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COMPARING THREE MEASURES OF DEPRESSIVE SYMPTOMS AMONG AMERICAN INDIAN ADOLESCENTS

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Abstract: This study examined the measurement of depressive symptoms among American Indian adolescents as assessed by the Center for Epidemiologic Studies Depression Scale (CES-D), Youth Self Report (YSR), and the Tri-Ethnic Center's for Prevention Research Depression Scale (TEDS). This analysis demonstrated that the TEDS had good internal consistency, demonstrated construct validity, and shared a commonality with the other two measures, but had limited predictive validity. The YSR had strong predictive validity but, like the CES-D, showed weakness in construct validity. Unexpectedly, the CES-D and YSR revealed enculturated youth were at risk of depressive symptoms. These findings do not generate unequivocal support for any one measure, but suggest that their strengths and potential shortcomings should be taken into account when assessing depressive symptoms among American Indian youth.

Traditional measures of depressive symptoms were designed for use in the majority population. Too often cultural complexity has been overlooked, and these constructs have been applied casually to other groups. Assessment measures developed for use with European Americans generally have not taken into account that American Indians conceptualize depressive symptoms differently; consequently, they must be used with caution or modified for cross-cultural applications (Ackerson, Dick, Manson, & Baron, 1990; Manson, 1994; Manson, Shore, & Bloom, 1985). For example, words such as "depressed" and "anxious" are not present in some American Indians' and Alaskan Natives' languages. For Hopi Indians, feelings of guilt, shame, and sinfulness are dissimilar and carry different meanings than signified by

Western culture (Manson et al., 1985), whereas expressions of deep sadness and sorrow are discouraged among Navajo Indians (Miller & Schoenfeld, 1971). Cultural differences are magnified because American Indians (AIs) in the U.S. speak over 200 distinct languages (Fleming, 1992; LaFromboise, 1988).

Apart from the general inattention to cultural differences, the weight of the literature has examined depressive symptoms among AI adults. Manson and colleagues examined the factorial structure of the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977, 1991) among AI adolescents and young adults (Beals, Manson, Keane, & Dick, 1991; Manson, Ackerson, Dick, Baron, & Fleming, 1990; Wiegman Dick, Beals, Keane, & Manson, 1994). The depressed affect and somatic complaint dimensions of the CES-D were more similar than different among AI adolescents and young people (Beals et al., 1991; Wiegman Dick et al., 1994). Cultural differences were also noted, as AI youth interpreted a somatic complaint item (i.e., everything you did was an effort) as an indicator of well-being (Wiegman Dick et al., 1994). To date, no study has compared well-established measures like the CES-D or the Youth Self Report depressive symptom scales (YSR; Achenbach, 1966, 1991) to the Tri-Ethnic Center's for Prevention Research Depression Scale (TEDS), a construct that was designed for use with minority youth. This study aims to fill these gaps in the literature by examining three measures of self-reported depressive symptoms among AI adolescents. It evaluated the psychometric properties, compared traditional correlates of depressive symptoms, and examined specific scale items of the CES-D, YSR, and TEDS to assess the commonalities and untangle the variations that exist among those measures. This paper extends the literature by examining the crucial role of instrumentation in measuring depressive symptoms among AI youth.

Literature Review

Tri-Ethnic Depression Scale (TEDS)

The TEDS was designed as a culturally sensitive instrument suitable for identifying depressive symptomology among samples of culturally diverse youth. Reports of empirical examinations of the properties of the TEDS were not found, although Oetting, Swaim, Edwards, & Beauvais (1989) used five of the scale items to assess depressive symptoms among AI adolescents who were residing on a reservation. The Cronbach *alpha* coefficient for this abridged version was .92. This measure was designed for its conciseness and simplicity, and does not impose mainstream bias through its competitive, conflictual worldview. In addition, it is sensitive to cultural differences in time orientation (Dauphinais & King, 1992; Manson et al., 1997). The importance of the frequency and duration of depressive symptoms should be

understood in cultural context. The TEDS allows respondents to measure subjectively the frequency of symptoms instead of specifying a numeric equivalent.

