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Examining the Factor Structure of Anxiety and Depression Symptom Items Among Adolescents in Santiago, Chile

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Abstract

The co-occurrence of emotional disorders among adolescents has received considerable empirical attention. This study aims to contribute to the understanding of co-occurring anxiety and depression by examining the factor structure of the Youth Self-Report used with a sample of low-income adolescents from Santiago, Chile. Data from two independent, randomly selected subsamples were analyzed using exploratory and confirmatory factor analyses. Results indicate the best fit for the data is a two-factor model of anxiety and depression symptoms, which factors anxiety and depression into separate latent constructs. Because the findings show that anxiety and depression are not measured by the same factor in this international sample, the results imply that a valid and useful distinction exists between these constructs. That these constructs are found to be separate factors suggests that anxiety and depression may have separate etiologies and consequences, which might be best addressed by separate intervention components. These findings are consistent with the viewpoint that anxiety and depression constructs have similar emotional features and, despite sharing a common underlying internalizing disorder, distinct items capture aspects of each construct.

Keywords

anxiety; depression; adolescents; international social work; cross-cultural mental health

The co-occurrence of emotional disorders within an individual has received considerable empirical attention, particularly in relation to depressive symptoms and depressive disorders co-occurring with symptoms of anxiety and anxiety disorders (Angold, Costello, & Erkanli, 1999). Because of the extent of overlap, some researchers have questioned the validity of separating anxiety and depressive disorders whereas others have argued for thinking of the two disorders as related features of a common, underlying disorder (Brady & Kendall, 1992; Hale, Raaijmakers, Muris, van Hoof, & Meeus, 2009; Laurent & Ettelson, 2001).

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Although these disorders affect all ages, the controversy surrounding the co-occurrence of anxiety and depression is more salient for child and adolescent populations given the implication for the development of problems that persist into adulthood (Copeland, Shanahan, Costello, & Angold, 2009). In addition, a number of studies have found that adolescents' reports of anxiety and depressive symptoms are highly correlated (Brady & Kendall, 1992; Stark & Laurent, 2001). In fact, studies involving a wide range of children, including hospitalized and nonhospitalized populations, have found correlations between behavioral ratings scales measuring the constructs of anxiety and depression in the range of 0.56 to 0.70 (Eason, Finch, Brasted, & Saylor, 1985; Norvell, Brophy, & Finch, 1985; Ollendick & Yule, 1990; Wolfe et al., 1987). One explanation for the co-occurrence of these disorders suggests they share characteristics related to the overall role that negative affect plays in anxiety and depressive disorders (Watson, 2005). Negative affect is thought to reflect stable individual differences in emotionality, and encompasses a range of negative emotions such as fear, anger, sadness, guilt, and disgust (Watson & Clark, 1984). Further, cognitions of threat are common to both anxiety and depressive symptoms (Beck, Laude, & Bohnert, 1974). Despite these shared characteristics, differences exist between the two sets of symptoms, leading some researchers to suggest the main emotion in anxiety is fear whereas the dominant emotion in depression is sadness (Blumberg & Izard, 1986; Marien & Bell, 2004).

Interestingly, commonly used measures of anxiety and depression share similar items, which might contribute to the high correlations observed in assessments of depressive and anxiety symptoms. To better understand the co-occurrence of these disorders, several studies have tested the factor structure of anxiety and depressive symptoms among adolescents. Gurley, Cohen, Pine, and Brook (1996) examined the factor structure of the Diagnostic Interview Schedule for Children (DISC; Costello, Edelbrock, Kalas, Kessler, & Klaric, 1982) and found that a single factor containing symptoms of anxiety and depression best fit the data for adolescents who did not meet clinical levels of anxiety and depressive disorders. However, for adolescents who met clinical threshold levels, a two-factor structure of anxiety and depression was the better fit. On the other hand, recent work with a community sample of Dutch participants suggested the patterns of longitudinal development for anxiety and depression during adolescence follow separate, but parallel, growth trajectories (Hale et al., 2009). Such findings imply that anxiety and depression are not the same disorder, but are instead separate disorders that happen to unfold at similar developmental times and follow correlated but distinguishable growth patterns. Further support for this notion came from a study that examined whether distinct groups of adolescents in a community sample could be classified based on anxiety and depressive symptoms as measured by the Youth Self-Report (Achenbach, 1991); the findings showed that five discrete groups best fit the data (van Lang, Ferdinand, Ormel, & Verhulst, 2006). However, van Lang et al. also found that each group contained some elements of anxiety and depressive symptoms.

