Heterogeneous classes of co-occurring externalizing symptoms in a sample of youth referred for anxiety disorders[☆]

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ABSTRACT

The present study used latent class analysis to identify patterns of externalizing symptoms in a predominantly Hispanic sample of clinic referred anxious youth ($N = 224$; 6–16 years; 54% males) and their parents. Findings revealed that the sample of youth could be classified into three distinct classes: (1) High Externalizing, (2) Moderate Externalizing, and (3) Low Externalizing. The High Externalizing Class was characterized as having a relatively high probability of all ADHD and aggressive symptoms in the clinical range. The Moderate Externalizing Class was characterized as having a relatively high probability of three symptoms in the clinical range: "argues a lot", "disobedient at home", and "fails to finish." The Low Externalizing Class was characterized as having a relatively low probability of all ADHD and aggressive symptoms in the clinical range. The conceptual, empirical, and clinical implications of the findings are discussed.

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There is growing use of person centered approaches, or approaches that capture heterogeneity within and between groups, such as latent class analysis (LCA) to classify children and adolescents on the basis of common symptoms (Ferdinand, de Nijs, van Lier, & Verhulst, 2005; Ferdinand, van Lang, Ormel, & Verhulst, 2006; Wadsworth, Hudziak, Heath, & Achenbach, 2001). The LCA model is analogous to the factor analysis model in that both posit an underlying latent variable that is measured by observed variables (Collins & Lanza, 2010). LCA, however, focuses on the structure of cases or the classification of individuals; factor analysis focuses on the structure or classification of variables. In efforts to advance understanding about the pattern of co-occurring symptoms in sample populations, LCA provides another advantage over variable centered approaches: variable centered approaches assume the pattern of co-occurring symptoms is homogeneous within a population. In fact, there is likely to be heterogeneity, including in symptom severity, symptom type, or both (Cunningham & Ollendick, 2010; Jarrett & Ollendick, 2008).

Given the advantages of LCA, in this study we used LCA to identify classes of co-occurring externalizing symptoms in a sample of youth referred for anxiety disorders. As far as we know, this is the first study to apply LCA for this purpose with this type of sample. Such an application can advance understanding about patterns of symptoms within anxiety psychopathologic conditions, which in turn has the potential to assist in case conceptualization and treatment formulation. Although comorbidity is known to exist between anxiety and externalizing conditions in community (Angold, Costello, & Erkanli, 1999; Costello, Mustillo, Erkanli, Keeler, & Angold, 2003) and general clinic samples (Biederman, Faraone, Mick, & Lelon, 1995; Biederman, Mick, & Faraone, 1998), it is unknown which subgroups, or classes, of anxious children and adolescents are likely to show which types of patterns of externalizing symptoms. In the absence of this knowledge, researchers and clinicians lack an empirical basis when considering specific externalizing symptoms that may be present for developing a case conceptualization of and treatment plan for a specific clinic referred anxious youth.

Additionally, this study applied LCA to model patterns of externalizing symptoms in a sample that contained predominantly Hispanic youth referred for anxiety disorders. Hispanics accounted for more than half of the growth in the total U.S. population between 2000 and 2010 (Humes, Jones, & Ramirez, 2011). Given Hispanic youth have been documented as having high rates of aggressive and delinquent behaviors (Centers for Disease Control & Prevention, 2003), it is possible that among these anxious referred Hispanic youth, there will be a high rate of externalizing problems. In the subsequent section we summarize related LCA research and show how this research informs the present study's questions and methodology.

Identification of youths' internalizing symptoms using LCA. Several studies have used LCA to identify patterns of internalizing symptoms (i.e., anxiety, depression, or both) (Ferdinand et al., 2005, 2006; Wadsworth et al., 2001). Using parent ratings on the Child Behavior Checklist Anxious/Depressed Scale (CBCL-A/D; Achenbach, 1991) with nonreferred (n = 1987; 4–18 years) and general clinic referred (n = 1987; 4–18 years) children and adolescents, Wadsworth et al. (2001) found no specific classes of anxiety or depressive symptoms. Instead, three classes were identified, each of which contained a wide variety of anxious and depressive symptoms. Thus, each class was of the *mixed* anxiety and depressive symptom type; all of which differed by symptom severity (i.e., mild, moderate, severe).

