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Predictors of depression in American Indian adolescents

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Discriminant analysis was conducted to examine the
empirical use of psychosocial variables and stressful life
events scales in classifying depressed and non-depressed
American Indian adolescents using a standardized criterion
measure. Subjects attending a Bureau of Indian Affair
boarding school were administered a mental health screening
survey and were interviewed within four weeks using the
Diagnostic Interview Schedule for Children-Revised (DISC-R).
Three models of discriminant analysis were used to determine
the overall and incremental variance contributed by the

stressful life events scales and the related psychosocial variables (i.e., gender, perceived social support from family and from friends, self-esteem, and depressive symptoms) to the criterion variable of depression. Results indicated that none of the models contributed significantly to the overall and unique variance in the classification of the groups. It is recommended that psychosocial correlates other than those that had been identified in this study (e.g. substance abuse, suicide behaviors, etc.) need to be examined and considered in future examination of American Indian adolescent depression.

PREDICTORS OF DEPRESSION IN AMERICAN

INDIAN ADOLESCENTS

by

QUANG DUONG-TRAN

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INTRODUCTION

The proposed study examines the empirical use of psychosocial predictors and symptom scales in predicting diagnosed depression among American Indian adolescents using a standardized criterion measure. In a recent literature review, Berlin (1986) states that psychopathology among American Indian adolescents appears qualitatively similar to that found in the rest of the United States adolescent population. However, Berlin notes substantial quantitative differences in psychopathology in comparison to non-Native American adolescents.

Beiser (1981) describes the influence of external events on the development of mental illness in American Indians. He points out that the correlates of poverty, chaotic family living, and the large increase in single-parent families appear to be the most critical etiological factors. Ablon, Metcalf, and Miller (1967) further ascribe most psychopathology among American Indian children and adolescents to forced acculturation with the subsequent loss of traditional family, clan, and tribal roles. Past literature characterizes typical development for American Indian children and adolescents with early family disruptions and dramatic sociocultural upheavals.

There is evidence found in American Indian adult psychopathology which attributes these major changes to sociocultural stress and differing values of Anglo and Indian societies (Krause & Buffler, 1979).

There are reasons to believe that American Indian children and adolescents suffer major psychopathologies as a result of disruptive changes in their early development and social milieu. However, depressive disorders in American Indian adolescents still remain unexplored due to inadequate assessment techniques and weak methodological designs. Measurement problems of depressive disorders in American Indian adolescents are primarily attributed: (1) to the lack of criterion-related measures; (2) to the exclusive Caucasian standardized norms for existing symptom scales where cultural differences are not addressed; and, (3) to the inadequacies of life event studies in dealing with culturally specific life stress.

This study focused on determining the psychosocial predictors of depression among American Indian adolescents that would contribute significant knowledge to the issues of early detection, assessment, and diagnosis. These findings can be significant in future preventive intervention efforts in American Indian adolescent depression.

ADOLESCENT DEPRESSION

Although criterion-related diagnosis of depression in
the adult population has advanced significantly in recent
years, child and adolescent depressive disorders remain
relatively unexplored. Research on adolescent depression
has suffered from inadequate assessment techniques and the
lack of standardized diagnostic systems. The use of a
standard protocol (e.g., Diagnostic Interview for Children
and Adolescents and Diagnostic Interview Schedule for
Children) based on DSM-III classification system (APA, 1980)
has been recommended in the assessment of mental disorders
in children to improve the diagnosis of depression in
at-risk children (Pfeffer, 1986). Acceptable reliability
has been demonstrated in using diagnostic clinical
interviews (e.g. K-SADS) as a means of gathering diagnostic
data and has shown that it can be very helpful in studying
the course of childhood depression (e.g., Puig-Antich,
Chambers, & Tabrizi, 1983). One of the many advantages of
the semi-structured diagnostic interview format is that it
allows the clinician to make objective observations and draw
conclusions about the child's emotional state based on
ratings derived from the child's own report (Pfeffer, 1986).

