

# Ataques de Nervios and their Psychiatric Correlates in Puerto Rican Children From Two Different Contexts

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**Abstract:** Among Latino adults and children, *ataques de nervios* has been associated with an array of psychiatric disorders. Using data from a probability sample of Puerto Rican children, aged 5 to 13 years ( $N = 2491$ ), we assessed the lifetime prevalence and psychiatric correlates of *ataques* in youth residing in the South Bronx, New York and San Juan, Puerto Rico. Baseline site comparisons indicated that between 4% and 5% of children had a lifetime prevalence of *ataques* (either by child or parent report) and that *ataques* were associated with greater global impairment and a host of childhood disorders within the previous twelve months. *Ataques* were also correlated with greater exposure to violence, as well as more stressful life events for the South Bronx sample. After controlling for several covariates, *ataques* continued to be significantly associated with psychopathology. *Ataques* are, therefore, a significant correlate of global impairment and childhood psychopathology among Puerto Rican youth.

**Key Words:** Ataques de nervios, Puerto Rican children, culture-bound syndromes, child psychopathology, cross-cultural psychiatry.

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Over the past 2 decades, there has been extensive work on the relationship of culture and cultural syndromes to psychiatric distress and disorder (Kleinman, 1988; Guarnaccia and Rogler, 1999; López and Guarnaccia, 2005). In particular, among Caribbean adults, such as Puerto Ricans, the Latino cultural syndrome of *ataques de nervios* (henceforth *ataques*) has received considerable attention both in terms of its cultural meanings (Guarnaccia et al., 1989, 1996, 2003) and its relationship to psychiatric disorders (Guarnaccia et al., 1993; Lewis-Fernández et al., 2002a; Liebowitz et al., 1994; Weingartner et al., 2002). However, there is still a significant need to extend this research to children (Canino et al., 1998; Canino and Spurlack, 1994).

Recently, researchers have begun to study cultural syndromes in children, using *ataques* as a model, and found it to be associated with an array of childhood disorders in Island Puerto Rican children

(Guarnaccia et al., 2005). Building on this work, in this study, we compared the sociodemographic profiles and estimated lifetime prevalence of children with *ataques* in a representative community sample of Puerto Rican youth living in San Juan, Puerto Rico, and in the South Bronx, New York. Additionally, we assessed the association of *ataques* with various psychosocial stressors to see if *ataques* would still be associated with childhood psychopathology and global impairment once we controlled for these variables.

## ATAQUES DE NERVIOS AND ADULT PSYCHOPATHOLOGY

Briefly defined, *ataques* are typically characterized by a variety of symptoms, such as trembling, crying, convulsions, and screaming (Cintrón et al., 2005; Febo San Miguel et al., 2006; Guarnaccia et al., 1989, 1996). In contrast to panic attacks, with which they are often compared, *ataques* are typically experienced in the presence of others who provide support, and after an episode people with *ataques* often report feeling better or relieved (Lewis-Fernández et al., 2002a). *Ataques* are episodic and usually provoked by disruptions in familial bonds, such as a conflict or a death in the family. Among Puerto Ricans, who have a high lifetime estimated prevalence rate of *ataques* (approximately 14%), *ataques* are most common among older, less educated, and formerly married Latinas (Guarnaccia et al., 1989, 1993). Within this population, clinical and epidemiological studies have consistently noted that, while *ataques* are culturally sanctioned, they are still strongly comorbid with an array of disorders, most notably anxiety and depression (Guarnaccia et al., 2003; Lewis-Fernández et al., 2002a; Liebowitz et al., 1994; Salman et al., 1998; Weingartner et al., 2002).

## ATAQUES DE NERVIOS AND CHILD PSYCHOPATHOLOGY

Although the majority of studies on *ataques* have been with adult *ataque* sufferers and not children, there has been a growing interest in the developmental origins of *ataques*. For example, in one retrospective study with an adult clinical sample, Latinos with either an anxiety or depressive disorder who endorsed *ataques* reported a history of childhood trauma more often than those who did not (Schechter et al., 2000). Additionally, another study noted very high rates of childhood trauma among women with *ataques*, although it was not able to establish a link between past childhood trauma and frequency of *ataques* (Lewis-Fernández et al., 2002b). While such differences could be attributed to methodological issues, such as variations related to the participants' recall of *ataques*, these findings underscore the importance of assessing *ataques*, and stressful life experiences, prospectively with children.

