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PREVALENCE AND CORRELATES OF CHILDHOOD-ONSET ANXIETY DISORDERS AMONG LATINOS AND NON-LATINO WHITES IN THE UNITED STATES

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Abstract

Anxiety disorders are the most prevalent class of psychiatric disorders (Kessler *et al.,* 2005) and their early onset places individuals at risk for a wide range of subsequent problems (Weissman *et al.,* 1999). Data from the National Latino and Asian American Study (NLAAS) and the National Comorbidity Survey-Replication (NCS-R) were used to investigate the prevalence and correlates of childhood-onset anxiety disorders among U.S.-born whites, U.S.-born Latinos, and foreign-born Latinos. Significant differences in rates of childhood-onset anxiety disorders were found, with foreign-born Latinos reporting the lowest rates. Across all three ethnicity/nativity groups, individuals with childhood-onset anxiety disorders had equal or higher levels of past-year impairment, relative to individuals with adult-onset anxiety disorders. The chronic course associated with childhood-onset anxiety disorders was also evident regardless of ethnicity and nativity, as indicated by the similarities across groups in the mean number of lifetime disorders and comorbidity rates. Treatment and assessment recommendations are discussed with respect to the findings.

KEY WORDS: *age of onset, childhood anxiety, epidemiology, Latinos, nativity*.

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Resumen

Los trastornos de ansiedad son los trastornos psiquiátricos más comunes (Kessler *et al.,* 2005) y su comienzo a temprana edad pone a las personas en riesgo de una gran variedad de problemas posteriores (Weissman *et al.,* 1999). Se utilizaron los datos del Estudio Nacional de Latinos y Asiáticos Americanos (*National Latino and Asian American Study*, NLAAS) y de la Replicación de la Encuesta Nacional de Comorbilidad (*National Comorbidity Survey-Replication*, NCS-R) para investigar la prevalencia y los factores asociados con el inicio de la ansiedad en la infancia entre los blancos nacidos en Estados Unidos, Latinos nacidos en Estados Unidos y Latinos nacidos en el extranjero. Se encontraron diferencias significativas en las tasas del trastorno por ansiedad con inicio en la infancia, con las tasas más bajas en los Latinos nacidos en el extranjero. En los tres grupos de etnia/lugar de nacimiento, los individuos con trastornos de ansiedad con inicio en la infancia mostraron niveles similares o más elevados de deterioro en el año anterior que los individuos con trastornos de ansiedad con inicio en la adultez. También se mostró el curso crónico asociado con los trastornos de ansiedad de comienzo en la infancia, pues estuvo presente sin importar la etnia o el lugar de nacimiento, indicado por las semejanzas a través de los grupos en el número promedio de trastornos a lo largo de la vida y las tasas de comorbilidad. Se discuten recomendaciones para la evaluación y el tratamiento con respecto a los hallazgos del estudio.

PALABRAS CLAVE: *edad de inicio, ansiedad infantil, epidemiología, latinos, lugar de nacimiento*.

Anxiety disorders, relative to other classes of disorders, are the most common mental health disorders in the general U.S. population (Kessler et al., 2005a). They result in substantial cost to health care systems (Greenberg et al., 1999; Hofmann & Barlow, 1999; Rice & Miller, 1993) and are associated with reductions in productivity (DuPont et al., 1996; Kessler & Frank, 1997; Kouzis & Eaton, 1994). Childhood is a high risk period for the development of anxiety disorders (Kovacs & Devlin, 1998). For example, results from the National Comorbidity Survey Replication study (NCS-R) revealed a median age of onset for anxiety disorders of 11 years, with most participants receiving a diagnosis between the ages of 6 and 22 (Kessler et al., 2005b). Studies in the United States (Christie et al., 1988) and other countries (Kessler, 2007; Lee et al., 2007; WHO International Consortium in Psychiatric Epidemiology, 2000) have confirmed earlier ages of onset for childhood anxiety disorders relative to other psychiatric disorders.

There is evidence, however, that age of onset varies across anxiety disorders. For example, Generalized Anxiety Disorder (GAD) and Panic Disorder have been reported as emerging in late adolescence, while Separation Anxiety Disorder (SAD), Simple Phobia, and Social Phobia are typically reported by mid-adolescence or earlier (Beidel, Turner, & Morris, 1999; Giaconia et al., 1994; Kessler et al., 2005b; Merikangas, 2005; Velting & Albano 2001). While an early diagnosis of an anxiety disorder is often predictive of future episodes of the same type of disorder, they often also precede the onset of other disorders commonly

experienced in childhood, such as disruptive behavior disorders (emerging in mid childhood) and depression (emerging in late childhood; Kovacs & Devlin, 1998).

An anxiety disorder diagnosis in childhood has been associated with higher parental psychopathology, greater severity and functional impairment, use of long term psychiatric and medical services, and greater risk of developing a range of disorders across the lifespan including substance abuse and conduct problems (Giaconia et al., 1994; Goldstein, Wickramaratne, Horwath, & Weissman, 1997; Marquenie et al., 2007; Otto et al., 2001; Weissman et al., 1999). Additionally, a childhood diagnosis of anxiety disorders has been found to be a common precursor among individuals diagnosed with eating disorders in adulthood (Godart, Flament, Lecrubier, & Jeammet, 2000).

Anxiety disorders among U.S. Latinos

Latinos are the largest ethnic minority currently residing in the U.S. (U.S. Census Bureau, 2006). It is estimated that by 2050, Latinos will represent more than 25% of the total U.S. population (U.S. Census Bureau, 2003). Thus, it is important to understand factors associated with the prevalence, comorbidity, and age of onset of psychiatric disorders in this population. In general, studies have found that the rates of psychopathology among Latinos in the U.S. (Alegria et al., 2008; Breslau et al., 2006) are lower than those of their non-Latino white counterparts, particularly among those who are foreign-born (Robins & Regler, 1991; Vega et al., 1998).

