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CONCURRENT VALIDITY STUDY OF THE CLINICAL ASSESSMENT OF DEPRESSION WITH THE REYNOLDS ADOLESCENT DEPRESSION SCALE

A Specialist Project
Presented to
The Faculty of the Department of Psychology
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
of the Requirements of the Degree
Specialist in Education

By
Brooke Wootton Tinsley

April, 2004

CONCURRENT VALIDITY STUDY OF THE CLINICAL ASSESSMENT OF DEPRESSION WITH THE REYNOLDS ADOLESCENT DEPRESSION SCALE

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Brooke Wootton Tinsley April, 2004 45 pages

Directed by: Dr. Elizabeth Jones (Chair), Dr. Carl Myers, and Dr. Reagan Brown

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It is critical for the depressive symptoms of adolescents to be recognized, evaluated, and treated. Depression can increase the risk for illness and interpersonal difficulties in the future and affect almost every aspect of an individual's life. Self-report measures are often utilized to assess depression, and when these measures are able to effectively detect depression, diagnosis and treatment are expedited. In order to validate the usefulness and psychometric properties of a new self-report measure, existing measures are often used as one criterion by which to judge them. The present study explored concurrent and discriminant validity of a new self-report depression measure, the Clinical Assessment of Depression (CAD; Bracken & Howell, 2004), with an established self-report measure, the Reynolds Adolescent Depression Scale (RADS; Reynolds, 1987). The population for this investigation consisted of 122 adolescents (ages 13 to 18), a group of 99 non-referred and a group of 23 individuals with a primary diagnosis of unipolar depression. Strong, significant correlations ranging from .70 to .97 were found between the CAD and the RADS. This study also found that the CAD is a sound instrument that can be used to discriminate between clinical and non-referred adolescent populations. The CAD appears to have acceptable validity that supports its use with adolescent populations.

Review of the Literature

It is imperative for society to gain insight into the disorder of depression. Accurate identification and treatment of adolescent depression is essential to ensure the well being of young people. Depression measures that currently exist assess depressive symptoms for specific age ranges, not across the lifespan. A new depression scale has been developed that assesses depressive symptoms across the lifespan using one scale. As this new measure is under development, it is crucial to evaluate it using an established measure for comparison purposes. As stronger assessment tools are developed, the better the chance of early, accurate identification and treatment.

This section will provide a review of the literature relevant to this investigation of the validity of the Clinical Assessment of Depression (CAD; Bracken & Howell, 2004) with the Reynolds Adolescent Depression Scale (RADS; Reynolds, 1987). First, an overview of child and adolescent depression will be provided including incidence, symptomology, and diagnostic criteria. Next, the psychometric assessment of depression in children and adolescents will be discussed. Lastly, the purpose of the present investigation will be presented.

Depression in Adolescents

Depression is a psychological disorder that is often overlooked among child and adolescent populations. Health care providers and family members of children and adolescents often view possible indicators of depression expressed by young people as typical mood swings and, as a result, the disorder remains under-diagnosed and untreated (Evans, Velsor, &

Schumacher, 2002; National Institute of Mental Health [NIMH], 2000). Children and adolescents commonly find it difficult to identify and express the internal emotional state they are in, but often display classic symptoms such as low self-esteem, guilt, loss of interest in school activities, decreased school performance, and boredom (NIMH, 2000). It is critical for the depressive symptoms of adolescents to be recognized, evaluated and treated, as depression can increase the risk for illness and interpersonal difficulties in the future and affect almost every aspect of that individual's life (Evans et al., 2002; Stanard, 2000).

The body of research concerning childhood and adolescent depression has increased over the past two decades and a knowledge base regarding childhood depression has consequently emerged. Prevalence rates for major depression are comparable to that of adults, making depression a major health problem among youths. The incidence of depression among youth in the United States ages 9-17 is estimated to be around five percent with between 1.5% and 4.7% being diagnosed with Major Depressive Disorder (Fritz, 1997; Pullen, Modrcin-McCarthy, & Graf, 2000; Stanard, 2000). The prevalence of depressive disorders differs in countries throughout the world. Past research indicates percentages ranging from 11.7% of adolescents in East Germany to 40% of Bulgarian adolescents. In the United States, Canada, and Britain, the prevalence was found to be around 10% and in Poland, the percentage was around 30 (Boyd, Gullone, Kostanski, Ollendick, & Shek, 2000). While prevalence rates may vary across countries, depression appears to be a universal construct of significant concern in children and adolescents.

Gender and depression. When looking at the prevalence rates of depression by gender, an equal number of boys and girls suffer from depression prior to adolescence. The percentage of adolescent boys identified as experiencing a depressed mood is between 20 and 35 percent; for

adolescent girls, the percentage rate is between 25 and 40 percent (Peterson et al., 1993). According to Reynolds (1992), 8 to 18 percent of school-aged youth have experienced a clinical level of depression.

During adolescence, however, rates of unipolar depression (major depressive disorder, dysthymic disorder, or depressive disorder not otherwise specified) have been found to be higher for girls than for boys (Herson & Ammerman, 2000; Marcotte, Fortin, Potvin, & Papillon, 2002; Rutter, Graham, Chadwick, & Yule, 1976). In a study comparing female and male mean scores on the Reynolds Adolescent Depression Scale (RADS) and the Beck Depression Inventory (BDI), Baron and Campbell (1993) examined whether females continue to exhibit higher mean scores on discriminating items. It was found that females do in fact have higher mean scores on these items. This supports the view that females characteristically report more depressive symptoms than males (Baron & Campbell, 1993).

Diagnostic criteria. In determining a diagnosis of depression for adolescents, the criteria set forth by the Diagnostic and Statistical Manual of Mental Disorders-4th Edition Text Revision ([DSM-IV-TR] American Psychiatric Association [APA], 2000) must be met. The DSM-IV-TR consists of three diagnostic categories for unipolar depressive disorders: major depressive disorder, dysthymic disorder, and depressive disorder not otherwise specified.

