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Dimensional Diagnosis of Anxiety in Youth

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Dimensional Diagnosis of Anxiety in Youth

The diagnosis of anxiety disorders in children and adolescents is associated with several problems including high comorbidity and low clinical utility of diagnostic categories. This chapter will begin by outlining the weaknesses of the current categorical diagnostic system and reviewing the history and evidence for taking a dimensional approach to the diagnosis of anxiety disorders in children and adolescents. The problem of the high comorbidity of anxiety and depression in youth will be discussed, followed by a review of several quantitative structural models which have been proposed to differentiate between the shared and specific components of anxiety and depression. Based on the research indicating that anxiety disorders are best classified as highly correlated symptom clusters comprising internalizing syndromes, approaches to assessment and diagnosis will be covered in the last section of this chapter. Tools that have been validated to measure anxiety and depression dimensionally in youth will be presented, as well as measurement of narrow traits that have been found to put children and adolescents at risk for the development of pathological anxiety. Finally, we will discuss the need to move toward a system of classification that corresponds more directly to effective interventions for anxiety disorders in youth.

DSM-IV Diagnostic Categories of Anxiety Disorders

Currently the diagnostic categories for anxiety disorders are rationally derived. That is, they are grouped together according to phenotypically similar symptoms. However, the tradition in psychology is to evaluate dimensionally, as evidenced by the types of measures used to assess symptom severity. The current diagnostic system has attempted to include a dimensional quality by including the global assessment of functioning (GAF) scale, but this scale is not considered a psychometrically adequate measure since it is a single item that groups together multiple constructs (e.g., suicidality, basic daily functioning, interpersonal relatedness). Therefore, there is tension between the clinically relevant practice of rating symptom severity dimensionally and assigning a categorical diagnosis.

Notably, there were only three categories of anxiety disorders in the second edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-ll*; American Psychiatric Association, 1968). There are 12 categories in the current edition (*DSM-IV-TR*; American Psychiatric Association, 1994). Brown, Chorpita, and Barlow (1998) argued that the increasing

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number of anxiety diagnoses indicates that the "classification systems have become overly precise to the point that they are now erroneously distinguishing symptoms and disorders that actually reflect inconsequential variations of broader, underlying syndromes" (p. 179). This reflects the "splitting" movement, whereby disorders are defined in increasingly narrow domains. Accordingly, with this level of specificity, existing diagnoses can in some instances lack syndromal validity and fail to offer distinctions that allow for effective treatment planning.

Dimensional Approaches – A Brief History

Dimensional models of psychopathology have been advocated for some time now, and the arguments advanced for this approach include several important points. First, categorically based diagnosis assumes that each disorder is a discrete entity (Carson, 1991). This is generally an inaccurate view, but it is the one understood by the architects of the symptom-based DSM (Frances et al., 1991). Second, since diagnoses in the current DSM are formulated based on consensus agreement in committees and task forces, rather than based on medical and/or psychological etiology from agreed upon theoretical concepts, the diagnoses are potentially arbitrary entities whose existence is based on a posteriori reasoning (for a discussion of different taxonomic methods and models, see Blashfield, Keely, & Burgess, 2009). Third, dimensional models permeate other medical sciences, where severity and complicating factors play a prominent role in classification. These factors are critical in any taxonomy because they contribute to prediction of course and treatment outcome (again, see Blashfield et al.). And finally, a guiding principle in the development of many categories in the current DSM was the degree that clinicians would be likely to accept the diagnosis, and thereby utilize it in evaluating clients (Carson, 1991). This last difficulty is perhaps most problematic since it undermines the very utility of a diagnostic system by formulating diagnosis on the basis of consensus rather than syndromal validity.

Since the earlier recommendations that a dimensional approach be adopted, a growing effort to develop statistical methodologies for identifying entities that are either continuous or taxonic has emerged. This approach, referred to as taxometric analysis, has allowed for the identification of conditions that may be taxonic (that is, composed of some discrete point whereby levels of a psychopathological indicator would suggest a unique and separate entity) or may be on a continuum of severity. Two notable examples from the anxiety disorder literature illustrate this. The first involves dissociation, which is commonly associated with trauma and acute anxiety and has been shown to be taxonic. That is, scores on a major measure of dissociation can be categorized where some individuals are considered nondissociators (or to a very limited degree) and those scoring above that point are considered dissociators (Waller, Putnam, & Carlson, 1996). On the other hand, anxiety sensitivity (AS) has been examined for taxonic status. AS refers to the degree that changes in internal bodily state are experienced as dangerous, and it is commonly present in most anxiety disorders (Taylor, 1999). Research has shown that this construct is nontaxonic, or dimensional (Broman-Fulks et al., 2010).

In the case of the major constructs used to understand anxious psychopathology, the majority are dimensional in nature. Among those that are dimensional in nature are worry (Olatunji, Broman-Fulks, Bergman, Green, & Zlomke, 2010), post-traumatic reactions (Ruscio, Ruscio, & Keane, 2002), and obsessive-compulsive symptoms and beliefs (Haslam, Williams, Kyrios, McKay, & Taylor, 2005). Likewise in children, there is a high degree of dimensionality evident in anxiety disorder relevant constructs. Notably, AS (Bernstein, Zvolensky, Stewart, & Comeau, 2007) and trauma (Goodman et al., 2003) both have been found to have a dimensional structure. There have been far fewer taxometric studies involving children, likely due to the large sample sizes necessary for stable estimates of effect (see Waller & Meehl, 1998, for a technical discussion of taxometric analysis).

What this suggests is that most psychological indicators involved in conceptualization and

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assessment of anxiety disorders have a dimensional quality. This would rule out a categorical approach since such models eliminate a great deal of information regarding symptom severity and relevant treatment components.