The term "immigrant paradox" (Abraído-Lanza, Chao, & Flórez, 2005; Franzini, Ribble & Keddie, 2001) has been used to describe the notion that certain immigrant groups display more favorable health outcomes despite having demographic profiles typically associated with greater risk. For example, foreign-born Latinos have reported particularly low rates of substance-related disorders, relative to both U.S.-born Latinos and non-Latino Whites (Burnam et al., 1987; Grant et al., 2004; Vega, Alderete, Kolody, & Aguilar-Gaxiola, 1998). Epidemiologic surveys have similarly found lower lifetime rates of anxiety disorders among foreign-born Latinos living in the United States (Grant et al., 2004). More recently, Alegria et al. (2008) found that as an aggregate, Latinos are at lower risk for anxiety disorders compared to non-Latino whites and that U.S.-born Latinos report higher rates of anxiety disorders than Latino immigrants. However, rates vary when data are stratified by nativity and disorder and adjusted by demographic and socioeconomic differences across Latino subgroups. Among Mexicans, the immigrant paradox steadily holds across anxiety disorders but this pattern is not seen for Cubans, Puerto Ricans and other Latinos. In fact, Puerto Ricans have similar rates of anxiety disorders as non-Latino whites (Alegria et al., 2008). Published reports of anxiety disorders among U.S. Latinos have primarily focused on documenting their prevalence rates. Very little information is available, however, regarding other highly relevant clinical characteristics, including cross-cultural differences in the onset and course of anxiety disorders.

Much of the evidence on the comorbidity and onset of anxiety disorders has not attended to the potential influence of race/ethnicity and other cultural factors. The available data pertain mostly to European American samples and the English speaking U.S. population. To begin to address this gap, this study utilizes data from two nationally representative surveys - the National Comorbidity Survey Replication (NCS-R) and the National Latino and Asian American Study (NLAAS) – to investigate differences across three ethnicity/nativity groups (U.S.-born whites, U.S.-born Latinos and foreign-born Latinos). More specifically, the study examines: (1) differences in the onset for each of the anxiety disorders assessed by both the NLAAS and the NCS-R (Social Phobia, Generalized Anxiety Disorder, Post-Traumatic Stress Disorder, Panic Disorder, and Agoraphobia); (2) demographic and clinical characteristics that differentiate individuals with childhood-onset versus adult-onset anxiety disorders; and (3) patterns of comorbidity relevant to individuals with childhood-onset anxiety diagnoses.

Method

Participants

This paper combines data from two of the three nationally representative epidemiological surveys that are part of the Collaborative Psychiatric Epidemiology Surveys (CPES), sponsored by the National Institute of Mental Health (Pennell et al., 2004), which include the National Comorbidity Study-Replication (NCS-R), the National Latino and Asian American Study (NLAAS) and the National Survey of American Life (NSAL). These surveys offer comprehensive epidemiological data regarding the distribution of mental health disorders among the U.S. population, with special emphasis on ethnic minority groups. The core assessment batteries used in each of the CPES surveys were designed to be comparable, with identical measures of psychiatric illness, service use and impairment. The data were gathered following similar procedures across surveys so that key scientific constructs could be cross-linked. In order to examine prevalence rates and correlates for the ethnicity/nativity groups relevant to this study, data for U.S.-born Whites were drawn from the National Comorbidity Survey Replication (NCS-R), while data for foreign-born and U.S.-born Latinos were drawn from the National Latino and Asian American Study (NLAAS).

The National Comorbidity Survey-Replication (NCS-R) is a nationally representative survey (n = 9,282) of English-speaking household residents aged 18 years and older living in the coterminous United States (Kessler & Merikangas, 2004; Kessler et al., 2004). Since Spanish-speaking Latinos were not represented in the NCS-R, only the non-Latino, U.S.-born whites from this dataset were included in the present study (n = 4,047). Face-to-face interviews were conducted by professional interviewers from the Institute for Social Research at the University of Michigan, Ann Arbor. These interviews were conducted between February 2001 and April 2003. The overall response rate for the survey was 70.9%. Survey administration

was done in two parts, with part I consisting of a core diagnostic assessment and part II additionally consisting of questions about risk factors, consequences, other correlates, and additional disorders. In the present study, we use Part II only of the NCS-R pooled with the NLAAS Latinos, since we require detailed information on health status, demographics, and correlates of disorder.

The National Latino and Asian American Study (NLAAS) is a nationally representative survey of English and Spanish-speaking household residents, aged 18 and older, drawn from the non-institutionalized population of the coterminous United States (Heeringa et al., 2004). It is one of the few nationally representative studies to include both English and Spanish-speaking Latinos (50% Spanish speaking respondents). The data for this survey were collected by the Institute for Social Research (ISR) at the University of Michigan between May 2002 and November 2003. Respondents were selected from a multi-stage clustered area probability sample of households. The final sample of 2554 Latinos represented four sub-ethnic groups (as indicated by their self-reported ethnicity using the same procedures as the U.S. Census). Of the total sample, 868 were of Mexican origin, 495 were Puerto Rican, and 577 were Cuban. A fourth group was composed of Latinos from other backgrounds, and included individuals born in the Dominican Republic, Colombia, El Salvador, Ecuador, Guatemala, Honduras, Peru, and Nicaragua, among others (Alegria et al., 2007a). The response rate for the overall sample was 75.5%.