As a severe form of depression, Major Depressive Disorder is characterized by one or more Major Depressive Episodes. These episodes last at least two weeks and consist of depressed mood and loss of interest in most all activities. The individual must also suffer from at least four additional symptoms of the following list: “changes in appetite or weight, sleep, and psychomotor activity; decreased energy; feelings of worthlessness or guilt; difficulty thinking,

concentrating, or making decisions; or recurrent thoughts of death or suicidal ideation, plans or attempts" (APA, 2000, p. 356).

A second unipolar depressive diagnostic category is Dysthymic Disorder. This form of depression consists of a less severe symptom pattern than major depression; however, the symptoms are chronic in that they are experienced for at least one year. With children and adolescents, symptoms must last at least one year and must include two or more of the following: irritability, poor self-esteem, poor social skills, feelings of hopelessness, and impaired school performance (APA, 2000).

The third diagnostic category involving unipolar depression in the DSM-IV-TR is Depressive Disorder Not Otherwise Specified. This form of depression includes depressive features consistent with that required to diagnose major depression or dysthymia, yet the symptom pattern does not meet the criteria for any other Depressive Disorders in severity, quantity, or duration. When there is inadequate or contradictory information, this form of depression may be used for diagnosis (APA, 2000).

Adolescent symptoms. While the same criteria are required for a diagnosis of Major Depressive Disorder in adolescents as in adults, the symptoms are commonly presented differently (Mash & Wolfe, 2002; Mellin & Beamish, 2002; Oster & Montgomery, 1995; Stanard, 2000). Adolescents experiencing depressive disorders tend to exhibit more helplessness, fatigue, despair, lack of pleasure, suicidal thoughts, hypersomnia, and variations in weight than depressed adults (Evans et al., 2002; NIMH, 2000; Stanard, 2000). Depressive Disorders during adolescence also tend to be more episodic, with phases of depression, followed by phases of better functioning (Mellin & Beamish, 2002). Impairments in academic performances and relationships with others are often noted in adolescents experiencing clinical

levels of depression (Evans et al., 2002; Mellin & Beamish, 2002). Adolescent depression may also be expressed in ways that do not resemble depressive symptoms, such as behavior problems, family problems, substance abuse, or rebellion (Mellin & Beamish, 2002). There are also gender differences in the expression of depressive symptoms. Males tend to exhibit more irritability, work inhibition, sleep disturbance, and social withdrawal while females tend to exhibit more body image distortion, loss of appetite, sadness, dissatisfaction, and weight loss (Baron & Campbell, 1993).

Assessment of Depression

Use of self-report scales. The diagnosis of depression is reached after a comprehensive assessment in which information about the individual's symptoms and behavior/behavior patterns are obtained. Recommended practices in diagnosis are to gain such information primarily through a multimodal assessment approach utilizing clinical/diagnostic interviews with the child/adolescent or their parent(s), documentation of the child's/adolescent's behavior over time through use of behavior checklists, and self-report measures to assess symptom pattern and severity. While all of these methods are important to use in a thorough assessment, self-report measures are frequently utilized to assess depression and are the focus for this investigation (Wright-Strawderman, Lindsey, Navarrete, & Slippo, 1996).

Self-report measures are frequently used in social-emotional assessment (Marcotte et al., 2002; Merrell, 1999; Reynolds, 1990; Stanard, 2000; Wright-Strawderman et al., 1996). The utilization of such measures enables individuals to report their own internal thoughts, feelings, and emotions. This allows for better first-hand information of an individual's internal experience of depression than what could be obtained from a third party's observation of symptom patterns.

Objective self-report measures are often standardized instruments. They require the completion of questions or items concerning an individual's perception of his or her social or emotional behavior and answers are compared to a population sample. It has been proposed by Martin (1988) that self-report measures must have four essential characteristics present before being considered as objective measures: (a) adequate test-retest reliability, (b) standardized procedures, (c) provide normative data for comparison, and (d) adequate validity. It is important to address Martin's characteristics in the test development process.

Types of rating scales. Self report rating scales vary on the scope of the behaviors or symptomology covered. There are some self-report measures available that deal with a broad range of symptomology, however there are also measures available that focus specifically on depressive symptomology, a narrow range of symptomology. Such standardized measures that specifically assess adolescent depression include the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) and the Reynolds Adolescent Depression Scale (RADS; Reynolds, 1987). There are other measures that assess a broad range of symptomology, including depression (e.g., Behavior Assessment System for Children, Child Behavior Checklist), that are helpful as a screening device to provide depressive symptom information, however the RADS and the BDI-II provide more systematic and specific coverage of the symptoms of depression.

The Reynolds Adolescent Depression Scale (RADS) was developed by William M. Reynolds in 1986. This was the first depression scale developed specifically for use with adolescents and it was developed by selecting items based on symptomology described by the DSM-III for Major Depression and Dysthymic Disorder. It is an accepted measure among clinicians (Merrell, 1990) and assesses depressive symptoms in adolescents ages 13 through 18.

The RADS can also be used for individuals outside of this age range who are in junior or senior high school settings.

Martin's evaluation criteria for objective self-report measures can be used to evaluate the RADS (1988). There are four essential characteristics that a self-report measure should possess in order to be considered a good self-report measure. The RADS has an established test-retest reliability ranging from .63 to .80 from studies that have been conducted (Platt, 1999; Reynolds 1987). Standardized administration procedures are utilized in the RADS. Presentation of test items is done in a consistent manner and the responses are compared to responses of other individuals. The RADS also provides normative data that allows scores to be compared to a larger group of individuals and it has established validity (Platt, 1999; Reynolds 1987). Based on these criteria, the RADS is an established self-report measure that provides reliable, norm referenced, valid information to the professionals who utilize it.

The Clinical Assessment of Depression (CAD), developed by Bracken and Howell, is an instrument that is under development by Psychological Assessment Resources (PAR). It was developed to answer the question as to whether or not depressive symptoms are consistent across the age range from childhood through adulthood. The existing published measures of depression are designed either for adult or child populations. The CAD was developed to assess depression among children, adolescents, and adults using a single form.