In the one study, to date, that directly studied *ataques* in children, Island Puerto Rican children in community and clinical settings had estimated lifetime rates ranging from 9% to 26%, respectively. Furthermore, children with *ataques* were more likely to be adolescent females and have significantly higher levels of perceived poverty than those without *ataques*. Endorsement of *ataques* was also associated with increased likelihood of meeting criteria for

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a number of DSM-IV diagnoses, such as any depression, anxiety, or disruptive disorder (Guarnaccia et al., 2005).

Although this study was the first to empirically assess the association between ataques and childhood psychiatric disorders, it was not able to fully characterize the experience of ataques among Puerto Rican children because it only examined Island youth. However, Puerto Rican children may have divergent sociodemographic profiles and experiences, depending on where they live. For example, Puerto Rican children residing in the South Bronx, NY, are more likely to live in single-headed households and to have less educated mothers than their peers in San Juan (Bird et al., 2007; Landale and Haun, 1992). These differences, in turn, may be associated with a host of negative outcomes for children (Anderson Moore et al., 2006; Tolani and Brooks-Gunn, 2006).

Given these different profiles, it is important to assess for site differences in cultural idioms of distress, especially because the prevalence and experience of ataques may vary by site. For example, anthropologists have noted how the construction and meanings attached to illness can change as a function of context (Guarnaccia et al., 1993; Trostle, 2005). Thus, ataques could be a more prominent expression of distress in Puerto Rico than in the continental United States, which in turn could elicit different rates of help-seeking behavior among these 2 populations.

In addition, to assess the unique contribution of ataques to childhood psychopathology, it is important to control for ethnic specific, as well as shared, risk factors that are associated with childhood distress and impairment. For example, among Puerto Rican children, perceived parental cultural stress has been associated with greater childhood symptomatology and would thus be an important variable to control in assessing childhood psychopathology (Duarte et al., 2008). Additionally, shared general risk factors, such as stressful life events and exposure to violence, are consistently associated with a wide array of negative consequences and psychiatric disorders among diverse groups of children and should therefore be assessed (Lynch, 2003; Osofsky, 1995; Tiet et al., 2001).

**GOALS OF THE PRESENT STUDY**

With these concerns in mind, we present the results of a comparative study of ataques de nervios, using cross-sectional data from a study that included representative samples of Puerto Rican

children living in the South Bronx, NY and in the San Juan metropolitan area in Puerto Rico (Bird, et al., 2006a, b). Using a series of across and within site comparisons of children with and without ataques, we examined the lifetime prevalence and sociodemographic profiles of youth with ataques.

Due to its cultural saliency, we hypothesized that ataques would be more prevalent in San Juan than in the South Bronx, but that children in the South Bronx would seek more help for these experiences. Additionally, we predicted that although ataques would be precipitated by stress in both sites, ataques would occur more often among girls than boys across both sites, and that, girls in San Juan would have a greater occurrence of ataques. We also posited that while ataques would be associated with an array of psychosocial stressors, the associations between ataques, childhood psychopathology and global impairment, would persist after controlling for general and specific risk factors associated with psychopathology.

**METHODS**

**Participants**

Participants were Puerto Rican children and adolescents (*N* = 2951), ages 5 to 13 years, residing in either the South Bronx, NY, (*n* = 1138), an area with the largest Puerto Rican population outside of Puerto Rico (U.S. Census, 2001), or the Standard Metropolitan Areas in Puerto Rico, which comprises the more densely populated areas in the northeast section of Puerto Rico, including the San Juan and Caguas metropolitan areas (*n* = 1353). Children identified as having had an ataque, either by child or parent report, were compared with those who did not endorse ataques. The biological mother was the adult informant in 89% of the cases (see Table 1 for more descriptive information about the children).