Procedure

NCS-R surveys were conducted by 342 certified English interviewers, while NLAAS data were collected by 275 trained multilingual interviewers (Alegria et al., 2004a). All study materials for NLAAS were translated into Spanish. Alegria et al. (2004b) describes steps taken to ensure that the translated NLASS instruments maintained semantic, content, and technical equivalence, as well as cultural relevance and internal consistency. This process included professional translation and back translation, a review by a multinational bilingual committee, and focus groups with Spanish-speaking respondents representing several Latino subgroups (Mexican, Cuban, and Puerto Rican). Approximately half of the NLAAS participants were monolingual Spanish speakers, or had limited English proficiency and requested the interview in Spanish.

Measures

The NCS-R and NLAAS were designed to include parallel assessments across most demographic characteristics and all clinical measures. The present study includes those common to both datasets. Additional details about the design and methodology in the NLAAS and NCS-R datasets can be found at the Collaborative Psychiatric Epidemiology Survey Website (http://www.icpsr.umich.edu/CPES/background.html).

DEMOGRAPHIC CHARACTERISTICS

Three *ethnicity/nativity* groups were formed from the combined datasets. The U.S.-born whites group consisted of all white participants born in the United States included in the NCS-R dataset (n = 4,047). The U.S.-born Latino group consisted of all participants born in the United States included in the NLAAS dataset (n = 924) while the foreign-born Latino group consisted of all participants born outside the U.S. included in the NLAAS dataset (n = 1,630).

Age was coded using four categories (18-34 years; 35-49 years; 50-64 years; and 65 years or more). G*ender* was coded using dummy variables (0=male; 1=female). *Marital status* was coded as three dummy categories: (a) married; (b) not married (single/never married); and (c) separated, widowed or divorced. *Employment* was coded as employed, out of labor force, and unemployed. *Education* was coded into four categories based on the number of years of education completed by the respondent (11 years or less; 12 years; 13-16 years; and 17 years or more). *Household income* was grouped into four categories based on reported household income from the previous year ($0-14,999; $15,000-34,999; $35,000-74,999; and $75,000 or more).

DIAGNOSTIC MEASURES AND ASSOCIATED CLINICAL CHARACTERISTICS

Lifetime and past-year diagnostic assessment: Both lifetime and past-year prevalence of psychiatric disorders were evaluated using the World Health Organization Composite International Diagnostic Interview (WMH-CIDI) (Kessler & Ustun, 2004). The WMH-CIDI is a fully structured diagnostic instrument administered by trained lay interviewers that is based on criteria of the DSM-IV (American Psychiatric Association, 2000). Diagnoses were made with DSM-IV organic exclusion rules. Diagnostic categories assessed in both NLAAS and NCS-R studies and used in this report included 5 anxiety disorders (Social Phobia, Generalized Anxiety Disorder, Post-Traumatic Stress Disorder, Panic Disorder, and Agoraphobia), 2 depressive disorders (Major Depressive Disorder and Dysthymia), 4 substance use disorders (Alcohol Abuse, Alcohol Dependence, Drug Abuse, and Drug Dependence) and 2 eating disorders (Bulimia Nervosa and Anorexia Nervosa).

Age of onset and childhood onset classification: Retrospective age of onset reports were obtained using the methodology described by Breslau et al. (2007). Participants were asked "Can you remember your *exact age* the *very first time* you (HAD THE SYNDROME)?" Respondents who did not recall an exact age were probed for a bound of uncertainty by moving up the age range incrementally (e.g., "Was it before you first started school?" "Was it before you became a teenager?" and so forth). Age of onset was set at the upper end of the bound (e.g., age 5 for those reporting an onset before school started and age 12 for those whose onset was before they became teenagers). This question sequence has been shown to yield more plausible age of onset responses relative to methods used in prior epidemiological surveys (Knauper et al., 1999). For the present study, two onset

categories were formed. Individuals reporting an onset prior to age 18 for the five anxiety disorders evaluated were categorized as having a childhood-onset disorder.

Past-year impairment associated with anxiety disorder: When past-year symptom criteria were met for one or more of the five anxiety disorders evaluated, respondents were asked to judge, on a scale from 0 (no interference) to 10 (severe interference), the extent to which the problem(s) interfered with their lives across each of four domains (home management, work, relationships, and social life). Moderate or severe impairment was coded as being present if at least one of the scores on any of the interference items were rated as 4 (moderate) or higher.

Analytical strategy

In the combined NCS-R and NLAAS samples, those who reported onset of the assessed anxiety disorders before the age of 18 were categorized as having childhood onset, while those reported onset at age 18 or older were categorized as having adult onset. The weighted average age of onset and weighted prevalence rates of childhood-onset among those with lifetime anxiety disorders were computed separately for U.S.-born whites, foreign-born Latinos, and U.S.-born Latinos in Table 1. Demographic and clinical characteristics were contrasted for the three ethnic/nativity groups (adjusting for age and gender) in Tables 2 and 4. Significance tests for differences in Tables 1 and 4 were conducted using design-adjusted Wald test, and tests in Table 2 were conducted using a Rao–Scott statistic for the Pearson chi-squared test for contingency tables. Logistic regression models in Table 3 were adjusted for sampling design through a first-order Taylor series approximation, and significance tests were performed using design-adjusted Wald tests. The statistical software Stata (version 9.2) was used to conduct all analyses (Stata Statistical Software Release, 2006).