As the CAD is currently in development, only limited information is available. However, this measure has a test-retest reliability ranging from .81 to .87 and the author reports there is evidence for adequate validity. The CAD is a standardized measure yielding age-related scores for the total measure and four subscales. The presentation of test items is done in a consistent manner and item responses can be compared to responses of other individuals (B. A. Bracken,

personal communication, March 25, 2004). The CAD appears to be a promising measure for use in the assessment of depression.

Purpose of Present Investigation

Self-report measures play an important role in the assessment of depression. Due to the internalizing nature of depression, an individual is more in-tune to his or her own thoughts and feelings than what a third party can ascertain through observation (Merrell, 1999; Reynolds, 1990; Stanard, 2000). When depression measures are able to effectively detect depression, diagnosis and treatment can be expediated. In order to validate the usefulness and psychometric properties of new measures, existing measures are one criterion by which to judge new instruments. According to the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 1999), such investigations should be conducted prior to use in the field. As noted previously, the RADS is considered to be a psychometrically adequate instrument that is used to assess depression in adolescents. And it is reasonable to use the RADS as a criterion measure for establishing validity of similar measures under development. The purpose of this investigation is to explore the concurrent validity of a measure under development, the Clinical Assessment of Depression (CAD), with an existing proven measure, the Reynolds Adolescent Depression Scale (RADS). Classification efficacy of the CAD for diagnosing depression will also be explored. The hypotheses for this investigation are as follows.

1. The CAD total score, and subscales will evidence strong concurrent validity with the RADS total score for the combined total sample.
2. The clinical group will evidence significantly higher mean scores on the CAD than the non-referred group and higher mean scores on the RADS than the non-referred group.

In addition to the hypotheses above, the classification efficacy of the CAD was examined using the RADS as the criterion measure.

Method

Participants

The sample consisted of adolescents residing in south central Kentucky (ages 13 to 18) who have either been diagnosed with Major Depressive Disorder, Dysthymia, or Depressive Disorder NOS (clinical group) or who have no diagnosis (non-referred group). One hundred twenty two adolescents (ages 13 to 18), 57 males and 65 females comprised the clinical (n=23) and non-referred groups (n=99).

The clinical sample consisted of individuals diagnosed with unipolar depression diagnoses including: Major Depressive Disorder (n=5), Dysthymia (n=2), or Depressive Disorder, NOS (n=14) according to DSM-IV-TR criteria (APA, 2000). One participant was diagnosed with Major Depressive Disorder as a secondary diagnosis, and one participant was diagnosed with Cyclothymic Disorder. The mean age for the clinical sample was 15.0 and consisted of 91.3% Caucasian participants and 8.7% minority participants.

The non-referred group was composed of individuals from a high school in south central Kentucky. Mean age for the non-referred group was 15.4 years. The non-referred sample consisted of 91.9% Caucasian participants and 8.1 percent minority participants. The total sample combining both groups consisted of 91.8% Caucasian and 8.2% minority participants.

Instruments

Reynolds Adolescent Depression Scale (RADS). The Reynolds Adolescent Depression Scale is a brief, 30-item, self-report measure for adolescents ages 13-18 that can be administered individually or in a group or orally to the reading disabled and takes about 10 minutes to

complete. It requires a response by the adolescents that indicates how they usually feel. The RADS is used as a screening measure for identifying depressive symptoms in school and clinical populations. It is used for research on depression and has subscales that evaluate Dysphoric Mood, Anhedonia/ Negative Affect, Negative Self-Evaluation, and Somatic Complaints. The RADS is also used for evaluation of treatment outcomes (Reynolds, 1987).

According to the RADS Professional Manual, the internal consistency of the standardization sample for the RADS ranged from .909 to .939, with a total sample alpha of .922 and split-half reliability with the same sample was .91. Other internal consistency data obtained found results similar to these (Merrell, 1999). The results of three studies that were conducted to examine test-retest reliability obtained coefficients of .80, .79, and .63. Data support that this test is a reliable measure.

Content validity assesses whether or not a test measures adequately a particular domain, such as depression, in this case. Content validity was found by looking at the similarity of item content with depressive symptomology and item total scale correlations indicating item consistency. Using a standardization sample of 2,296 adolescents, item total correlation coefficients were mainly in the .50s and .60s with median correlation being .53 (Platt, 1999). Using a sample of 111 high school adolescents, concurrent validity with the Hamilton Depression Rating Scale (HDRS) was found to be .83, which indicates a strong relationship between the two measures in their ability to assess depression (Davis, 1990; Platt, 1999). A sample of 1054 adolescents (age 12-14) produced a correlation of .70 between the RADS and the Children's Depression Inventory (Reynolds, 1987). Brown, Overholser, Spirito, and Fritz's study (as cited in Reynolds, 1992) reported a correlation of .64 in a sample of adolescent suicide attemptors. Several supporting studies of construct validity were provided in the RADS manual

and successive studies have been published supporting its validity (Merrell, 1999). When compared to other self-report measures of depression, the following correlations were reported: between the RADS and the Beck Depression Inventory correlations ranged from .68 to .76; correlations between the RADS and the CES-D (the Center for Epidemiological Studies Depression Scale) ranged from.74 to .76; the correlation between the RADS and the Self Rating Depression Scale was .72 (Davis, 1990; Platt, 1999; Reynolds, 1987).

Platt (1999) describes the RADS as possessing several strengths. It's attractive appearance and inviting front cover give the test examinee a sense of ease when describing their feelings. The instructions were found to be direct and easily understandable, and scoring of this instrument was found to be quick and easy (Platt, 1999). The RADS also makes validity checks to account for truthfulness of respondents. Supporting previous research also indicates that the RADS manual is well written and strongly documented (Merrell, 1999). Merrell (1999) supports that the RADS is gaining acceptance throughout the clinical and research communities and is a strong supplement to the adolescent self-report instrumentation that is being used.