DEPRESSION IN ADOLESCENCE USING

CRITERION-RELATED MEASUREMENT

Puig-Antich, Perel, Lupatkin, Chambers, Tabrizi, King, Goetz, Davies, and Stiller (1987) reviewed past studies of childhood depression and concluded that the majority of research in depressive disorders were flawed by inadequate assessment methods and weak methodological designs. They found that in the majority of studies the diagnosis was made in clinical fashion without structured interviews or specification of diagnostic criteria of the specific symptoms to be observed.

Similarly, Hodges and Siegel (1985) expressed concern that the prevalence of depression in children and adolescents is difficult to evaluate due to the lack of generally accepted methods of assessment and diagnostic criteria. In previous research studies the prevalence rates of depression in children have been found to fluctuate considerably depending on factors ranging from the population studied to the diagnostic criteria and evaluation procedures used. For example, prevalence rates for depression among children have been found to vary from 0.14 percent to 59 percent (Kashani, Husain, Shekim, Hodges, Cytryn, & McKnew, 1981; Kashani & Simonds, 1979; Lefkowitz & Testiny, 1982). The wide fluctuation in prevalence rates presents a major difficulty in reliably assessing depression

without criterion measures standardized against DSM-III diagnostic criteria. Underscoring the potential problems in measurement of depressive disorders, Carlson and Cantwell (1979) found that less than half of a sample of adolescents actually met full DSM-III criteria for depression who were reported being depressed based on a self-report screening index of symptom scales.

DEPRESSION IN SPECIAL POPULATIONS

Cross-Cultural Issues in Assessment of Depression

Issues in ethnocultural research have posed challenging problems of methodology and measurement of mental disorders in ethnic minorities. Western concepts of depression, for instance, traditionally assume a covariation of personality variables and depression (Marsella, 1987). There are inherent shortcomings with this conceptualization in explaining the phenomenon of depression. The cross-cultural literature has implicated ecological influences in that many aspects of depressive disorders are partly determined by the cultural factors in one's social environment (Marsella, Sartorious, Jablensky, & Fenton, 1985).

Depression among Non-Caucasian Populations

Epidemiologic research has shown a high prevalence of chronic somatic symptoms in non-Caucasian populations that might have potential significance in the etiology of

depressive disorders. However, the paucity of criterion-related studies of depression in special populations is critical in terms of the inadequacy of detection and treatment of depression in these populations. For instance, Kaplan, Roberts, Camacho, and Coyne (1987) reported a higher risk for depressive symptoms among Blacks than non-Blacks in their study. However, a criterion measure was not used in their assessment. This type of study typifies the clinical research inadequacies concerning special populations and consequently contributes to the shortcomings in the diagnosis of depression (e.g., Aldwin & Greenberger, 1987). Vega, Warheit, and Meinhart (1983) expressed similar shortcomings in Hispanic mental health research by noting that the bulk of ethnic studies are predominantly based on nondiagnostic, statistically-derived symptom indices. The heavy reliance on symptom scales without criterion-related diagnoses precludes uniform outcome comparisons and validation of diagnostic prevalence across populations.

Depression in American Indian Adolescents

Berlin (1987) cited many psychosocial factors potentially contributing to both American Indian child and adolescent psychopathology without specifically focusing on the psychosocial predictors and prevalence of depression in this population. The prevalence of depression in the

American Indian population has been suggested to be higher than the prevalence rate in the general population (Beiser, 1974). Nevertheless, there is little empirical data to support this assumption. Baseline information on the onset and development of depressive illnesses among Native American adolescents are nonexistent. Several studies have estimated the prevalence of major psychopathologies among American Indian children and adolescents. Based on treatment utilization rates, Beiser and Attneave (1982) found that Indian adolescents were at higher risk for entering treatment for psychiatric disoders than non-Indian children. In a study of boarding schools, Kleinfeld and Bloom (1977) reported that 49 percent of the 132 Alaskan Eskimo children had school-related social or emotional problems. Similarly, Odgen (1970) reported that Indian adolescents are at higher risk for committing suicide than non-Indians (Ogden, 1970). However, these studies characterize the typical limitation of American Indian research where systematic assessment and diagnosis of depressive disorders are rarely examined.