**Sample Design and Procedure**

This study was part of a larger study whose aim was to assess and compare the level of psychopathology among Puerto Rican youth in 2 different contexts (see Bird et al., 2006a for further description of parent study). Both multistage probability samples represented the population of Puerto Rican children living in the South Bronx and San Juan. To be eligible for the study, a household had to include at least one child, and a residing primary caregiver, who identified as Puerto Rican. Whenever possible, parents and

**TABLE 1.** Comparison of Sociodemographic Variables of Children With and Without *Ataques* by Site

	South Bronx ( <i>n</i> = 1138) <sup>a</sup>				San Juan ( <i>n</i> = 1353) <sup>a</sup>			
	No Ataque	Ataque Group	Contrasts		No Ataque	Ataque Group	Contrasts	
			$\chi^2/t$	<i>p</i>			$\chi^2/t$	<i>p</i>
Child sex								
Female	526	22 (3.97)	0.24	0.62	612	45 (6.75)	3.41	0.07
Male	559	28 (4.65)			664	29 (4.13)		
Child age	9.21	9.83	2.09	0.04	9.11	10.28	3.14	0.002
Family structure								
Single parent	490	27 (4.91)	0.73	0.40	359	30 (8.34)	4.80	0.03
2 parent	584	23 (3.90)			916	43 (4.24)		
Maternal education								
<High school	488	21 (4.00)	3.01	0.23	303	21 (6.38)	1.27	0.53
High school	452	26 (5.42)			523	31 (5.08)		
College+	114	3 (2.19)			432	18 (4.41)		

Actual sample size is unweighted. However, percentages in parenthesis were weighted to adjust for complex sampling design. Means listed are for continuous variables.  
<sup>a</sup>Tabulations do not add up to the total sample sizes because of missing cases.

children were simultaneously interviewed by different interviewers in the language of their choice. In the South Bronx sample, an overwhelming majority of parents (75%) and children (97%) completed their interviews in English, while all the subjects completed their interviews in Spanish in San Juan. Interviews typically took place in the home.

Data for this study were collected and analyzed following approvals by the Institutional Review Boards at the New York State Psychiatric Institute, the University of Puerto Rico Medical School, and Rutgers University. Informed consent was obtained from all adult informants and assent was obtained for all children over 7 years old. With parental and child approval, interviews were audiotaped and 15% of all interviews were systematically spot-checked for quality control. Upon completion, each parent-child dyad received 75 dollars. The overall response rate was 84.4% (80.5% and 88.7% for the South Bronx and San Juan, respectively). The majority of the interviews were conducted between 2001 and 2004.

## Measures

### Translation

With the exception of the Diagnostic Interview Schedule for Children-IV (DISC-IV), which was previously translated and tested for use among Spanish-speaking Puerto Rican children (Bravo et al., 2001), all measures were translated from English into Spanish, back-translated, and culturally adapted to ensure that they would be equivalent to their originals using established research methods (Canino and Bravo, 1994; Matias-Carrello et al., 2003). All questionnaires were administered and coded by trained lay interviewers, using laptop computers.

### Ataques de Nervios

In accordance with past research, children 9 and older self-identified whether they ever had an ataque, while caregivers identified whether younger children ever had an ataque (Guarnaccia et al., 1993, 2005; Liebowitz et al., 1994). In keeping with previous psychiatric epidemiological methods (Bird et al., 1992), children were identified as having an ataque when either they, or their adult informant, reported this experience (Guarnaccia et al., 2005). Children and their caretakers were also asked the age of the first episode, the number of ataques experienced in the last year, if they believed the ataques were caused by something stressful, and whether they sought help or treatment for these experiences.

### Diagnostic Interview Schedule for Children

Psychiatric disorders, as defined by DSM-IV criteria, were assessed by parallel child and informant interviews, using the English and Spanish translations of the DISC-IV (Bravo et al., 2001; Shaffer et al., 2000). The DISC-IV is a structured instrument widely used to diagnose children as young as 4 years old. However, because previous research has indicated that young children can be unreliable informants, only the adult informant version of the DISC-IV was used to ascertain diagnoses for this study (Bird et al., 2006a, b; Fallon and Schwab-Stone, 1994). The Spanish translation of the DISC-IV yielded comparable test-retest reliability with its original English version (Bravo et al., 2001).