Weaknesses mentioned by Pratt (1999) include the limited sample used in standardization. While a large sample was used, it did not take into account racial diversity or more than one geographic location. The test-retest reliability dropped over one year's time. This drop could have been influenced by external factors, for example therapeutic interventions or internal factors.

Clinical Assessment of Depression (CAD). The CAD (Bracken & Howell, 2004) is currently in development by Psychological Assessment Resources. It is a 50-item scale that takes approximately 10 minutes to complete. The age range for this scale is 9 to 79 years. The CAD assesses depressive symptomology on four subscales: Depressed Mood, Anxiety/Worry,

Diminished Interest, and Cognitive and Physical Fatigue. Items in these categories were developed using wording and content appropriate for all ages.

Although the CAD is currently under development, pre-publication psychometric data were obtained (B. A. Bracken, personal communication, March 23, 2004). CAD Total Scale score reliability ranged from .96 to .98 and vary little by age, race, and gender. Subscale reliabilities are as follows: Depressed Mood subscale ranged from .95 to .97; Anxiety/Worry subscale ranged from .82 to .90; Diminished Interest subscale ranged from .79 to .92; and Cognitive and Physical fatigue subscale ranged from .79 to .91. Variation of these subscales is largely due to sample size. Test-retest reliability for the Total Scale score ranged from .81 to .87. Concurrent validity was established through correlations between the CAD Total Scale score and the Beck Depression Inventory (BDI-II; r = .71) and between the CAD Total Scale score and the RADS (r = .64). The author reported confirmatory factor analyses support the four subscales structure of the instrument.

Procedure

Clinical group participants were recruited through private clinicians and psychiatric hospitals. Once permission was obtained to solicit participants from these treatment providers, these providers were given packets and directions for distributing forms to parents/guardians. Each parent/guardian was given a packet containing a letter including the description of the study and an invitation to participate, two parent consent forms (WKU and PAR), a release of information form, an instruction sheet, an adolescent assent form, and the three depression scales (CAD, BDI-II, and RADS; see Appendix A for forms). Data collection for this study overlapped with another investigation that necessitated the BDI-II be included in the packet. Parents were

asked to complete the two consent forms and the release of information form. The adolescents were asked to complete the assent form and the three depression scales. Upon completion of the three depression scales and the consent and assent forms, participants were asked to place and seal the scales in one envelope and the consent and assent forms in a separate envelope. The parent/guardian or participant then returned both packets to their clinician from whom the conductor of this study retrieved them. Participants were given a local fast food restaurant coupon that did not exceed $2.00 in value for their participation. The researcher provided these coupons to the therapist who distributed them. The researcher of this study then asked the therapist to complete the Clinician's Record Form after a signed release form was obtained from the parent/guardian (see Appendix A).

Subjects comprising the non-referred group were solicited from a local high school. For data collection at the high school, an introductory letter and consent form were sent home with one randomly selected 9th, 10th, 11th, and 12th grade classroom in a public high school in south central Kentucky (100 students; see Appendix B for forms). Students who returned forms to the school received a local fast food restaurant coupon that did not exceed a $2.00 value. A coupon was given for returning the consent form whether or not consent was granted. The students for whom parental consent was obtained were asked to sign an assent form and complete three measures during school hours. An appropriate time for completion of questionnaires, which was approximately 25 minutes, was determined between the researcher and the students' teacher. A coding system was used so that a student could be identified in the event of significant responses indicating depression or suicidal ideation. Parents/guardians were notified by the researcher when significant ratings were obtained in the non-referred group. Names were kept separate from all forms, with no names appearing on the forms. All procedures for this study were

approved by Western Kentucky University's Human Subjects Review Board in April 2003 (see Appendix C).

Results

This researcher had three purposes: (a) to examine the relationship between the CAD and the RADS, (b) to determine whether group differences existed between the clinical group and the non-referred group on the CAD and the RADS, and (c) to explore the hit rate or classification consistency when using the RADS as the criterion measure.

The sample consisted of 122 adolescents ages 13 to 18 from south central Kentucky (57 males and 65 females). Twenty-three comprised the clinical group (10 males and 13 females); ninety-nine comprised the non-referred group. Table 1 provides the mean score (*M)*, the standard deviation (*SD*), and the standard error of the mean (*SEM*) for the raw scores on each measure for the clinical and non-referred groups.

To examine the relationship between the CAD and the RADS, Pearson product-moment correlation coefficients were computed for the total raw scores for each scale and for each subscale of the CAD (Depressed Mood, Anxiety/Worry, Diminished Interest, and Cognitive and Physical Fatigue) with the RADS total score. Using the Bonferroni approach to control for Type I error across the 12 correlations, a p value of less than .003 was established for significance. The results of the correlational analyses are presented in Table 2. All of the 15 correlations were statistically significant. Using Cohen's (1988) effect sizes, the correlations obtained were classified within the strong range. The results suggest strong concurrent validity between the total score on the RADS and the total score on the CAD, as well as between the RADS and each subscale on the CAD.

Table 1

Sample Descriptive Statistics for the Raw Scores on the RADS[a] and the CAD[b]

	RADS				CAD			
Sample	*N*	*M*	*SD*	*SEM*	*N*	*M*	*SD*	*SEM*
Non-referred								
Male	46	56.20	17.37	2.56	47	97.34	29.81	4.35
Female	52	65.62	18.73	2.60	52	107.12	29.29	4.06
Total	98	61.19	18.62	1.88	99	102.47	29.80	2.99
Clinical								
Male	10	57.90	11.80	3.73	10	106.40	26.07	8.25
Female	13	80.85	16.97	4.71	13	138.77	27.33	7.58
Total	23	70.87	18.69	3.90	23	124.70	30.90	6.44
Total Sample								
Male	56	57.05	16.43	2.20	57	101.87	29.18	3.86
Female	65	73.24	19.27	2.40	65	122.95	31.40	3.90
Total	121	63.03	18.94	1.72	122	106.66	31.12	2.82

Note. Clinical sample consisted of individuals diagnosed primarily with Major Depressive Disorder, Dysthymia, or Depressive Disorder, NOS.