Given Latin America's history of political unrest, high rates of unemployment, and unstable economies, many countries in this region are potential breeding grounds for mental health problems. In fact, recent estimates have suggested that 12 million people in Latin America suffered from major depression and another 6 million suffered from anxiety disorders (Kohn et al., 2005). Existing research has shown that the lifetime prevalence rate of mental disorders among adults is around 17% to 25% among community samples (Alarcón, 2003; Bijl et al., 2003; World Health Internal Consortium in Psychiatric Epidemiology, 2000). The present study was conducted in Chile, which has one of the highest disease burdens of neuropsychiatric disorders worldwide (World Health Organization [WHO], 2010). A survey of adults in four Chilean provinces using the Composite International Diagnostic Interview (WHO, 1990) found that 36% of respondents reported a history of a psychiatric disorder (Vicente, Rioseco, Saldivia, Kohn, & Torres, 2002). In addition, Vincente and colleagues

found that among adults the 6-month prevalence rate of both affective disorders (e.g., major depression, bipolar disorder, dysthymia) and anxious disorders (e.g., panic disorder, agoraphobia, general anxiety disorder, posttraumatic stress) was 7.9%.

Much less research is available about the prevalence of mental health problems among Chilean children and adolescents. Existing evidence based on community samples from Brazil, Chile, Colombia, Guatemala, Mexico, and Puerto Rico has shown the lifetime prevalence of mental disorders among children and adolescents to range from 15% to 23% (Duarte et al., 2003). Studies with community samples of Chilean adolescents found that as compared with boys, girls had higher rates of both social anxiety (Olivares et al., 2010) and anxious/depressive symptoms (Bralio, 1987), but lower rates of aggressive behavior (Bralio, 1987).

To develop a better understanding of the co-occurrence of depressive and anxiety symptoms among children around the world, we examined the factor structure of the Youth Self-Report Anxious/Depressed subscale (Achenbach & Rescorla, 2001) using exploratory and confirmatory factor analyses with a community sample of youth from Santiago, Chile. Derived from the Child Behavior Checklist, the Youth Self-Report is the self-administered component of a package of instruments that includes teacher and parent reports of youths' (ages 11 to 18 years) behavioral symptoms. The group of reports can be used by mental health professionals in assessing children's and adolescents' functioning (Achenbach & Rescorla, 2001). The Anxious/Depressed subscale used in this study was selected because it contained items measuring aspects of both anxiety and depression. The purpose of this study was to examine the underlying factor structure of the Anxious/Depressed subscale.

Method

Sample and Procedures

Data for this study were obtained from adolescents participating in a study of urban youth in Santiago, Chile, known as the Santiago Longitudinal Study (SLS). The SLS is a collaborative project between Chilean and U.S. institutions that is supported with funding from the National Institute on Drug Abuse (NIDA). SLS participants included 1,657 adolescents who had participated in a study of iron supplementation when they were infants (Lozoff et al., 2003). Participants in the iron study were healthy infants whose parents were recruited from working-class communities in the Southern area of Santiago. Approximately 1,200 of these youth were successfully followed and interviewed when they were 10 years old. The sample for the present study was primarily drawn from these 1,200 children; however, some youth in the present study were among the initial infant sample (N=1,657) but were not interviewed at age 10. Altogether, 1,025 youth were interviewed between 2008 and 2010 (mean age = 14.4 years, SD=1.45, 48.4% female). Of these youth, 27 were excluded from our sample because their records were missing data on all the variables of interest; however, the excluded youth did not differ in characteristics from the 998 youth who made up our analytic sample.

The youth and their families were contacted by project staff and invited to participate in the present project using the following recruitment process. Project staff contacted parents to schedule appointments. On the day of the appointment, a van was sent to pick up the participants and bring parents (primarily the mother) and youth to the study site, which was a well-known health and medical research entity in Santiago. In designing the project for cultural acceptance, project staff indicated that providing transportation to and from study appointments was culturally appropriate. In addition, project staff noted that providing van transportation was the best way to ensure participation because parents (mainly mothers) had expressed concerns about having to explain to neighbors and relatives where the family

was going in the middle of the day, for so many hours. Further, project staff indicated that offers to reimburse participants for their transportation costs—whether they used bus, taxi, or their own car—would likely result in low participation rates because participants were likely to forget appointments or decide that paying for transportation and then being reimbursed was inconvenient or a financial burden. On the other hand, providing transportation ensured that over 95% of contacted families would participate. Moreover, using the van, which had the logo of the research site on its door, enabled the project to leverage the community goodwill toward the research site. The research site is well known for its health and medical research that has improved the lives of those living in neighboring communities (where participants mainly resided) as well as all Chilean citizens; this reputation has established a level of community "buy-in" that helped maintain high participation rates when the van was used to pick up participants. Further, front-line project staff relayed that many participants reported feeling a sense of pride when they were picked up by the van because they felt they were contributing to the research conducted at the site, which would benefit the lives of Chilean citizens.

Once at the study site, each adolescent participant completed a 2-hour questionnaire that was administered by an interviewer. The questionnaire used standardized measures that had been pilot tested and validated with the target population before being used in the current study (The extensive process used to validate the measures is described elsewhere; see Bares, Andrade, Delva, & Grogan-Kaylor, 2011). The questionnaire assessed constructs ranging from the quality of the adolescent's relationship with his or her parents; to the adolescent's self-perceptions and perception of peers; to the adolescent's behavior, health status, and substance use. The study site provided a private office for all interviews, and all interviews were conducted in Spanish by Chilean psychologists trained in the administration of standardized instruments.