The Problem of Comorbidity

From an epidemiological perspective, the current DSM system has resulted in a high probability of comorbid conditions. Brady and Kendall (1992) reported a 16% comorbidity rate in a community sample of children and adolescents that were not seeking treatment and comorbidity rates ranging from 28 to 62% in clinical samples of youth that were seeking treatment. As was discussed above concerning the problem of dimensional vs. discrete categories, the problem of comorbidity rate has been addressed in the literature. For example, Mineka, Watson and Clark (1998) described "excessive diagnostic splitting" as a potential cause of comorbidity with regard to highly similar disorders (e.g., overanxious disorder and generalized anxiety disorder [GAD] in children; Caron & Rutter, 1991). Researchers have also provided excellent suggestions for handling this issue in conceptualization and treatment planning. For example, Rachman (1991) offered four recommendations for handling comorbidity, including (a) behavioral analysis of presenting symptoms; (b) assessment of subjective experience of all comorbid conditions to identify overlapping features; (c) commonalities in psychophysiological responses; and (d) semantic overlap among diagnoses.

Around this same time, it was widely recognized that depression and anxiety tend to co-occur, or exist together at sub-threshold levels, but collectively lead to serious psychological disturbance (Barlow & Campbell, 2000). This emerged due to the frequent finding that, regardless of sample, depression and anxiety tend to correlate. In the case of self-report measures, the correlation between depression anxiety is typically greater than 0.6, even after removing items that could reasonably reflect the other construct and thereby inflate the correlation (Barlow, 1991). Similar results have been observed for other methods of assessing these constructs, indicating that this is not due to common method variance.

Among youth, there is significant amount of overlap between symptoms of anxiety and depression. In particular, Brady and Kendall (1992) found that the correlation between self-report measures of anxiety and depression ranged from $r = 0.50$ to 0.70 among children and adolescents. Although this high correlation may be due in part to similar item content on self-report measures of anxiety and depression, previous research has found that there is still substantial correlation when overlapping items are removed (Cole, Truglio, & Peeke, 1997; Stark & Laurent, 2001).

Generally, the net result has been to recognize that each is dimensional, rather than discrete entities, given the robustness of such a finding. Some in the psychiatry profession have called for a purely dimensional approach given that (a) depression and anxiety are commonly experienced in the general population and (b) severity is not tied to a reliable biological substrate (Goldberg, 2000). Indeed, consider that, even in the realm of behavioral genetics where the aim is to identify phenotypic signs of psychiatric disturbance, the field relies on dimensional models (Kendler, 2006). This is largely because there is recognition of the range of disturbance present in individuals suffering from psychiatric problems, and the dimensional approach permits greater reliability in findings given the increased variability and hence greater power in statistical tests (DiLalla, 2004).

Alternate Conceptualizations of Anxiety Disorders

Because of the high level of comorbidity, it has been suggested that a quantitative approach to diagnosis be used to uncover actual, rather than perceived, similarities among mood disorder diagnoses. Several models have been proposed in which correlated syndromes are grouped together in the same diagnostic class. These models aim to explain the shared and specific factors contributing to the etiology of anxiety and depression and serve to identify relevant treatment targets.

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Negative Affect and Positive Affect

Negative affect (NA) is the tendency to experience negative moods (e.g., sadness, fear, guilt, and hostility) and has been described as a stable trait. It has been proposed that NA should be considered a main vulnerability factor for the development of anxiety and depression (Clark, Watson, & Mineka, 1994). Positive affect (PA), on the other hand, has been suggested as a vulnerability factor specifically related to depression. Watson, Clark, and Tellegen (1988) described PA as reflecting "the extent to which a person feels enthusiastic, active, and alert" (p. 1063), with low PA reflecting anhedonia. Tellegen (1985) theorized that these personality dimensions could be used to differentiate between anxiety and depression. Specifically, he hypothesized that NA is a nonspecific factor related to both anxiety and depression, and that the existing symptom overlap and resulting comorbidity are due to this shared trait. Furthermore, he suggested that PA is a specific factor that could be used to distinguish between anxiety and depression because they found that PA was related (negatively) to depression diagnoses in adults, but PA was not correlated with anxiety disorders (Watson, Clark, & Carey, 1988).

Among a nonclinical sample of elementary school–aged children, Crook, Beaver, and Bell (1998) did not find support for this model. Rather, they found that NA was significantly related to both self-reported depression symptoms ($r = 0.66$, $p < 0.001$) and self-reported anxiety symptoms ($r = 0.68$, $p < 0.001$). They also found that PA was negatively correlated with both depression symptoms ($r = -0.50$, $p < 0.001$) and anxiety symptoms ($r = -0.34$, $p < 0.001$). Although these initial results seemed to refute the specific relationship of PA to depression symptoms, Crook et al. also performed hierarchical regression to examine the partial correlations of PA and NA with measures of anxiety and depression, and they found that PA had a significant negative partial correlation with depression scores when anxiety and NA scores were controlled, whereas PA was unrelated to anxiety scores when depression and NA scores were controlled.

Tripartite Model

Clark and Watson (1991) expanded upon the original two-factor model of anxiety and depression by introducing another factor. They proposed the tripartite model as a means of differentiating anxiety and depression despite their high symptom overlap and diagnostic comorbidity, which posits that depression and anxiety both share the common component of NA. Depression, however, is specifically characterized by low PA, whereas anxiety is associated with high physiological hyperarousal (PH). While NA and PA have been described as stable temperaments or personality traits, PH has not. However, Clark et al. (1994) have related the concept of PH to AS, and AS has been described in the literature as a trait that is a risk factor for the development of anxiety disorders (McNally, 1990).

Barlow, Chorpita, and Turovsky (1996) have also described a very similar three-factor model for conceptualizing anxiety and depression which attributes the development of these disorders to problems with three basic emotions: anxiety (or anxious apprehension), fear, and depression. Their model indicates that (a) general distress (i.e., high NA) leads to *anxiety* (anxious apprehension), (b) autonomic arousal leads to *fear/panic*, and (c) anhedonia (i.e., low PA) and hopelessness lead to *depression*. As in the tripartite model, autonomic arousal is theorized to be specific to anxiety diagnoses while anhedonia/low PA is related only to depression. High NA/distress is hypothesized to be a common factor to both anxiety and depression.

