

Comparative Data on Child and Adolescent Cognitive Measures Associated With Depression

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As a way to better understand the effects of treatment for depression, comparative data on measures of cognition have been compiled previously for adults. Such data should be able to aid the evaluation of cognition and cognitive change, and may provide valuable information for clinicians and researchers alike. In this article, analogous comparative data on cognitive measures associated with depression in children and adolescents are presented. The reviewed instruments assess cognitive errors, attributional style, dysfunctional attitudes, hopelessness, negative self-statements, and Beck's negative cognitive triad. As with adults, these data may have implications for enhancing understanding of empirically supported treatments for children and adolescents, may be useful in vulnerability research, and may be useful to clinicians seeking to develop treatment strategies and to gauge treatment effectiveness.

Keywords: depression, cognition, cognitive change, cognitive-behavioral treatment

Kendall (1999) persuasively argued that understanding the benefits of psychological treatments requires close attention to the degree to which those treatments are efficacious. Efficacious treatments are those methods that show superior outcomes to that of a control group or another treatment condition (Ingram, Scott, & Hayes, 2000; Kazdin & Kendall, 1998). Efficacy alone, however, does not necessarily reflect clinically meaningful changes. Hence, as researchers gain knowledge about psychological treatments that appear to be efficacious, they must also assess the degree to which these treatments are clinically significant (Kendall, 1999; McGlinchey, Atkins, & Jacobson, 2002). Kazdin (2001) defined clinical significance as the "practical value of importance of the effect of an intervention—that is, whether it makes any real difference to the clients or to others with whom they interact in everyday life" (p. 455).

What Is Normal?

One method of assessing clinical significance is an examination of whether, following treatment, individuals return to normal on the measure(s) of interest. A number of researchers have operationally defined *normal* in reference to normative comparisons. Within the context of clinical significance, such comparisons evaluate whether patients who have presumably been treated into remission can be distinguished from nondisordered reference

groups (Kendall & Grove, 1988; Kendall, Marrs-Garcia, Nath, & Sheldrick, 1999). It is important to note, however, that there is not unanimous agreement that data from such nondisordered individuals are normative. Noting criteria constructed by early test developers, Achenbach (2001) argued that true normative comparisons require reference to samples carefully chosen to represent demographic variables and other important characteristics of the population. However, it is important to note that many psychometrically sound measures have not been normed in this manner, and thus requiring such normative procedures would disallow most comparisons to nondisordered groups for the purpose of evaluating clinical significance.

While noting that comparisons presented in the current article are not normative in the classical sense, we argue that they nevertheless provide for valid contrasts and can be useful for clinical research, treatment, and assessment. From a practical standpoint, Sabshin (1989) noted two different views of such comparisons that have appeared in the literature. One view is that because psychopathology is defined by the presence of symptoms, the absence of symptoms indicates a state of "health" or normality. Comparison groups based on this idea are formed using exclusionary criteria; that is, individuals who show an elevation or presence of symptoms are excluded, whereas individuals who meet the criterion of no symptoms are deemed *normal*. A different view of normality, which has dominated clinical research, is that of *average* and implies a continuous distribution of individual scores on a given trait represented by a bell-shaped curve. Comparison groups based on this idea include a random sample of all individuals, whether they score very low, average, or very high on measures of the construct(s) of interest. Despite the fact that different sample means might result from these two conceptualizations of normal, no consensus on which definition is appropriate has emerged from the literature (Kendall & Grove, 1988; Kendall et al., 1999).

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Cognitive Measures of Clinical Significance

Beyond symptom reduction, several researchers have recommended the additional evaluation of theoretically relevant measures of treatment outcome (e.g., Dozois, Covin, & Brinker, 2003; Dozois & Dobson, 2002; Kazdin, 1999, 2001; Kendall et al., 1999; Lambert & Lambert, 1999). In line with this idea, Dozois et al. recently published data on six adult depression-related measures of cognition and examined the ways in which the compilation of these data might be valuable to clinicians and researchers alike. For example, by comparing treated samples to normal groups' responses on these measures, they argued that such a database can aid investigators' attempts to evaluate clinical significance in psychotherapy outcome trials. They also noted that such data could be useful to clinicians trying to gauge the relative level of a client's cognitive functioning and may aid in treatment planning and assessment of treatment effectiveness.

Dozois et al. (2003) made a compelling case for the need for a database for measures of depression-related cognition in nondisordered adult populations. However, there is little in the way of a comparable database for measures of depression-related cognition in children and adolescents. Because child and adolescent depression is among the most common of all psychological disorders in young people (Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993), and because cognitive methods are both common and efficacious in the treatment of child and adolescent depression (Kaslow & Thompson, 1998), this represents a significant gap in the literature. Moreover, just as the assessment of theoretically related constructs (e.g., changes in frequency of cognitive errors) during the course of cognitive-behavioral therapy (CBT) is recommended for adults (Swallow & Segal, 1995), it is similarly important during the course of CBT for children and adolescents (Kendall et al., 2005). Therefore, the purpose of the current research was to report data on cognitive measures related to depression in children and adolescents. Paralleling work by Dozois et al. (2003) we used both the exclusionary and the average method to examine data for six child-adolescent self-report measures of cognition.

We based selection of measures to review on three broad criteria: (a) a link to a cognitive theoretical perspective on depression, (b) a parallel to adult measures of depression, and (c) the relatively common use of the measure. We reasoned that atheoretical measures, or measures tied to a noncognitive theory, would be inappropriate for assessing cognitive norms. Although there are differences in the functioning of depressed adults and children, our decision to parallel as closely as possible Dozois et al.'s (2003) review was based on an effort to provide a step toward understanding similarities and differences between adults and children. Finally, it made sense to examine measures that have been used with some frequency in research.