After a Spanish language version of the instrument was prepared, that instrument was pilot tested with 30 youth. The instrument was administered to the youth by interviewers. Youth were asked to indicate if they did not understand a question or if they were confused by the meaning of a question. In addition, interviewers were asked to note which, if any, questions or response categories posed difficulties for the youths. Using both the youth and interviewer feedback, the project staff refined difficult questions to make the questions easier to understand; revisions were reviewed to ensure the question still measured the desired construct.

Some measures were already available in Spanish, and thus did not require translation, but required a careful examination of meaning. For example, a Spanish language version of the Youth Self-Report was available, and the majority of the substance use and abuse questions were taken from Spanish language instruments used in Chile's national substance-use surveys. For the existing Spanish language instruments, the process of ascertaining language and semantic equivalency involved translating items into English, having a team discuss the meaning of each question and its response categories, and pilot testing the instrument as described above. This process identified numerous questions requiring modification. However, the questions of concern to this study (i.e., Youth Self-Report Anxious/Depressed subscale) did not require modifications.

Signed parental consent and adolescent assent were obtained by the interviewers before beginning the interviews. As part of the consent process, participants were informed that disclosures of child abuse or inflicting harm on someone else would require the project staff to notify the proper authorities. The study received human subject approval from the institutional review boards of the University of Chile and the University of Michigan.

Measures

Assessment of anxiety and depression—We used the Youth Self-Report (YSR) to measure levels of depression and anxiety (Achenbach & Rescorla, 2001). The YSR belongs to the family of instruments known as the Achenbach System of Empirically Based Assessment (ASEBA; Achenbach & Rescorla, 2001). The ASEBA, previously known as the Child Behavior Checklist, is a collection of three behavioral rating scales that can be completed by different raters. The three forms are the YSR, Parent Report, and the Teacher Report. Together these forms provide eight syndromes that can be identified by different raters (Achenbach, 1993). In practice, these forms are used concurrently to assess problem behaviors and to refer youth to appropriate services or service providers (Achenbach, McConaughy, & Howell, 1987). Our intention in this study is not to take the self-reports of children and adolescents as indicators of a clinical diagnosis (Morgan & Cauce, 1999), but rather to empirically examine the structure of those self-reports to learn about the ways in which the latent constructs of anxiety and depression items are observed among adolescents in Chile.

ASEBA is widely used internationally and is one of the most commonly used assessment tools for problem behaviors among children and adolescents (Achenbach & Rescorla, 2001). Numerous studies have shown the measures to have adequate reliability and validity (Ivanova et al., 2007; Leung et al., 2006; Rescorla et al., 2007).

The YSR instrument is appropriate for children or adolescents between 11 and 18 years old to complete as a self-administered questionnaire. The YSR yields separate Internalizing and Externalizing scales that are divided into six subscales. For our analyses, we used the Anxious/Depressed subscale. Conveniently, the YSR Anxious/Depressed subscale captures symptoms of both anxiety and depression symptoms making it a useful instrument to answer the question of whether a one-factor versus two-factor structure of anxious and depressive symptoms is most appropriate.

The stem question for the YSR, and hence for the 13 items that constitute the Anxiety/Depression sub-scale, was as follows: “Below is a list of items that describes kids. For each item that describes you now or within the past 6 months, please tell me if the item is *very true or often true* (0), *somewhat or sometimes true* (1), or *is not true* (2).” The items included “I cry a lot,” “I am afraid of certain places or situations,” “I am afraid of going to school,” “I am afraid I might think or do something bad,” “I feel that I have to be perfect,” “I feel that no one loves me,” “I feel worthless or inferior,” “I am nervous or tense,” “I am too fearful or anxious,” “I feel too guilty,” “I am self-conscious or easily embarrassed,” “I think about killing myself.” and “I worry a lot.”

Analytic Method

All analyses were conducted using Mplus, Version 6.1 (Muthén & Muthén, 2010). Analyses proceeded in three steps. First, our analytic sample was randomly divided into two subsamples. There were no significant differences between the two subsamples relative to the proportion of female participants, mean age, or mean income (see Table 1).

Table 1 also illustrates that the two subsamples did not have significance differences relative to the percentage of adolescents who answered *somewhat* or *very true* to each of the YSR Anxious/Depressed items.

Second, to test the factor structure of the scale items, we conducted an exploratory factor analysis (EFA) with one of the randomly selected subsamples (n = 503), and conducted a confirmatory factor analysis (CFA) using the other subsample (n = 507). The purpose of EFA is to arrive at a conceptual understanding of a set of variables by determining “the

number and nature of common factors needed to account for the pattern of correlations among the measured variables" (Fabrigar, Wegener, MacCallum, & Strahan, 1999, p. 274). In addition, EFA provides item loadings that can be used to assign items to the number of factors extracted (Costello & Osborne, 2005).