Although the tripartite model was developed to explain the relationship between anxiety and depression in adults, it has been shown to be relevant to children and adolescents as well. For example, in a large sample of anxious and depressed youth, Lerner et al. (1999) found factors from measures of anxiety and depression that corresponded to the models described in Clark and Watson (1991). Furthermore, in a large unselected sample (N=1,289) of children, similar findings were obtained using a different assessment of depression and anxiety, and were replicated in a smaller second sample (N=300) (Chorpita, Daleiden, Moffitt, Yim, & Umemoto, 2000).

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The relationship among NA, PA, and PH was further examined among inpatient children and adolescents, and support was again found for the tripartite model among youth (Joiner & Lonigan, 2000). Although many studies have supported the tripartite model, there is some evidence that the relationship among the three variables (i.e., NA, PA, and PH) may not be identical across all of the anxiety disorder diagnoses. In particular, there is evidence that predictions made using the tripartite model do not hold for youth diagnosed with Social Anxiety Disorder.

Brown et al. (1998) examined the structural relations among NA, PA, and PH in a large sample of individuals with one of five DSM-IV diagnoses: GAD, Depression, Panic Disorder, Obsessive-Compulsive Disorder (OCD), and Social Phobia. The use of structural equation modeling allowed the researchers to test the tripartite model with a dimensional approach to the DSM diagnostic categories as opposed to other approaches that would require the researchers to confirm a categorical diagnosis. Brown et al. found that all paths from NA to the DSM-IV disorder factors were statistically significant, which supports the notion that NA is a general dimension common to mood and anxiety disorders. The strength of the relationship varied across diagnosis, with the strongest relationships existing between NA and Depression and NA and GAD. The smallest association was found between NA and Social Phobia. When PA was added to the structural models, there was a significant negative path from PA to Depression. Notably, after creating a path from PA to Depression, the modification indices suggested that a path should also be added from PA to Social Phobia. A significant negative path was found between PA and Social Phobia, and the results indicated that the fit of this model was so good that it would not be improved by adding additional paths from PA to any other latent variable (i.e., other DSM-IV anxiety diagnoses). Furthermore, the strength of the path between PA and Depression (−0.29) was comparable to the strength of the path from PA to Social Phobia (−0.28). Finally, the addition of PH to the structural models did not improve the fit of the models. In terms of the different anxiety disorders, the strongest path from PH was found to Panic Disorder/Agoraphobia. The paths from OCD and Social Phobia to PH were not significant. Notably, the path from GAD to PH was significant and negative.

Turner and Barrett (2003) found that the tripartite model was consistent across three age groups (ages 8–9, 11–12, and 14–15) suggesting that the three major components of the model are not developmentally dependent. The balance of research has generally supported the tripartite model, but much of this has involved self-report measures or assessments that do not necessarily pose a strict test of the model (Anderson & Hope, 2008). However, the tripartite model has shown considerable promise in assessment of anxiety in youth, may be relatively robust across major anxiety diagnoses, and illustrates the potential clinical utility of a dimensional model of nosology.

Hierarchical Models

Although there has been empirical support for the tripartite model of depression and anxiety, this structural model asserts that all anxiety diagnoses are characterized by the shared component of high autonomic arousal, which differentiates anxiety from depression. Researchers have instead proposed that a hierarchical model of anxiety disorders may be more appropriate to account for the heterogeneity of anxiety diagnoses (Brown et al., 1998; Zinbarg & Barlow, 1996). In this model, each anxiety disorder has unique and shared components, with the shard component representing a higher-order factor of anxious apprehension (i.e., high NA). This model not only accounts for the high correlation among anxiety disorder diagnoses due to this shared component but also accounts for the high comorbidity among anxiety and depression because high NA is common to depression as well as anxiety.

Mineka et al. suggested a more comprehensive structural model that combines the tripartite model with the hierarchical model described above based on the fact that it is unlikely that each is equally and adequately explained by the dimension of

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autonomic hyperarousal as proposed by those models. Therefore, Mineka et al. proposed the integrative hierarchical model, which suggests that syndromes have both common and unique components. As in previous models, high NA/distress is considered to be the shared component of both anxiety disorders and depression, but anxious arousal (AA) is not viewed as broadly characteristic of all anxiety disorders. Instead, each individual anxiety disorder is presumed to have some unique component that differentiates it from all others. AA is viewed as the specific component of panic disorder alone.

Support for this model has been found in children using structural equation modeling. In a sample of children, Spence (1997) examined four models to see which best explained the structure of self-reported anxiety symptom data (i.e., a single-factor model, a six-uncorrelated-factor model for each specific DSM-IV anxiety diagnosis, a six-correlated-factor model, and a higher-order model with six first-order factors loading onto a single second-order factor). The results indicated that the correlated six-factor model with these six factors loading onto a higher second-order "anxiety" factor provided the best fit to the data. Additionally, she found that the major proportion of variance in anxiety symptoms was explained by this higher-order anxiety factor, which suggests that while there are distinguishable anxiety diagnostic categories, the high comorbidity can be explained by a high correlation among the diagnoses in youth.

The integrative hierarchical model need not be confined to anxiety disorders and depression alone, but can be broadened to encompass other disorders that are characterized by high NA (Mineka et al., 1998). Krueger and Piasecki (2002) proposed the hierarchical spectrum model, which was an attempt to capture the correlation among DSM diagnoses by clustering symptoms to comprise syndromes with these syndromes comprising broader families of disorders or spectra. The broadest categories identified are the internalizing and externalizing disorders, with the internalizing disorders being comprised of depression and the anxiety disorders. Externalizing disorders include substance dependence, antisocial behavior, and disinhibited behavior diagnoses. This model has been promising in understanding anxiety disorders (Taylor, Abramowitz, McKay, & Asmundson, 2010), but has not yet been extensively examined in youth.

