. *American Journal of Public Health*, *99*(2), 258–263. doi:10.2105/ajph.2008.139006.

Pirkola, S., Isometsä, E., Aro, H., Kestilä, L., Hämäläinen, J., & Veijola, J., et al. (2005). Childhood adversities as risk factors for adult mental disorders. *Social Psychiatry and Psychiatric Epidemiology*, *40*(10), 769–777. doi:10.1007/s00127-005-0950-x.

Raia, J. (1995). Perceived social support and coping as moderators of children's exposure to community violence. PhD dissertation, University of Los Angeles, Los Angeles.

Ramos-Olazagasti, M. A., Shrout, P. E., Yoshikawa, H., Canino, G. J., & Bird, H. R. (2013). Contextual risk and promotive processes in Puerto Rican youths' internalizing trajectories in Puerto Rico and New York. *Developmental Psychopathology*, *25*(3), 755–771. doi:10.1017/s0954579413000151.

Richters, J. E., & Martinez, P. (1993). The NIMH community violence project: I. Children as victims of and witnesses to violence. *Psychiatry*, *56*(1), 7–21.

Rivera, F., López, I., Guarnaccia, P., Ramirez, R., Canino, G., & Bird, H. (2011). Perceived discrimination and antisocial behaviors in Puerto Rican children. *Journal of Immigrant and Minority Health*, *13*(3), 453–461.

Rothman, E. F., Edwards, E. M., Heeren, T., & Hingson, R. W. (2008). Adverse childhood experiences predict earlier age of drinking onset: Results from a representative US sample of current or former drinkers. *Pediatrics*, *122*(2), e298–304. doi:10.1542/peds.2007-3412.

Rutter, M. (1979). Protective factors in children's responses to stress and disadvantage. In M. Kent, & J. Rolf (Eds.), *Primary prevention of psychopathology: III. Promoting social competence and coping in children* (pp. 49–74). Hanover, NH: University Press of New England.

Sameroff, A. J., Bartko, W. T., Baldwin, A., Baldwin, C., & Siefer, R. (1998). Family and social influences on the development of child competence. In M. Lewis, & C. Feiring (Eds.), *Families, risk, and competence* (pp. 161–185). Mahwah, NJ: Erlbaum.

Schulte, M. T., Ramo, D., & Brown, S. A. (2009). Gender differences in factors influencing alcohol use and drinking progression among adolescents. *Clinical Psychology Review*, *29*(6), 535–547. doi:10.1016/j.cpr.2009.06.003.

Schwartz, S. J., Unger, J. B., Baezconde-Garbanati, L., Zamboanga, B. L., Lorenzo-Blanco, E. I., & Des Rosiers, S. E., et al. (2015). Trajectories of cultural stressors and effects on mental health and substance use among Hispanic immigrant adolescents. *Journal of Adolescent Health*, *56*(4), 433–439. doi:10.1016/j.jadohealth.2014.12.011.

Shaffer, D., Fisher, P., Lucas, C. P., Dulcan, M. K., & Schwab-Stone, M. E. (2000). NIMH diagnostic interview schedule for children version IV (NIMH DISC-IV): Description, differences from previous versions, and reliability of some common diagnoses. *Journal of the American Academy of Child Adolescent Psychiatry*, *39*(1), 28–38. doi:10.1097/00004583-200001000-00014.

Sledjeski, E. M., Dierker, L. C., Bird, H. R., & Canino, G. (2009). Predicting child maltreatment among Puerto Rican children from migrant and non-migrant families. *Child Abuse and Neglect*, *33*(6), 382–392.

Straus, M. A., Hamby, S. L., Finkelhor, D., Moore, D. W., & Runyan, D. (1998). Identification of child maltreatment with the parent-child conflict tactics scales: Development and psychometric data for a national sample of American parents. *Child Abuse & Neglect*, *22*(4), 249–270.

Stueve, A., & O'Donnell, L. N. (2005). Early alcohol initiation and subsequent sexual and alcohol risk behaviors among urban youths. *American Journal of Public Health*, *95*(5), 887.