Method

Measure Selection Criteria

As noted, an important selection criterion was a measure's theory-specific nature. Hence, child and adolescent measures were included if the measure purported to assess depressotypic cognition central either to Beck's cognitive theory of depression (Beck, 1967; Beck, Rush, Shaw, & Emery, 1979) or to attributional or

hopelessness approaches to depression (Abramson, Metalsky, & Alloy, 1989; Alloy, Abramson, Metalsky, & Hartlage, 1988). Several reports met this criterion, but other problems precluded their being included in the final list of articles (e.g., their not reporting appropriate means or only reporting means graphically so that it was not possible to obtain precise means).

Beyond corresponding to a cognitive theory that has been used as the basis for treating depression, the selection of measures was also based as much as possible on the adult cognitive measures examined by Dozois et al. (2003). Dozois et al. reported data on the Automatic Thoughts Questionnaire—Negative (Hollon & Kendall, 1980), the Automatic Thoughts Questionnaire—Positive (Ingram & Wisnicki, 1988), the Beck Hopelessness Scale (Beck, Weissman, Lester, & Trexler, 1974), the Cognitive Bias Questionnaire (Krantz & Hammen, 1979), the Cognitive Errors Questionnaire (Lefebvre, 1980), and the Dysfunctional Attitude Scale (DAS; Weissman & Beck, 1978). It is important to note, however, that because extant measures of depression-related cognition in the adult and child literatures are not identical, the measures examined in the current study parallel those examined by Dozois et al. but were not exactly the same.¹

Measures

Two measures of attributions were considered: the Children's Attributional Style Questionnaire (CASQ) and the Children's Attributional Style Questionnaire—Revised (Kaslow & Nolen-Hoeksema, 1991). The latter attributional measure was not included because relatively few studies have reported comparative data. Thus, the CASQ was included to represent attributional models of depression. It should be noted that extensive reviews of the CASQ have been reported by Gladstone and Kaslow (1995) and by Joiner and Wagner (1995). These reviews were designed to evaluate attributional models of child and adolescent depression, but neither reviewed normative data. The CASQ is a self-report, 48-item measure developed by Kaslow, Tanenbaum, and Seligman (1978) to assess the ways in which children typically attribute causality for positive and negative events central to the hopelessness theory of depression (Abramson et al., 1989; Alloy et al., 1988). The instrument is designed to assess three different dimensions of attributional style, internality, stability, and globality. Each of the 48 items presents a hypothetical event followed by two possible causes for the event varying along a single dimension of attributional style while the other two dimensions are held constant. Respondents are instructed to endorse the attribution that would be the closest to their own in a similar situation. Responses are scored 0 and 1, with higher scores characterizing the attributional style being assessed. Half of the items are hypothetical positive events, and half are negative events. Positive and negative scales are derived by summing across the 24 positive and 24 negative items, respectively. A total composite score is calculated

¹ A number of valid and potentially useful measures were considered—for example, the Adolescent Cognitive Style Questionnaire (Hankin & Abramson, 2002), the Children's Thought Questionnaire (Marien & Bell, 2004), and the Cognitive Bias Questionnaire for Children (Haley, Fine, Marriage, Moretti, & Freeman, 1985)—but were not included because they did not meet one or more of the three inclusion criteria (e.g., too few studies reported).

by subtracting the negative score from the positive score, with lower scores indicating a more depressive attributional style.

The psychometric properties of the CASQ have been thoroughly evaluated and have shown the instrument to possess moderate internal consistency and test-retest reliability (Nolen-Hoeksema, Girgus, & Seligman, 1986; Panak & Garber, 1992; Seligman et al., 1984). The CASQ is correlated with depression, measured diagnostically and on self-report measures (Gladstone & Kaslow, 1995; Gladstone, Kaslow, Seeley, & Lewinsohn, 1997; Kaslow, Rehm, Pollack, & Siegel, 1988) and predicts later depression (Seligman et al., 1984; Spence, Sheffield, & Donovan, 2002). The CASQ has also been found to mediate the relationship between peer-related competencies and Children's Depression Inventory (CDI; Kovacs, 1982) scores (Cole & Turner, 1993) and to correlate significantly with the adult Attributional Style Questionnaire (Dalley, Bolocofsky, Alcorn, & Baker, 1992). The CASQ is related to risk for depression (Garber & Robinson, 1997) and has been found to be sensitive to treatment effects (Clarke et al., 1995; Gillham, Reivich, Jaycox, & Seligman, 1995).

The Children's Negative Cognitive Errors Questionnaire (CNCEQ) was selected because of its link to cognitive models and because of its correspondence to the adult measure used by Dozois et al. (2003; i.e., the Cognitive Error Questionnaire; Leitenberg, Yost, & Carroll-Wilson, 1986). The CNCEQ was developed by Leitenberg et al. (1986) to measure four types of negative cognitive errors central in Beck's theory of depression (Beck, 1967; Beck et al., 1979): (a) catastrophizing, (b) overgeneralizing, (c) personalizing, and (d) selective abstraction. The scale consists of 24 items with each item presenting a hypothetical scenario and a corresponding cognitive error. Respondents are asked to rate how closely the error would be to their own interpretation in a similar situation on a 5-point scale (e.g., 1 = *not at all like I would think*, 5 = *almost exactly like I would think*). Scores can range from 24 to 120 with higher scores indicating more negative errors.

Leitenberg et al. (1986) reported moderate test-retest reliability (.65) and acceptable internal consistency (a coefficient alpha of .89) for the CNCEQ. Data show that the CNCEQ differentiates anxious, dysphoric, and mixed anxious-dysphoric children from controls (Epkins, 1996) and that higher scores are related to low self-esteem and to increased evaluation anxiety and depression as assessed by the CDI (Leitenberg et al., 1986). Data have also shown that CNCEQ scores improve after treatment for depression (Tems, Stewart, Skinner, Hughes, & Emslie, 1993).