Krueger (1999) analyzed data from the National Comorbidity Study (NCS) to find that a three-factor structure best accounted for the relationship among psychiatric diagnoses. The three latent factors were Anxious-Misery (which included major depression, dysthymia, and GAD), Fear (which included panic disorder, agoraphobia, Social Phobia, and simple phobia), and Externalizing disorders (which included alcohol dependence, drug dependence, and antisocial personality disorder). The Anxious-Misery and Fear latent factors were highly correlated and thus were found to comprise a second-order factor of Internalizing disorders, which collectively form a group of conditions that tend to co-occur in varying levels. Interestingly, while the three-factor structure was found for the total NCS sample, in a treatment-seeking sample, the lower-order latent factors of Anxious-Misery and Fear could not be recovered. This suggests that among individuals experiencing functional impairment the individual diagnoses are even more highly correlated in a "superclass" of emotional disorders (Clark & Watson, 2006; Krueger & Markon, 2006; Watson, 2005).

The presence of such a superclass of disorders provides additional weight to the need for a dimensional approach to diagnosis since the underlying phenotype of anxiety confers a higher risk for a wide range of putative psychiatric conditions. Hereditability data have borne this out, whereby no single diagnosis increases the risk for anxiety disorder in offspring. Instead, the presence of any anxiety disorder increases the risk of any anxiety disorder in offspring (Hettema, Neale, & Kendler, 2001).

Measuring Anxiety Along a Dimension in Children

In general, the procedures used to assess and diagnose anxiety in children and adults are quite similar and typically include diagnostic interviews, self-report measures, and behavioral assessment.

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However, it is important to consider developmental differences throughout the assessment process because due to speed of physical, emotional, and cognitive development in childhood, assessment strategies will differ according to age. For example, a multi-informant, multi-method approach is recommended to gather comprehensive information about symptoms and impairment. Thus, in addition to clinical interview, observation, and self-report, reports from parents and teachers are recommended when assessing emotional symptoms in a child, and the amount of collateral data needed from caretakers is typically inversely related to the age of the child. Furthermore, when assessing young people, it is also necessary to have knowledge of normative development, so that manifestations of "normal fears" are not considered abnormal behaviors (Beidel & Turner, 2005).

The Child Behavior Checklist (CBCL; Achenbach, 1991; Achenbach, Demenci, & Rescorla, 2003) and Teacher Report Form (TRF; Achenbach, 1991) are the most widely used parent and teacher reports. The CBCL is a standardized assessment that asks parents to report on behaviors, problems, and competencies in children aged 4–18 years. The TRF is completed by teachers and is identical in content to the CBCL. The clinical scales of the CBCL and TRF are comprised of a Total Problems score, Internalizing Problems, Externalizing Problems, and eight syndromes (i.e., Aggressive Behavior, Delinquent Behavior, Withdrawn, Somatic Complaints, Anxious/Depressed, Attention Problems, Social Problems, and Thought Problems). These syndrome scales were not developed to reflect DSM-IV diagnoses, but they were derived through multivariate statistical analyses to identify separate empirically validated syndromes in line with the hierarchical models described above. Specifically, with regard to anxiety, it was determined that anxiety and depression were so highly correlated that they represent a singular syndrome in youth.

Although the CBCL and TRF were originally developed with this empirically based approach to identifying symptoms along a continuum, Achenbach et al. (2003) created DSM scales by asking pediatric psychologists and psychiatrists from diverse cultural backgrounds to rate how consistent CBCL/TRF items were with a specific DSM category. Achenbach et al. selected items that were reliably rated as "very consistent with the DSM category" to create the DSM scales. A six-item Anxiety subscale was developed through this approach. Kendall et al. (2007) noted that these six items do not include any somatic symptoms, and this omission calls the validity of the Anxiety subscale into question given that somatic symptoms are a necessary criterion for many of the DSM-IV anxiety disorder diagnoses. Thus, Kendall et al. derived an alternative measure of anxiety based on the CBCL/TRF items.

Kendall et al. (2007) developed an initial list of 22 items by asking experienced clinicians with a specialty in childhood anxiety disorders to select CBCL/TRF items related to the diagnosis of an anxiety disorder. Of these items, 18 achieved item-total remainder estimates above 0.40 and were retained in their anxiety scale. These researchers found that their anxiety scale significantly discriminated anxious and nonanxious children aged 9–13 years, and their anxiety scale better predicted an anxiety disorder diagnosis than did the Anxious/Depressed and Internalizing Scales of the CBCL and TRF. In addition, they found that their anxiety scale was sensitive to treatment effects. Participants who received treatment demonstrated a significantly lower score after treatment, while those on the waitlist showed no significant change in score. Therefore, Kendall et al.'s (2007) anxiety subscale of the CBCL seems to be a good predictor of pathological anxiety in children and adolescents and can be used to identify gains made in treatment. However, there is some evidence that its utility may depend on the reporter. Kendall et al. found that when compared to the CBCL Anxiety Subscale developed by Achenbach et al. (2003), their anxiety scale better predicted anxiety disorder status according to mother report, while the Achenbach et al. Anxiety Subscale better predicted anxiety disorder status according to father report.

Another dimensional measure that may be useful for measuring factors related to anxiety is the Positive and Negative Affectivity Scale – Child

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version (PANAS-C; Laurent et al., 1999). The PANAS-C is a 20-item self-report measure consisting of two scales: PA and NA. Respondents are asked to rate how often within the last week they have experienced 20 mood adjectives. The 10 positive-mood adjectives and 10 negative-mood adjectives are rated on a 5-point Likert-type scale. The scale choices are "very slightly or not at all," "a little," "moderately," "quite a bit," and "extremely." The findings suggest that the children's version of the PANAS has a similar structure as the adult counterpart. Since the development of this scale, several investigations have shown that it performs consistently across different cultural groups (Kiernan, Laurent, Joiner, Catanzaro, & MacLachlan, 2001), in unselected elementary and high school children (Jacques & Mash, 2004), and in children with diagnosed anxiety disorders (Hughes & Kendall, 2009). This last study identified difficulties in discriminant validity for the scale, however, with higher than anticipated relations with social anxiety and depressive symptoms. In some ways, this is not surprising, and reflective of the aforementioned long-standing difficulty in distinguishing anxiety from depression (see, for example, Rapee & Barlow, 1991).