The Center for Epidemiologic Studies Depression Scale (CES-D)

The CES-D was developed for use in the general population. It has been tested among high school and college students as well as junior high school youth, with the evidence suggesting that it is an acceptable and reliable measure (Radloff, 1991). In respect to junior high school students, some caution is warranted due to the inflation of CES-D scores (Radloff, 1991; Schoenbach, Kaplan, Grimson, & Wagner, 1982). Self-reports of junior high school students indicated a higher prevalence of depressive symptoms among Blacks and low-income families (Schoenbach et al., 1982). Other research failed to uncover significant grade, sex, or race differences (Felner, Rowlison, Raley, & Evans, 1988). Adolescent females who had a previous history of depressive symptoms reported more symptoms than their male counterparts; however, prior to the first episode, gender did not play a role (Lewinsohn et al., 1994). For younger girls, negative life events were positively related to increased levels of depressive symptoms (Siegel & Brown, 1988). The instrument has good internal consistency as well as concurrent and construct validity (Radloff, 1977). Reliability coefficients generally have ranged between .8 and .9 (Roberts, Andrews, Lewinsohn, & Hops, 1990). However, among AI elders, CES-D items pertaining to being a failure or feeling fearful (depressive affect), talking less than usual (somatic complaint), and feeling disliked or being treated in an unfriendly manner (interpersonal) had less relevance in “cooperative, group-oriented cultures” (Chapleski, Lamphere, Kaczynski, Lichtenberg, & Dwyer, 1997).

Youth Self-Report Internalizing Scale (YSR)

The YSR has been used extensively to assess psychopathology as well as specific behavioral and emotional problems in children and adolescents (Achenbach, 1966, 1991; Achenbach & Brown, 1991). Studies have shown that the YSR Internalizing measure is well suited for youth in the general population (Laitinen-Krispijn, Van-der-Ende, & Verhulst, 1999). It also has been deemed appropriate for youth in residential, shelter, psychiatric (Handwerk, Lazelere, Soper, & Friman, 1999; Rey & Morris-Yates, 1992), and juvenile justice facilities (Atkins et al., 1999). The instrument has been employed in the African American population (Summerville, Kaslow, Abbate, & Cronan, 1994) and in cross-cultural studies (Achenbach et al., 1990; Verhulst, Prince, Vervuurt-Poot, & de Jong, 1989). There has been some suggestion that the YSR varies by gender and includes additional narrowband syndromes (Song, Singh, & Singer, 1994). The 1991 and pre-1991

Internalizing scales displayed remarkable similarity even though the withdrawn component was omitted from the earlier scale. Cronbach's *alpha* has been reported as .91 and test-retest reliability as .80 (Achenbach, 1991).

Focus groups were conducted with Dakotan/Lakotan parents who found the Child Behavior Checklist (CBCL)-the parent version of the YSR-to be culturally sensitive. However, participants questioned why the somatic complaints were included and interpreted being fearful or anxious as excitement rather than anxiety. Since AI children are encouraged to bond with family and friends and are discouraged from close relationships with mainstream "others," using the term "others" in the question stem was confusing to AI participants (Rosenberg Oesterheld & Haber, 1997).

Validity of Self-Report Data

The aforementioned measures rely on self-report of internalizing symptoms. Children reported significantly higher rates of problem behavior than their parents did (Stanger & Lewis, 1993; Thomas, Forehand, Armistead, Wierson, & Fauber, 1990). La Greca (1990) has defended children's self-reports due to the subjective nature of internalizing problems. Other research has supported the validity of both children and adolescents' assessment of their symptoms of depression (Moretti, Fine, Haley, & Marriage, 1985).

Predictors of Depressive Symptoms

Research findings have indicated that the timing of the first occurrence of symptoms of depression generally was in childhood, adolescence, or early adulthood (Robins & Regier, 1991). Kessler and Magee (1994) have confirmed that the early onset of depressive symptoms was a significant predictor of recurrence in adulthood. Studies have shown that girls' symptoms of depression dramatically increased with adolescence, as compared to boys' rates (Allgood-Merton, Lewinsohn, & Hops, 1990; Baron & Perron, 1986). For girls, two studies have found that the emergence of higher depressive symptom rates occurred at 13 or 14 years (Brooks-Gunn, 1991; Nolen-Hoeksema, Girgus, & Seligman, 1991).

Several researchers have pointed out that children whose parents divorce early were more likely to experience psychological dysfunction as well as depression and anxiety disorders (Harris, Brown, & Bifulco, 1990; McLeod, 1991; Tweed, Schoenbach, George, & Blazer, 1989). Economic resources proved to be the greatest difference between mother-only and two-parent families; only 50% of single mothers have incomes above the poverty line (Garfinkel & McLanahan, 1986). SES was one of the most reliable predictors of psychological well-being (Holzer et al., 1986). Lower SES was a risk factor associated with an initial occurrence of depressive symptoms (Murphy et al., 1991) as well as adolescent psychological distress (Kaplan,

Hong, & Weinhold, 1984). The economic conditions of the family were an indicator of the neighborhood context, the quality of schools, and the broader community (Menaghan, 1999).