We conducted an EFA with oblique rotation (geomin) and WLSM estimator (weighted least square parameter estimate using a diagonal weight matrix with standard errors and mean-adjusted chi-square test statistic that uses a full weight matrix) to obtain an initial idea of the factor structure (Muthén & Muthén, 2010). An oblique rotation was preferred to an orthogonal rotation because anxiety and depression are correlated constructs, and the assumption of orthogonality between factors did not apply in this case. Moreover, the type of rotation did not affect the fit of the model (Kim & Muller, 1978). Given that our sample represented a population that was substantially different from the U.S. sample of adolescents used to build the original YSR factor structures, it was necessary to explore two other aspects before using CFA: (a) the number of factors that reflected the anxiety and depression items, and (b) the loadings of the items within each estimated factor. This initial estimation provided the structures to be tested in the confirmatory factor analysis.

Based on the EFA results showing two factors were present, two structures (i.e., unidimensional vs. bidimensional) were compared using CFA. This analytic step used MLSMV estimator (weighted least square parameter estimate using a diagonal weight matrix with standard errors and mean- and variance-adjusted chi-square test statistic that uses a full weight matrix; Muthén & Muthén, 2010). To test whether the data better supported a two-factor structure, it was necessary to compare the two-factor structure with a one-factor structure. It was possible for us to test if the difference between the two models was statistically significant because the one-factor structure was nested in the two-factor structure, and neither of the models had correlated errors. To test which model fit the data better, we used the robust chi-square difference test with mean and variance adjusted test statistics as proposed by Asparouhov and Muthén (2006). Finally, to obtain a preliminary validation of the two-factor solution, we correlated the anxiety and depression scales with the Positive and Negative Affect Scale for Children (Watson, Clark, & Tellegen, 1988).

Results

Tables 2 and 3 present the correlation matrices used for the EFA and CFA, respectively. The EFA resulted in two factors with eigenvalues greater than one. The scree test, depicted in Figure 1, also supported the idea that two factors should be retained. Based on these results, each item of the YSR Anxious/Depressed scale was then classified into the two factors using the following two criteria as suggested by Costello and Osborne (2005). The first criterion involved examining the factor loadings for each item and assigning items to a factor when the item loading was above .30 (Costello & Osborne, 2005). Items were retained in the model and assigned to the factor on which they loaded the highest.

The second criterion involved examining the content of the items to determine the latent construct each item was measuring and naming each factor (Fabrigar et al., 1999). Based on these criteria, 12 of the 13 items loaded in one of the two factors whereas one item (Item 32) did not load on either factor (see Table 4).

The manner in which the items loaded into two factors suggested the existence of a distinct latent trait for each factor; one of which was labeled *depression latent construct,* and the other labeled *anxiety latent construct*. Table 4 shows the results of the EFA. Based on the criteria described earlier, the items loading in this factor were "I cry a lot," "I feel that no one loves me" "I feel worthless or inferior," and "I think about killing myself." This factor

was characterized mainly by the items “I think about killing myself” (β=0.825), “I feel that no one loves me” (β=0.817), and “I feel worthless or inferior” (β=0.751).

In contrast, the items that loaded in the anxiety factor were, “I cry a lot,” “I am afraid of certain places or situations,” “I am afraid of going to school,” “I am afraid I might think or do something bad,” “I feel I have to be perfect,” “I am nervous or tense,” “I am too fearful or anxious,” “I feel too guilty,” “I am self-conscious or easily embarrassed,” and “I worry a lot.” The items that characterized this factor were “I am too fearful or anxious” (β=0.627), “I am afraid of certain places or situations” (β=0.573), and “I am nervous or tense” (β=0.448).

To confirm the EFA results, two CFAs were fit and compared. In conducting CFA, all aspects of the CFA model must be specified based on previous theory or evidence (Brown, 2006). In this article, we have used the results of the EFA as evidence of the underlying two-factor structure of the YSR Anxious/Depressed items, and confirmed this factor structure with the CFA. We ran two separate CFA models to enable a comparison of the fit indices of each to determine which model was the better fit to the data. The first model was a CFA that assumed one underlying structure between the depression latent construct and the anxiety latent construct. The second CFA assumed two separate factors for the constructs described above. Table 5 presents the results for both CFA models along with factor loadings, goodness of fit indices, and the chi-square test to compare nested models with categorical indicators. According to the robust chi-square difference testing with mean and variance adjusted test statistics (Asparouhov & Muthén, 2006), the model specifying a two-factor structure fits the data better than the model with a one-factor structure (20.281, $p < 0.001$). Note that the goodness of fit indices (Tucker-Lewis index [TLI], Comparative fit index [CFI] and root mean squared error of approximation [RMSEA]) also greatly favored the two-factor structure solution. The two-factor model has TLI and CFI above 0.965 and the confidence interval of the RMSEA below 0.050. Note that in the case of the unidimensional structure, the TLI was below 0.95 and the confidence interval for the RMSEA was greater than 0.050, which does not suggest an adequate fit.

Figure 2 depicts the model with the two-factor structure. The CFA supported the existence of an anxiety latent construct and a depression latent construct. Further, as illustrated in Figure 2, there was a correlation of 0.802 between the two factors, which suggested that anxiety and depression are positively correlated but are not the same latent construct. This finding is analogous to the correlation that can be observed between height and weight even though they are not the same constructs.