Cultural Factors in the Assessment of Depression

Vega, Hough, and Miranda (1985) posit that the experiencing of stress is universal, but the unique relationship between individuals and their environments is culture-specific and demands special attention to the

suspected etiological relationships. Further, the authors recommend that it is critically important to closely examine cultural variations, cognitive processes, and coping behaviors within particular ethnic groups in order to more precisely identify factors associated with both stress and risk for mental illness. Similarly, Fairbank and Hough (1981) insist that the identification of the universe of events significant to a given culture is crucial because quite different events are significant indicators of life change in different cultures.

The Relation of Life Events and Depression

Stressful life events have been linked conceptually to symptomatology and depressive disorder (e.g., Ensel, 1986; Lin & Ansel; Paykel, 1974; Tausig, 1986). Kaplan, Robbins, and Martin (1983) suggest that exposure to life events can undermine feelings of self-esteem by disrupting the person's repertoire of coping responses, or by increasing demands upon the individual and thus increasing the probability of failing to meet these demands. Similarly, Brown and Harris (1978) suggest that an event can "trigger" an onset of psychiatric impairment by forcing an individual to see his or her life situation in a new or more negative light.

Significant correlations have been found between life events and measures of health and illness, psychological

disturbance, and accidents for adolescents (e.g., Gad & Johnson, 1980; Johnson & McCutcheon, 1980). In a cross-sectional study of early adolescent life stress, Swearingen and Cohen (1985a) found a significant relation between young adolescents' negative events and their depression and anxiety.

SOCIAL SUPPORT IN STRESSFUL LIFE EVENTS

In a structural-equation study of social support, undesirable life events, and depression among adults, social support shows significant direct effects on change in depression and as a mediating factor for undesirable life events (Lin, 1981). The author (Lin, 1981) concludes that social support affects depression contemporaneously and over time, as well as mediating the potential effect of undesirable life events on depression. Similar findings were found in a study of peer social support on symptomatology in adolescents. Peer support was found to have a significant direct effect on symptom level (Walker & Greene, 1986). However, a differential significant effect was found among males and females. Walker and Greene (1986) reported that the symptom levels for females with high peer social support approached those for females with low peer support as negative life events increased. In the same study, males with low peer support reported more symptoms

when negative life events increased than males with high peer support. However, at low levels of negative life events, peer support was unrelated to males' symptomatology.

PREDICTORS OF DEPRESSION IN AMERICAN INDIAN ADOLESCENTS

This study focused on examining the empirical use of psychosocial predictors and symptom scales in predicting diagnosed depression among American Indian adolescents using a standardized criterion measure.

Issues of assessment and diagnosis of depression in special populations remain inconclusive which is partly attributable to inadequate assessment techniques and weak methodology. A lack of empirical identification of psychosocial predictors of depression precludes a systematic understanding of potential causes and symptomatology of depression in special populations. Although the American Indian literature discussed earlier provides preliminary epidemiological data into serious psychological and adaptational problems among American Indian adolescents, there is little research attempting to investigate depression and related psychosocial predictors in this particular age group.