To assess for any depressive disorders within the previous 12 months, a category, using the collapsed diagnoses of major depression and dysthymia was created. Any anxiety disorder consisted of all generalized anxiety, post traumatic stress, panic, social phobia, and separation anxiety disorders. Any disruptive disorder included the collapsed diagnoses for attention deficit, oppositional defiant (ODD), and conduct disorders (CD), although the DSM-IV criteria for ODD were relaxed so a participant could also be simultaneously diagnosed with CD. However, overall counts of any disruptive

disorder included participants who met criteria for either CD or ODD, or both. Finally, to assess for the occurrence of any disorder within the previous 12 months, we included all the collapsed diagnoses for all alcohol, marijuana, and nicotine-related disorders. Using computerized diagnostic algorithms, a case was considered positive if it met full DSM-IV diagnostic criteria, along with moderate impairment in at least one area of functioning, as defined by the DISC-IV impairment A schedule, in the parental report.

### Global Impairment

To assess global impairment, the Parent-Interview Child Global Assessment Scale (PIC-GAS) was used (Bird et al., 1996). The PIC-GAS is the lay version of the Children's Global Assessment Scale in which trained interviewers make a judgment of a child's overall global emotional and behavioral functioning based on parental reports, using a single numeric score. In accordance with previous psychometric research using lay interviewers, a score of 69 or lower was used to classify children as functionally impaired (Bird et al., 1996). This measure has previously been used with Puerto Rican children, and has high interrater reliability, and established concurrent, discriminant, and constructs validity (Bird et al., 1996). In addition, its Spanish translation has shown a moderate degree of test-retest reliability, with an interclass correlation of 0.69 (Bird et al., 1987; Bird and Gould, 1995).

### Stressful Life Events

The Stressful Life Events Scale was used to assess stressful events within the last year (Goodman et al., 1998). It is a 21-item scale that was originally derived from Johnson and McCutcheon (1980) Life Events Checklist. With this scale, children were first asked whether various negative events occurred to them within the previous 12 months (e.g., "During the past 12 months, did a close friend die?"). Once an event was endorsed, children were asked to rate whether these events were "mostly good" (1) or "mostly bad" (2) for them, and how much these events affected their lives, from "not at all" (1) to "a lot" (2). For an event to be counted as stressful it had to be reported as mostly bad and to have had a negative impact. As in previous research, a dichotomous variable, defined as having experienced 2 or more life events, was used to denote a higher probability of experiencing stressful life events. For comparative purposes, the mean number of stressful life events was also computed. Previous research with this abridged version has noted it has good reliability, with kappas ranging from 0.49 to 0.76 (Goodman et al., 1998).

### Exposure to Violence

To assess lifetime exposure to violence, Raia's (1996) derivation of Richters and Martínez's (1993) Exposure to Community Violence Scale was used. In this scale, children were asked to report whether a host of violent events happened to them or someone else. For example, children were asked if they ever saw someone being beaten, mugged, or sexually assaulted. Responses were dichotomous; however, to account for greater distress, a sum scale was created that differentially weighted the levels of exposure.

### Parental Cultural Stress

Parental cultural stress was measured by 4 dichotomous items adapted from the Hispanic Stress Inventory (Cervantes, et al., 1990; Duarte et al., 2008). This subscale included items that assessed problems with understanding English, family conflicts about cultural customs, difficulty mixing both cultures, and feelings of not belonging either in the United States or Puerto Rico. This scale was translated for this study and modest alphas of 0.51 were obtained for both sites (Duarte et al., 2008).

**Demographics**

A host of demographic variables were also assessed, including child sex and age. In addition, 2 proxies of socioeconomic status, maternal education and household structure were included (Bird et al., 2006a).

**Statistical Analyses**

Data analyses were conducted using specialized statistical software which adjusted for differences in the probability of selection and for the multistage cluster design (SUDAAN, Release 9.0.1, Research Triangle Institute, 2004). In addition, the data were weighted to match the age and gender distributions of the 2000 US Census. All parameters in the statistical model were estimated with Taylor Series linearization methods. In addition, we used robust standard errors (Binder, 1984).