Conceptual Validation

Following standard practice in the validation of anxiety and depression symptoms and their relationship to negative affect (Laurent & Ettelson, 2001), we examined how the individual anxiety and depression scales identified by the factor analysis techniques would perform against the Positive and Negative Affect scale (PANAS) for Children (Watson et al., 1988). The negative affect component of PANAS includes the emotions of fear, sadness, anger, and guilt. Negative affect has been suggested to be a shared component of both anxiety and depression. On the other hand, positive affect, which is considered as the extent to which a person is pleasantly engaged with his or her environment, is thought to distinguish between anxiety and depression because depression is often characterized by low levels of positive affect whereas anxiety is not influenced by positive affect. Previous research has found that the correlation between a depression measure and the negative affect scale was in the range of 0.52 and 0.60, and the correlation between anxiety and the negative affect scale of the PANAS ranged between 0.50 and 0.68 (Laurent et al., 1999; Stark & Laurent, 2001; Watson et al., 1988). In our analyses, we found that the correlation between the YSR anxiety scale and the negative affect scale of the PANAS was 0.56, and the correlation between the YSR

depression scale and negative affect was 0.46. These results are not only consistent with past research but also consistent with the hypothesized relationships between negative affect and the constructs of anxiety and depression.

Discussion

The goal of this study was to investigate the factor structure of the Anxious/Depressed subscale of the YSR. First, we sought to determine the number of factors that best described the subscale, and then we examined the factor loadings for each item. Based on our findings, we tested whether the suggested two-factor structure of the anxiety and depression latent constructs best fitted the data when compared with the simpler structure of the one-factor model.

The study findings indicated that 12 items of anxiety and depression measured by the YSR using a community sample of low-income Chilean adolescents were best characterized by a two-factor structure, and that one item did not load on either of the factors. The findings regarding the structure of these constructs were consistent with previous work whereby separate constructs for anxiety and depression best fit the data of adolescent samples within the United States (Clark, Steer, & Beck, 1994; Crowley & Emerson, 1996; Stark & Laurent, 2001) and outside the United States (Gonzalez, Herrero, Vina, Ibanes, & Penate, 2004; Karagozoglu, Masten, & Baloglu, 2005; Tully, Zajac, & Venning, 2009). Our findings indicated that each item of the YSR Anxious/Depressed subscale loaded onto one of two factors that are measures of underlying anxiety and depression latent constructs. These findings suggest that the YSR Anxious/Depressed subscale represents unique but co-occurring domains of an internalizing behavior. The correlation between these factors might represent a common generalized internalizing factor, as has been found by others among adult samples (Vollebergh et al., 2001). Often, the high correlation of anxiety and depression disorders has been explained in the literature as an artifact of symptom overlap between the two disorders when measured with separate scales (i.e., anxiety and depression) that contain the same items (Brady & Kendall, 1992). In contrast, this study's use of a scale that asserts to measure both constructs simultaneously enabled us to delve deeper into the exact nature of the relationship between the anxiety and depression constructs. We found each item of the YSR Anxious/Depressed scale loaded uniquely on the two factors, and therefore, the correlation between the factors cannot be attributed to symptom overlap. Instead, these findings suggest the constructs' underlying commonality. Further, in contrast to the suggested single-factor structure of the YSR Anxious/Depressed subscale, our findings indicate that these constructs are separate yet correlated entities that happen to co-occur among this group of adolescents.

We suspect that the differences in factor structure observed in this group of adolescents might be due to the ways in which adolescents experience and manifest symptoms of anxiety and depression in different cultural contexts. Specifically, we found the item measuring the extent to which adolescents feel they have to be perfect did not load on either the depression or the anxiety latent construct. Perhaps perfectionism does not adequately capture the constructs of anxiety and depression among Chilean adolescents. To date, few researchers have examined the prevalence of childhood mental disorders in Chile, and even less research attention has been given to examining the factor structure of measures commonly used to assess these problem behaviors. Consequently, there is not enough available research to put our findings in a meaningful context. What we do know is that Chile has the highest burden of psychiatric disorders in the world largely because there are high levels of unmet psychiatric need. Despite the Chilean government's efforts over the past three decades to improve mental health programs (Araya, Alvarado, & Minoletti, 2009), data from a household survey of adults in Santiago found that "fewer than one-twentieth" of

adult individuals with mental disorders had been seen by a psychiatrist (Araya, Rojas, Fritsch, Frank, & Lewis, 2006, p. 111). Results from other research on parental reports of child and adolescent problems have shown that about 50% of the offspring of depressed mothers had scores in the clinical range of the Child Behavior Checklist (CBCL; Fritsch, Montt, Solis, Pilowsky, & Rojas, 2007). However, those findings should be used carefully given that the mothers' depression might have influenced the ways in which they responded to their child's problematic behaviors (Crijnen, Achenbach, & Verhulst, 1997). Clearly, more research on the mental health of Chilean youth is needed.