In another study, Ferdinand et al. (2005) used the Youth Self Report (YSR; Achenbach and Edelbrock, 1987) with general clinic referred children and adolescents (N = 2032; 11–18 years) to identify youths' internalizing symptoms (i.e., anxiety, depression, or both). Three anxiety problem and four affective problem classes were identified. These classes all differed by symptom severity (*very often true versus sometimes true*).

Using a nonreferred sample (N = 2210; 10–12 years), Ferdinand et al. (2006) used the youth self rating scale, the Revised Child Anxiety and Depression Scale (RCADS; Chorpita, Yim, Moffitt, Umemoto, & Francis, 2000), to identify youths' anxiety symptoms (depressive symptoms were not examined). Only classes that differed by severity (never versus sometimes, often, or always), not type, were found in this study. Specifically, five anxiety classes were found and each class contained the symptoms of multiple DSM-IV anxiety disorders (i.e., no class displayed a perfect correspondence to any DSM-IV anxiety disorder).

As noted, the above studies applied LCA to identify patterns of internalizing symptoms (i.e., anxiety, depression) in nonreferred and general clinic referred child and adolescent samples. These studies' LCA findings identified distinct classes of youth with respect to symptom severity, symptom type (i.e., depression, anxiety, depression and anxiety), or both (Ferdinand et al., 2005, 2006; Wadsworth et al., 2001). What does the research show with respect to LCA application to identify patterns of externalizing symptoms? This research is summarized next.

Identification of youths' externalizing symptoms using LCA. Neuman et al. (2001) used LCA to identify both externalizing and internalizing symptoms in an epidemiologic sample of adolescent female twins (N = 2904; 13–23 years). Nine classes were identified, including a (1) class with few or no symptoms and five "pure" symptom classes (i.e., participants had a high probability of endorsing one type of symptom and a low probability of endorsing all other types of symptoms), (2) pure depressive symptoms class, (3) pure separation anxiety symptoms class, (4) pure oppositional defiant disorder (ODD) symptoms class, (5) pure attention disorder hyperactivity disorder (ADHD) inattentive symptoms class, and (6) pure ADHD mild hyperactive impulsive symptoms class. Three classes characterized by the co-occurrence of symptom types also were identified (7) ADHD inattentive type with ODD symptoms class, (8) ADHD combined type with ODD symptoms class, and (9) ODD with separation anxiety and depressive symptoms class. Overall, these findings indicate the existence of multiple classes, which differ primarily by symptom type rather than symptom severity.

Using a school based sample of sixth graders (N = 2187), Mezulis, Stoep, Stone, and McCauley (2011) identified patterns of depressive symptoms and externalizing symptoms. Six classes of depressive and externalizing symptoms were identified, including a (1) very low depressive and externalizing class, (2) moderate depressive and Low Externalizing Class, (3) moderate externalizing and low depressive, (4) moderate externalizing and high depressive class, (5) high depressive and externalizing class, and (6) very high depressive and externalizing class. Mezulis et al. concluded that

youth who report elevated depression symptoms were also likely to report elevated externalizing symptoms. The classes differed primarily by total number of depressive and externalizing symptoms endorsed, not type of symptoms endorsed.

In summary, the above studies provide evidence of heterogeneity in patterns of internalizing (e.g., depression, anxiety) and externalizing symptoms (e.g., ADHD) in general clinic referred and non-referred samples. In some studies (Ferdinand et al., 2006; Mezulis et al., 2011; Wadsworth et al., 2001) heterogeneity was identified with respect to symptom severity; in other studies (Ferdinand et al., 2005; Neuman et al., 2001) heterogeneity was identified with respect to symptom type.

The present study. The present study used a sample of largely Hispanic anxiety referred youth to examine whether there would be heterogeneity with respect to symptom severity, symptom type, or both when summarizing parents' ratings of their child's externalizing symptoms. As noted, past studies with nonreferred and general clinic referred samples have consistently found evidence of heterogeneity in symptom classes, but have produced mixed findings with regard to the nature of symptom classes. All studies summarized above, regardless of sampling strategy, found evidence of a class characterized by low symptom severity and a class characterized by high symptom severity. We thus expected to identify a low externalizing symptom severity class and a high externalizing symptom severity class in our sample of anxiety referred youth. Because most studies reviewed above also found evidence of one or more moderate symptom severity classes (Ferdinand et al., 2005, 2006; Mezulis et al., 2011; Wadsworth et al., 2001), we tentatively expected to identify a third class in our sample characterized by a moderate level of externalizing symptom severity.