[a]Reynolds Adolescent Depression Scale. [b]Clinical Assessment of Depression.

Table 2
Correlations of RADS[a] Total Score with CADS[b] Total Score and Scales

Subscale	1	2	3	4	5	6
1. CAD Total Score	-	.97*	.93*	.90*	.86*	.88*
2. CAD, Depressed Mood	-	-	.86*	.84*	.74*	.86*
3. CAD, Anxiety/Worry	-	-	-	.78*	.78*	.84*
4. CAD, Diminished Interest	-	-	-	-	.77*	.78*
5. CAD, Cognitive and Physical Fatigue	-	-	-	-	-	.70*
6. RADS Total Score	-	-	-	-	-	-

[a]Reynolds Adolescent Depression Scale. [b]Clinical Assessment of Depression.

* $p < .004$

To determine whether group differences existed between the clinical and non-referred groups, independent samples *t* tests were conducted to see how each of the two scales (RADS and CAD) could distinguish between the two groups (clinical and non-referred) mean scores. Levene's Test for the Equality of Variances was computed due to the number of group participants being unequal. All significance levels for the equality of variances test were found to be above .05. Therefore the *t* test results were interpretable. The tests were significant, $t(119) = -2.24$, $p = .027$ for the RADS, and $t(120) = -3.2$, $p = .002$ for the CAD. The results support the hypothesis that the clinical group will evidence higher scores on each of the two scales than the non-referred group. Participants in the clinical group displayed higher scores on both scales than participants in the non-referred group.

Classification efficacy of the CAD was explored using the RADS as the criterion measure. Bracken recommends using a T-score of 60 as the cutoff score for distinguishing between depressed and non-depressed individuals (B. Bracken, personal communication, March 23, 2004). Using the RADS cutoff raw score of 77, and comparing CAD categories of depressed and non-depressed to actual RADS findings, a 2 x 2 contingency table was computed (Table 3) for the total sample. An examination of the association between the RADS cutoff score and the CAD cutoff score resulted in a $\chi^2 = 51.74$, ($p < .000$). An examination of cell proportions indicated that the CAD and the RADS, as to their diagnostic category for the total sample, consistently identified 84% of the adolescents.

Further contingency tables were computed in order to understand the classification efficacy of the CAD and the RADS using group membership (clinical and non-referred) as the criterion. Table 4 shows a contingency table for the CAD and group membership. The hit rate for the CAD was found to be 68%. There were 25% false positives and 7% false negatives.

Table 3

Total Sample Classification Table between RADS[a] Cutoff and CAD[b] Diagnosis of Depression

	CAD Classification		
RADS Classification	Non-depressed	Depressed	Total
Non-depressed	63%	16%	79%
	(n=77)	(n=19)	(n=96)
Depressed	1%	20%	21%
	(n=1)	(n=25)	(n=26)
Total	64%	36%	100%
	(n=78)	(n=44)	(n=122)

$\chi^2 = 51.74$

[a]Reynolds Adolescent Depression Scale; depression classification based on raw score $\geq$ 77.

[b]Clinical Assessment of Depression; depression classification based on T-score $\geq$ 60.

Table 4

Classification Table between CAD[a] Diagnosis of Depression and Group Membership[b]

	CAD Classification		
Group Membership	Non-Significant	Depressed	Total
Non-Referred	57%	25%	81%
	(n=69)	(n=30)	(n=99)
Clinical	7.4%	11.5%	19%
	(n=9)	(n=14)	(n=23)
Total	64%	36%	100%
	(n=78)	(n=44)	(n=122)

$\chi^2 = 7.56$

[a]Clinical Assessment of Depression; depression classification based on T-score $\geq$ 60.

[b]Non-referred consisted of 99 adolescents 13-18 years of age; clinical sample consisted of 23 individuals, 13-18 years of age, diagnosed primarily with Major Depressive Disorder, Dysthymia, or Depressive Disorder, NOS.

The χ^2 statistic was significant, $\chi^2 = 7.56$, ($p < .006$) indicating the cell proportions are not a chance occurrence. Table 5 shows a contingency table for the RADS and group membership. The hit rate for the RADS was found to be 73%, with 15% false positives and 12% false negatives identified. The χ^2 statistic was significant, $\chi^2 = 3.07$, ($p < .08$) indicating the cell proportions are not a chance occurrence.

Table 5

Classification Table between RADS[a] Diagnosis of Depression and Group Membership[b]

	RADS Classification		
Group Membership	Non-Significant	Depressed	Total
Non-Referred	66%	15%	81%
	(n=81)	(n=18)	(n=99)
Clinical	12.3%	6.6%	19%
	(n=15)	(n=8)	(n=23)
Total	79%	21%	100%
	(n=96)	(n=26)	(n=122)

$\chi^2 = 3.07$

[a]Reynolds Adolescent Depression Scale; depression classification based on T-score $\geq$ 77.

[b]Non-referred consisted of 99 adolescents 13-18 years of age; clinical sample consisted of 23 individuals, 13-18 years of age, diagnosed primarily with Major Depressive Disorder, Dysthymia, or Depressive Disorder, NOS.

Discussion

The current study expected to find that there is a significant positive correlation between the CAD and the RADS for the clinical and non-referred group participants. Total scores were expected to yield moderate to high correlations between the two scales. In addition, the CAD was expected to discriminate between clinical and normal groups of adolescents. On the CAD and the RADS, total scores were to yield significantly higher scores in the clinical population than in the normal population. In addition, classification efficacy was to be examined.

The first objective of this study was to determine how concurrently the CAD and the RADS could identify depressive symptoms in both the clinical and non-referred sample. Pearson product moment correlations computed for the RADS total score, CAD total scale score, CAD Depressed Mood scale, CAD Anxiety/Worry scale, CAD Diminished Interest scale, and CAD Cognitive and Physical Fatigue scale were significant and positive ranging from .70 to .97. Using Cohen's (1988) effect sizes to determine the strength of the correlation, all correlations are considered to be strong, accounting for 49% to 94% of the variance between the two measures. The weakest correlation (.70) was between the RADS total score and the CAD Cognitive and Physical Fatigue scale score; the strongest correlation (.97) was between the CAD total score and the CAD Depressed Mood scale score. The findings support the hypothesis that the CAD will evidence strong concurrent validity with the RADS.