To our knowledge, with the exception of study samples that have included U.S. Hispanics and Puerto Ricans, ours is the first study to have examined the factor structure of the YSR Anxious/Depressed scale among Latin American youth. Of note, although researchers may have used the YSR instrument with other Latin American populations, we are not aware of other efforts that have examined the psychometric properties of any of the YSR scales or subscales with Latin American adolescents. The original development of the factor structure of the entire YSR instrument was carried out using a nationally representative sample of U.S. children and adolescents through exploratory and confirmatory factor analytic techniques (Achenbach et al., 2008). This work yielded eight factors of clinical syndromes using samples of clinically referred and nonreferred children. Previous examinations of the YSR have found similar factor structures in countries other than the United States (de Groot, Koot, & Verhulst, 1996; Kuramoto et al., 2002). In Asia, the YSR has been reported to have satisfactory reliability and internal consistency (Leung & Wong, 2003); however, adaptations of the parent (CBCL) and teacher (TRF) forms for Taiwanese populations resulted in the addition of items that measure culture-specific symptomatology (Yang, Soong, Chiang, & Chen, 2000). Ivanova and colleagues (2007) conducted a CFA of the YSR in 23 different societies, but none of the analyses included a Latin American country. Although the authors of the YSR instrument have stated that the ASEBA instruments are supported by confirmatory factor analytic techniques of samples drawn from many countries, factor analysis is in fact a sample-dependent technique that does not lend itself to extrapolation of its factor structure to other populations. Thus, a necessary first step in using the YSR, or other of the ASEBA instruments, in a new setting is the use of factor analytic techniques to explore the underlying structure of the factors among the target population.

We reiterate that these findings are based upon a cross-sectional sample of Chilean adolescents. If anxiety and depression are indeed different constructs, then more attention is needed to understand how and when anxiety and depression become separate constructs over time, which requires longitudinal data. The literature suggests that in younger children anxiety and depression form a single construct (Cole, Truglio, & Peeke, 1997). If that is the case, then research would benefit from a closer examination of the points during a child's development when anxiety and depression become differentiated, and how these separate yet correlated constructs unfold over time. Perhaps one reason our study found such a high correlation between the two latent constructs of anxiety and depression is that we were observing the natural process of separation between anxiety and depression, which begins, but is not completed, during adolescence. Longitudinal research of this nature is rare, particularly in cross-cultural contexts. However, research that explores changes in the trajectories of the underlying latent constructs over time with child and adolescent populations will benefit the research literature on adolescent mental health worldwide by providing a clearer understanding of the growth trajectory of adolescent mental health (see Fergusson, Horwood, & Boden, 2006).

Further research in this area is clearly warranted. If anxiety and depression are indeed distinct constructs, then researchers should pay more attention to the distinct antecedents of each construct. For example, it may be that a distinct set of community, family, and

individual factors are predictive of the development of depression rather than anxiety. Research in this area might serve to identify distinct modifiable factors for each disorder that could guide the development of interventions designed to address both disorders.

Research would also benefit from more attention to the potential differential consequences of anxiety and depression. It may be that anxiety and depression have very different relationships with problems such as substance use or school failure. Such links between mental health disorders and other problems are poorly understood in cross-cultural contexts.

Study Limitations

One of the limitations of this study is that there is no information on diagnosis to compare the extent to which responses to YSR items are correlated with diagnostic criteria such as those in the *Diagnostic and Statistical Manual of Mental Disorders-IV-TR* (American Psychiatric Association, 2000) or the *International Classification of Diseases-10* (WHO, 1992). A second limitation is related to the sources of data used in our study. Currently, we do not have data from other sources about the sampled youths' symptoms of depression and anxiety. The adult guardians that accompanied the youths to the study site completed the CBCL; however, those data will not be available for analysis for another year. When the parent report data are available, we will compare the adolescents' responses with the parents' reports. Further, this study did not obtain teacher reports of youth behavior. Although, the unavailability of those data does not detract from the main purpose of the present study, which was to examine the factorial validity of the YSR Anxious/Depressed subscale, information from those other sources would have provided richer detail about the validity of the sub-scale. A third limitation of this research is that the ASEBA instruments, including the YSR, have not been normed with a Chilean adolescent population, thus impeding our ability to compare our findings with nationally representative samples.

Notwithstanding these limitations, the study findings are particularly relevant to social workers and mental health workers practicing in international settings and for those seeking to understand the expression and manifestation of mental health among Latin American adolescents. Standard treatment practices for anxiety and depressive disorders involve treating each disorder separately (Kendall, Kortlander, Chansky, & Brady, 1992; Saavedra, Silverman, Morgan-Lopez, & Kurtines, 2010; Spielmans, Pasek, & McFall, 2007). The high correlation between the latent constructs of anxiety and depression found in this study is consistent with the notion that anxiety and depression disorders often co-occur during adolescence (Brady & Kendall, 1992) as well as other times in the lifespan (Krueger, Caspi, Moffitt, & Silva, 1998). Although these disorders often co-occur, recent research has indicated that during adolescence some individuals can have a depressive disorder without anxiety and others can have anxiety without depression (Olino, Klein, Lewinsohn, Rohde, & Seeley, 2010). As others have suggested, anxiety and depression disorders occur together because they share features of a common, underlying internalizing disorder (Fergusson et al., 2006). However, the finding that anxiety and depression constructs are indeed separate among this population fits with current evidence-based mental health interventions that treat these disorders individually, which are available in various parts of the world. Those working in the mental health field or with families and children in Latin America should be aware that although anxiety and depressive symptoms may sometimes co-occur in adolescents, these symptoms are likely to represent distinct disorders, and thus attention to addressing both disorders may be necessary.