Once the number and types of classes were identified, another objective was to determine whether the classes differ by the following covariates: (1) parent ratings of their child's anxiety symptoms; (2) parent ratings of their child's social skills; and (3) parent ratings of their parental behaviors (parental acceptance, parental control). In LCA, the term "covariate" is used to refer to a variable that is included in the latent class model to refine class descriptions and improve classification (Magidson & Vermunt, 2002). The above variables were included as covariates because each has been linked with clinic referred anxious youth (e.g., Beidel, Turner, & Morris, 1999; Motoca, Williams, & Silverman, 2012; Wood, Piacentini, Southam-Gerow, Chu, & Sigman, 2006).

With respect to parent ratings of their child's anxiety symptoms, we selected this variable as a covariate because it was important to note how the classes differed in terms of frequency of anxiety symptoms and whether parental high endorsement of anxiety symptoms in their children was related to specific types of externalizing behaviors (e.g., ADHD, oppositional). With respect to parent ratings of their child's social skills, we selected this variable given research indicating children and adolescents with anxiety disorders possess less social skills than youth without anxiety disorders (Beidel et al., 1999; Motoca et al., 2012). Parenting behaviors, specifically parental acceptance and parental control were included as covariates given their linkages to the maintenance of anxiety. Specifically, parents of youth with anxiety disorders have been found to be low in acceptance and low in autonomy granting (i.e., controlling) of their children (Siqueland, Kendall, & Steinberg, 1996; Wood et al., 2006).

1. Method

1.1. Participants

The data analyzed in this study were collected as part of a larger data gathering effort between 2003 and 2010. Participants were

224 youth (54% males) and their parents who presented to an anxiety disorders specialty research clinic. The youth were 6–16 years of age (M = 9.90 years, SD = 2.32); 77% were Hispanic/Latino. All youth were referred by school counselors, psychiatrists, pediatricians, and other mental health professionals because of difficulties with excessive fear and/or anxiety. Exclusionary criteria were developmental delays (e.g., Asperger's syndrome, mental retardation, autism) or severe psychopathology (e.g., schizophrenia). The initial screening was conducted using a standard telephone consultation used within the clinic. Following the initial screening, a battery of measures was administered to all youth and their parents (usually the mother), including a semi-structured interview schedule, the Anxiety Disorders Interview Schedule for DSM-IV: child and parent versions (Silverman & Albano, 1996). In the next section, we present the measures completed by parents.

1.2. Measures: class indicators

Child Behavior Checklist (*CBCL*, Achenbach & Rescorla, 2001). The CBCL was completed by parents to assess for behavioral and emotional problems in their child. The CBCL consists of 118 items to assess specific behavioral and emotional problems. These items are rated on a 3-point scale (0 = *not true*; 1 = *somewhat or sometimes true*; 2 = *very true or often true*). The CBCL includes two broadband scales (i.e., externalizing, internalizing) and eight narrowband subscales (i.e., Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, Rule-Breaking Behavior, and Aggressive Behavior). Studies indicate high retest reliability for the Attention Problems, Rule-Breaking Behavior, and Aggressive Behavior scales (e.g., r = .76–.91) (Achenbach, 1991). Internal consistency estimates range from .56 to .78 (Achenbach, 1991). Estimates of concurrent validity for the CBCL have been found to range from (rs) .52 to .88 (Achenbach, 1991). For the current study, items from the externalizing narrowband subscales, Attention Problems, Rule-Breaking Behavior, and Aggressive Behavior, were used. For analyses presented in the current study, the 3- point scale was dummy coded (i.e., 0 coded as '0', 1–2 coded as '1' to capture items that were endorsed).

1.3. Covariates

Revised Children's Manifest Anxiety Scale (Parent Report; RCMAS/P). As done in past research (e.g., Kendall, 1994; Pina, Silverman, Saavedra, & Weems, 2001; Strauss, Lease, Kadin, Dulcan, & Last, 1989), the wording of the RCMAS was modified so that "I. . ." was changed to "My child. . ." similar to the RCMAS, the parent version contains 37 items that comprise the total Anxiety Scale and 9 items that comprise the Lie Scale. Each item was rated as either *Yes* or *No* and scored 1 or 0. Using a 3-week interval, Pela and Reynolds (1982) reported retest reliability of r = .98 for the Total Anxiety scale. Estimates of concurrent validity for the RCMAS have been found to range from (rs) .65 to .76 (Lee, Piercel, Friedlander, & Collamer, 1988). The Total Anxiety score was used in this study. Internal consistency (alpha) using the present sample was α = .78.