Results

Across the pooled NCS-R and NLAAS samples, a total of 1,939 individuals reported one or more anxiety disorders. Of these, the majority reported that at least one of these anxiety disorders had an onset prior to age 18 (1,281/1,939). The mean age of onset reported across all anxiety disorders was 17.10 (SE = 0.35). As Table 1 indicates, significant age of onset differences were found across the three ethnicity/nativity groups. The mean age of onset across all anxiety disorders was in adolescence for U.S.-born Latinos (M = 15.2) and U.S.-born whites (M = 16.9). In contrast, foreign-born Latinos had a mean age of onset in early adulthood (M = 22.6). These group differences were statistically significant ($F_{2,92}$ = 6.56, $p < .01$). When individual anxiety disorders were examined, statistical tests revealed significant differences for GAD and social phobia. In both cases, foreign-born Latinos reported ages of onset that were, on average,

between 5 and 10 years later than those reported by U.S.-born Latinos and U.S.-born whites. On the other hand, across all three ethnicity/nativity groups, social phobia had the earliest age of onset of all anxiety disorders, while GAD had the latest age of onset.

Table 1 also shows significant differences in the proportion of anxiety disorders which are diagnosed in childhood. U.S.-born Latinos (68.3%) and U.S.-born non-Latino whites (65.5%) reported a higher prevalence of childhood-onset anxiety disorders relative to foreign-born Latinos (53.4%; $F_{2,92} = 4.79$, $p < .05$). Significant ethnicity/nativity differences in rates of childhood-onset prevalence were found for agoraphobia ($F_{2,73} = 6.59$, $p < .01$) panic disorder ($F_{2,77} = 3.63$, $p < .05$), and social phobia ($F_{2,87} = 5.83$, $p < .01$). In general, foreign-born Latinos were less likely to have an anxiety disorder with a childhood-onset.

Table 2 focuses exclusively on individuals diagnosed with one or more lifetime anxiety disorders. Within this subsample, demographic and clinical characteristics are compared between those individuals who reported childhood- versus adult-onset anxiety disorders. These onset comparisons were made separately for each of the three ethnicity/nativity groups. Relative to those with a childhood onset, individuals with adult onset anxiety disorders were more likely to be female among both the U.S.-born white ($F_{1,42} = 9.76$, $p < .01$) and foreign-born Latino groups ($F_{1,45} = 4.16$, $p < .05$). Differences in marital status were found across child- and adult-onset groups among U.S.-born whites ($F_{1.71,71.67} = 22.07$, $p < .001$). Among foreign-born Latinos, there were differences in income ($F_{2.70,121.65} = 3.57$, $p < .05$) and employment status ($F_{1.94, 87.15} = 4.03$, $p < .05$) between childhood and adult onset groups. Foreign-born Latinos with adult-onset anxiety disorders were more likely to have lower incomes and less likely to be employed than their counterparts with a childhood onset anxiety disorder.

Prevalence of selected clinical characteristics across child- and adult-onset groups are also presented in Table 2 for each of the three ethnicity/nativity groups. There were significant differences in the number of past-year anxiety disorders between those with childhood-onset anxiety disorders and those with adult-onset among U.S.-born non-Latino whites and foreign-born Latinos ($F_{2.64,110.99} = 9.21$, $p < .0001$ and $F_{2.21, 99.43} = 5.28$, $p < .01$) with more individuals who had a childhood-onset anxiety disorder having at least one past-year anxiety disorder. Moderate to severe past-year impairment associated with an anxiety disorder was more prevalent in those with childhood onset compared to those with adult-onset among U.S.-born non-Latino whites ($F_{1,42} = 26.27$, $p < .0001$) and foreign-born Latinos ($F_{1,45} = 4.69$, $p < .05$).

Table 3 displays the odds ratios for comorbid lifetime depressive and substance use disorders estimated using logistic regression models. The main effects model included age, sex, anxiety disorder onset category, and ethnicity/nativity categories. This model indicated that individuals with a lifetime anxiety disorder were more than six times as likely to have a lifetime depressive disorder compared to those without an anxiety disorder for both onset groups. Similarly, about a three-fold risk for substance use disorders was associated with individuals with a lifetime anxiety disorder, regardless of age of onset. Additionally, the main effects model indicated

Table 1
Reported mean age of onset and percentage of individuals reporting childhood-onset anxiety disorders across ethnic/nativity groups†

	U.S.-born Non Latino Whites		U.S.-born Latinos		Foreign-born Latinos		Overall tests across ethnic/nativity groups	
Reported mean age of onset	*n*	*M (SE)*	*n*	*M (SE)*	*n*	*M (SE)*	*F*	*p*
Any Anxiety	1503	16.9 (0.4)	167	15.2 (1.0)	269	22.6 (1.9)	6.56	0.002
Agoraphobia	155	18.4 (1.1)	31	14.6 (1.4)	65	16.6 (2.4)	2.35	0.103
General Anxiety Disorder	566	26.3 (0.8)	57	24.2 (1.4)	97	33.2 (2.8)	3.35	0.040
Panic Disorder	319	23.6 (0.9)	35	18.1 (4.1)	56	20.8 (2.3)	1.10	0.337
Posttraumatic Stress Disorder	417	20.5 (0.6)	60	22.9 (2.5)	75	31.0 (4.5)	3.02	0.054
Social Phobia	806	11.2 (0.2)	84	10.2 (0.5)	112	16.1 (1.3)	10.23	0.0001
Percentage reporting a childhood onset anxiety disorder	*n*	% *(SE)*	*n*	% *(SE)*	*n*	% *(SE)*	*F*	*P*
Any Anxiety	1503	65.5% (1.3%)	167	68.3% (4.2%)	269	53.4% (3.9%)	4.79	0.010
Agoraphobia	155	54.8% (4.1%)	31	79.2% (5.3%)	65	62.6% (7.6%)	6.59	0.002
General Anxiety Disorder	566	29.5% (2.3%)	57	23.1% (9.2%)	97	18.4% (5.6%)	1.76	0.179
Panic Disorder	319	34.5% (3.1%)	35	55.6% (15.9%)	56	50.3% (7.3%)	3.63	0.031
Posttraumatic Stress Disorder	417	47.0% (2.9%)	60	39.0% (8.1%)	75	30.6% (8.0%)	1.94	0.150
Social Phobia	806	90.5% (1.0%)	84	92.2% (1.8%)	112	73.0% (5.1%)	5.83	0.004

Note: †Means and rates are age and sex adjusted; childhood-onset anxiety disorders are defined as those that are reported as having an onset before the age of 18.