Research findings have indicated that self-esteem acts as a protective mechanism to decrease depressive symptoms (Allgood-Merten, Lewinsohn, & Hops, 1990; Cheng & Lam, 1997; DuBois, Felner, Sherman, & Bull, 1994; Oetting et al., 1989). Oetting and colleagues (1989) found a modest negative correlation ($r = -.26$) between depressive symptoms and self-esteem among 327 reservation AI youth. Since members of cultural and racial minorities have been overrepresented in the lower economic strata, stressful life events for minority groups have more deleterious effects (Slavin, Rainer, McCreary, & Gowda, 1991). Adolescents from impoverished backgrounds experienced more negative life events (Garrison, Schluchter, Schoenbach, & Kaplan, 1989; Gore, Aseltine, & Colton, 1992). Other findings suggested that experiencing multiple, concurrent stressors placed adolescents at increased risk (Petersen, Sarigiani, & Kennedy, 1991; Simmons, Burgeson, Carlton-Ford, & Blyth, 1987).

Perceived discrimination is an additional life stressor faced by minorities (Feagin, 1991); however, racism-related stress is not captured by traditional life event inventories (Williams, Yu, Jackson, & Anderson, 1997). Research findings indicated that perceived discrimination was correlated with depressive symptoms among both adults and adolescents (Essed, 1991; Feagin, 1991; Jackson, Williams, & Torres, 1997; Noh, Beiser, Hou, & Kaspar, 1998; Rumbaut, 1994; Whitbeck, Hoyt, McMorris, Chen, & Stubben, 2001). Wright, Hirlinger, and England (1998) add that feelings of institutional discrimination increased as adolescents grew older. AI youth who identified more with their culture experienced higher levels of discrimination (Whitbeck et al., 2001).

The Role of Culture

Investigators have argued that culture may act as a protective mechanism, enhancing psychological well-being (Harrell, 2000; Zimmerman, Ramirez, Washienko, Walter, & Dyer, 1994). In particular, enculturation is viewed as a possible source of resilience in the face of adversity. Adolescents are said to be enculturated if they have a strong cultural identity, sense of pride in their culture, and participate in traditional activities (Little Soldier, 1985; Zimmerman et al., 1994). It is important to recognize that these models suggest enculturation should operate primarily as a buffer for the effects of culturally-linked stressors (e.g., discrimination) on depressive symptoms, rather than showing any main effect. Indeed, one of the criteria for a scale to be culturally unbiased is for it to have no significant association with measures of enculturation once the influence of culturally-linked stressors has been controlled.

Measurement

Sample

The data for the current paper are based on interviews with 213 children (116 boys and 97 girls) and their parents who participated in a baseline survey for a prevention study. In 1998-1999, the study was conducted on three AI reservations located in the upper Midwest. The reservations were similarly situated in rural areas with high unemployment and poverty, but were somewhat different in size and economic base. Children who were enrolled tribal members in the 5th-8th grades were eligible for participation. The eligible families were recruited by on-site AI staff using a culturally-based recruitment protocol designed by the staff and tribal advisory boards. Interviewers had tribal affiliations (in a few cases interviewers were community members who were relatives of tribal members) and were supervised directly by on-site staff. All interviews were conducted in home visits by one or two interviewers. Advisory boards were established on each reservation and provided guidance throughout the research project.

Measures

Control Variables. Missing values were handled within individual scales. Unless otherwise indicated, the mean value of answered items within a given scale was imputed when more than half of the items in a scale had legitimate values. Primary caretakers reported the following demographic variables. The mean *Age of adolescent* was 12.1 years; values ranged from 9 to 16 years, although 98% of the children were between the ages of 10 and 15 years. *Gender* was a dichotomous variable (0 = male; 1 = female); nearly half of the sample was female (46%). The family structure variable, *Male caretaker in household,* was coded “0” if the household consisted of a single female caretaker and “1” if a male was also present in the home. This variable does not refer exclusively to a biological father or stepfather of the child, because another male in the household (e.g., grandfather) may be involved in supervising the child. Men were present in over two-thirds of the households (67%). *Household income per capita* was constructed by recoding the ordinal measure of income to the midpoints and dividing by the total number of individuals in the household. Income ranged from a minimum of $278 to a maximum of $25,000 for each household member. The median household income reported was between $15,000 and $20,000.

Predictor variables. The self-esteem scale consisted of 11 items (mean imputed for 3% of cases if 9 items had legitimate values) from the Tri-Ethnic Center for Prevention Research at Colorado State University instrument. The scale assessed feelings of self-worth and likeability.