Parenting behavior inventory (Parent Report; Schludermann & Schludermann, 1970). The Parenting Behavior Inventory has three scales (i.e., Psychological Control, Acceptance, and Firm/Lax Control) each of which contains ten questions. These items are rated 1 (*not like her/him*), 2 (*somewhat like her/him*), and 3 (*a lot like her/him*). In this study, the Psychological Control and Acceptance subscales were used. Test-retest reliability for the parent and child subscale versions has been reported as .79 and .74, respectively (Schludermann and Schludermann, 1970). Estimates of concurrent validity for the Parenting Behavior Inventory have been found to range from (rs) .39 to .61 (Schwarz, Barton-Henry, & Pruzinsky, 1985). Internal consistency (alphas) for the Acceptance

and Psychological Control subscales using the present sample were .78 and .74, respectively (Schwarz et al., 1985).

Social Skills Rating System. The Social Skills Rating System (SSRS Parent Report; Gresham & Elliott, 1990) provides a comprehensive assessment of the social skills behaviors of youth from the parent perspective. The SSRS consists of 34 questions to which respondents rate using a 3-point Likert scale (0 = *never*, 1 = *sometimes*, 2 = *very often*). The SSRS parent form consists of four subscales (i.e., Cooperation, Assertiveness, Responsibility, Self-control) with ten items for each subscale. Because two of the items load on the same factors, the total number of items is 38. Estimates of concurrent validity for the SSRS have been found to range from (rs) .30 to .58 (Van der Oord et al., 2005). Internal consistency (alphas) for the Cooperation, Assertiveness, Responsibility, Self-control subscales using the present sample were .75, .77, .64, and .74, respectively.

1.4. Procedures

The study's questionnaires were administered by research assistants after parents provided informed consent and youths provided informed assent. All research assistants received training in the proper administration of the questionnaires by doctoral students supervised by the program director. Research assistants received thorough training of procedural protocols including familiarizing themselves with the questionnaires and observing others administer the questionnaires to ensure familiarity with the protocol. Youth participants received their own version of questionnaires and the research assistants were trained to read aloud the questionnaires' items and not to observe the youths' responses. The doctoral students provided guidance and ongoing feedback to the research assistants administering the questionnaires throughout the study.

1.5. Data analytic plan

T-scores from the Externalizing subscales indicated a substantial portion of the parents (67%) rated clinically significant ADHD and aggressive symptoms in their children.

To identify possible subgroups of youth based on patterns of parent rated externalizing symptoms, LCA was conducted using M*plus*, version 5.0 (Muthén & Muthén, 2007). LCA examines the possibility that the relation among a set of observed items can be described by an underlying latent variable. In the present study, the observed items (or latent class indicators) were selected from the CBCL Attention Problems, Rule-Breaking Behavior, and Aggressive Behavior subscales. The underlying latent variable represents a discrete set of homogeneous subgroups that differ, in this instance, with regard to patterns of externalizing symptoms. Each subgroup, or latent class, represents a distinct profile of item endorsement probabilities and it is assumed these probabilities are the same for all members in the class (Sysko, Sha, Wang, Duan, & Walsh, 2010). Posterior class probabilities are estimated and can be used to assign participants to a particular class.

Two- to five-class models were fit to the data. The Bayesian Information Criterion (BIC; Schwarz, 1978), the sample size adjusted BIC (SSABIC; Sclove, 1987), and the Bootstrap Likelihood Ratio Test (BLRT; Efron & Tibshirani, 1993) were used to determine the best fitting model in terms of the number of classes. Simulation work suggests these are the most consistent statistical indicators for determining the number of classes (Nylund, Asparouhov, & Muthen, 2007). Lower BIC and SSABIC values are indicative of the best model fit. Statistically significant BLRT values indicate that the k class model provides a superior model fit than the k-1 class model. We also report the Akaike Information Criterion (AIC; Akaike, 1974), although simulation work suggests the AIC may over extract classes (Nylund et al., 2007).

The final unconditional model was selected based on the indicators described above and on the interpretability of the estimated classes. Good interpretability includes reasonable class sizes ($n > 5\%$ of the total sample) and the absence of improbable values (i.e., Heywood cases). Though not considered in class enumeration, we also report entropy scores, which reflect the average classification accuracy in assigning participants to classes.