A third measure that has been developed to measure mood symptoms along a dimension is the Mood and Anxiety Symptom Questionnaire (MASQ; Watson et al., 1995a, 1995b). The MASQ was created as a specific measure of the tripartite model described above. It is a 77-item self-report measure with three subscales: (1) General Distress: depressive symptoms (12 items), anxious symptoms (11 items), and mixed symptoms (15 items); (2) Anxiety-specific (AA, 17 items); and (3) Depression-specific (Anhedonic Depression [AD], 22 items). Buckby, Yung, Cosgrave, and Killackey (2007) found support for the clinical use of the MASQ to differentiate between anxious and depressed adolescents and young adults. Using ROC analyses, these authors found that the AD scale accurately predicted the presence of a mood disorder (72.8%) and the AA scale predicted anxiety disorders (61%). Thus, it seems that the AD scale may be superior to the AA scale in predicting the presence of the particular disorder it is intended to measure. Notably, the AA scale did better at identifying the absence of an anxiety disorder (83.5%). Furthermore, Buckby et al. (2007) found that AA and AD scores were highly and significantly correlated in all participants with a current Axis I disorder ($r = 0.59$). This high correlation calls into question the assumption that these are separate constructs, which is in line with the hierarchical models which indicate that these both fall on the broader spectrum of internalizing disorders.

Narrow Traits and Risk Factors in Youth

Given that heredity studies suggest that the presence of an anxiety disorder in a biological parent predicts development of *any* anxiety disorder in offspring (Hettema et al., 2001), it is assumed that a general tendency to develop anxiety disorders (i.e., anxiety proneness) is inherited rather than a specific anxiety disorder (Turner, Beidel, & Roberson-Nay, 2005). Thus, it is recommended that assessment also includes attention to these personality traits and temperaments that have been identified as risk factors for the development of anxiety disorders.

Behavioral Inhibition

Behavioral inhibition (BI) is a temperamental trait that is characterized by the tendency of children and adolescents to become uncomfortable in, and avoid, novel social situations. These youth are extremely shy and are reluctant to engage in adventurous activities or participate in unfamiliar social situations (Kagan, Reznick, & Snidman, 1988). BI has consistently been found to be related to the development of anxiety disorders, particularly Social Anxiety Disorder (Hirshfeld-Becker et al., 2008). Furthermore, BI seems to be most predictive of anxiety disorders when it is found among the children of parents with anxiety disorders (Biederman et al., 2001).

BI is typically measured using objective standardized laboratory observation protocols which involve exposing toddlers and preschoolers to unfamiliar people and situations. There are also

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several parent, teacher, and self-report measures of BI. For example, the Behavioral Inhibition Questionnaire (BIQ; Bishop, Spence, & McDonald, 2003) may be used to assess BI in preschool-aged children (i.e., 3–5 years old). There are both parent and TRFs of the BIQ. In older children and adolescents (i.e., 11–18 years old), the Behavioral Inhibition Instrument (BII; Muris, Merckelbach, Wessel, & van de Ven, 1999) can be used.

Anxiety Sensitivity

AS refers to a person's beliefs that his or her anxious physical symptoms will lead to aversive physical, psychological, and social consequences (Reiss, 1991; Reiss, Peterson, Gursky, & McNally, 1986). In other words, AS can be understood as the likelihood for an individual to report that normal bodily changes associated with anxiety are likely to have extreme negative consequences. For example, an individual with high AS is likely to believe that heart palpitations are a sign of a heart attack, whereas an individual low on AS perceives heart palpitations to be nothing more than brief physical discomfort. Those with high AS have been described as having the "fear of anxiety" (Reiss, Peterson, & Gursky, 1988, p. 341).

AS has consistently been shown to be higher among youth with anxiety disorders as compared to those without anxiety (Hayward et al., 1997; Weems, Hayward, Killen, & Taylor, 2002). This indicates that AS likely serves as a risk factor in the development and maintenance of anxiety disorders in young people. AS is measured using the Childhood Anxiety Sensitivity Index (CASI; Silverman, Fleisig, Rabian, & Peterson, 1991).

Anxiety Control

Anxiety control (AC) is a cognitive construct that is defined as a person's perceived control over his or her emotional and bodily reactions due to anxiety (e.g., internal physiological reactions) as well as his or her perceived control over external events or threats that cause anxiety (Rapee, Craske, Brown, & Barlow, 1996). Low AC has been identified as a factor that can differentiate between youth who have been referred to a clinic for anxiety treatment and controls, and AC has been shown to predict anxiety disorder status among children and adolescents when controlling for anxiety symptoms (Weems, Silverman, Rapee, & Pina, 2003).

The Anxiety Control Questionnaire for Children (ACQ-C; Weems et al., 2003) may be used to measure AC. The ACQ-C measures beliefs along two dimensions: (1) Internal Reactions (e.g., "I can take charge and control my feelings") and (2) External Threats (e.g., "When something scares me, there is always something I can do"). In a recent study, Marin, Rey, Nichols-Lopez, and Silverman (2008) found that both dimensions of AC predict anxiety symptoms in youth, but they found a different pattern for boys and girls. Specifically, in boys, low perceived control over Internal Reactions predicted anxiety symptoms. However, in girls, low perceived control over External Threats predicted anxiety symptoms.

Diathesis–Stress Model

The presence of any one of these identified risk factors alone is likely not sufficient to lead to the development of an anxiety disorder. In other words, even if a child is anxiety prone, a disorder's onset will probably be triggered by the interaction of the biological predisposition with environmental/psychological factors (e.g., parenting factors) as described in the diathesis–stress model. In fact, there is evidence that some of these inherited vulnerability factors may be mitigated by environmental factors. For example, BI, which has been identified as a relatively stable temperamental trait, has been shown to be reduced among young children if parents are instructed in the risks associated with over-protective parenting and how to intentionally expose their child to novel social situations (Rapee, Kennedy, Ingram, Edwards, & Sweeney, 2005). There is ample empirical support for the usefulness of measuring these narrow traits as part of dimensional diagnosis of anxiety disorders in youth. Because many of these traits are currently measured via self-report, Turner et al. (2005) recommended that physiological reactivity can be used as a measure of anxiety proneness that is not dependent on subjective report.