Response categories for individual items were 0 = none of the time, 1 = some of the time, and 2 = most of the time. Scale values ranged from 1.5 to 3.0 (mean = 2.6). Cronbach's *alpha* was 0.77.

The *Negative life events scale* was the sum of 13 items. Respondents specified if they were ill or injured, if they had moved, or if a new person had joined the household. They indicated whether they had broken up with or had a close friend move away, had failed a class, or were not accepted into an activity at school. Adolescents also reported a death of a friend, relative, or pet, and criminal victimization of family. Individual items within the scale were dichotomous (0 = no; 1 = yes); values ranged from 0 to 9 affirmative responses. The mean was imputed in 6% of cases if a least 7 items had legitimate values.

Adolescent's enculturation was a multiple-dimension standardized factor score of each youth's immersion in AI culture. The first dimension, the traditional activities measure, was assessed with a 2-item composite tapping involvement and participation in tribal pow-wows in the past year, knowledge and use of tribal language with 4 items, as well as 12 traditional activities. The second dimension, cultural identification, was the 6-item sum of Oetting and Beauvais' (1991) AI cultural identification measure. The items were summed and mean-imputed in 7.1% of cases if at least 4 items had legitimate values. The third dimension, traditional spirituality, was measured with a 3-item summed scale (e.g., participation, frequency, and importance) with 4.7% of cases requiring mean imputation. Of the three standardized dimensions of *adolescent's enculturation,* intercorrelations ranged from .41 to .49 and loaded onto a single factor in exploratory factor analysis.

The final predictor variable, *adolescent's perception of discrimination,* was the sum of 10 items, with the mean imputed in 4.2% of cases if at least 6 items had legitimate values. Adolescents reported how often they had been ignored, excluded, verbally insulted, or threatened with physical harm because of their ethnicity. Additional items assessed whether teachers had negative expectations of them, or whether store clerks discriminated against them because of their ethnic background. Response categories for individual items ranged from 1 = never to 3 = always. Adolescent reports ranged from 1 to 2.70. Cronbach's *alpha* for the scale was .80. To reduce skewness, a log transformation was applied.

Measures of depressive symptoms. Outcome measures were scored such that higher values indicated higher levels of depressive symptomology. First, the *TEDS* was the mean of 7 items, with mean imputed in 3% of cases, constructed from the Tri-Ethnic Center's for Prevention Research measure. Adolescents reported how often they felt sad, unhappy, depressed, lonely, lonesome, low, and bad (see Appendix A). Adolescents' responses ranged from 1 = none of the time to 3 = most of the time. Scale scores ranged from 1 to 3 (mean = 1.6). Cronbach's *alpha* was .86. Second, the *CES-D* depressive symptom scale was the sum of 7 items, with mean imputed in 7% of cases (Radloff, 1977, 1991) (see Appendix A). Response categories

ranged from 0 = 0 days to 4 = 5-7 days; scores ranged from 0 to 17 (mean = 3.5). Cronbach's *alpha* was .80. Third, the *YSR* depressive symptom scale was the sum of 6 items, with mean imputed in 1.5% of cases (Achenbach, 1991). The individual scale items are listed in Appendix A. Response categories ranged from 0 = not true to 2 = very true. Scale scores ranged from 0 to 9 (mean = 1.1). Cronbach's *alpha* was .68. To reduce skewness, a log transformation was applied to the *YSR* and *CES-D*.

Results

Intercorrelations of the Three Measures

The correlation matrix for the variables used in the study is presented in Table 1. The correlations among the three scales were compared to establish convergent validity. The CES-D and the YSR depressive symptom scales were selected because they are well-established instruments. As would be expected, the CES-D and the YSR displayed a robust positive relationship (r = .45). A stronger correlation was found between the TEDS and CES-D (r = .59), while the TEDS and YSR have a moderately strong relationship (r = .34). In terms of discriminant validity, the TEDS correlates more highly with measures of depressive symptoms than with other traditional correlates.

It is evident from these correlations that there is overlap in the measurement of depressive symptoms as well as divergence. The stronger correlation between the TEDS and CES-D may be due to the commonality in assessing sadness, loneliness, and depression, while the variation may be accounted for by the CES-D's emphasis on mainstream expectations of personal success and emotional expression (e.g., crying) that may have a different connotation in traditional culture. The YSR's suicide orientation may be another contributing factor that explains the modest correlation with the TEDS.