After deciding on the number of classes, a set of covariates was entered to improve model fit and establish convergent validity of the classes. As noted, the covariates were all rated by the parents. The parent measures assessed the following variables: parental acceptance, parental control, youth social skills (i.e., Cooperation, Assertiveness, Responsibility, Self-control). All were analyzed using multinomial logistic regression. The identified class with low item probability (e.g., low probability of endorsing the items) served as the study's first reference class. Two covariate comparisons were made, namely, the likelihood of being in each of the two high item probability classes as compared to the low item probability class. Subsequently, the reference class was replaced by the remaining identified classes so that all classes could be compared with each other.

2. Results

2.1. Latent class analysis

A three-class model was identified as the preferred solution. This was evidenced by lower BIC, SSABIC, and AIC values for the three-class solution when compared to the two-class solution and the statistically significant BLRT (see Table 1). Although the four-class solution was accompanied by a significant BLRT, the BIC, SSABIC, and AIC values increased from the three-class model. We based our decision to retain the three-class model on the BIC and interpretability of the classes. Fig. 1 displays the item probabilities of the CBCL Attention Problems and Aggressive Behavior items for each of the three classes.

As Fig. 1 illustrates, Class 1 was characterized by having a high probability (>0.70) of parents endorsing all ADHD (e.g., inattentive, impulsive, cannot sit still) and aggressive (e.g., temper, argues a lot, disobedient at home) items of the CBCL. We therefore refer to this Class 1 ($n = 62$; 33%) as High Externalizing. Class 2 was characterized by having a high probability (>0.70) of endorsing symptoms "argues a lot", "disobedient at home", and "fails to finish." We refer to Class 2 ($n = 65$; 35%) as Moderate Externalizing. The final class, Class 3, was characterized by having a low probability (≤ 0.30) of endorsing *all* ADHD and aggressive items of the CBCL. We refer to Class 3 ($n = 61$; 33%) as Low Externalizing. All three classes had low parental endorsement of rule-breaking items (not shown in Fig. 1).

2.2. Covariates

To describe the differences among the identified latent classes, the covariates were added to the model. Three sets of comparisons were made for each covariate to describe the differences between:
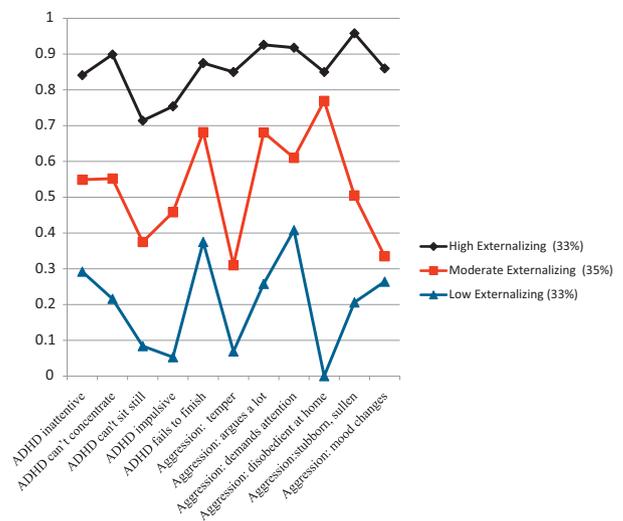

Fig. 1. Item probabilities for the three class solution.

(1) High Externalizing Class vs. Low Externalizing Class (2) Moderate Externalizing Class vs. Low Externalizing Class, and (3) High Externalizing Class vs. Moderate Externalizing Class. When covariates were added to the model, class membership remained virtually unchanged, with less than 3% changes in class proportions. Initial analyses indicated that the likelihood of being in any given class did not differ by age and gender. Table 2 presents log odds coefficients and odds ratio for all other covariates. Statistically significant covariates were youth anxiety, the social skill subscales; cooperation and self-control, and parental control. Significant differences in anxiety and social skills (i.e., cooperation, self-control) were found between the High Externalizing and the Low Externalizing Class. Parents of children in the High Externalizing Class rated their children as having higher levels of anxiety (OR = 1.30 and CI = 1.10–1.49), less cooperation (OR = 0.80 and CI = 0.63–.97), and less self-control (OR = 0.61 and CI = 0.44–0.77) than parents of children in the Low Externalizing Class. Parents of children in the High Externalizing Class also self-reported higher levels of parental control than parents of children in the Low Externalizing Class (OR = 1.38 and CI = 1.20–1.64). Significant differences in social skills (i.e., cooperation, self-control) also were found between the Moderate Externalizing Class and Low Externalizing Class. Parents of children in the Moderate Externalizing Class rated their children as having less cooperation (OR = 0.83 and CI = 0.69–0.98) and less self-control (OR = 0.72 and CI = 0.56–0.87).