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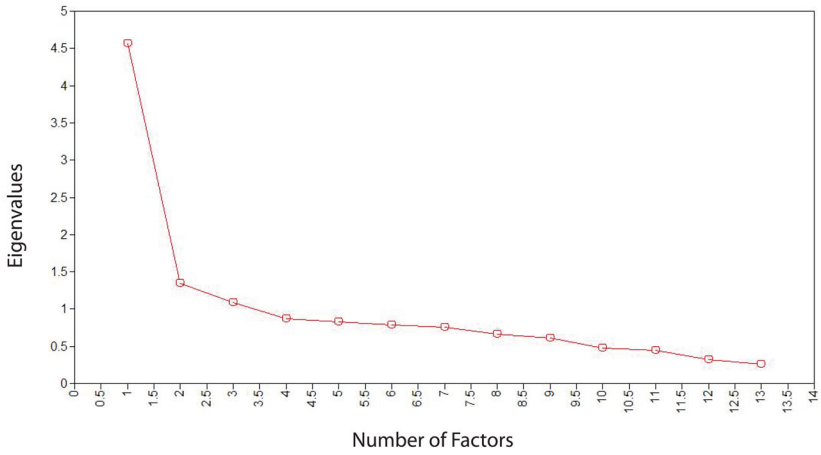

Figure 1.
Results of Exploratory Factor Analysis: Eigenvalues (n=503)

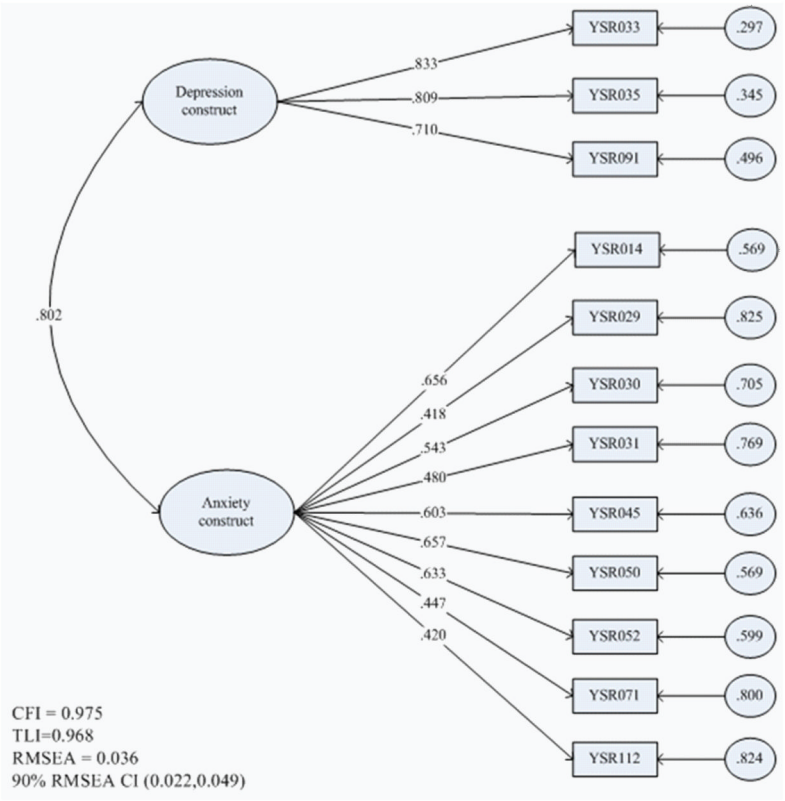

Figure 2. YSR Confirmatory Factor Analysis: Two-factor Structure (n=507)

All coefficients were significant at $p<0.001$ otherwise indicated. ~ ($p<0.1$), **($p<0.01$). The double arrowed lines indicate correlations.

Table 1

Proportion of Adolescents Endorsing YSR Anxiety/Depression Items With Values 1 or 2 by Subsample

Youth Self-Report Anxiety/Depression Subscale Items	Sample EFA (*n*=503) %/mean	Sample CFA (*n*=507) %/mean
YSR 14. I cry a lot.	36	36
YSR 29. I am afraid of certain places, or situations.	50	54
YSR 30. I am afraid of going to school.	7	4
YSR 31. I am afraid I might think or do something bad.	37	42
YSR 32. I feel that I have to be perfect.	29	34
YSR 33. I feel that no one loves me.	26	21
YSR 35. I feel worthless or inferior.	16	17
YSR 45. I am nervous or tense.	59	60
YSR 50. I am too fearful or anxious.	56	55
YSR 52. I feel too guilty.[a]	30	36
YSR 71. I am self-conscious or easily embarrassed.	65	61
YSR 91. I think about killing myself.	10	10
YSR 112. I worry a lot.	74	74
Demographics		
Female	51	46
Age	14.40	14.40
Income	326	323