The next objective of this study was to determine if the CAD could discriminate between the clinical and non-referred population. The RADS was used as the criterion measure due to its

empirically validated ability to detect depressive symptoms. Independent samples *t* tests were computed to examine mean group differences (clinical versus non-referred) of the two scales (RADS and CAD). The *t* test for each measure was significant. The *t* test for the RADS scores indicated that the samples can be discriminated on the basis of mean scores. The *t* test for the CAD indicates that the clinical group had higher mean scores than the non-referred group. The findings support the hypothesis that the clinical group will evidence higher mean scores on the two scales than the non-referred group.

The final objective of this study was to examine the classification efficacy of the CAD using the RADS as the criterion. Using a 2 x 2 contingency table, the hit rate for the total sample was found to be high at 84%. However, 16% were identified as false positive and one percent as false negative. A false negative occurred when the RADS identified a person as depressed and the CAD identified that person as not depressed; this is considered a more liberal classification. A false positive occurred when the RADS identified an individual as not depressed and the CAD identified that same person as depressed; this can be considered a conservative classification. A false positive, while it is an error, is more conservative in diagnosing depression. When using group membership as a criterion, the CAD produced a hit rate of 68%, with 25% false positives and 7% false negatives. The RADS produced a hit rate of 73%, with 15% false positives and 12% false negatives. There are a few explanations that may account for these discrepancies. First, there was a small number of clinical participants (n=23) in comparison to the non-referred participants (n=99). A higher hit rate was found in the non-referred population, and this is likely due to the larger sample size. Secondly, major depression is not a stable symptomology. When the clinical participants were diagnosed with depression, the symptoms may have been much more severe than they were at the time of participation in this study. The researcher was not

aware of the length of time the clinical participants had been in treatment, and some participants were currently on medication at the time of participation. Depression exists on a continuum, and this helps to explain why there would be an expected amount of variation in the severity of the ratings made by the clinical participants.

Limitations

While valuable information can be obtained from this study, there are limitations that could affect the interpretation of the results. Low sample size, particularly in the clinical population, may have limited the amount of information that was gathered. Also, clinical participants were recruited through both inpatient and outpatient facilities, which may explain some of the discrepancy in classification within that sample.

A threat to the internal validity of the study was the differential selection of the participants. The clinical participants were all receiving services; it is possible that there was something unique about the clinical sample (being in treatment) that affected the results. There were threats to the external validity of the study as well. The clinical sample was not completely homogenous in that it was comprised of three types of diagnoses and had other diagnoses secondary to depression and one participant had depression as a secondary diagnosis. A more homogeneous sample would increase confidence in findings. Another external threat is that the study relied on participants in treatment to represent the clinical population; depressed individuals who did not seek treatment were not represented in this study. Therefore, it is difficult to say how generalizable the findings of this study are. A final external threat affects data collection. Data were collected in one geographic region (south-central Kentucky), and while the study sample's ethnicity was representative of the region (7% minority), it is not

typical of the United States as a whole. Therefore, generalizability to other geographic regions may not be as valid.

Implications

Practical implications. Findings of the current study have strong implications for the field of psychology. As depression measures are limited for child and adolescent populations, it is important that additional measures be established. The current study has provided evidence for the validity of a newly developed depression scale, the CAD, with adolescents and expanded the knowledge base of adolescent depression measures. With prevalence rates of childhood depression on the rise and the high need for identification of depression in adolescents, it is imperative that valid, reliable, and standardized measures be established and made accessible. Measures that can adequately identify and diagnose depressive symptoms will increase the likelihood of accurate treatment.

Recommendations for future research. The present study focused on convergent validity with the CAD and RADS, which are two instruments designed specifically for depressive symptom identification. Further investigation with the CAD should explore it's use with inpatient and outpatient settings, individuals over the course of treatment and more homogeneously defined clincal groups. In addition, further investigations might explore divergent validity of the CAD with measures that assess a wider range of clinical symptoms, including internalizing behaviors such as depression, but also focus on a wider assessment of overall symptoms. Further evidence of validity should be explored through factor analysis. This would help to substantiate the subscale structure of the CAD.

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Appendix A

Clinical Packet Form

Dear Parent/Guardian,

Your child is invited to participate in a study looking at the usefulness of 3 measures of social and emotional well-being. This study is being conducted by Shanna Bowers, Brooke Wootton and Dr. Elizabeth Jones of Western Kentucky University in cooperation with your child's clinician. The results of the study will be used to determine how well these 3 instruments measure social and emotional well-being in adolescents.

In addition, the data from this study will be used to evaluate a new instrument that measures social and emotional well-being. Such data can provide information about the new instruments' usefulness and ability to measure what it sets out to measure. If you agree to allow your child's responses to be used in this evaluation process, there is a separate consent form included in this packet that requires your signature. This form will be returned to the test publisher.

Upon your consent and your child's assent, your child will be asked to complete 3 questionnaires concerning their thoughts, feelings, and emotions as they relate to their day-to-day functioning. It will take approximately 25 minutes to complete and this may be done before or after your child's therapy sessions. You will also be asked to complete a release of information form to allow your child's therapist to release diagnosis, medication, and family history information. This information will only be used by the researchers to insure that research requirements are met. Your child's name will not appear on this form. For your child's participation in this study he or she will receive a local fast food restaurant coupon that will not exceed a $2.00 value.