Significant differences in youth anxiety and parenting were found between the High Externalizing Class and the Moderate Externalizing Class. Parents of children in the High Externalizing Class rated their child as having higher levels of anxiety (OR = 0.75 and CI = 0.62–0.87) than parents of children in the Moderate Externalizing Class. Parents of children in the High Externalizing Class also rated themselves higher in parental control than parents of children in the Moderate Externalizing Class (OR = 0.42 and CI = 0.36–0.48).

3. Discussion

The present study contributes to the youth anxiety research literature in several ways. First, this is the first study to apply LCA methods to identify patterns of co-occurring externalizing symptoms in children and adolescents referred for anxiety disorders. Using LCA, the present study identified heterogeneous subgroups within a sample that on first thought might be viewed as homogeneous, namely youth with anxiety problems. The findings indicate

Table 1
Fit indices for latent class model with 2–5 classes.

Number of classes	BIC	AIC	Entropy	SSABIC	BLRT
2	6123.92	5903.61	0.927	5905.40	*P* < 0.0000
3[*]	**6103.95**	**5677.95**	**0.950**	**5682.47**	*P* < **0.0000**
4	6153.33	5709.51	0.927	5713.12	*P* < 0.0000
5	6233.53	5771.55	0.914	5774.58	*P* < 0.0000

Note. BIC is the Bayesian Information Criterion (Schwarz, 1978), AIC is the Akaike Information Criterion (Akaike, 1974), SSABIC is the sample size adjusted BIC (Sclove, 1987), and BLRT is the Bootstrap Likelihood Ratio Test (Efron and Tibshirani, 1993).
[*] This model was identified as the preferred solution.

Table 2
Log odds coefficients and odds ratio for three-class model with parent covariates.

Covariates	Reference class	Comparison class	95% CI	Logit	Odds ratio
RCMAS (parent rated)	Class 1	Class 3	1.102–1.488	0.098	1.30[*]
CGAS (clinician rated)	Class 1	Class 3	0.886–1.095	0.535	0.99
Parental Acceptance	Class 1	Class 3	0.679–1.149	0.200	0.91
Parental Control	Class 1	Class 3	1.200–1.638	0.132	1.38[*]
SSRS Cooperation	Class 1	Class 3	0.632–0.968	0.086	0.80[*]
SSRS Assertiveness	Class 1	Class 3	0.972–1.488	0.131	1.23
SSRS Responsibility	Class 1	Class 3	0.866–1.142	0.165	1.19
SSRS Self-Control	Class 1	Class 3	0.445–0.765	0.082	0.60[*]
RCMAS (parent rated)	Class 2	Class 3	0.865–1.070	0.052	0.97
CGAS (clinician rated)	Class 2	Class 3	0.878–1.060	0.047	0.97
Parental Acceptance	Class 2	Class 3	0.716–1.181	0.118	0.95
Parental Control	Class 2	Class 3	0.955–1.332	0.097	1.14
SSRS Cooperation	Class 2	Class 3	0.690–0.978	0.073	0.83[*]
SSRS Assertiveness	Class 2	Class 3	0.863–1.252	0.099	1.06
SSRS Responsibility	Class 2	Class 3	0.965–1.666	0.179	1.31
SSRS Self-Control	Class 2	Class 3	0.559–0.871	0.079	0.72[*]
RCMAS (parent rated)	Class 1	Class 2	0.621–0.874	0.064	0.75[*]
CGAS (clinician rated)	Class 1	Class 2	0.867–1.088	0.056	0.98
Parental Acceptance	Class 1	Class 2	0.826–1.250	0.108	1.04
Parental Control	Class 1	Class 2	0.353–0.482	0.032	0.42[*]
SSRS Cooperation	Class 1	Class 2	0.796–1.290	0.126	1.04
SSRS Assertiveness	Class 1	Class 2	0.653–1.068	0.106	0.861
SSRS Responsibility	Class 1	Class 2	0.859–1.353	0.126	1.10
SSRS Self-Control	Class 1	Class 2	0.908–1.455	0.139	1.18

Note. Class 1 is the High Externalizing Class, Class 2 is the Moderate Externalizing Class, Class 3 is the Low Externalizing Class, RCMAS is the Children's Manifest Anxiety Scale Revised, CGAS is the Children's Global Assessment Scale, SSRS is the Social Skills Rating System.