[a] Significant difference at p =0.045. Income is expressed in thousands (Chilean pesos)

Table 2

Correlation Matrix Between YSR Anxious/Depressed Items for Subsample Used in the Exploratory Factor Analysis (n=503)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Cry												
2. Self-conscious	0.153											
3. Afraid places	0.248	0.243										
4. Afraid school	0.250	0.268	0.277									
5. Afraid think bad	0.245	0.227	0.243	0.417								
6. Be perfect	0.287	0.148	0.238	0.146	0.180							
7. No one loves me	0.494	0.232	0.205	0.479	0.277	0.282						
8. Feel inferior	0.400	0.090	0.202	0.289	0.253	0.329	0.670					
9. Kill myself	0.513	0.159	0.066	0.358	0.265	0.229	0.606	0.519				
10. Feel nervous	0.215	0.237	0.156	0.393	0.239	0.231	0.349	0.307	0.171			
11. Too fearful	0.423	0.275	0.378	0.255	0.250	0.208	0.340	0.300	0.137	0.343		
12. Too guilty	0.307	0.270	0.253	0.322	0.357	0.238	0.445	0.385	0.344	0.301	0.378	
13. Worry a lot	0.333	0.259	0.157	0.406	0.215	0.150	0.347	0.242	0.281	0.340	0.190	0.275

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Table 3

Correlation Matrix Between YSR Anxious/Depressed Items for Subsample Used in the Confirmatory Factor Analysis (n=507)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Cry												
2. Self-conscious	0.285											
3. Afraid places	0.269	0.160										
4. Afraid school	0.350	0.239	−0.004									
5. Afraid think bad	0.220	0.232	0.261	0.200								
6. Be perfect	0.249	0.169	0.169	0.148	0.172							
7. No one loves me	0.484	0.367	0.222	0.430	0.259	0.378						
8. Feel inferior	0.484	0.325	0.213	0.375	0.309	0.272	0.690					
9. Kill myself	0.416	0.276	0.127	0.405	0.388	0.359	0.606	0.516				
10. Feel nervous	0.343	0.225	0.271	0.437	0.199	0.088	0.425	0.460	0.222			
11. Too fearful	0.432	0.326	0.395	0.329	0.316	0.239	0.356	0.322	0.341	0.461		
12. Too guilty	0.387	0.227	0.244	0.239	0.439	0.219	0.413	0.418	0.473	0.334	0.392	
13. Worry a lot	0.326	0.151	0.192	0.285	0.173	0.267	0.247	0.239	0.160	0.295	0.251	0.294

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Table 4

Factor Loadings for Exploratory Factor Analysis of YSR Anxious/Depressed Items (n=503).

Item	Factor I	Factor II
YSR 14. I cry a lot.	**.445**	.246
YSR 29. I am afraid of certain places, or situations.	−.116	**.573**
YSR 30. I am afraid of going to school.	.216	**.466**
YSR 31. I am afraid I might think or do something bad.	.100	**.426**
YSR 32. I feel that I have to be perfect.	.215	.241
YSR 33. I feel that no one loves me.	**.817**	.069
YSR 35. I feel worthless or inferior.	**.751**	.002
YSR 45. I am nervous or tense.	.112	**.448**
YSR 50. I am too fearful or anxious.	.002	**.627**
YSR 52. I feel too guilty.	.237	**.438**
YSR 71. I am self-conscious or easily embarrassed.	−.086	**.520**
YSR 91. I think about killing myself.	**.825**	−.144
YSR 112. I worry a lot.	.210	**.334**
	CFI=0.987	
	TLI=0.981	
	RMSEA = 0.030	

Factor loadings **in bold** indicate the factor in which the item was judged to belong.

Table 5

Factor Loadings for Confirmatory Factor Analysis off YSR Anxious/Depressed Items (n=507)[a]

Item	Unidimensional Factor Structure	Factor I	Factor II
YSR 14. I cry a lot.	.639		.565
YSR 29. I am afraid of certain places, or situations.	.405		.418
YSR 30. I am afraid of going to school.	.532		.543
YSR 31. I am afraid I might think or do something bad.	.469		.480
YSR 33. I feel that no one loves me.	.767	.838	
YSR 35. I feel worthless or inferior.	.746	.809	
YSR 45. I am nervous or tense.	.589		.603
YSR 50. I am too fearful or anxious.	.636		.657
YSR 52. I feel too guilty.	.615		.633
YSR 71. I am self-conscious or easily embarrassed.	.440		.447
YSR 91. I think about killing myself.	.656	.710	
YSR 112. I worry a lot.	.409		.420
	CFI=0.957	CFI=0.975	
	TLI=0.947	TLI=0.968	
	RMSEA = 0.047	RMSEA=0.036	
	90% CI 0.035–0.059	90% CI 0.022–0.049	

[a]Robust chi-square difference test with mean and variance adjusted test statistic was 20.281 $p<0.001$. All coefficients are significant at $p<0.001$ unless otherwise indicated.