Table 2

Demographic and clinical characteristics for individuals with childhood- and adult- onset anxiety disorders across ethnic and nativity groups[†]

	U.S. born Non-Latino Whites				*U.S. born Latinos*				*Foreign-born Latinos*			
Demographic characteristics	*n*	Child Onset	Adult Onset	*F*	*n*	Child Onset	Adult Onset	*F*	*n*	Child Onset	Adult Onset	*F*
Sex				9.76**				0.01				4.16*
Males	534	41.3%	34.9%		60	39.5%	38.4%		82	41.6%	26.5%	
Females	969	58.7%	65.1%		107	60.5%	61.6%		187	58.4%	73.5%	
Age (years)				27.31****				5.37**				9.23****
18-34	460	40.0%	17.0%		77	34.2%	13.7%		78	34.5%	12.8%	
35-49	548	37.5%	43.5%		67	31.1%	62.6%		85	36.2%	17.7%	
50-64	352	16.0%	28.5%		18	15.2%	23.7%		79	23.2%	32.1%	
65 or more	143	6.5%	10.9%		5	19.5%	0.0%		27	6.0%	37.4%	
Income				2.53[a]				1.70				3.57*
$0-14,999	209	14.4%	10.7%		42	22.1%	17.9%		93	29.8%	45.0%	
$15,000-34,999	336	20.5%	26.8%		41	19.4%	24.1%		79	24.2%	33.6%	
$35,000-74,999	538	36.5%	33.1%		46	39.1%	22.7%		60	27.1%	13.4%	
$75,000 or more	420	28.5%	29.3%		38	19.3%	38.2%		37	18.8%	8.0%	
Education (years)				0.54				1.16				1.14
11 or less	194	14.1%	11.1%		57	38.7%	29.8%		126	52.5%	64.1%	
12	417	28.4%	29.0%		41	28.6%	17.0%		64	21.3%	19.7%	
13-16	715	46.0%	47.7%		63	28.9%	47.3%		62	19.4%	10.6%	
17 or more	176	11.5%	12.2%		6	3.8%	5.8%		17	6.8%	5.6%	
Employment				1.33				2.25				4.03*
Employed	1,007	70.6%	66.1%		93	49.3%	74.6%		120	54.3%	33.6%	
Unemployed	79	3.8%	4.4%		14	6.4%	4.1%		17	5.7%	3.2%	
Out of labor force	416	25.6%	29.6%		60	44.3%	21.3%		132	40.0%	63.2%	
Marital status				22.07***				0.49				2.89[a]
Married	712	44.5%	51.0%		60	46.8%	38.0%		129	50.7%	51.2%	
Never married	336	32.0%	13.4%		61	27.1%	28.0%		54	21.3%	7.8%	
Widowed, divorced, or separated	454	23.5%	35.6%		46	26.2%	33.9%		86	28.0%	41.8%	

Note: [†]Age and sex adjusted rates; [a]p<.10, *p<.05, **p<.01, ***p<.001, ****p<.0001.

Table 2
Demographic and clinical characteristics for individuals with childhood- and adult- onset anxiety disorders across ethnic and nativity groups† (continued)

	U.S. born Non-Latino Whites				U.S. born Latinos				Foreign-born Latinos			
Clinical Characteristics	*n*	Child Onset	Adult Onset	*F*	*n*	Child Onset	Adult Onset	*F*	*n*	Child Onset	Adult Onset	*F*
Past year disorders				2.43				1.65				2.34[a]
No disorder	544	34.0%	43.5%		47	34.8%	44.9%		77	27.6%	38.6%	
One disorder	481	33.4%	29.0%		52	25.4%	40.5%		81	39.6%	21.2%	
Two disorders	243	15.8%	15.5%		28	14.3%	8.2%		49	13.2%	23.7%	
Three or more disorders	235	16.8%	11.9%		40	25.5%	6.3%		62	19.7%	16.5%	
Past year anxiety disorder				9.21****				1.99				5.28**
No anxiety disorder	634	40.2%	49.3%		58	41.6%	53.2%		93	32.4%	49.7%	
One anxiety disorder	629	41.7%	43.0%		74	33.7%	46.8%		114	47.2%	35.0%	
Two anxiety disorders	162	11.8%	5.3%		19	14.1%	0.0%		38	10.0%	14.7%	
Three or more anxiety disorders	78	6.4%	2.4%		16	10.6%	0.0%		24	10.5%	0.7%	
Past-year impairment due to anxiety disorder				26.27****				0.71				4.69*
No moderate or severe impairment	839	52.0%	66.8%		83	53.6%	56.0%		125	45.5%	62.6%	
One or more moderate severe impairment	664	48.0%	33.2%		83	46.4%	44.0%		140	54.5%	37.4%	

Note: †Age and sex adjusted rates; [a]p<.10, *p<.05, **p<.01, ***p<.001, ****p<.0001.