Tolin, D. F., & Foa, E. B. (2006). Sex differences in trauma and posttraumatic stress disorder: A quantitative review of 25 years of research. *Psychological Bulletin*, *132*(6), 959.

Unger, J. B., Schwartz, S. J., Huh, J., Soto, D. W., & Baezconde-Garbanati, L. (2014). Acculturation and perceived discrimination: Predictors of substance use trajectories from adolescence to emerging adulthood among Hispanics. *Addictive Behavior*, *39*(9), 1293–1296. doi:10.1016/j.addbeh.2014.04.014.

Vaughn, M. G., Salas-Wright, C. P., Huang, J., Qian, Z., Terzis, L. D., & Helton, J. J. (2015). Adverse childhood experiences among immigrants to the United States. *Journal of Interpersonal Violence*, 1–22. doi:10.1177/0886260515589568.

Westling, E., Andrews, J. A., Hampson, S. E., & Peterson, M. (2008). Pubertal timing and substance use: The effects of gender, parental monitoring and deviant peers. *Journal of Adolescent Health*, *42*(6), 555–563. doi:10.1016/j.jadohealth.2007.11.002.

Widom, C. S., Ireland, T., & Glynn, P. J. (1995). Alcohol abuse in abused and neglected children followed-up: Are they at increased risk? *Journal of Studies on Alcohol and Drugs*, *56*(2), 207–217.

Widom, C. S., Marmorstein, N. R., & White, H. R. (2006). Childhood victimization and illicit drug use in middle adulthood. *Psychology of Addictive Behaviors*, *20*(4), 394–403. doi:10.1037/0893-164X.20.4.394.

Widom, C. S., White, H. R., Czaja, S. J., & Marmorstein, N. R. (2007). Long-term effects of child abuse and neglect on alcohol use and excessive drinking in middle adulthood. *Journal of Studies on Alcohol and Drugs*, *68*(3), 317.

de Wit, H. (2009). Impulsivity as a determinant and consequence of drug use: A review of underlying processes. *Addiction Biology*, *14*(1), 22–31. doi:10.1111/j.1369-1600.2008.00129.x.

Wood, J. V. (1989). Theory and research concerning social comparisons of personal attributes. *Psychological Bulletin*, *106*(2), 231–248. doi:10.1037/0033-2909.106.2.231.

Wu, P., Bird, H. R., Liu, X., Duarte, C. S., Fuller, C., & Fan, B., et al. (2010). Trauma, posttraumatic stress symptoms, and alcohol-use initiation in children. *Journal of Studies on Alcohol and Drugs*, *71*(3), 326–334.

Wu, P., Bird, H. R., Liu, X., Fan, B., Fuller, C., & Shen, S., et al. (2006). Childhood depressive symptoms and early onset of alcohol use. *Pediatrics*, *118*(5), 1907–1915. doi:10.1542/peds.2006-1221.

Maria A. Ramos-Olazagasti is a Research Scientist at the New York State Psychiatric Institute and Assistant Professor of Clinical Psychology at Columbia University. She earned her PhD in Community and Developmental Psychology from New York University. She is interested in the social and cultural determinants of Latino youths' risk behaviors and mental health.

Hector R. Bird is Emeritus Professor of Clinical Psychiatry at Columbia University. He received his medical degree from Yale Medical School. He is interested in child psychiatric epidemiology and the development of instruments to assess psychiatric impairment in children.

Glorisa J. Canino is a Professor and Director of the Behavioral Sciences Research Institute at the University of Puerto Rico, School of Medicine. She holds a Doctorate degree in psychology from Temple University. Her research focuses on cross-cultural child and adult psychiatric epidemiology, service utilization patterns and barriers to care faced by Latino children and adults, and cultural adaptation and translation of instruments to the Latino culture.

Cristiane S. Duarte is the Lambert Associate Professor of Child Psychiatry at Columbia University. Her research interest is focused on developmental psychopathology among low-income children, adolescent and young adults, particularly of Latino background, living in the US and elsewhere.