Figure 1 adapted by Vega, Hough, and Miranda (1985) from the Rahe-Arthur conceptualizations (Rahe & Arthur, 1978) shows an interactive model of potential correlates

MENTAL HEALTH

OUTCOMES

STRESSORS

Life changes and persistent strains
Academic
Interpersonal
Residential
Cultural
Peer Pressure

Gender→

MEDIATORS

Friend Support
Family Support

Loss of self-esteem
Elevated symptomatology
Depression (DSM-III)
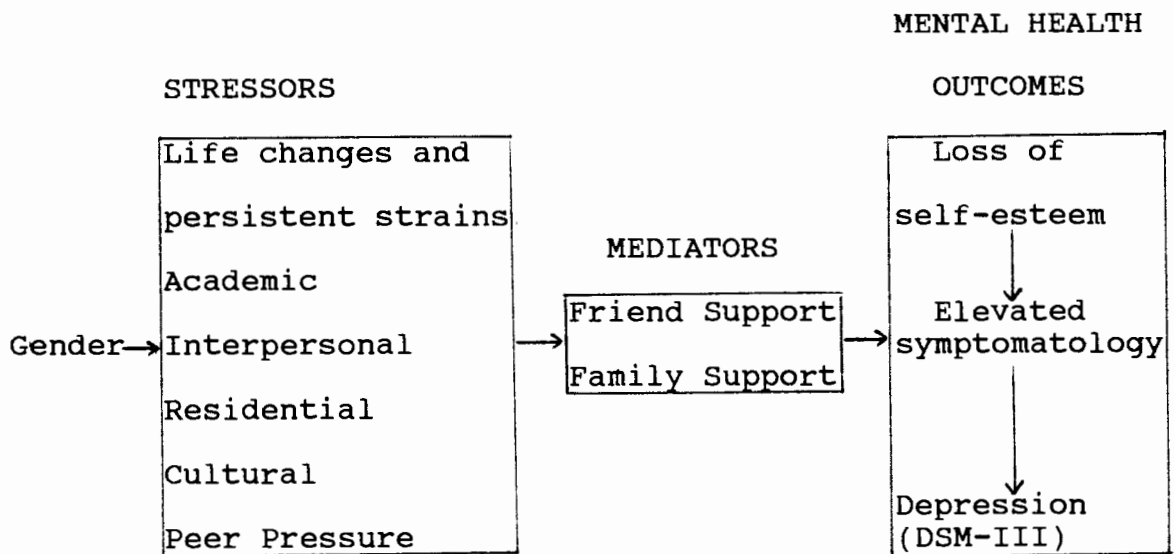
Figure 1. A schematic of interactive factors in
American Indian adolescent depression.

that lead to depressive disorders. It depicts the relationships and interaction between gender, life stressors, social support mediators, and negative mental health outcomes. According to the schematic, depression indicated by an increase in depressive symptoms which may have resulted from a loss in self-esteem. In the same framework, stressful life events are shown to have either a direct effect on depression or an indirect effect through which social support mediators lessen the negative impact that may lead to depression. Finally, gender renders a potential direct effect on depression through the lack of self-esteem and the onset of depressive symptoms.

It is hypothesized that gender, stressful life events, perceived social support from friends and family, self-esteem, and depressive symptoms will be significant predictors of depression in American Indian adolescents.

Past research has consistently shown a linear relationship between life stress and the occurrence of depressive symptoms leading to depression through the mediating variables of social support and self-esteem. The Indian Adolescent Stressful Life Events Inventory is a newly developed scale (Dinges, Joos, & Clarke, 1987) still lacking substantive psychometric data of either construct or predictive validity. In this study, five stressful life event (SLE) scales with high internal consistency (alphas

ranging from .82 to .88) of the eight factor-analytic scales of the Indian Adolescent Stressful Life Events Inventory will be used to predict depression. Several research questions regarding the scale's utility and validity will be examined in this study. How well do the five SLE scales identify depression among American Indian adolescents? Or, how much more can these SLE scales additionally contribute to predicting depression aside from gender, perceived social support from friends (PSS-FR) and from family (PSS-FA), self-esteem (Esteem), and depressive symptoms (CES-D)?