Table 3

Odds ratios for comorbid depressive and substance use disorders across onset and ethnicity/nativity groups†

		Depressive Disorders		*Substance Use Disorders*	
		*MDD and DD**		*AA, AD, DA, DD***	
		OR†	(95% CI)	OR†	(95% CI)
Main Effects Model					
Onset	No lifetime anxiety disorder	1.00		1.00	
	Childhood onset anxiety disorder	6.74	(5.473, 8.298)	2.95	(2.461, 3.530)
	Adult onset anxiety disorder	6.19	(5.047, 7.593)	2.94	(2.417, 3.580)
Sex					
	Male	1.00		1.00	
	Female	1.56	(1.342, 1.807)	0.32	(0.279, 0.364)
Age					
	18-34	1.00		1.00	
	35-49	1.18	(0.969, 1.440)	0.99	(0.784, 1.243)
	50-64	1.07	(0.856, 1.338)	0.70	(0.524, 0.929)
	65 or more	0.60	(0.464, 0.767)	0.24	(0.147, 0.398)
Ethnicity/ Nativity					
	U.S. born White	1.00		1.00	
	U.S. born Latino	0.83	(0.632, 1.090)	1.28	(0.885, 1.852)
	Foreign born Latino	0.97	(0.694, 1.345)	0.28	(0.190, 0.414)
Interaction Models ††					
Childhood vs. adult onset within each ethnic group					
	USB White childhood onset - USB White adult onset	0.91	(0.699, 1.175)	1.03	(0.801, 1.332)
	USB Latino childhood onset - USB Latino adult onset	0.54	(0.210, 1.377)	0.94	(0336, 2.823)
	FB Latino childhood onset - FB Latino adult onset	1.36	(0.480, 3.874)	0.34	(0.113, 1.018)
Childhood vs. adult onset across ethnic groups					
	USB White adult onset - USB Latino childhood onset	1.15	(0.721, 1.820)	1.11	(0.616, 1.999)
	FB Latino adult onset - USB Latino childhood onset	0.79	(0.343, 1.808)	5.52	(1.586, 19.241)
	USB Latino adult onset - USB White childhood onset	1.79	(0.802, 3.995)	0.89	(0.443, 1.806)
	FB Latino adult onset - USB White childhood onset	0.76	(0.363, 1.584)	4.82	(1.702, 13.632)
	USB White adult onset - FB Latino childhood onset	1.07	(0.622, 1.827)	0.59	(0.330, 1.062)
	USB Latino adult onset - FB Latino childhood onset	1.73	(0.630, 4.753)	0.55	(0.236, 1.270)
Childhood vs. childhood onset across ethnic groups					
	USB Latino childhood onset - USB White childhood onset	0.96	(0.602, 1.541)	0.87	(0.495, 1.535)
	FB Latino childhood onset - USB Latino childhood onset	1.07	(0.563, 2.050)	1.88	(0.9269, 3.628)
	FB Latino childhood onset - USB White childhood onset	1.03	(0.598, 1.790)	1.64	(0.929, 2.878)

Note: †Main effects and interactions models run separately; interactions model controlling for age and sex; ††First category listed is the reference group; USB= U.S. Born; FB= Foreign Born; *MDD= Major Depressive Disorder; DD= Dysthymic Disorder; **AA= Alcohol Abuse; AD= Alcohol Dependence; DA= Drug Abuse; DD= Drug Dependence

Table 4
Onset and clinical comorbidity paths among individuals with childhood- onset anxiety disorders†

	U.S.-born Non Latino Whites		*U.S.-Born Latinos*		*Foreign-born Latinos*		*Overall test across groups*	
	n	*M* or % *(SE)*	*n*	*M* or % *(SE)*	*n*	*M* or % *(SE)*	*F*	*p*
MEAN NUMBER OF LIFETIME DISORDERS	1,004	2.9 (0.08)	120	2.9 (0.23)	157	2.6 (0.17)	1.23	0.297
COMORBIDITY RATES								
No comorbidity	285	30.2 (2.2)	23	24.6 (4.2)	47	30.9 (5.9)	0.75	0.475
One or more anxiety disorder	414	37.9 (1.7)	52	37.7 (6.7)	61	35.2 (4.1)	0.19	0.831
One or more depressive disorder	506	50.3 (2.4)	64	49.5 (4.8)	82	49.6 (6.2)	0.02	0.985
One or more substance use disorder	277	27.6 (1.5)	38	27.1 (4.9)	22	19.3 (4.5)	1.54	0.220
One or more eating disorder	26	2.4 (0.5)	11	8.0 (2.8)	8	3.1 (1.3)	1.97	0.145
ONSET AND COMORBIDITY CATEGORIES (includes only those who have a comorbid depressive or substance use disorder)								
Anxiety disorder precedes non-anxiety disorder	474	75.5 (1.8)	61	81.4 (5.7)	69	84.8 (5.0)	1.54	0.220
Onset occurred during the same year	80	14.3 (1.9)	6	7.1 (3.4)	11	5.9 (2.4)	3.83	0.026
Non-anxiety disorder precedes anxiety disorder	64	10.2 (1.3)	13	11.5 (3.9)	12	9.4 (3.7)	0.011	0.900

Note: †Age and sex adjusted rates.

that relative to U.S.-born whites, foreign-born Latino's were less likely to report substance use disorders (OR = 0.28, 95%, CI = [0.190, 0.414]).