Reliability Coefficients and Exploratory Factor Analysis

Overall, the assessment of the internal consistency of the TEDS demonstrated that the TEDS had the highest Cronbach *alpha* value (.86). There was a slight reduction in *alpha* (.80) for the CES-D, and an appreciable decline for the YSR (*alpha* = .68). Exploratory factor analysis was employed on the 20 depressive symptoms to investigate the construct validity of the instruments, in lieu of confirmatory factor techniques due to the small sample size. All factor scores were obtained by principal components extraction and varimax rotation, with the Anderson-Rubin procedure used to produce z-score summary values of each resulting factor. This method produces factors uncorrelated with each other, with mean zero and standard deviation one.

Table 1
Correlation Matrix (*N* = 203)

	1	2	3	4	5	6	7	8	9	10	11
1 TEDS Depression	—										
2 CES-D Depression	.59**	—									
3 YSR Depression	.34**	.45**	—								
4 Age	-.14*	-.15*	-.08	—							
5 Female = 1	.01	.07	.21**	-.03	—						
6 Male in household = 1	.05	.05	-.04	-.00	-.00	—					
7 Household income per capita	-.13	-.08	.04	.14*	-.06	.08	—				
8 Self-esteem	-.26**	-.13	-.20**	-.02	.01	-.03	.05	—			
9 Negative life events	.19**	.26**	.28**	-.01	.13	-.08	-.21**	-.04	—		
10 Enculturation	.12	.19**	.20**	-.03	.15*	-.16*	-.18*	.10	.25**	—	
11 Discrimination	.16*	.23**	.19**	.23**	.07	-.14*	-.14	-.07	.46**	.25**	—
M	1.61	.65	.45	12.11	.46	.67	3.63	2.57	3.88	-.00	.37
SD	.43	.27	.18	1.44	.50	.47	.33	.29	2.14	1.01	.05

*$p < .05$; **$p < .01$

Five factors were produced. The TEDS loaded on one factor; factor loadings ranged from .66 to .76. For the CES-D, blues, fearful, failure, sad, cry, and depressed items generally loaded on a second factor; factor loadings ranged from .44 to .70. A third factor consisted of 6 loneliness and tearful expression items. The CES-D's cry (.51) and the TEDS's lonesome (.41) and lonely items (.39) cross-loaded. In addition, the CES-D's lonely (.60), and the YSR's lonely (.67) and cry (.74) items had robust loadings. The YSR suicidal items loaded on a fourth factor (.78; .82). YSR's not loved and worthless items loaded on a fifth factor (.70; .80) while CES-D's depressed affect cross-loaded (.43). This factor analysis indicates that the YSR and CES-D depressive symptom scales are not unidimensional constructs. In regard to suicidal thoughts, inferiority, and loved by others, the YSR shares little with the CES-D and TEDS. It is clear that the measures overlap the most on the loneliness/cry factor.

Correlates of Depressive Symptoms

Among traditional correlates, the TEDS was positively associated with negative life events (r = .19) and discrimination (r = .16) and negatively correlated with self-esteem (r = -.26) (Table 1). These correlations were significant and in the predicted direction. There was no significant correlation between the TEDS and gender, male caretaker in household, per capita household income, and enculturation. In regard to the CES-D, the correlations with negative life events (r = .26) and discrimination (r = .23) were significant and more robust. However, there was no association with self-esteem, but enculturation was significantly correlated with increased symptoms of depression (r = .19). Similar to the TEDS, there were no significant correlations for gender, presence of a male, and per capita income. For the YSR, as with both the TEDS and CES-D, depressive symptoms were significantly and positively correlated with negative life events (r = .28) and discrimination (r = .19). Like the TEDS, it was negatively related to self-esteem (r = -.20). The YSR measure was positively associated with enculturation (r = .20). Again, having a male in the home and income were not associated with the YSR. However, girls reported more YSR depressive symptoms than boys (r = .21).

Multivariate Models

TEDS model. Variables were entered into the ordinary least squares regression model in five stages (Table 2). In the final model, age was a significant predictor. Counter-intuitively, younger adolescents experienced more symptoms of depression ($ß$ = -.17, p < .05). The self-esteem scale was strongly negatively associated with depressive symptoms ($ß$ = -.26, p < .01).