The Cognitive Triad Inventory—Children (CTI-C) was developed by Kaslow, Stark, Printz, Livingston, and Tsai (1992) to measure Beck's (1976) negative cognitive triad of depression in children. The instrument contains 36 items, half of which are worded positively and half negatively, and is subdivided into three 12-item subscales that describe specific thoughts that reflect the child's views about self, the world, and the future. Respondents indicate on a 3-point scale (with response options *yes*, *maybe*, or *no*) whether they are currently thinking each of the thoughts presented. Scores on the CTI-C can range from 0 to 72 with lower scores indicating more depressive cognitions.

The CTI-C has been shown to possess good internal consistency (.92) and to reliably differentiate children who are depressed from mentally healthy children (Epkins, 1996; Kaslow et al., 1992; Laurent & Stark, 1993), and it correlates with the CDI (Kaslow et al., 1992) and the depression Schedule for Affective Disorders and

Schizophrenia for School-Aged Children (K-SADS; Kaufman et al., 1997; Stark, Schmidt, & Joiner, 1996). The CTI-C has also been found to predict later depression scores on the CDI (Greening, Stoppelbein, Dhossche, & Martin, 2005).

The DAS (Weissman & Beck, 1978) was developed to test Beck's (1967) cognitive theory of depression, which postulates that depressed individuals are characterized by dysfunctional core beliefs and attitudes. Two parallel 40-item self-report forms (A and B) exist, which are intended to assess one's underlying beliefs and attitudes. Each item is rated on a 7-point scale (1 = *totally agree*, 7 = *totally disagree*) yielding a total score range of 40 to 280 with higher scores representing a higher number of dysfunctional beliefs and attitudes.

The DAS was originally intended for adult populations, and within this population both DAS forms (A and B) have been found to demonstrate good reliability (with alpha coefficients of .85 and .81, respectively; Oliver & Baumgart, 1985) and to correlate well with one another ($r = .79$; Beck, Epstein, & Harrison, 1983). Although the DAS was developed for adult populations and was included by Dozois et al. (2003), it has also been commonly used with adolescent populations (i.e., 11- to 18-year-olds). Within this population researchers have found the DAS to exhibit good psychometric properties with internal consistency estimates ranging from .86 to .92 (Garber & Robinson, 1997; Marton, Churchard, & Kutcher, 1993; Moilanen, 1995). Using a clinical interview, higher DAS scores have been found to differentiate depressed from other nondepressed psychiatric adolescents and nonclinical controls (Marton et al., 1993). DAS scores are also significantly correlated with Beck Depression Inventory (Beck et al., 1979) scores in adolescents (Moilanen, 1995) and account for significant variance in depressive symptoms on the CDI in psychiatric inpatient adolescents after accounting for coping and perceived distress (Marton, Kazarian, & Breiter, 1995). Higher scores are associated with more severe depression in adolescents (Marton & Kutcher, 1995), and remission of depression is associated with significant decreases in DAS scores (Marton et al., 1993).

The Hopelessness Scale for Children (HSC; Kazdin, French, Unis, Esveldt-Dawson, & Sherick, 1983) is based on the Hopelessness Scale for adults (Beck et al., 1974), but was designed to measure hopelessness in children and adolescents. The HSC consists of 17 true-false statements designed to reflect hopelessness, with scores ranging from 0 to 17.

The HSC has been shown to have good internal consistency (.96; Kazdin et al., 1983; Kazdin, Rodgers, & Colbus, 1986; Spirito, Williams, Stark, & Hart, 1988) and moderate test-retest consistency over 6 weeks ($r = .52$; Kazdin et al., 1986). The scale has been shown to correlate positively with measures of childhood depression (i.e., the CDI, $r = .58$) and negative emotionality, and it correlates negatively with measures of self-esteem and social behavior (Kazdin et al., 1983). Significant differences have been observed among nonclinical children, outpatient children, and children who have attempted suicide (Spirito et al., 1988). Children and adolescents with high hopelessness as measured by the scale are at increased risk for suicide and depression (Kashani, Reid, & Rosenberg, 1989). In addition, inpatient children with high hopelessness have been found to express aggression and overt anger and to endorse low levels of perceived support (Kashani, Suarez, Allan, & Reid, 1997). Data further suggest that the HSC decreases with treatment. For example, Grizenko (1997) found significantly

decreased scores from intake to discharge on the measure in children with attention-deficit/hyperactivity disorder or oppositional defiant disorder and also found that scores remained significantly decreased at a 5-year follow-up. Likewise, Robinson, Powers, Cleveland, and Thyer (1990) found that inpatient children and adolescents who were depressed showed reduced levels of hopelessness and improved global functioning following a multimodal treatment program.

The Negative Affect Self-Statement Questionnaire (NASSQ) was selected because of its correspondence to Beck's theory and to the adult measures used by Dozois et al. (2003; i.e., Automatic Thoughts Questionnaire—Negative). Ronan, Kendall, and Rowe (1994) developed two forms of the NASSQ to evaluate the frequency of self-statements associated with negative affect in children and adolescents. The NASSQ is intended for use with 11- to 15-year-olds and consists of 39 items composing three different subscales: anxiety-specific, depression-specific, and negative affect self-statements. A separate version intended for use with 7- to 10-year-olds consists of 14 items composing two subscales: anxiety-specific and depression-specific self-statements. Each version of the NASSQ is scored from 1 (*not at all*) to 5 (*all the time*) and the total score is computed by summing all of the items within each version. Scores can range from 14 to 70 on the version intended for 7- to 10-year-olds and 39 to 195 for the version intended for 11- to 15-year-olds.

Both the short and long versions of the NASSQ have been found to demonstrate acceptable reliability (coefficient alphas of .89 and .96, respectively) and 2-week test-retest stability (.96 and .78, respectively). In addition, the NASSQ has been found to distinguish between children with anxiety, children who are depressed, and mentally healthy children and to correlate significantly with depression on the CDI and anxiety on the Spielberger (1973) State-Trait Anxiety Inventory for Children: A—Trait Scale (STAIC-T; Ronan et al., 1994). The measure is correlated with self-reported anxiety and depression and has shown some promise for discriminating between anxiety and depression (Lerner et al., 1999). The anxiety subscale has also been found to be sensitive to treatment for anxiety (Treadwell & Kendall, 1996).