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Correspondence to Treatment Models Rather than Diagnostic Categories

A shift in diagnostic classification from a categorical to dimensional conceptualization can lead to a fuller understanding of the components that underlie anxiety and mood problems. The current DSM-IV criteria focus on the differential diagnosis of anxiety problems at the risk of neglecting aspects relevant to the amelioration of these anxiety problems. However, a dimensional model, which supports an understanding of mood disorders as highly related disorders residing together in a broader spectrum and consisting of common and unique components, can be used to hone in on relevant aspects of the disturbance in therapeutic interventions. Specifically, cognitive behavioral treatments have been shown to be effective treatments for anxiety disorders in children and adolescents (e.g., Kendall, 1994) and the adoption of a dimensional model may ensure that all relevant cognitive aspects are addressed in treatment even though they may not be narrow (i.e., unique) symptoms associated with a particular diagnosis. For example, treatment of Social Anxiety Disorder without attention to the identified correlate of low PA may not be as effective, but this relationship that has been shown empirically is not reflected in the diagnostic criteria. Similarly, Marin et al. (2008) found that different aspects of AC were useful for predicting anxiety disorders for boys and girls, which suggests that cognitive behavioral interventions may have separate targets for the different genders. As the literature covered in this chapter amply illustrates, there are many advantages that can be conferred on treatment of children with anxiety disorders by relying on dimensional perspectives. Further research into quantitatively derived models for the dimensional diagnosis of anxiety in youth promises to inform and improve our treatment of these disorders by highlighting the relevant personality traits, cognitive factors, and emotional and behavioral responses that will lead to increased functioning. This can also provide a rich understanding of what dimensions may potentially form distinct categories at the extreme boundaries based on empirically based evaluations. In contrast to the large and diverse number of diagnoses that currently exist, it appears that there are in fact numerous dimensions but few distinct binary categories. Refinement of dimensional models would permit better treatment decisions based on severity level and the rarer categorical psychiatric conditions.

References

Achenbach, T. M. (1991). *Manual for the child behavior checklist 4–18 and 1991 profile*. Burlington: Department of Psychiatry, University of Vermont.

Achenbach, T. M., Demenci, L., & Rescorla, L. A. (2003). DSM-oriented and empirically based approaches to constructing scales from the same item pools. *Journal of Clinical Child and Adolescent Psychology, 32*, 328–340.

American Psychiatric Association. (1968). *Diagnostic and statistical manual of mental disorders* (2nd ed.). Washington: American Psychiatric Association.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington: American Psychiatric Association.

Anderson, E. R., & Hope, D. A. (2008). A review of the tripartite model for understanding the link between anxiety and depression in youth. *Clinical Psychology Review, 28*, 275–287.

Barlow, D. H. (1991). The nature of anxiety: Anxiety, depression, and emotional disorders. In R. M. Rapee & D. H. Barlow (Eds.), *Chronic anxiety, generalized anxiety disorder, and mixed-anxiety depression* (pp. 1–28). New York: Guilford.

Barlow, D. H., & Campbell, L. A. (2000). Mixed anxiety-depression and its implications for models of mood and anxiety disorders. *Comprehensive Psychiatry, 41*(Suppl 1), 55–60.

Barlow, D. H., Chorpita, B. F., & Turovsky, J. (1996). Fear, panic, anxiety and disorders of emotion. *Nebraska Symposium of Motivation, 432*, 251–328.

Beidel, D. C., & Turner, S. M. (2005). *Childhood anxiety disorders: A guide to treatment and research*. New York: Routledge.

Bernstein, A., Zvolensky, M. J., Stewart, S., & Comeau, N. (2007). Taxometric and factor analytic models of anxiety sensitivity among youth: Exploring the latent structure of anxiety psychopathology vulnerability. *Behavior Therapy, 38*, 269–283.

Biederman, J., Hirshfeld-Becker, D. R., Rosenbaum, J. F., Herot, C., Friedman, D., Snidman, N., et al. (2001). Further evidence of association between behavioral inhibition and social anxiety in children. *American Journal of Psychiatry, 158*, 1673–1679.

Bishop, G., Spence, S. H., & McDonald, C. (2003). Can parents and teachers provide a reliable and valid report of behavioral inhibition? *Child Development, 74*, 1899–1917.

Uncorrected Proof

Editor's Proof

Blashfield, R. K., Keely, J. W., & Burgess, D. R. (2009). Classification. In P. Blaney & T. Millon (Eds.), *Oxford textbook of psychopathology* (2nd ed., pp. 35–57). New York: Oxford University Press.

Brady, E. U., & Kendall, P. C. (1992). Comorbidity of anxiety and depression in children and adolescents. *Psychological Bulletin, 111*, 244–255.

Broman-Fulks, J. J., Deacon, B. J., Olatunji, B. O., Bondy, C. L., Abramowitz, J. S., & Tolin, D. F. (2010). Categorical or dimensional: A reanalysis of the anxiety sensitivity construct. *Behavior Therapy, 41*, 154–171.

Brown, T. A., Chorpita, B. F., & Barlow, D. H. (1998). Structural relationships among dimensions of the DSM-IV anxiety and mood disorders and dimensions of negative affect, positive affect, and autonomic arousal. *Journal of Abnormal Psychology, 107*, 179–192.

Buckby, J. A., Yung, A. R., Cosgrave, E. M., & Killackey, E. J. (2007). Clinical utility of the Mood and Anxiety Symptom Questionnaire (MASQ) in a sample of young help-seekers. *BioMed Central Psychiatry, 7*, 50.

Caron, C., & Rutter, M. (1991). Comorbidity in child psychopathology: concepts, issues and research strategies. *Journal of Child Psychology and Psychiatry, 32*, 1063–1080.

Carson, R. C. (1991). Dilemmas in the pathway of the DSM-IV. *Journal of Abnormal Psychology, 100*, 302–307.

Chorpita, B. F., Daleiden, E. L., Moffitt, C., Yim, L., & Umemento, L. A. (2000). Assessment of tripartite factors of emotion in children and adolescents I: Structural validity and normative data of an affect and arousal scale. *Journal of Psychopathology and Behavioral Assessment, 22*, 141–160.