Table 2
Regression Models Predicting TEDS Depression (*N* = 204)

Independent Variable	Model 1 B (*SE*)	Model 1 ß	Model 2 B (*SE*)	Model 2 ß	Model 3 B (*SE*)	Model 3 ß	Model 4 B (*SE*)	Model 4 ß	Model 5 B (*SE*)	Model 5 ß
Age	-.04	-.13	-.04	-.13	**-.04***	**-.14**	**-.04***	**-.14**	**-.05***	**-.17**
	(.02)		(.02)		(.02)		(.02)		(.02)	
Female	.00	.00	.00	.00	-.01	-.02	-.03	-.03	-.03	-.03
	(.06)		(.06)		(.06)		(.06)		(.06)	
Male in household = 1	.06	.06	.05	.05	.06	.06	.07	.08	.08	.09
	(.06)		(.06)		(.06)		(.06)		(.06)	
Household income per capita	-.16	-.12	-.14	-.10	-.09	-.07	-.08	-.06	-.06	-.05
	(.10)		(.09)		(.09)		(.09)		(.09)	
Self-esteem			**-.38****	**-.26**	**-.37****	**-.25**	**-.39****	**-.27**	**-.38****	**-.26**
			(.10)		(.10)		(.10)		(.10)	
Negative life events					**.04***	**.17**	**.03***	**.15**	.02	.10
					(.01)		(.01)		(.02)	
Adolescent enculturation							.04	.10	.04	.09
							(.03)		(.03)	
Adolescent discrimination									1.04	.13
									(.65)	
Intercept	2.60		3.54		3.21		3.21		2.91	
R^2	.04		.11		.13		.14		.15	
Adjusted R^2	.02		.08		.11		.11		.12	

*p < .05; **p < .01

With the addition of discrimination to the model, the effects of negative life events on depressive symptoms became nonsignificant. Contrary to expectations after controlling for other variables, discrimination did not increase depressive symptoms. Overall, the final model explained 12% of the variation in adolescents' depressive symptoms.

CES-D model. Table 3 presents the results of the same set of models for the CES-D scale. In the final model, older adolescents experienced less depression than their younger counterparts (*ß* = -.20, p < .01). Self-esteem did not increase reports of depressive symptoms. In contrast to the results for the TEDS measure, enculturation was associated with higher symptom scores on the CES-D (*ß* = .15, p < .05). Perceived discrimination was significantly related to adolescents' reports of depressive symptoms (*ß* = .18, p < .05). After controlling for discrimination, the negative life events scale was no longer significantly associated with increased levels of adolescents' symptoms of depression. Overall, the model explained 11% of the variation in the CES-D.

Table 3
Regression Models Predicting CES-D Depression (*N*= 204)

Independent Varible	Model 1 B (*SE*)	Model 1 ß	Model 2 B (*SE*)	Model 2 ß	Model 3 B (*SE*)	Model 3 ß	Model 4 B (*SE*)	Model 4 ß	Model 5 B (*SE*)	Model 5 ß
Age	**-.03***	**-.15**	**-.03***	**-.15**	**-.03***	**-.16**	**-.03***	**-.16**	**-.04****	**-.20**
	(.01)		(.01)		(.01)		(.01)		(.01)	
Female	.04	.07	.04	.07	.03	.05	.02	.03	.02	.03
	(.04)		(.04)		(.04)		(.04)		(.04)	
Male in household = 1	.03	.05	.03	.05	.04	.06	.05	.09	.06	.10
	(.04)		(.04)		(.04)		(.04)		(.04)	
Household income per capita	-.04	-.05	-.03	-.04	.01	.01	.03	.03	.04	.04
	(.06)		(.06)		(.06)		(.06)		(.06)	
Self-esteem			-.11	-.12	-.10	-.11	-.12	-.13	-.11	-.12
			(.06)		(.06)		(.06)		(.06)	
Negative life events					**.03****	**.24**	**.03****	**.20**	**.02**	**.13**
					(.01)		(.01)		(.01)	
Adolescent enculturation							**.05***	**.18**	**.04***	**.15**
							(.02)		(.02)	
Adolescent discrimination									**.91***	**.18**
									(.41)	
Intercept	1.09		1.35		1.08		1.07		.81	
R^2	.03		.05		.10		.13		.15	
Adjusted R^2	.01		.02		.07		.10		.11	

*p < .05; **p < .01

YSR Model. Table 4 presents the results for the YSR measure of depressive symptoms. In the final model, girls were significantly more likely to report higher rates of depressive symptoms (*ß* = .17, p < .05) while income increased depressive symptoms (*ß* = .16, p < .05). Self-esteem was a significant predictor, decreasing depressive symptomology (*ß* = .22, p < .01). In contrast to the analyses from the other scales, negative life events was significantly related to depressive symptoms after controlling for other variables (*ß* = .21, p < .01). Similar to the CES-D, enculturation predicted adolescents' symptoms of depression (*ß* = .15, p < .01). Consistent with the TEDS, discrimination was not a significant predictor. This final model explained 16% of the variation in depressive symptoms.