**RESULTS**

**Participant Characteristics**

A total of 2491 children were surveyed at baseline. Within group differences in the sociodemographic profiles of these children are described in Table 1, while between group differences are noted in the text. In the South Bronx, 4.3% of children were identified as having lifetime ataques ( $n = 50$ ) compared with 5.4% in San Juan ( $n = 74$ ), indicating that there were no significant site differences in lifetime estimated prevalence of ataques,  $chi-square (1, N = 2491) = 1.41, p = ns$ . However, in San Juan, girls were more likely to have ataques than girls in the South Bronx, 6.8% versus 4%,  $chi-square (1, N = 2491) = 3.92, p = 0.05$ . There was also a trend for San Juan girls to be more likely to have ataques than boys, 6.8% versus 4.1%,  $chi-square (1, N = 2491) = 3.41, p = 0.07$ . However, in the South Bronx, girls were no more likely than boys to have an ataque, 3.97% versus 4.7%. In addition, there were no site differences between boys,  $chi-square (1, N = 2491) = 0.16, p = ns$ .

Across both samples, children with ataques were more likely to be older than those without ataques, South Bronx (9.8 vs. 9.2 years) and San Juan (10.3 vs. 9.1 years). However, there were no age differences between the 2 ataque subgroups,  $t(90) = -0.98, p = ns$ . In both sites, the mean age of the first episode was 7.8, with a similar age range of 2 to 13 years in both samples,  $t(90) = 0.01, p = ns$ . Both samples had approximately 1 ataque in the last year, 1.34 versus 1.46 in San Juan and the South Bronx, respectively,  $chi-square (1, N = 2491) = 0.47, p = ns$ . More specifically, over half of both samples reported having 1 to 3 ataques in the last year, 57% to 61% in the South Bronx and San Juan, respectively,  $chi-square (1, N = 2491) = 2.31, p = ns$ .

In the South Bronx, there were no differences in household composition, or maternal education for those children with and without ataques, whereas in San Juan, there were no differences in maternal

education (Table 1). However, children in San Juan with ataques (8.3%) were more likely to come from a single, rather than two, parent household than those without ataques (4.2%). Additionally, children in San Juan with ataques, were more likely to have more educated mothers than their peers in the South Bronx,  $chi-square (1, N = 2491) = 91.07, p < 0.0001$ , although this may have been due to preexisting educational differences in the parent sample.

There were no reported site differences with regards to the cause of ataques,  $chi-square (1, N = 2491) = 1.22, p = ns$ , with the majority of both sites indicating that their ataques were caused by stress, 53.6% to 65.1% of children in the South Bronx and San Juan, respectively. Additionally, although 30.8% versus 18.5% of children in the South Bronx and San Juan received help or treatment for these episodes, these differences were not statistically significant,  $chi-square (1, N = 2491) = 2.30, p = ns$ . When the samples were combined, although more than half of all children with ataques (55.9%) believed that their ataques were caused by stress, an overwhelming majority (71.6%) did not receive help or treatment for their ataques.

**Association Between Ataques, Global Impairment, and Psychosocial Stressors**

Table 2 notes the differences in means and associations among ataques, global impairment, and various indicators of psychosocial stressors, as specified by the number of stressful life events experienced in the last year, lifetime exposure to violence, and perceived parental cultural stress. In both samples, children with ataques were significantly more functionally impaired than those without ataques. On average, children with ataques scored 10 points lower than those without ataques (Table 2). In both samples, children with ataques also had more lifetime exposure to violence than their non-ataque peers. However, they did not differ with respect to parental cultural stress. In the South Bronx, children with ataques experienced more stressful life events in the last year than those without ataques. However, the same was not true for children in San Juan.