Table 3 also displays a series of interaction models that were conducted to test differences in the likelihood of having a comorbid depressive or substance use disorder across onset groups and ethnicity/nativity categories, after controlling for sex and age. First, comparisons were made between childhood- vs. adult-onset groups within each ethnicity/nativity group, using the childhood-onset category as the reference group for each individual comparison. No differences between childhood- vs. adult- onset groups were found within ethnicity/nativity groups for comorbid depressive or substance use disorders. Next, comparisons were made between childhood- vs. adult-onset categories across each ethnicity/nativity group, using the adult-onset category as the reference group for each individual comparison. Relative to foreign-born Latinos with adult-onset anxiety disorders, U.S.-born Latinos with childhood-onset anxiety were more likely to report a comorbid substance abuse disorder (OR = 5.52, 95%, CI = [1.586, 19.241]). Additionally, relative to foreign-born Latinos with adult onset anxiety disorders, U.S.-born whites with childhood-onset anxiety were more likely to report a comorbid substance use disorder (OR = 4.82, 95%, CI [1.702, 13.632]). No significant differences in risk for comorbid depressive disorders were found across ethnicity/nativity groups. Finally, comparisons were made between childhood-onset categories across the different ethnicity/nativity groups. The risk for comorbid depressive and substance use disorders was not significantly different when comparing childhood-onset groups across ethnicity/nativity categories.

Table 4 shows the mean number of lifetime psychiatric disorders, comorbidity rates, and order of onset for anxiety and non-anxiety (depressive and substance) disorders among individuals with childhood-onset anxiety disorders across ethnicity/nativity categories. Reported findings have been adjusted for age and sex differences across the groups. Individuals with childhood-onset anxiety disorders reported somewhere between 2.6 (foreign-born Latinos) and 2.9 (U.S.-born Latinos) lifetime disorders, and these differences were not significant across the three ethnicity/nativity groups.

Between one quarter and one third of individuals with a childhood-onset anxiety disorder reported no comorbidity of the 13 assessed disorders. Across ethnicity/nativity groups, rates for comorbid anxiety disorders (i.e., more than one lifetime anxiety disorder) among individuals with childhood-onset anxiety disorders ranged from 35.2% to 37.9%. Rates of comorbid depressive disorders ranged from 49.5% to 50.3%, while rates of comorbid substance use disorders ranged from 19.3% to 27.6%. A smaller proportion of individuals with childhood-onset anxiety disorders had comorbid eating disorders (2.4% to 8.0%). Differences in comorbidity rates were not significant across ethnicity/nativity groups.

The majority of the individuals with childhood-onset anxiety disorders who also reported a comorbid depressive and substance disorder reported that the anxiety disorder preceded these comorbid disorders. This pattern was consistent across all three ethnicity/nativity groups.

Discussion

There is consistent evidence to suggest that differences in prevalence rates of anxiety disorders exist across ethnic and nativity groups in the United States (Alegria et al., 2008; Grant et al., 2004). This study was carried out to expand the knowledge base regarding other relevant clinical aspects of anxiety disorders. In particular, comparisons were made between U.S.-born Whites, U.S.-born Latinos, and foreign-born Latinos in terms of their reported age of onset and comorbidity.

Foreign-born Latinos reported ages of onset for several anxiety disorders that were, on average, several years older than those reported by U.S.-born Latinos and U.S.-born whites. For example, the reported age of onset for Generalized Anxiety Disorders was well into the third decade of life. Similarly, both U.S.-born whites and U.S.-born Latinos reported ages of onset prior to the beginning of the adolescent years, whereas foreign-born Latinos had a reported onset of social phobia after the age of 16.

The fact that U.S.-born Latinos and U.S.-born whites were more likely to report childhood-onset anxiety disorders, relative to foreign-born Latinos, is consistent with cross-national findings suggesting that anxiety disorders are particularly prevalent among English-speaking North American samples (WHO International Consortium in Psychiatric Epidemiology, 2000). Prior studies have identified that time in the U.S. and age of arrival are significant predictors of lifetime risk of psychiatric disorders, although variations have been found for specific Latino subgroups (Alegria et al., 2007c; Alderete, Vega, Kolody, & Aguilar-Gaxiola, 2000). In these studies, longer length of residence in the Latin American countries of origin has been associated with a reduced cumulative risk of onset and lower lifetime rates of psychiatric disorders. Since an earlier onset has been associated with a more chronic course of illness, these findings further suggest that, relative to U.S.-born populations, immigrant Latinos may be additionally protected even if they are diagnosed with the disorder at some point in their lives by having a later age of onset.

The apparent reduced risk profile among immigrant Latinos may be associated with protective factors derived from their culture of origin (e.g., family support networks), which may buffer or delay the onset of anxiety disorders. Therefore, prevention and treatment implications for children point to the importance of identifying and capitalizing on the strengths and coping strategies found among cultural groups known to have lower risks of anxiety disorders. Because anxiety disorders are among the most likely to emerge in childhood, more studies of early life environments are needed to better understand risk and protective factors associated with the development of psychopathology among different ethnic and cultural groups. Research with cross-national samples as well as research with youth of immigrant families without a history of early onset anxiety disorders may be particularly helpful in this regard.

Most individuals with anxiety disorders report an onset in childhood, which confirms that these disorders first emerge during a critical period of development. Moreover, when anxiety disorders emerge in childhood, they are associated with

a chronic course. Relative to those with adult-onset anxiety disorders, individuals reporting childhood-onset anxiety disorders were more likely to report one or more past-year anxiety disorders. This was the case for both U.S.-born whites and foreign-born-Latinos. Higher rates of past-year impairment associated with an anxiety disorder were found among those with childhood-onset anxiety disorders relative to those with adult-onset anxiety. This latter finding was statistically significant among U.S.-born whites and foreign-born Latinos.