Table 4
Regression Models Predicting YSR Depression (*N* = 202)

Independent Variable	Model 1 B (*SE*)	Model 1 ß	Model 2 B (*SE*)	Model 2 ß	Model 3 B (*SE*)	Model 3 ß	Model 4 B (*SE*)	Model 4 ß	Model 5 B (*SE*)	Model 5 ß
Age	-.01	-.09	-.01	-.09	-.01	-.10	-.01	-.10	-.02	-.12
	(.01)		(.01)		(.01)		(.01)		(.01)	
Female	**.08****	**.21**	**.08****	**.21**	**.07****	**.18**	**.06***	**.17**	**.06***	**.17**
	(.03)		(.02)		(.02)		(.02)		(.02)	
Male in household = 1	-.02	-.05	-.02	-.06	-.02	-.04	-.01	-.02	-.01	-.01
	(.03)		(.03)		(.03)		(.03)		(.03)	
Household income per capita	.04	.07	.05	.08	**.08***	**.14**	**.09***	**.16**	**.09***	**.16**
	(.04)		(.04)		(.04)		(.04)		(.04)	
Self-esteem			**-.13****	**-.21**	**-.12****	**-.20**	**-.14****	**-.22**	**-.13****	**-.22**
			(.04)		(.04)		(.04)		(.04)	
Negative life events					**.02****	**.27**	**.02****	**.24**	**.02****	**.21**
					(.01)		(.01)		(.01)	
Adolescent enculturation							**.03***	**.16**	**.03***	**.15**
							(.01)		(.01)	
Adolescent discrimination									.26	.08
									(.27)	
Intercept	.41		.73		.53		.52		.45	
R^2	.06		.10		.17		.19		.20	
Adjusted R^2	.04		.08		.15		.16		.16	

**p* < .05; ***p* < .01

Conclusion

These analyses illustrate that there are both points of convergence among the measures and some marked differences. This study stresses the importance of instrumentation and the significance of culture in examining depressive symptoms among AI adolescents. These analyses reinforce the importance of critical methodological evaluation of measurement scales among cultural minorities. Cultural and social differences must be taken into account when assessing the appropriateness of measures. Symptoms of psychopathology and the meaning attached to them are not always equivalent across cultural contexts. An understanding of how AIs conceptualize their depressive symptoms is integral to constructing reliable and valid diagnostic instruments (Kleinman, 1980). This study took the first step in this direction, by evaluating depressive symptom scales among a sample of AI adolescents.

Overall, this study sought to evaluate the validity and the reliability of the TEDS. Its commonality with the YSR and CES-D depressive symptom scales is indicated by significant correlations. In addition, the TEDS' less robust, but significant, correlations with other relevant predictors supports the instrument's discriminant validity. We find evidence of a single factor underlying the TEDS measure, which reinforces its construct validity. It also shows high internal consistency.

On closer inspection, this analysis demonstrates that there are also differences among the three measures that are worth noting. Each of these instruments has respective strengths and weaknesses in this study of AI youth. Comparatively speaking, the YSR depressive symptom scale demonstrates better predictive validity. However, it wavers on aspects of construct validity and has the lowest reliability coefficient. The results suggest that it has three unique dimensions, even though it was designed to be a unidimensional construct. In terms of divergent validity, after stepping in the TEDS, all predictors except the enculturation measure remain significant. In terms of convergent validity, the YSR is more strongly associated with the TEDS depressive symptoms, but continues to predict traditional correlates of depressive symptoms as well. In a similar analysis predicting CES-D depressive symptoms, it shows a robust association with the TEDS but did not predict other theoretically meaningful constructs. In regard to construct validity, the CES-D did not have a single underlying dimension.

For the TEDS and CES-D, we found a significant negative association with age. This interesting finding seems to run counter to the general trend in the early adolescent years of higher levels of depressive symptoms increasing with age. One potential interpretation is that at younger ages AI youth internalize the feelings associated with the hardship of life on the reservation; but at older ages youth may begin to externalize in response to their situation. Gender was significant only for the YSR measure. Since the YSR is restricted to depressive symptoms, it is not related to higher female self-reports of selected somatic complaints. This is a highly replicable finding, but it seems timely to conduct research with other tribal nations to validate these findings among AI girls.

The YSR and TEDS both show a buffering effect of higher self-esteem; however, the CES-D did not. This suggests that the CES-D is unable to explain variability as well as do traditional correlates of depressive symptoms. For each of the outcomes, the effect of negative life events is positive and significant. After entering discrimination into the final TEDS and CES-D models, negative life events are not associated with depressive symptoms. Under most circumstances, after controlling for discrimination, negative life events would predict depressive symptoms. Unlike the TEDS and YSR, the CES-D was significantly related to discrimination. The CES-D results are consistent with other studies that have explored the substantive relationship between racial discrimination and psychological distress (Jackson, Brown, & Williams, 1996; Young & Takeuchi, 1998).