[*] $p < .05$.

instead that these youth referred to an anxiety clinic could be classified into three groups on the basis of externalizing behaviors: High Externalizing, Moderate Externalizing, and Low Externalizing. The class characterized by the highest level of elevations in externalizing symptoms was the High Externalizing Class (33% of the sample). This class was characterized by parents with a relatively high probability of endorsing *all* ADHD and aggressive symptoms to describe their child's behaviors. There also was a second class, a Moderate Externalizing Class (35% of the sample), characterized by parents with a relatively high probability of endorsing symptoms "fails to finish", "argues a lot", and "disobedient at home" to describe their child's behavior. This Moderate Externalizing Class was distinct from the High Externalizing Class because ADHD symptoms relating to difficulties with attention and impulsivity and other aggressive symptoms (e.g., mood changes, temper) were not likely to be endorsed by the parents of the children in this class. A Low Externalizing Class consisting of 33% of the youth was the third class. This class was characterized by low probabilities of parents' endorsing every single externalizing item of the CBCL.

Another aim of this study was to examine whether there would be heterogeneity with respect to symptom severity, symptom type, or both. Past LCA studies have found either, or both, to occur in differing samples of youth (Ferdinand et al., 2005, 2006; Mezulis et al., 2011; Neuman et al., 2001; Wadsworth et al., 2001). We found heterogeneity with respect to symptom severity. Specifically, we identified three classes that differed primarily by the number of externalizing symptoms endorsed by parents, which reflects the severity of externalizing problems. None of the classes mapped onto a single DSM-IV externalizing disorder. Rather, each class contained symptoms of ADHD, ODD, and Conduct Disorder. Specifically, we found approximately one-third of anxiety referred youth presented with problematic levels of inattention, impulsivity, and aggression. Thus, although a given anxiety referred child may present with symptoms of only one externalizing disorder, our findings indicate that distinctions among anxiety referred youth are more likely to reflect overall levels of a wide variety of externalizing problems.

All together, these study's findings underscore the importance of assessing externalizing symptoms as well as internalizing symptoms when working with anxious referred youth. The findings further suggest the utility of an assessment based on the profile of an individual, rather than merely the symptoms that are impairing enough at the time of the assessment to warrant a diagnosis. The findings further underscore the importance of directing attention toward the overall level of externalizing problems in addition to the presence or absence of specific DSM-IV externalizing disorders. This is because we found that anxiety referred youth may not meet full eligibility for an externalizing disorder clinical diagnosis, but the youth still may display subthreshold externalizing symptoms that cause impairment. As such, these externalizing symptoms have the potential to disrupt intervention. If left unattended, they could become increasingly difficult to reduce over time (Drabick, Gadow, & Sprafkin, 2006; Drabick, Gadow, & Loney, 2007; Ezpeleta, Keeler, Erkanli, Costello, & Angold, 2001).

The present study is also the first study to apply LCA to model patterns of externalizing symptoms in a sample that contained predominantly Hispanic youth referred for anxiety disorders. Past LCA studies provide evidence of heterogeneity in patterns of internalizing (e.g., depression, anxiety) and externalizing symptoms (e.g., ADHD) in general clinic referred and non-referred samples. However, these studies consisted of samples that included less than 10% of Hispanics or no Hispanics at all. The present findings extend past research that examined anxiety disorders among Hispanics because it demonstrates heterogeneity in this ethnic sample of clinic referred anxious youth.

Research indicating that Hispanic youth exhibit high rates of aggressive and delinquent behaviors (Centers for Disease Control and Prevention, 2003) is consistent with study findings indicating significant ADHD and aggressive symptoms in this population. The T-scores for each of the three externalizing narrowband subscales (i.e., Attention Problems, Rule-Breaking Behavior, Aggressive Behavior) showed a substantial portion of the parents (67%) rated clinically significant ADHD and aggressive symptoms in their children. This finding is consistent with past studies showing that clinical referred anxious youth display externalizing problems,

with rates of comorbid externalizing diagnoses ranging from 6% to 61% (see Russo & Beidel, 1994 for review). Because our study is the first to conduct LCA with clinic referred anxious children and adolescents, we view these findings as constituting the first step on the 'ladder of knowledge.' It is incumbent on researchers to improve their efforts to broaden the diversity of their youth anxiety samples to permit replication and extension of the present findings.