Clark, L. A., & Watson, D. (1991). Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology, 100*, 316–336.

Clark, L. A., Watson, D., & Mineka, S. (1994). Temperament, personality, and the mood and anxiety disorders. *Journal of Abnormal Psychology, 103*, 103–116.

Clark, L. A., & Watson, D. (2006). Distress and fear disorders: An alternative empirically based taxonomy of the "mood" and "anxiety" disorders. *British Journal of Psychiatry, 189*, 481–483.

Cole, D. A., Truglio, R., & Peeke, L. (1997). Relation between symptoms of anxiety and depression in children: A multitrait-multimethod-multigroup assessment. *Journal of Consulting and Clinical Psychology, 65*, 110–119.

Crook, K., Beaver, B. R., & Bell, M. (1998). Anxiety and depression in children: A preliminary examination of the utility of the PANAS-C. *Journal of Psychopathology and Behavioral Assessment, 20*, 333–350.

DiLalla, L. F. (2004). *Behavior genetics principles: Perspectives in development, personality, and psychopathology*. Washington: American Psychological Press.

Frances, A. J., First, M. B., Widiger, T. A., Miele, G. M., Tilly, S. M., Davis, W. W., et al. (1991). An A to Z guide to DSM-IV conundrums. *Journal of Abnormal Psychology, 100*, 407–412.

Goldberg, D. (2000). Plato versus Aristotle: Categorical and dimensional models for common mental disorders. *Comprehensive Psychiatry, 41*(Suppl 1), 8–13.

Goodman, M., Weiss, D. S., Mitropoulou, V., New, A., Koenigsburg, H., Silverman, J. M., et al. (2003). The relationship between pathological dissociation, self-injury, and childhood trauma in patients with personality disorders using taxometric analysis. *Journal of Trauma and Dissociation, 4*, 65–88.

Haslam, N., Williams, B. A., Kyrios, M., McKay, D., & Taylor, S. (2005). Subtyping obsessive-compulsive disorder: A taxometric analysis. *Behavior Therapy, 36*, 381–391.

Hayward, C., Killen, J. D., Kraemer, H. C., Blair-Greiner, A., Strachowski, D., Cunning, D., et al. (1997). Assessment and phenomenology of nonclinical panic attacks in adolescent girls. *Journal of Anxiety Disorders, 11*, 17–32.

Hettema, J. M., Neale, M. C., & Kendler, K. S. (2001). A review and meta-analysis of the genetic epidemiology of anxiety disorders. *American Journal of Psychiatry, 158*, 1568–1578.

Hirshfeld-Becker, D. R., Micco, J., Henin, A., Bloomfield, A., Biederman, J. and Rosenbaum, J. (2008). Behavioral inhibition. *Depression and Anxiety, 25*, 357–367.

Hughes, A. A., & Kendall, P. C. (2009). Psychometric properties of the positive and negative affect scale for children (PANAS-C) in children with anxiety disorders. *Child Psychiatry and Human Development, 40*, 343–352.

Jacques, H. A. K., & Mash, E. J. (2004). A test of the tripartite model of anxiety and depression in elementary and high school boys and girls. *Journal of Abnormal Child Psychology, 32*, 13–25.

Joiner, T. E., & Lonigan, C. J. (2000). Tripartite model of depression and anxiety in youth psychiatric inpatients: Relations with diagnostic status and future symptoms. *Journal of Clinical Child and Adolescent Psychology, 29*, 372–382.

Kagan, J., Reznick, J. S., & Snidman, N. (1988). Biological bases of childhood shyness. *Science, 240*, 167–171.

Kendall, P. C. (1994). Treating anxiety disorders in children: Results of a randomized clinical trial. *Journal of Consulting and Clinical Psychology, 62*, 100–110.

Kendall, P. C., Puliafico, A. C., Barmish, A. J., Choudhury, M. S., Henin, A., & Treadwell, K. S. (2007). Assessing anxiety with the child behavior checklist and the teacher report form. *Journal of Anxiety Disorders, 21*, 104–1015.

Kendler, K. S. (2006). Reflections on the relationship between psychiatric genetics and psychiatric nosology. *American Journal of Psychiatry, 163*, 1138–1146.

Kiernan, G., Laurent, J., Joiner, T. E., Catanzaro, S. J., & MacLachlan, M. (2001). Cross-cultural examination of the tripartite model with children: Data from the Barretstown studies. *Journal of Personality Assessment, 77*, 359–379.

Uncorrected Proof

Editor's Proof

Krueger, R. F. (1999). The structure of common mental disorders. *Archives of General Psychiatry, 56*, 921–926.

Krueger, R. F., & Markon, T. M. (2006). Understanding psychopathology: Melding behavior genetics, personality, and quantitative psychology to develop an empirically based model. *Current Directions in Psychological Science, 15*, 113–117.

Krueger, R. F., & Piasecki, T. M. (2002). Toward a dimensional approach and psychometrically-informed approach to conceptualizing psychopathology. *Behaviour Research and Therapy, 40*, 485–500.

Laurent, J., Catanzaro, S. J., Joiner, T. E., Rudolph, K. D., Potter, K. I., Lambert, S., et al. (1999). A measure of positive and negative affect for children: Scale development and preliminary validation. *Psychological Assessment, 11*, 326–338.

Lerner, J., Safren, S. A., Henin, A., Warman, M., Heimberg, R. G. & Kendall, P. C. (1999). Differentiating Anxious and Depressive Self-statements in Youth: Factor Structure of the Negative Affect Self-statement Questionnaire Among Youth Referred to an Anxiety Disorders Clinic. *Journal of Clinical Child & Adolescent Psychology, 28*, 82–93.

Marin, C. E., Rey, Y., Nichol-Lopez, K., & Silverman, W. K. (2008). The relations between anxiety sensitivity and anxiety control in the prediction of anxiety symptoms among children and adolescents. *Behavioural and Cognitive Psychotherapy, 36*, 391–402.

McNally, R. (1990). Psychological approaches to panic disorder: A review. *Psychological Bulletin, 108*, 403–419.