Procedure for Inclusion of Articles

An extensive review using the PsycINFO database was performed to find articles that included one or more of the measures of interest. The review consisted of searching the database with each measure's name as the keyword in the search. Additional searches were performed using alternative spellings (e.g., *Children's Attributional Styles Questionnaire* instead of *Children's Attributional Style Questionnaire*) as well as keyword searches using more general terms, such as *attributional style* or *cognitive errors*. To aid in the comprehensiveness of the search, each obtained article was examined to determine whether it contained additional references not found in the initial search.

The criteria for including a study in this review were that (a) studies had to contain either a specified "normal" control group or a sample that was from a "normal" population and (b) means reported in these studies had to come from persons free from serious physical or mental health problems. Additional criteria consisted of only published articles, written in English, adminis-

tered in the original format, and scored using the original procedure.

Results

Results for respective measures are presented in Tables 1 through 6. In addition to means and standard deviations in each study, where there is more than one study, composite means and standard deviations are reported. Sample size, the percentage of female participants, ethnic group identification, mean age, and age range are also reported.

CASQ

The CASQ is perhaps the most widely used adolescent depression-related measure of cognition. The literature search revealed 40 articles that reported using the CASQ. Twenty of the 40 articles met the inclusion criteria previously described. Because a number of different scores can be reported (e.g., positive-internal, global-negative, etc.), we report the composite scores (positive minus negative scores), which reflect overall attributional style. Of the 20 published articles listed in Table 1, five studies used exclusionary criteria in their sample selection and formation of comparison groups. For example, Kaslow, Rehm, and Siegel (1984) formed depressed and nondepressed groups based on scores from the CDI. Children with a CDI score of 10.5 or lower were classified as nondepressed, whereas those scoring above 11 were classified as depressed. The other studies incorporating exclusionary criteria used either the CDI or the K-SADS (Orvaschel, Puig-Antich, Chambers, Tabrizi, & Johnson, 1982) or a known history of sexual abuse. The remaining 15 studies did not include exclusionary criteria in their sample selection.

For the five studies ($n = 1,496$) incorporating exclusionary criteria, CASQ composite scores ranged from 3.6 to 8.6, with a mean CASQ composite of 4.15 ($SD = 4.89$).² CASQ composite scores ranged from 3.3 to 7.23 with a mean score of 5.95 ($SD = 4.86$) for the 15 studies ($n = 5,446$) that did not include exclusionary criteria when selecting their comparison samples. As expected, the mean of the group formed without exclusionary criteria was found to be significantly greater than the mean of the group formed with exclusionary criteria, $t(2808) = 9.00$, $p < .05$.³ Separate means and standard deviations for each gender were reported in only one of the reviewed articles (Cunningham, 2003). Boys and girls did not differ significantly on their composite scores in that study.

CNCEQ

The literature search revealed 12 articles that reported using the CNCEQ. Seven of the 12 articles qualified for inclusion in the present review (see Table 2). Two studies reported means from a

² For each given measure a weighted mean was calculated to determine the overall mean of the sample. In addition, a pooled variance was calculated because larger sample sizes are better estimates of the population variance than are smaller sample sizes. These formulas were taken from Kendall and Sheldrick (2000).

³ For each t test, only those studies that provided standard deviations were included in the analysis.

Table 1

Comparative Children's Attributional Style Questionnaire Means and Standard Deviations

Citation	Exclusionary criteria	Sample size	% female	% African-American-Black	% Asian American-Pacific Islander	% European-American-White	% Hispanic American-Indian	% other ethnicity	Mean age (years)	Age range	Mean score	SD
Bell et al. (2004)	None	63	44	—	—	—	—	—	—	—	5.60	5.38
Cunningham (2003) ^a	None	359	54	—	—	—	—	—	11.10	9–12	4.91	5.01
Rodriguez & Pehi (1998)	None	69	43	—	—	85.5	—	14.5	11.10	8–14	4.75	4.19
Bennett & Bates (1995) ^b	None	190	47	—	—	—	—	—	12.00	11–13	5.45	4.85
Yates et al. (1995)	None	145	43	—	—	—	—	—	—	8–12	5.87	—
DeMoss et al. (1993)	None	128	45	—	—	—	—	—	—	—	4.52	—
Tems et al. (1993) ^b	None	180	67	—	—	—	—	—	12.57	—	5.47	—
Dalley et al. (1992) ^c	None	105	63	—	—	90	9	2	17.30	—	6.13	4.20
Nolen-Hoeksema et al. (1992) ^b	None	3,027	—	—	—	—	—	—	—	—	5.90	—
Panak & Garber (1992)	None	521	—	25	4	71	—	—	—	—	7.23	4.88
Nolen-Hoeksema et al. (1991)	None	352	49	10	0	80	10	0	—	—	6.64	—
Rotheram-Borus et al. (1990)	None	23	100	23	—	16	61	—	14.70	12–17	3.30	—
Robins & Hinkley (1989)	None	61	59	—	—	—	—	—	9.90	8–12	4.60	4.55
Rodriguez & Routh (1989)	None	31	29	—	—	—	—	—	10.90	8–13	4.90	4.90
Seligman et al. (1984) ^b	None	192	48	—	—	—	—	—	—	8–13	7.13	—
Composite												
Gladstone et al. (1997)	K-SADS	1,273	52	—	—	—	—	—	16.60	—	5.95	4.86
Mannarino & Cohen (1996)	Known history of sexual abuse	88	100	—	—	—	—	—	—	7–12	3.60	4.90
Bodiford et al. (1988)	CDI	25	59	—	—	—	—	—	—	8–11	7.80	3.70
Kaslow et al. (1988)	K-SADS	25	52	8	0	76	0	16	10.00	8–12	4.30	4.30
Kaslow et al. (1984)	CDI	85	52	—	—	—	—	—	10.47	6–14	8.60	—
Composite											4.15	4.89

Note. Dashes indicate data were not reported. K-SADS = Schedule for Affective Disorders and Schizophrenia for School-Age Children; CDI = Children's Depression Inventory.