3.1. Covariates

The present study also determined whether the identified classes can be further distinguished by a set of variables relating to parents' ratings of their child's anxiety symptoms, social skills, and parental behavior (parental control/acceptance). All covariates were found to be significant. Parents of children in the High Externalizing Class rated their children higher in anxiety than parents of children in the Moderate Externalizing Class and the Low Externalizing Class. This finding suggest that youth anxiety problems coupled with High Externalizing problems places young people at increased odds of experiencing elevated levels of anxiety than youth with low to moderate levels of external problems, as viewed by parents.

Finding a positive relation between parents' ratings of their children's anxiety and their children's externalizing symptoms may reflect the challenges involved in parenting a highly anxious child. In an effort to avoid anxiety provoking situations, some youth perhaps "up the ante" and display oppositional (i.e., aggressive) behavior. Research indicates that when anxious youth experience fear of their environment or of people they may exhibit aggressive behavior (Kashani, Deuser, & Reid, 1991), even in reacting to relatively slight provocations (Ialongo, Edelsohn, Werthamer-Larsson, & Crockett, 1996). This behavior may be further exacerbated if the youth has difficulty with attention and impulsivity, as these youth show increased negative parent-child interactions and increased oppositional behavior (Dishion & Patterson, 1999; McMahon & Estes, 1997). Thus, as anxiety increases, aggressive behavior may also increase and may be more severe if the youth is displaying other problem behaviors related to attention and impulsivity. Of course, the above pattern is unlikely to be unidirectional and further research is needed to ascertain the directionality, including possible bidirectionality, of effects (Silverman, Kurtines, Jaccard, & Pina, 2009).

In terms of social skills, parents of children in the High Externalizing Class and the Moderate Externalizing Class rated their children as demonstrating less cooperation and less self-control than parents of children in the Low Externalizing Class. This finding is consistent with research indicating that children with externalizing behavior problems also demonstrate social skills difficulties and are at risk for developing problematic peer relationships (Egeland, Kalkoske, Gottesman, & Erickson, 1990; Vitaro, Tremblay, Gagnon, & Biovin, 1992; Vitaro, Tremblay, Gagnon, & Pelletier, 1994).

In terms of parental behavior, findings indicated the High Externalizing Class demonstrated higher levels of parental control than the Moderate Externalizing Class and the Low Externalizing Class. These findings also are consistent with past theoretical and empirical links between elevated levels of anxiety and externalizing behaviors with high levels of parental psychological control (Chorpita & Barlow, 1998; Pettit, Laird, Bates, Dodge, & Criss, 2001; Rapee, 2001).

3.2. Implications for treatment

The present study's findings have potential implications for treatment. Findings suggest that professionals treating children for anxiety disorders might consider not only screening these children for externalizing problems, but also consider how these symptoms might impact case formulation and treatment decisions. Findings from this study also highlight the benefit of using treatment programs that address both internalizing and externalizing symptoms, particularly for youth demonstrating comorbid symptoms (Chase & Eyberg, 2008).

3.3. Limitations and future research directions

Although the present study makes an important contribution by identifying classes of externalizing symptoms in children and adolescents referred to an anxiety clinic, there are study limitations. First, the data were cross-sectional. Future research might include assessments over multiple time intervals to allow for the examination of the identified classes over time. This would provide some insight about the relative stability of the identified classes. Second, the study findings may not generalize to other samples given the present sample was comprised of predominantly Hispanic participants, a study strength in light of the absence of any past research with Hispanic samples. Nevertheless, the generalizability of the findings is unknown, as well as the fact that there is heterogeneity within Hispanics. Our sample was comprised largely of Cuban American; future studies need to include a broader range of different Hispanic groups (e.g., Mexicans), as well as other ethnic and racial groups.

In summary, the present study extends the literature regarding symptoms of externalizing disorders using a sample of Hispanic youth referred for anxious disorders. Further investigation of these classes across different samples with additional informants will offer an even more comprehensive picture of child and adolescent internalizing and externalizing disorders. Such work has the potential to advance understanding of the nature of psychopathological conditions in young people.

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