**Association Among Ataques, Child Psychopathology, and Global Impairment**

To assess whether there were any site differences in the association between ataques and any depressive, anxiety, or disruptive disorder, as well as any diagnosis or global impairment, a series of hierarchical logistic regressions were computed. In the initial model, step 1 included whether a child had an ataque, followed by site, and the interaction between site and ataque status. Step 2 included the covariates of child age and sex, household composition, and maternal education. In the final step, step 3, a number of psychosocial stressors, such as stressful life events, exposure to violence, and parental cultural stress were entered. However, since

**TABLE 2.** Separate Site Comparisons Between Ataque and Nonataque Groups on Global Impairment and Various Psychosocial Stressors

	South Bronx (n = 1138)					San Juan (n = 1353)				
	Overall Sample	No Ataque	Ataque Group	Contrasts		Overall Sample	No Ataque	Ataque Group	Contrasts	
				t	p				t	p
Global impairment	77.80	78.27	67.07	4.58	0.0001	79.09	79.65	69.37	5.60	0.0001
Stressful life events (yearly)	0.94	0.90	1.71	2.68	0.0087	1.00	0.99	1.29	1.47	0.15
Exposure to violence (lifetime)	4.003	0.847	0.73	3.46	0.0008	3.74	3.64	5.48	2.35	0.02
Parental cultural stress	0.09.	.09	0.15	1.37	0.17	0.09	0.09	0.14	1.35	0.18

Means, t statistic values and specific p values are listed.

the initial analyses revealed no significant interactions between site and ataque status (data not shown), this interaction was dropped and step 1 was reduced to only ataque status and site. Each step of this reduced model is presented below.

In step 1, having an ataque was generally associated with most forms of childhood psychopathology. Specifically, children with ataques were more likely to have any disruptive or anxiety disorder (unadjusted ORs = 3.09–3.98,  $ps < 0.0002–0.0001$ , respectively). They were also more likely to have any psychiatric disorder and greater global impairment (unadjusted ORs = 3.49–3.24,  $ps < 0.0001$ , respectively). However, there was no association between ataques and any depressive disorder despite the elevated odds ratio of this disorder (unadjusted OR = 2.51, 95% CI = 0.83–7.56,  $p = ns$ ).

In step 2, adding the demographic variables generally did little to alter the associations between ataques, child psychopathology, and global impairment (data not shown). For example, except for ataque status, no other variables were associated with any anxiety disorder. Additionally, ataques remained an important correlate of psychopathology despite the fact that males had greater global impairment, and were more likely to be diagnosed with any disorder, including any disruptive disorder (ORs = 1.59–2.03,  $ps < 0.001–0.0004$ ). In all, the associations between ataques and any disorder (OR = 3.24  $p < 0.0001$ ), including any anxiety (OR = 3.99,  $p < 0.001$ ) and any disruptive disorder, remained essentially unchanged (OR = 3.06,  $p < 0.0003$ ). The same was true for the association between ataques and global impairment (OR = 3.35,  $p < 0.0001$ ).

Similarly, in step 3, ataques continued to be associated with child psychopathology above and beyond the inclusion of psychosocial stressors. For example, according to the results of the final adjusted models presented in Table 3, children with ataques were still approximately 3 times more likely to be diagnosed with any anxiety disorder, even though stressful life events and parental cultural stress were associated with having any anxiety disorder. Additionally, children with ataques were still nearly 2 and a half

times more likely to be diagnosed with any disruptive disorder, even though having any disorder, including any disruptive disorder, was far greater for boys, and those children with greater exposure to violence and parental cultural stress (Table 3). Similarly, children with ataques were close to 3 times more likely to report greater global impairment than their non-ataque peers, above and beyond the association between impairment and psychosocial stressors. In sum, with the exception of any depressive disorder, children with ataques were more impaired, and at greater risk of having a psychiatric disorder, than those without ataques.

### DISCUSSION

To our knowledge, this is the first comparative epidemiological study of a cultural idiom of distress in children. Contrary to our initial hypothesis, the estimated lifetime prevalence rates obtained for ataques did not differ by site, indicating that ataques de nervios are a meaningful and culturally salient experience for Puerto Rican youth residing in the South Bronx, New York, and San Juan, Puerto Rico (4%–5%, respectively). Yet, despite the overall similarity in prevalence rates by site, our results indicated a number of between and within site differences in the occurrence of ataques and its correlates.

Specifically, although past research has shown that ataques are a gendered form of distress, in our study we did not find any differences in the occurrence of ataques between girls and boys. Instead, we found that more girls in San Juan had ataques than girls in the South Bronx. Additionally, within San Juan, ataque sufferers were more likely to come from single parent homes when compared with those without ataques while overall, youth in San Juan were more likely to come from a 2 parent homes in comparison to their peers in the South Bronx (Bird et al., 2006b).