^a The reported standard deviation represents a pooled standard deviation. ^b The reported data were derived by combining multiple assessments. ^c The ethnicities were reported as approximations and do not total 100%.

Table 2
Comparative Children's Negative Cognitive Errors Questionnaire Means and Standard Deviations

Citation	Exclusionary criteria	Sample size	% female	% African American-Black	% Asian American-Pacific Islander	% European American-White	% Hispanic American-Indian	% other ethnicity	Mean age (years)	Age range	Mean score	SD
Ostrander et al. (1998)	None	43	44	—	—	—	—	—	11.90	7–17	50.95	15.42
Cole & Turner (1993)	None	356	51	32.6	5	57.3	4.1	1.1	11.60	9–15	93.37	15.62
Tems et al. (1993) ^a	None	180	67	—	—	—	—	—	12.57	—	43.21	13.05
Robins & Hinkley (1989)	None	61	59	—	—	—	—	—	9.90	8–12	62.66	14.38
Leitenberg et al. (1986)	None	637	51	—	—	—	—	—	—	—	57.42	—
Composite											67.47	14.81
Leung & Wong (1998)	YSR	215	53	—	—	—	—	—	15.00	—	44.40	—
Epkins (1996) ^b	CDI and SASC-R	14	50	—	—	87	—	—	10.00	8–12	31.54	—
Composite											46.61	—

Note. Dashes indicate data were not reported. YSR = Youth Self-Report Form; CDI = Children's Depression Inventory; SASC-R = Social Anxiety Scale for Children—Revised.

^a The reported data were derived by combing multiple assessments. ^b Adjusted mean, adjusted for age.

sample formed with exclusionary criteria using either the Youth Self-Report Form (Achenbach, 1991) or the Social Anxiety Scale for Children—Revised (SASC-R; La Greca & Stone, 1993) and the CDI. The remaining five studies did not incorporate exclusionary restrictions. The two studies ($n = 229$) that used the CNCEQ and incorporated exclusionary criteria were found to have a mean of 46.61 (standard deviation not available). The five studies ($n = 1,277$) that reported using the CNCEQ in the absence of exclusionary criteria were found to have a mean score of 67.47 ($SD = 14.81$). The absence of reported standard deviations for the studies that reported using exclusionary criteria prohibits a statistical test of significance. However, given the large number of respondents and the large disparity between the two different reported means,

it appears reasonable to speculate that the difference would indeed be significant. CNCEQ means and standard deviations were not reported separately for each gender in any of the reviewed articles.

CTI-C

The literature search revealed nine studies that reported the use of the CTI-C, eight of which met our criteria (see Table 3). Four of these articles reported using exclusionary criteria, based on results from the CDI and the SASC-R or the K-SADS, in the formation of a control group. The remaining four articles formed their sample without restrictions on inclusion. For the four studies ($n = 65$) reporting the use of exclusionary criteria, CTI-C scores

Table 3
Comparative Cognitive Triad Inventory—Children (CTI-C) Means and Standard Deviations

Citation	Exclusionary criteria	Sample size	% female	% African American-Black	% Asian American-Pacific Islander	% European American-White	% Hispanic American-Indian	% other ethnicity	Mean age (years)	Age range	Mean score	SD
Greening et al. (2005)	None	880	55	66	—	34	—	—	15.94	14–17	58.21	9.77
Zauszniewski et al. (1999)	None	124	50	—	—	98	—	—	10.98	10–12	61.22	6.71
Jacobs & Joseph (1997) ^a	None	218	55	—	—	—	—	—	14.50	13–16	51.44	—
Stark et al. (1996)	None	133	74	6	—	82	10	2	11.66	9–14	50.28	12.85
Composite											56.62	9.90
Epkins (1996) ^b	CDI and SASC-R	14	50	—	—	87	—	—	10.00	8–12	69.43	—
Laurent & Stark (1993)	K-SADS	18	72	5.6	0	94.4	0	0	11.83	9–14	60.56	8.28
Stark et al. (1993)	K-SADS	18	78	—	—	—	—	—	11.60	9–14	60.06	8.67
Kaslow et al. (1992)	K-SADS	15	74	—	—	—	—	—	11.67	9–14	63.27	5.13
Composite											62.96	7.65

Note. Dashes indicate data were not reported. CDI = Children's Depression Inventory; SASC-R = Social Anxiety Scale for Children—Revised; K-SADS = Schedule for Affective Disorders and Schizophrenia for School-Age Children.

^a The authors scored the CTI-C 1 through 3 rather than 0 through 2 (S. Joseph, personal communication, July 2003). Thus, 36 was subtracted from the mean CTI-C score to derive the number reported. ^b Adjusted mean, adjusted for age.

ranged from 60.06 to 69.43 with a mean score of 62.96 ($SD = 7.65$). The four articles ($n = 1,355$) not incorporating exclusionary criteria combined to produce a mean score of 56.62 ($SD = 9.90$) with scores ranging from 50.28 to 61.22. The mean CTI-C score for this group was found to differ significantly from the mean score of studies that used exclusionary criteria in their formation of a control group, $t(1186) = 5.69, p < .05$. No study reported means and standard deviations separately by gender.

DAS

Eleven published articles were found that reported using the DAS. Five of those articles met criteria (see Table 4). Only a single study reported the use of exclusionary criteria in the formation of a control group. In particular, Garber and Robinson (1997) excluded participants based on the presence of maternal psychopathology. The mean DAS score for this single study ($n = 55$) was 91.09 ($SD = 19.42$). The remaining four studies ($n = 1,052$) that did not incorporate exclusionary criteria combined to form a mean of 133.42 ($SD = 31.92$). The difference in DAS mean scores was found to be statistically significant, $t(1105) = 9.74, p < .05$. None of the five studies included in this review reported separate means and standard deviations for gender.