In regard to the protective aspects of enculturation, it has been found to reduce youths' engagement in delinquent activities such as alcohol and drug use and early sexuality. Furthermore, in a sample of 121 AI adolescents (7-18 years), enculturated youth with high levels of self-esteem were buffered from alcohol and drug use (Zimmerman et al., 1994). On the other hand, Navajo children who identified with their AI culture evidenced higher levels of academic achievement (Vadas, 1995). In addition, a positive cultural identity may contribute to a sense of efficacy and self-esteem that may increase academic success (Hornett, 1990).

Therefore, the authors were perplexed by the relationship between enculturation and both YSR and CES-D depressive symptoms. The CES-D and YSR estimates evidence a main effect of enculturation; these findings suggest that greater involvement in AI culture is predictive of higher levels of depressive symptoms. Enculturation was significantly associated with both measures after introducing the effects of discrimination. This suggests that they may tap some cultural dimensions even after controlling for correlates of culturally-based stressors. In contrast to the TEDS models, the CES-D and YSR models indicate that youth who are more enculturated are more likely to experience depressive symptoms. This relationship runs counter to the hypothesized relationship.

We may be able to reconcile these conflicting findings by noting that the protective effects of enculturation are present only at higher levels of cultural identification. The YSR and CES-D may be discriminating adolescents with lower levels of enculturation, which in turn may create identity confusion and increase depressive symptoms. In a study of AI adults who reported high levels of participation in traditional activities, tradition protected them from CES-D depressive symptoms even in the face of discrimination. For those reporting low or moderate levels of traditional participation, discrimination eroded the protective influence of cultural practices. This indicates that there may be a price for participation in traditional activities for some adults. When traditional practices result in higher discrimination, it increases the likelihood of depressive symptoms among those who are less embedded in traditional culture (Whitbeck, McMorris, Hoyt, Stubben, & LaFromboise, 2002).

Some of the limitations of this study must be addressed. They include the use of cross-sectional data, sampling technique, and single-reporter accounts. Care must be taken in drawing conclusions about the processes at work because the data do not allow one to evaluate these mechanisms over time. The sample was drawn from AI reservations in the Upper Midwest, which restricts the ability to generalize to other tribes. Readers also should be aware of the bias associated with self-report data; while some of the data on household composition and finances come from parents, the adolescents were the sole source of information about depressive symptoms.

This study makes clear that the predictors of depressive symptoms are dependent on the choice of instrument; this has a great impact on the inferences made about AI culture. On the surface, the measures appear quite similar and are moderately to highly intercorrelated. Each of these measures clearly taps some degree of depressive symptoms. However, important differences are noted. The potential shortcoming of the TEDS measure and the strength of the YSR appear to lie in predictive validity. The TEDS has more modest zero-order association with standard predictor measures, resulting in lower estimates in multivariate models. The CES-D has a similar but less pronounced weakness. The CES-D and YSR both failed to demonstrate a single-factor structure. The CES-D and the YSR measures have patterns indicating that enculturation is a risk factor for depressive symptoms. Further research needs to be carried out to determine if these instruments are discriminating youth with lower levels of enculturation that in turn may lead to internalization symptomology. These measures demonstrated strengths and potential weaknesses that should be taken into account when assessing depressive symptoms among AI youth. In sum, while these findings do not generate unequivocal support for any one of the depressive symptom measures, this study underscores the need to reevaluate existing measures of depressive symptomology and to develop depressive symptom instruments sensitive to cultural differences.

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Appendix A: Scale Items

Tri-Ethnic Depression Scale

1. I am unhappy
2. I feel sad
3. I am lonesome
4. I feel low
5. I am depressed
6. I am lonely
7. I feel bad

Response Categories: 1 None of the time, 2 Some of the time, 3 Most of the time

CES-D Depressed Affect

1. You felt depressed
2. You felt that you could not shake off the blues even with help from your family or friends
3. You thought your life had been a failure
4. You felt fearful
5. You felt lonely
6. You had crying spells
7. You felt sad

Response Categories: 0 Days, 1 - 2 Days, 3 - 4 Days, 5 - 7 Days

Youth Self-Report Depression

1. I feel lonely
2. I cry a lot
3. I deliberately try to hurt or kill myself
4. I feel that no one loves me
5. I feel worthless or inferior
6. I think about killing myself

Response categories: 0 Not True, 1 Somewhat True, 2 Very True