Your consent and your child's participation are completely voluntary. At any time withdrawal from the study is possible. If you do not consent for your child to participate, it will have no negative outcomes for you or your child and will not affect the relationship with the clinician. There are no physical risks involved in filling out the questionnaires. However, answering the items on the questionnaires may cause your child to feel some emotional discomfort, due to the nature of the questions asked about your child's behavior. All information collected in this study will be kept strictly confidential and will be accessible only to project staff. However, all packets will be coded to allow for identification only if an individual's responses indicate a threat to self or others on the questionnaires. Researchers must by law report this information to your child's clinician and you will be immediately informed.

The procedures in this study have been reviewed and approved by the Western Kentucky University Human Subjects Review Board. If you have questions about the study you may contact Dr. Elizabeth Jones by phone at (270) 745-4414. We hope that both you and your child agree to take part in our study. To indicate your consent for participation please complete and sign the attached form, have your child complete the questionnaires, and return the packet to your child's clinician.

Sincerely,

Elizabeth L. Jones
Associate Professor of Psychology

Shanna Bowers
Brooke Wootton
School Psychology Graduate Students

Participation Consent Form

Child's Age ____ Child's Gender __ M __F Child's Race/Ethnicity_____

I have read the information provided concerning this study. I give consent for my child to participate in this study conducted by Shanna Bowers, Brooke Wootton, and Dr. Elizabeth Jones of Western Kentucky University. I understand that I may withdraw from the study at any time without penalty.

_____ I **DO** give consent for my child to participate in this study.

_____ I **DO NOT** give consent for my child to participate in this study.

Parent/Guardian Signature _____ Date _____

PARENT/GUARDIAN CONSENT FORM

Research Participation in a Behavioral Study

General Information and Purpose

My child:_____ has been asked to participate in a research study being conducted by PAR, Inc., a developer and publisher of educational and behavioral assessment tools. The purpose of the study is to evaluate a new test designed to identify behavioral problems in adolescents. I have been asked to participate in this study because I am the parent of a child (ages 2 to 18 years); if my child is between 8 and 18-years-old, he or she has also been asked to participate.

What is involved in my child's participation?

If I agree (and give consent for my child) to participate in this study, my child will complete one or more questionnaires that ask about my child's academic, social, and personal behaviors. Children questionnaires take from 15 to 30 minutes to complete.

Risks

There is no physical risk involved in filling out the questionnaires. Answering the questions on the questionnaires may cause my child to feel some emotional discomfort, due to the nature of the questions asked about my child's behavior.

Benefits

The results of this study may be of benefit in the future to children with behavioral problems and the professionals who evaluate and treat them. **There is no immediate benefit to my child for their participation, however they may benefit in the event that they indicate suicide or harm to others. If such indicators are present, they will be identified and I will be identified immediately.**

Confidentiality

My child's answers on the questionnaires are strictly confidential and anonymous. I will not be asked to put my child's name on the questionnaires. Only the primary researchers or their designees will have access to my child's confidential survey responses. However, the packets will be coded to allow for identification only if my child's responses indicate suicide or harm to others. By law researchers must report this information to you immediately.

Right to Withdraw or Decline to Participate

My child's participation in this study is completely voluntary. He/she may choose not to participate, or to withdraw from participation at any time without penalty.

I attest that I have read and understand all of the above pertaining to my child's participation in this study, and that all of my questions about the study have been answered to my satisfaction. I hereby give my informed consent for my child to participate in this research study.

_____ _____ _____

Parent's Name (please print) Parent's Signature Date

If you have any questions regarding this research study or participation in it, please call Michelle Owens or Dr. Mario Rodriguez (Project Director) at 1-866-PAR-DATA or 1-800-331-TEST. PAR, Inc./16204 N. Florida Avenue, Lutz FL 33549/Tel (813)968-3003/Fax (813)968-4684

Release of Information

CONCURRENT VALIDITY STUDY OF ADOLESCENT DEPRESSION MEASURES

(1) TO:_____ (2) DATE:_____

_____

_____

(3) RE:_____
Name

_____
Address

Authorization is hereby granted to release to Western Kentucky University (WKU) researchers: Dr. Elizabeth Jones, Shanna Bowers, and Brooke Wootton, and Psychological Assessment Resources (PAR) researchers such information relative to service rendered.

(4) _____
Signature of Parent

_____
Address

_____

(5) _____ _____
Witness Date

Information particularly requested is listed below:
Your Childs: Age
Gender
Race
Primary DSM-IV Diagnosis
List of Current Medications
Family History of DSM-IV Diagnosis

As mentioned before, the purpose of this study is to use self-report measures to identify social and emotional well-being in adolescents. To ensure that the participants of this study meet diagnosis criteria, it is necessary to obtain diagnosis information from a clinician.

Attached is a release form that must be completed so that your child's therapist can release diagnosis and medication information to the researchers.

- Fill in the name of your child's therapist at #1
- Put today's date at #2
- Put your child's name at #3
- Sign your name, provide address and date at #4
- Have a witness (someone over 18 years of age) sign at #5

Participation Assent Form

I have read and understand the information provided about this study. I give assent to participate in this study conducted by Shanna Bowers, Brooke Wootton, and Dr. Elizabeth Jones of Western Kentucky University. I understand that I may withdraw from this study at any time without penalty.

I, _____, understand that my parent/guardian has given permission for me to participate in a study concerning social and emotional well-being, under the direction of Western Kentucky University.

My participation in this project is completely voluntary, and I understand that I may stop my participation in this study at any time. I am aware that I am encouraged to answer all of the items, even if I am unsure how to respond, and that I hold the right to refuse to answer items. If I choose not to participate, it will not affect my treatment in any way.

Signature _____ Date_____

Clinician Record Form

Clinician Name:_____ Date: _____

Age: _____

Please provide the following information for the individual participant being rated/tested.