HSC

The literature search revealed 55 published articles that reported using the HSC. Seventeen of the 55 articles met inclusion criteria and are listed in Table 5. Five of these 17 articles used exclusionary criteria. For example, Stark, Kaslow, and Laurent (1993) excluded children from their control group based on the Children’s Depression Inventory (CDI; Kovacs, 1982), the Revised Children’s Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985), and the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS; Orvaschel et al., 1982). Each of the other four studies required participants to meet a single criterion, such as falling below a cutoff score on the Revised Child

Behavior Profile (RCBP; Achenbach & Edelbrock, 1983), the Youth’s Victimization by Community Violence Questionnaire (YVCVQ; adapted from Richters and Saltzman’s, 1990, Survey of Exposure to Community Violence Questionnaire), lacking a cystic fibrosis diagnosis, or having parents with no history of psychopathology. The remaining 12 studies did not use exclusionary criteria in forming their normative samples.

The five studies that used exclusionary criteria ($n = 154$) reported mean HSC scores that ranged from 1.26 to 2.3, with an overall mean score of 2.03 ($SD = 1.68$). The 12 studies that did not use exclusionary criteria ($n = 3,821$) reported mean HSC scores that ranged from 2.35 to 4.40, with an overall mean of 3.36 ($SD = 2.71$). The overall mean HSC score for studies that used exclusionary criteria differed significantly from those that did not use exclusionary criteria, $t(3943) = 8.47, p < .05$. Of the eight studies that listed HSC score means and standard deviations separately by gender, only one (Metha, Chen, Mulvenon, & Dode, 1998) found a significant difference between males ($M = 3.28, SD = 2.81$) and females ($M = 2.86, SD = 2.68$). Only 1 of the 17 articles to list normative HSC data directly compared HSC scores of different developmental age groups. Kashani et al. (1989) compared 8-, 12-, and 17-year-olds and found no significant differences in level of hopelessness. Thus, current evidence does not strongly support the notion that hopelessness varies by gender or developmental age, although this is based on only one study.

NASSQ

The literature search revealed six published articles that reported using the NASSQ, with two reports meeting inclusion criteria (see Table 6). Each of these two reports separately examined the long (for 11- to 15-year-olds) and the short version (for 7- to 10-year olds) of the NASSQ. In the absence of exclusionary criteria, Muris, Merckelbach, Mayer, and Snieder (1998) reported a short version mean of 19.8 ($SD = 4.6; n = 63$). For the short version of the NASSQ, Ronan et al. (1994) excluded participants based on results

Table 4
Comparative Dysfunctional Attitude Scale Means and Standard Deviations

Citation	Exclusionary criteria	Sample size	% female	% African American-Black	% Asian American-Pacific Islander	% European American-White	% Hispanic American-Indian	% other ethnicity	Mean age (years)	Age range	Mean score	SD
Marton & Kutcher (1995)	None	819	48	—	—	—	—	—	17.10	—	135.50	32.70
Moilanen (1995)	None	84	51	—	—	—	—	—	15.46	14–18	124.47	29.53
Dalley et al. (1992) ^a	None	105	63	—	—	90	9	2	17.30	—	123.00	29.47
Kauth & Zettle (1990)	None	44	52	—	—	—	—	—	13.87	12–17	136.72	26.55
Composite											133.42	31.92
Garber & Robinson (1997)	Presence of maternal psychopathology	55	49	—	—	—	—	—	11.93	—	91.09	19.42

Note. Dashes indicate data were not reported.
^a The ethnicities were reported as approximations and do not total 100%.

Table 5
Comparative Hopelessness Scale for Children Means and Standard Deviations

Citation	Exclusionary criteria	Sample size	% female	% African American-Black	% Asian American-Pacific Islander	% European American-White	% Hispanic American-Indian	% other ethnicity	Mean age (years)	Age range	Mean score	SD
Gibb et al. (2006)	None	448	58	51	1	24	10	14	9.77	—	3.63	2.69
Spann et al. (2006) ^a	None	176	65	82	—	—	—	18	15.52	13–19	3.10	2.58
Chaplin et al. (2006)	None	38	100	—	—	—	—	—	12.16	11–14	3.41	2.12
Greening & Stoppelbein, (2002)	None	1,098	53	28	0	72	0	0	15.9	14–18	3.35	2.57
Freiheit et al. (1998) ^{b,c}	None	85	49	6	—	92	—	2	15.3	—	4.40	3.81
Metha et al. (1998)	None	521	63	—	—	78	—	—	13.2	—	3.01	2.74
Cotton & Range (1996)	None	84	69	10	1	89	—	—	15.7	—	2.69	2.61
DuRant et al. (1995) ^a	None	225	56	100	0	0	0	0	14.4	11–19	2.35	2.26
Cotton & Range (1993)	None	60	45	—	—	—	—	—	9.69	6.67–13.00	3.83	1.81
Cotton & Range (1990)	None	42	24	—	—	—	—	—	9.08	6.08–2.17	3.88	1.90
Kashani et al. (1989) ^a	None	210	50	9	—	89	—	2	12.3	8–17	3.31	1.42
Spirito et al. (1988) ^b	None	834	49	—	—	79	—	—	14.7	13–17	3.7	3.2
Composite												
Kuther & Fisher (1998)	Nonvictim status, YVVCVQ	32	75	—	—	—	—	—	Grades 6–8	—	2.16	1.63
Garber & Robinson (1997)	Lifetime absence of parental psychopathology	49	—	19	—	74	—	8	11.93	—	1.26	1.69
Grizenko & Pawliuk (1994)	RCBP	25	40	—	—	—	—	—	9.1	—	3	1.7
Stark et al. (1993)	CDI, RCMAS, K-SADS	18	—	—	—	—	—	—	11.67	9.5–14.75	2.18	1.70
Kashani et al. (1988)	Health walkins, noncystic fibrosis	30	33	—	—	—	—	—	—	7–17	2.30	—
Composite											2.03	1.68

Note. Dashes indicate data were not reported. YVVCVQ = Youth's Victimization by Community Violence Questionnaire; RCBP = Revised Child Behavior Profile; CDI = Children's Depression Inventory; RCMAS = Revised Children's Manifest Anxiety Scale; K-SADS = Schedule for Affective Disorders and Schizophrenia for School-Age Children.
^aThe reported standard deviation represents a pooled standard deviation. ^bThe ethnicities were reported as approximations and do not total 100%. ^cSample was selected from low socioeconomic status population.