The idea that ataques are associated with risk or vulnerability is further supported by our findings that across both sites, children with ataques were more impaired than their non-ataque peers. In particular, children with ataques scored approximately 10 points

**TABLE 3.** Final Estimated Odds Ratios and 95% Confidence Intervals for Correlates of Child Psychopathology and Global Impairment

Variables	Any Depressive D/O ( <i>n</i> = 47)		Any Anxiety D/O ( <i>n</i> = 111)		Any Disruptive D/O ( <i>n</i> = 236)		Any Diagnosis ( <i>n</i> = 311)		Global Impairment ( <i>n</i> = 364)	
	Adj. OR	95% CI	Adj. OR	95% CI	Adj. OR	95% CI	Adj. OR	95% CI	Adj. OR	95% CI
Step 1: Ataques and site										
Ever had an ataque	1.52	0.42–5.52	3.11*	1.53–6.30	2.47*	1.33–4.59	2.53*	1.39–4.61	2.80**	1.52–5.18
Site, South Bronx	0.57	0.27–1.18	0.86	0.52–1.43	1.17	0.80–1.71	1.06	0.77–1.46	0.91	0.63–1.33
Step 2: Demographics										
Child age	1.40**	1.22–1.59	1.08	0.95–1.22	0.98	0.91–1.06	1.01	0.94–1.08	1.05	0.99–1.12
Child sex, males	0.67	0.29–1.56	1.28	0.77–2.14	2.12**	1.42–3.17	1.69*	1.19–2.40	1.70**	1.26–2.29
2 parent household	0.52	0.24–1.12	0.63	0.35–1.14	0.79	0.54–1.16	0.78	0.54–1.12	0.84	0.61–1.16
Maternal education (Less than H.S., referent)										
High school	0.83	0.32–2.11	0.74	0.39–1.39	1.34	0.85–2.12	1.14	0.75–1.74	0.89	0.65–1.21
College+	1.27	0.39–4.07	1.48	0.75–2.94	1.87	1.03–3.40	1.81	1.07–3.08****	0.98	0.61–1.57
Step 3: Stressors										
Stressful life events, 2+	2.91***	1.03–8.18	2.72*	1.49–4.96	1.81*	1.18–2.76	2.10**	1.39–3.17	1.44****	0.98–2.11
Exposure to violence	1.00	0.94–1.08	1.01	0.97–1.05	1.03***	1.00–1.05	1.02***	1.00–1.051	0.03***	1.00–1.05
Parental cultural stress	2.25	0.69–7.32	2.68***	1.04–6.90	2.02****	0.95–4.28	2.74	1.42–5.28*	3.70**	2.12–6.47

These are the final order adjusted statistics.  
 D/O indicates Disorder; Adj. OR, Adjusted Odds Ratio; CI, Confidence Interval.  
 All diagnoses refer to the previous 12 months and include moderate specific impairment criteria.  
 \* $p \leq 0.01$ ; \*\* $p \leq 0.001$ ; \*\*\* $p \leq 0.05$ ; \*\*\*\* $p < 0.07$ .

lower on the global impairment scale than their peers who did not report ataques, indicating that children with ataques experienced more variable functioning in several social areas. Furthermore, their average ratings classified them as children with an increased likelihood of meeting a disorder, as opposed to the non-ataque children who were generally functioning pretty well (Bird and Gould, 1995; Shaffer et al., 1983).

In addition, children with ataques had more lifetime exposure to violence than those without ataques. This finding is in keeping with previous research noting the relation between history of childhood trauma and ataques among adult Latinas (Lewis-Fernández et al., 2002b; Schechter et al., 2000). Taken together, these results highlight the relationship between general risk factors, such as the witnessing of violence, and the well-being of children, and show that expression of distress can also be culturally shaped in children.