Irrespective of ethnicity or nativity, the results of this study suggest that for individuals with anxiety disorders, comorbidity appears to be the norm rather than the exception. Consistent with prior findings (Marquenie et al., 2007), risk for comorbid depressive and substance use disorders was elevated among individuals with both childhood- and adult-onset anxiety disorders, although foreign-born Latinos showed lower likelihood of having comorbid substance use disorders relative to U.S.-born whites. It has been suggested that the protective role of cultural factors (e.g., family support) may be associated with the onset of psychiatric disorders (Breslau et al., 2007; Grant et al., 2004). However, in the present study, the reduced risk for comorbid substance use disorders among foreign-born Latinos was specific to those with adult- (and not childhood) onset anxiety disorders. The protective nativity effect among the foreign-born Latino adult-onset group was evident despite having a greater proportion of lower income individuals relative to their childhood-onset counterparts. These findings suggest that while cultural factors may protect foreign-born Latinos from the emergence of certain forms of psychopathology, this protective effect may have less of an influence if the anxiety disorders emerge in childhood. These findings point to the importance of early identification and intervention among immigrant and nonimmigrant populations alike.

The results reported in this study should be considered in light of several methodological limitations. Despite the use of new methodology to improve the accuracy of age-of-onset reports (Knauper et al., 1999), findings may be impacted by difficulties in exact recollection of onset, which are inherent in retrospective reports of lifetime psychopathology (Masia et al., 2003). In this study, age of onset was obtained by asking individuals to remember their age the first time they experienced a particular set of difficulties. However, they may not have met full criteria for the disorder at the time. Additionally, recall rates may vary for different types of psychopathology. Individuals may be more likely to recall the onset of their first panic attack, for example, than the very first time they experienced symptoms of generalized anxiety. The primary goal of this study, however, was to identify characteristics that distinguished individuals reporting childhood- and adult-onset disorders. This distinction is less likely to be impacted by inaccuracies in recall. Nonetheless, more prospective longitudinal studies in this area are warranted. Another potential limitation is that each subtype of anxiety disorders has been associated with varying developmental course and age of onset, with some typically emerging in early or mid childhood (e.g., social anxiety disorder), while others typically emerging in adulthood (e.g., generalized anxiety disorder). Most analyses in the present study utilized combined prevalence rates for anxiety

disorders. However, observed prevalence patterns and predictors may vary across cultural groups for different anxiety disorders. The results obtained from this study, however, offer preliminary support for the notion that, in general, the emergence of anxiety disorders in childhood is associated with greater long-term impairment.

Other limitations of the study pertain to exclusions in the sampling methodology and assessment battery. As is true with most epidemiological studies, the CPES surveys employed single informant and single method (diagnostic interview) procedures to assess for psychiatric disorders. Exclusion of incarcerated and homeless individuals may have resulted in an under-representation of seriously emotionally disturbed individuals in the NCS-R and NLAAS datasets (Kessler et al., 2005a). Additionally, anxiety-spectrum syndromes usually reported by immigrant populations (e.g., ataques de nervios, Salmán et al., 1998) were only included in the assessment battery for the NLAAS survey, and thus were not able to be included in the present analyses. Furthermore, some syndromes that are part of DSM-IV were not assessed in both datasets, and therefore were excluded in these analyses (e.g. childhood-onset separation anxiety disorder, obsessive compulsive disorder, and specific phobias).

Despite these limitations, our findings point to the importance of attending to the needs of individuals experiencing anxiety at young ages across ethnicity and nativity. Although previous studies have shown that foreign-born Latinos are at lower risk of psychopathology relative to U.S.-born Latinos and non-Latino whites, it is important note that there are exceptions to the immigrant paradox. Recent research findings suggest that the protective effect of foreign nativity against psychopathology and comorbidity varies by individual characteristics, including the type of psychiatric disorder, subethnicity (Alegria et al., 2008; Alegria, Canino, Stinson, & Grant, 2006) and by age of onset, as evidenced by the present study. Additionally, recent findings (Alegria et al., 2007b) have suggested that individuals for which both parents are foreign-born have a lower risk for anxiety disorders, and that family burden, family cultural conflict, and perceived discrimination are risk factors linked to augmented rates of anxiety disorders. Attempts to develop and deliver prevention and treatment programs for anxious youth should be guided by a greater understanding the buffering effect of specific characteristics within the culture of origin, as well as developmental, family, and societal factors that may be associated with increased risk of psychopathology.

The chronic course associated with childhood-onset anxiety disorders revealed by the present findings also point to important public health implications. While first-onset of anxiety disorders, and mental health conditions in general, are more likely to take place in childhood or adolescence, treatment typically does not occur until several years later (Kessler et al., 2007). In fact, studies have shown an inverse relationship between age of onset and time to initial help seeking among individuals with anxiety and mood disorders (Christiana et al., 2000). Children and adolescents rely on caregivers and adults to access services, but anxious children often suffer in silence, with symptoms often going unnoticed or overlooked. Upon reaching adulthood, these anxious individuals may consider their symptoms as part of a normative experience and therefore not recognize the need for treatment.

Public education efforts can serve to raise awareness about how to distinguish normative and problematic anxiety in children. In addition, studies suggest that racial/ethnic minorities, individuals with low income, and those without insurance experience the greatest unmet need for treatment (Wang et al., 2005; Wang et al., 2007). Disparities in access to care among minority and lower income populations may be due to stigma, discrimination, and limitations in resource availability for specific groups. More attention should be given to the needs of these vulnerable populations in order to develop outreach programs for early identification and treatment. These efforts should focus on increased accessibility of targeted services, capitalize on the strengths within the culture of origin, and they should be attentive to specific developmental needs. Finally, school-based anxiety prevention programs (Farrell & Barrett, 2007) show much promise in efforts to alleviate problematic anxiety and reduce the likelihood of developing subsequent psychiatric conditions, which ultimately result in reduced health care costs.

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