Table 6
Comparative Negative Affect Self-Statement Questionnaire Means and Standard Deviations

Citation	Exclusionary criteria	Sample size	% female	% African American-Black	% Asian American-Pacific Islander	% European American-White	% Hispanic American-Indian	% other ethnicity	Mean age (years)	Age range	Mean score	SD
Muris et al. (1998) Ronan et al. (1994)	None CDI, RCMAS, and STAIC-T	56 20	57 —	— —	— —	— —	— —	— —	11.40 11.95	11-15 11-15	65.8 65.90	16.8 —
Muris et al. (1998) Ronan et al. (1994)	None CDI, RCMAS, and STAIC-T	63 10	51 —	— —	— —	— —	— —	— —	9.3 9.00	7-10 7-10	19.8 21.29	4.6 —

Note. Dashes indicate data were not reported. CDI = Children's Depression Inventory; STAIC-T = State-Trait Anxiety Inventory for Children; A—Trait Scale; RCMAS = Revised Children's Manifest Anxiety Scale.

from the RCMAS (Reynolds & Richmond, 1985), the STAIC-T, and the CDI and reported a mean score ($n = 10$) of 21.29 (standard deviation not available). Ronan et al. also examined the long version using the same exclusion criteria and found a mean of 65.90 (standard deviation not reported; $n = 20$), while Muris et al. did not use exclusionary criteria with a sample of 56 children and found a mean of 65.80.

The absence of reported standard deviations prohibits a statistical test of significance between those using exclusionary criteria and those not using exclusionary criteria. However, given the very small disparity between the two different reported means, it seems reasonable to speculate that the difference would not be significant.

Discussion

The present article presents data on six child-adolescent measures of depression-related cognition and can be seen as a direct extension of work by Dozois et al. (2003), who compiled data on adult cognitive measures of depression. Examination of the number of studies available for this review shows that comparative data on child and adolescent cognition are not as abundant as data available for adult measures. Nevertheless, a sufficient number of studies have been published to permit examination of comparative data. As such, the present data may be useful for clinicians in determining level of improvement and for researchers seeking to understand the clinical significance of cognitive treatment methods for depression.

Issues of Normality and Sampling Methods

One important point to note about the present review is its presentation of two separate aggregations of data corresponding to the two predominant views of normality. Kendall and Sheldrick (2000) reviewed the differing views of normality (i.e., normality as health and normality as average) and concluded that no clear consensus exists as to the preferred definition. However, they did suggest that there is a consensus for investigators to explicitly articulate their perspective on what constitutes normality. The present review includes data consistent with the different views of normality and allows investigators and clinicians, regardless of their perspective of what represents normality, to use these data as deemed appropriate.

An additional point should be noted regarding the derived means and standard deviations from studies that incorporated exclusionary criteria versus those that did not. It is clear, as Kendall and Sheldrick (2000) suggested, that the procedure of screening participants for inclusion into a control group based on a cutoff score lowers the mean score on a given construct or trait of interest, thus creating a "supernormal" group. This suggestion is reaffirmed by the present findings of statistically significant differences between the mean scores of the two separate groups. Therefore, it is recommended that the means and standard deviations derived through different sampling procedures remain separate, as it is readily apparent that the two populations are different in important respects. Combining the samples would necessarily reduce the validity of the aggregate sample.

Although it is recommended that data derived from different sampling methods (i.e., presence or absence of exclusionary cri-

teria) not be combined, within each sampling method the means and standard deviations presented for each measure could be combined to form a more representative normative sample. However, the decision to combine samples should be made with caution. The samples to be combined, despite precautions made toward matching on important sample characteristics (e.g., gender, age, ethnicity), may differ on some unknown variable that ultimately causes a reduction in the validity of the combined sample (Kendall & Sheldrick, 2000).

Gender, Ethnic, and Developmental Differences

Few statistically significant gender differences were found for any of the measures included in the present review. However, given the limited availability of means reported separately for each gender, gender differences may in fact exist, but because of the paucity of the necessary data, were not found. In addition, ethnicity data were far too infrequently reported for us to draw any meaningful comparisons; such data were reported by far fewer than half of the studies, and some of the ethnicity data that were reported were quite limited. The lack of gender and ethnicity comparisons suggests a serious gap in the literature.

There were also too few data, and insufficiently reported data, to break down the information according to meaningful developmental differences; clearly, there is a large range in ages represented in these data, and sufficient information is not available to systematically examine possible differences. Hopefully, as research accumulates meaningful developmental and age norms, differences can begin to be addressed. For the time being, however, limits in the available data suggest that researchers or clinicians who use the presented aggregate means and standard deviations should do so with appropriate caution and with sufficient theoretical or empirical justification.