These findings also indicate that risk and protective factors can be culturally imbued. For example, although we did not find a relationship between perceived parental stress and ataques, ataques may still be correlated or precipitated by other ethnic specific risk factors. For example, the effect of culturally shaped factors can perhaps explain why stressful life events were only associated with ataques for children in the South Bronx and not in San Juan. That is, while these results may initially appear surprising given the hypothesized association between stress and ataques, these findings may also suggest the importance of additional protective factors that may diminish the relation between stressful life events and ataques among Puerto Rican youth living in San Juan. Namely, certain familial factors, such as family processes and maternal warmth, are important buffers for economically vulnerable populations (Mistry et al., 2002) and these familial characteristics have been found to be more prevalent in the San Juan than in the South Bronx (Bird et al., 2007). Context can, therefore, shed light on ethnic specific factors that may alter the usual relations between stress and outcome.

Most importantly, despite the associations between ataques and psychosocial stressors, ataques continue to be associated with global impairment and most forms of child psychopathology, especially any anxiety disorder. The only exception, however, was that ataques were not associated with any depressive disorder, which we believe may have been due to the relatively small sample size of this group (overall  $n = 47$ ) and the very low prevalence of depressive disorders in the South Bronx and San Juan, 1.2% to 2.1%, respectively (Bird et al., 2006b). Despite this exception, our findings are generally in keeping with past ataque research on adults and children (Guarnaccia et al., 1993, 2005).

Given its association with childhood psychopathology, impairment and stress, it is troubling that approximately 72% of the sample never sought help or treatment for their ataques. This may be because children, particularly ethnic minority children such as Latinos, are not consistently getting the appropriate mental health services they require (Alegria et al., 2004). However, another possible interpretation may be that, while we did not find that children in the South Bronx sought more help for these experiences than their peers in San Juan, the high proportion of the combined sample could suggest that across sites ataques are culturally normative experiences in response to overwhelming stress. For example, past anthropological research notes that unlike panic attacks, some sufferers of ataques may feel better after an episode, and not fear having future attacks—although they may still be concerned about the event that precipitated the attack (Guarnaccia, et al., 1989; Lewis-Fernández et al., 2002a).

### Limitations of the Study

The current study has a few limitations that warrant mention. First, although careful attempts were made to sample areas of Puerto Rico and the continental United States with the densest

concentrations of Puerto Ricans, the results of this study may not necessarily generalize to all Puerto Rican children because there exist other urban and rural areas that were not sampled. Furthermore, the cross-sectional design limits our inferences, making it difficult to ascertain the directionality of associations.

### Future Directions

Future directions for this work include the longitudinal analyses of children identified at baseline to examine the differences in rates of ataques over different cohorts and to assess its association with child psychopathology. Similar to previous research on panic attacks with children, we expect that ataques may serve as risk factors for psychopathology (Goodwin et al., 2004; Reed and Wittchen, 1998). Indeed, current research has found that anxiety sensitivity, which has been found to a precursor to a number of anxiety disorders (e.g., Kılıç et al., 2008), predicates the presence and severity of ataques, in part because an ataque may create catastrophic cognitions about symptoms (Hinton et al., 2008). However, other research has noted that the fear of anxiety does not lead to panic symptoms in Latino adolescents, as compared with Whites (Weems et al., 2002), perhaps because this fear is either more normative or culturally sanctioned. Either way, it is clear that even though ataques are often considered culturally normative, they are related to various forms of psychopathology and future research should investigate the mechanisms involved in establishing this association.

In sum, ataques are a meaningful and culturally salient expression of distress for Puerto Rican youth. We believe that further studies on cultural idioms of distress among children are needed because early identification of these patterns of distress may serve as predictors for future impairment, disorder, and can aide in future interventions. As our study suggests, although the prevalence rates for ataques may be similar for children in different contexts, the factors associated with this form of distress may differ by site. In particular, among Puerto Rican youth residing in 2 different contexts, the most explosive form of distress appears to occur among those who are the most disenfranchised, victimized, and impaired. We would thus argue that cross cultural epidemiological studies need to be done to document how various aspects of the social world shape who suffers from ataques and how this, in turn, is related to social vulnerability and psychopathology (López and Guarnaccia, 2005; Trostle, 2005). We believe that it is especially important to explore these issues with children because they are, by definition, the most vulnerable of all populations.

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