Mineka, S., Watson, D., & Clark, L. A. (1998). Comorbidity of anxiety and unipolar mood disorders. *Annual Review of Psychology, 49*, 377–412.

Muris, P., Merckelbach, H., Wessel, I., & van de Ven, M. (1999). Psychopathological correlates of self-reported behavioural inhibition in normal children. *Behaviour Research and Therapy, 37*, 575–584.

Olatunji, B. O., Broman-Fulks, J. J., Bergman, S. M., Green, B. A., & Zlomke, K. R. (2010). A taxometric investigation into the latent structure of worry: Dimensionality and association with depression, anxiety, and stress. *Behavior Therapy, 41*, 212–228.

Rachman, S. J. (1991). A psychological approach to the study of comorbidity. *Clinical Psychology Review, 11*, 461–464.

Rapee, R. M., & Barlow, D. H. (1991). *Chronic anxiety: Generalized anxiety disorder and mixed anxiety-depression*. New York: Guilford.

Rapee, R. M., Craske, M. G., Brown, T. A., & Barlow, D. H. (1996). Measurement of perceived control over anxiety related events. *Behavior Therapy, 27*, 279–293.

Rapee, R. M., Kennedy, S., Ingram, M., Edwards, S., & Sweeney, L. (2005). Prevention and early intervention of anxiety disorders in inhibited preschool children. *Journal of Consulting and Clinical Psychology, 73*, 488–497.

Reiss, S. (1991). Expectancy model of fear, anxiety, and panic. *Clinical Psychology Review, 11*, 141–153.

Reiss, S. S., Peterson, R. A., & Gursky, D. M. (1988). Anxiety sensitivity, injury sensitivity, and individual differences in fearfulness. *Behaviour Research and Therapy, 26*, 341–345.

Reiss, S., Peterson, R. A., Gursky, D. M., & McNally, R. J. (1986). Anxiety sensitivity, anxiety frequency and the predictions of fearfulness. *Behaviour Research and Therapy, 24*, 1–8.

Ruscio, A. M., Ruscio, J., & Keane, T. M. (2002). The latent structure of posttraumatic stress disorder: A taxometric investigation of reactions to extreme stress. *Journal of Abnormal Psychology, 111*, 290–301.

Silverman, W. K., Fleisig, W., Rabian, B., & Peterson, R. A. (1991). Childhood anxiety sensitivity index. *Journal of Clinical Child Psychology, 20*, 162–168.

Spence, S. H. (1997). Structure of anxiety symptoms among children: A confirmatory factor-analytic study. *Journal of Abnormal Psychology, 106*, 280–297.

Stark, K. D., & Laurent, J. (2001). Joint factor analysis of the children's depression inventory and the revised children's manifest anxiety scale. *Journal of Clinical Child Psychology, 30*, 552–567.

Taylor, S. (1999). *Anxiety sensitivity*. Mahwah: Erlbaum.

Taylor, S., Abramowitz, J. S., McKay, D., & Asmundson, G. J. G. (2010). Anxious traits and temperaments. In D. Stein, E. Hollander, & B. O. Rothbaum (Eds.), *American psychiatric publishing textbook of anxiety disorders* (2nd ed., pp. 81–96). Washington: American Psychiatric Press.

Tellegen, A. (1985). Structures of mood and personality and their relevance to assessing anxiety, with an emphasis on self-report. In A. H. Tuma & J. D. Maser (Eds.), *Anxiety and the anxiety disorders* (pp. 681–706). Hillsdale, NJ: Erlbaum.

Turner, C. M., & Barrett, P. M. (2003). Does age play a role in the structure of anxiety and depression in youth? An investigation of the tripartite model in three age cohorts. *Journal of Consulting and Clinical Psychology, 71*, 826–833.

Turner, S. M., Beidel, D. C., & Roberson-Nay, R. (2005). Offspring of anxious parents: Reactivity, habituation, and anxiety-proneness. *Behaviour Research and Therapy, 43*, 1263–1279.

Waller, N.G., & Meehl, P. E. (1998). *Multivariate taxometric procedures: Distinguishing types from continua*. Thousand Oaks, CA : Sage Publications.

Waller, N., Putnam, F. W., & Carlson, E. B. (1996). Types of dissociation and dissociative types: A taxometric analysis of dissociative experiences. *Psychological Methods, 1*, 300–321.

Watson, D. (2005). Rethinking the mood and anxiety disorders: A quantitative hierarchical model for DSM-V. *Journal of Abnormal Psychology, 114*, 522–536.

Watson, D., Clark, L. A., & Carey, G. (1988). Positive and negative affectivity and their relation to anxiety and depressive disorders. *Journal of Abnormal Psychology, 97*, 346–353.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales.

Uncorrected Proof

Editor's Proof

Journal of Personality and Social Psychology, 54, 1063–1070.

Watson, D., Clark, L. A., Weber, K., Assenheimer, J. S., Strauss, M. E., & McCormick, R. A. (1995a). Testing a tripartite model: I. Evaluating the convergent and discriminant validity of anxiety and depression symptom scales. *Journal of Abnormal Psychology, 104*, 3–14.

Watson, D., Clark, L. A., Weber, K., Assenheimer, J. S., Strauss, M. E., & McCormick, R. A. (1995b). Testing a tripartite model: II. Exploring the symptom structure of anxiety and depression in student, adult, and patient samples. *Journal of Abnormal Psychology, 104*, 15–25.

Weems, C. F., Hayward, C., Killen, J., & Taylor, C. B. (2002). A longitudinal investigation of anxiety sensitivity in adolescence. *Journal of Abnormal Psychology, 111*, 471–477.

Weems, C. F., Silverman, W. K., Rapee, R. M., & Pina, A. A. (2003). The role of control in childhood anxiety disorders. *Cognitive Therapy and Research, 27*, 557–568.

Zinbarg, R. E., & Barlow, D. H. (1996). Structure of anxiety and the anxiety disorders: A hierarchical model. *Journal of Abnormal Psychology, 105*, 181–193.

Uncorrected Proof