ID No.: _____ Gender: _____ Race/Ethnicity: _____

Primary DSM-IV Diagnosis(es): _____

Estimated Date of Dx: _____

Diagnosis made by: ☐ Psychologist ☐ Psychiatrist
☐ Pediatrician ☐ Primary care physician
☐ School Personnel ☐ Other: _____

1) _____

			Current?	
Secondary DSM-IV Diagnoses:	1) _____	Estimated Date of Dx: _____	Yes	No
	2) _____	Estimated Date of Dx:_____	Yes	No
	3) _____	Estimated Date of Dx: _____	Yes	No

Current Psychotropic Medications:

1) _____

2) _____

3) _____

Does either parent or any sibling carry a DSM-IV diagnosis(es)? ☐ No ☐ Yes

If yes, indicate biological relative(s) and respective diagnosis(es):

Mother Diagnosis(es): _____

☐ Father Diagnosis(es):_____

☐ Sibling 1 Diagnosis(es):_____

☐ Sibling 2 Diagnosis(es):_____

☐ Sibling 3 Diagnosis(es):_____

☐ Sibling 4 Diagnosis(es):_____

☐ Sibling 5 Diagnosis(es):_____

☐

Appendix B

Non-Referred Packet Forms

Dear Parent/Guardian,

Your child is invited to participate in a study looking at the usefulness of 3 measures of social and emotional well-being used with adolescents. This study is being conducted by Shanna Bowers, Brooke Wootton and Dr. Elizabeth Jones of Western Kentucky University. The results of the study will be used to determine how well these 3 instruments measure social and emotional well-being in adolescents.

In addition, the results of this study will be used to evaluate a new instrument that measures social and emotional well-being. Such data can provide information about the new instrument's usefulness and ability to measure what it sets out to measure. If you agree to allow your child's responses to be used in this evaluation process, there is a separate consent form included in this packet that requires your signature. This form will be returned to the test publisher.

Upon your consent and your child's assent, your child will be asked to complete 3 questionnaires concerning their thoughts, feelings, and emotions as they relate to their day-to-day functioning. It will take approximately 25 minutes to complete the three questionnaires.
For your child's participation in this study he or she will receive a local fast food restaurant coupon that will not exceed a $2.00 value.

Your consent and your child's participation are completely voluntary. At any time withdrawal from the study is possible. If you do not consent for your child to participate, it will have no negative outcomes for you or your child. There are no physical risks involved in filling out the questionnaires. However, answering the items on the questionnaires may cause your child to feel some emotional discomfort, due to the nature of the questions asked about your child's behavior. All information collected in this study will be kept strictly confidential and will be accessible only to the project staff. However, all packets will be coded to allow for identification only if an individual's responses indicate a threat to self or others on the questionnaires. Researchers must by law report this information to you immediately.

The procedures in this study have been reviewed and approved by the Western Kentucky University Human Subjects Review Board. If you have questions about the study you may contact Dr. Elizabeth Jones by phone at (270) 745-4414. We hope that both you and your child agree to take part in our study. To indicate your consent for participation please complete and sign the attached form.

Sincerely,

Elizabeth L. Jones — Associate Professor of Psychology

Shanna Bowers, Brooke Wootton — School Psychology Graduate Students

Participation Consent Form

Child's Age ____ Child's Gender __ M __F Child's Race/Ethnicity_____

I have read the information provided concerning this study. I give consent for my child to participate in this study conducted by Shanna Bowers, Brooke Wootton, and Dr. Elizabeth Jones of Western Kentucky University. I understand that I may withdraw from the study at any time without penalty.

_____ I **DO** give consent for my child to participate in this study.

_____ I **DO NOT** give consent for my child to participate in this study.

Parent/Guardian Signature_____ Date _____

Participation Assent Form

I have read and understand the information provided about this study. I give assent to participate in this study conducted by Shanna Bowers, Brooke Wootton, and Dr. Elizabeth Jones of Western Kentucky University. I understand that I may withdraw from this study at any time without penalty.

I, _____, understand that my parent/guardian has given permission for me to participate in a study concerning social and emotional well-being, under the direction of Western Kentucky University.

My participation in this project is completely voluntary, and I understand that I may stop my participation in this study at any time. I am aware that I am encouraged to answer all of the items, even if I am unsure how to respond, and that I hold the right to refuse to answer items. Whether or not I choose to participate, I will not be affected in any way.

Signature _____ Date_____

Appendix C

Letter of Human Subjects Review Board Approval

WESTERN KENTUCKY UNIVERSITY
Human Subjects Review Board
Office of Sponsored Programs
104 Foundation Building
270-745-4652; Fax 270-745-4211
E-mail: Phillip.Myers@Wku.Edu

In future correspondence please refer to HS03-077, April 3, 2003

Shanna Bowers
1500 Crossbreeze Ct.
Bowling Green, KY 42104

Dear Shanna:

Your research project, "Concurrent Validity of Adolescent Depression Measures," was reviewed by the HSRB and it has been determined that risks to subjects are: (1) minimized and reasonable; and that (2) research procedures are consistent with a sound research design and do not expose the subjects to unnecessary risk. Reviewers determined that: (1) benefits to subjects are considered along with the importance of the topic and that outcomes are reasonable; (2) selection of subjects is equitable; and (3) the purposes of the research and the research setting is amenable to subjects' welfare and producing desired outcomes; that indications of coercion or prejudice are absent, and that participation is clearly voluntary.

1. In addition, the IRB found that: (1) **signed informed consent will be obtained from all subjects.** (2) Provision is made for collecting, using and storing data in a manner that protects the safety and privacy of the subjects and the confidentiality of the data. (3) Appropriate safeguards are included to protect the rights and welfare of the subjects. (4) **Any ad or flyer used to recruit participants must be reviewed by the HSRB before used.**

a. Your research therefore meets the criteria of **Full Board Review** and is **Approved**.

2. Please note that the institution is not responsible for any actions regarding this protocol before approval. If you expand the project at a later date to use other instruments please re-apply. Copies of your request for human subjects review, your application, and this approval, are maintained in the Office of Sponsored Programs at the above address. Please report any changes to this approved protocol to this office. A Continuing Review protocol will be sent to you in the future to determine the status of the project.

Sincerely,

Phillip E. Myers, Ph.D.
Director, OSP and
Human Protections Administrator

cc: Human Subjects File HS03-077
cc: Brooke Wootton
cc: Dr. Elizabeth Jones