The potential importance of different age ranges in determining norms warrants reiteration. Kaslow, Adamson, and Collins (2000) noted that a primary issue concerning cognition and depression in children and adolescents has been to empirically demonstrate that the cognitions of adolescents who are depressed differ from those of adolescents who are not depressed, regardless of age or developmental level. The majority of research reviewed here has not addressed developmental differences in the cognitive processes central to the development and maintenance of depression. Kaslow et al. (2000) aptly summarized the current state of affairs, noting that

data from children and adolescents are consistent with predictions based on [adult] cognitive models [of depression] and suggest considerable continuity in the cognitive processes of depressed individuals from elementary school through adulthood. Despite these continuities, there are differences in the cognitive functioning of depressed infants, toddlers, elementary school children, adolescents, and adults due to cognitive developmental changes. (p. 506)

The adaptation of adult cognitive models of depression to children and adolescents of various ages and across all developmental levels is complex. Clearly, further theoretical and empirical work is needed to better understand the continuity of depressotypic cognitions across developmental levels. The age range and, hence, developmental level for some of the measures reviewed here were diverse; for example, the age range of the CASQ was 6 to 14 years.

Therefore, given the diverse age range for each of the reviewed measures, appropriate consideration and justification are clearly warranted before using the combined means and standard deviations across different age ranges. The use of the combined means and standard deviations is preferable under circumstances in which the sample's age diversity mirrors that of the normal sample. However, when using samples with a limited age range, it is recommended that, if possible, the comparative sample be matched for age. More generally, researchers who develop measures for cognitive constructs in children may wish to consider different forms for different age ranges. For example, by including a form for 7- to 10-year-olds and a different form for 11- to 15-year-olds, the NASSQ represents a good example of this strategy.

To eliminate some of the problems associated with the use of aggregate data, researchers may wish to select a small number of published studies (or a single study) included in the present review to make comparisons. This method of comparison allows researchers and clinicians to match the normal group to the group of interest on potentially important demographic characteristics and therefore avoid the potential problems described previously. For example, a clinician trying to determine whether a 15-year-old female client falls within the normal range on the CASQ (commonly within 1 standard deviation of the mean) could use the data reported by Rotheram-Borus, Trautman, Dopkins, and Shrout (1990). The authors reported a mean CASQ score of 3.3 from a sample composed solely of female participants with an average age of almost 15 years. As this example shows, this procedure allows the investigator to have some control over potentially important demographic variables and therefore maintain the validity of the comparison.

Research Implications

The data presented in this article may be useful to researchers in a variety of ways. One possibility is the application of comparisons toward the evaluation of clinical significance in psychotherapy outcome research. Kendall et al. (1999) suggested a normative comparison strategy for assessing both statistical and clinical significance in which equivalency testing (Rogers, Howard, & Vessey, 1993) is used in conjunction with more traditional statistical tests (see also Sheldrick, Kendall, & Heimberg, 2001). Although a complete review of this procedure is beyond the scope of the present article, a brief review of the methodology is important to the current discussion. The initial step is to select a range of closeness around zero in which the posttreatment group and the comparison group would be defined as clinically equivalent. If there was in actuality no difference between the groups, we would expect the mean difference to approximate zero. However, if the posttreatment mean falls within the range of closeness to the normative mean, the groups are indicated as clinically equivalent. Mathematically, to specify the range of closeness, two values are needed, an upper (positive delta) and lower (negative delta) bounded range, commonly 1 standard deviation above and below the normative mean.

The next step of normative comparisons is to conduct two 1-tailed *t* tests, one corresponding to each delta value. One test determines whether the difference between the means is less than the lower limit (negative delta), and the second determines whether the difference is greater than the upper limit (positive delta). Both

t tests reaching a significant level indicates that the difference in means between the posttreatment group and the comparison group falls within the range of closeness and the groups can be said to be clinically equivalent.

Researchers may also use such a database to assist with vulnerability research. A common methodology in vulnerability research is the high-risk paradigm, in which vulnerability is operationalized as the presence of high-risk behaviors (e.g., Alloy & Abramson, 1999). In the context of depression research, high-risk behaviors would consist of cognitive variables theoretically linked to depression vulnerability (Ingram, Miranda, & Segal, 1998). Although the behavioral high-risk paradigm is a commonly used methodology, it is not problem free. As Dozois et al. (2003) noted, vulnerability researchers often face the dilemma of choosing appropriate cutoff scores in defining vulnerability and nonvulnerability. Access to a normative database should aid researchers in making this differentiation. For example, defining high risk as a score of 43 or lower on the CTI-C (i.e., 1 standard deviation above the mean in which normative was defined as average)⁴ and low risk as a score of 63 or higher on the CTI-C (i.e., a mean in which normality was defined as health) could be used as cutoff scores in future studies.

Clinical Implications

The data presented in the present article may also be useful to clinicians. One possibility, in line with the recommendation that has been made by Kendall and colleagues (Kendall et al., 1999; Kendall & Sheldrick, 2000), is to use the normative data to aid in the evaluation of clinically significant cognitive change during treatment. Furthermore, the present data may also aid clinicians in treatment planning. Given the theory-specific nature of the current measures reviewed, the data could provide direction during the course of CBT. Monitoring change during the course of treatment may allow clinicians to tailor the intervention to specific areas of need. For instance, if a clinician establishes that a child's cognitive errors (as measured by the CNCEQ) have reached a normative level (commonly within 1 standard deviation of the mean) but also finds that dysfunctional attitudes (as measured by the DAS) are still elevated relative to the norm, the therapist might more specifically target dysfunctional attitudes while working toward maintaining treatment gains for cognitive errors.

Finally, the use of cognitive comparisons may also aid clinicians in assessing the timing of treatment termination. For example, upon symptom amelioration and finding that the patient falls into a normal range on theory-specific measures of cognition, the therapist and patient can concentrate on maintaining treatment gains, focus on relapse prevention, and plan for the end of treatment. Toward this end, the current review is a step in the direction of developing a comprehensive normative database, and we encourage clinicians and researchers to consider the utility of such data in the assessment of depression-related cognition in children and adolescents.

⁴ Kendall et al. (1999) noted that values falling within 1 standard deviation of a published normative mean are generally considered to be "average" and therefore not meaningfully different from one another. Therefore, the use of 1 standard deviation as a cutoff score indicates that scores falling outside of this range differ from "normal."

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