Discriminant analyses will be conducted to determine the potential variance contribution of specific psychosocial variables in the classification of depressed vs. non-depressed American Indian adolescents. Three models of discriminant analysis will be used to determine the increment in proportion of variance contributed by the SLE factor scales and related psychosocial variables to the criterion variable of depression. Model 1 presented in Table I will consist of Gender, PSS-FA, PSS-FR, Esteem, and CES-D, and the five SLE scales. This model will determine the amount of variance the entire set of discriminating variables contributes to the prediction of depression. Model 2 will consist of Gender, PSS-FR, PSS-FA, Esteem, and CES-D as shown in Table II. This model will demonstrate whether these psychosocial variables contribute any variance

TABLE I

DISCRIMINATING AND CRITERION VARIABLES
(MODEL 1)

Discriminating Variables   Criterion Variable

GENDER

PSS-FA

PSS-FR   DEPRESSION

ESTEEM

CES-D

ACADEMIC DEMANDS

INTERPERSONAL CONFLICTS AND TENSIONS

SCHOOL ENVIRONMENT/DISCIPLINE

LOSS OF CULTURAL SUPPORTS

SOCIAL REJECTION/PEER PRESSURES

Notations: PSS-FR=Perceived Social Support from Friends;
PSS-FA=Perceived Social Support from Family; ESTEEM=
Self-esteem; CES-D=Center for Epidemiologic
Studies-Depression Scale

in predicting depression in American Indian adolescents. In Table III, Model 3 will consist only of the five SLE scales. Comparisons of these three models will enable the determination of the amount of unique variance accounted for by the five SLE scales in predicting depression above and beyond the variance accounted for by the psychosocial variables alone. The results will also indicate the amount of variance each set of variables (SLE scales and psychosocial variables) account for on their own and jointly.

TABLE II

PSYCHOSOCIAL VARIABLES
(MODEL 2)

Discriminating Variables   Criterion Variable

GENDER

PSS-FA

PSS-FR   DEPRESSION

ESTEEM

CES-D

Notations: PSS-FR=Perceived Social Support from Friends;
PSS-FA=Perceived Social Support from Family; ESTEEM=
Self-esteem; CES-D=Center for Epidemiologic
Studies-Depression Scale

TABLE III

STRESSFUL LIFE EVENTS VARIABLES
(MODEL 3)

Discriminating Variables   Criterion Variable

ACADEMIC DEMANDS

INTERPERSONAL CONFLICTS AND TENSIONS

SCHOOL ENVIRONMENT/DISCIPLINE   DEPRESSION

LOSS OF CULTURAL SUPPORTS

SOCIAL REJECTION/PEER PRESSURES

Notations: PSS-FR=Perceived Social Support from Friends;
PSS-FA=Perceived Social Support from Family; ESTEEM=
Self-esteem; CES-D=Center for Epidemiologic
Studies-Depression Scale

METHOD

SUBJECTS

Subjects consisted of 95 American Indian high school
students 13 to 20 years old enrolled at Bureau of Indian
Affairs (BIA) Boarding High School for grades 9 to 12.
There were 43 males and 52 females. Seventy-six Ss had no
diagnosis of mental disorders including depression and 19 Ss
had a known diagnosis of Depression or Dysthymia according
to DSM-III criteria.

INSTRUMENTS

The Center for Epidemiologic Studies-Depression Scale
(CES-D; Radloff, 1977) is a 20-item scale which measures the
current level of depressive symptomatology in the general
population with emphasis on the affective component of
depressed mood. Respondents were asked the frequency with
which they experienced each of the symptoms during the
previous week, with response categories ranging from 1, less
than one day, through 4, five to seven days duration of
symptoms. Although the CES-D is not a diagnostic
instrument, a cutoff score of 16 or above is traditionally
used as measure of significant depressive symptomatology.

Indian Adolescent Stressful Events Inventory (Dinges,

Joos, & Clarke, 1987) is an 85-item instrument composed of stressful life events derived from available inventories (Dohrenwend & Dohrenwend, 1974; Zitzow, 1984) and items that focus specifically on stressful life events for Indian adolescents. The latter items were developed through interviews with staff and students at the BIA boarding school.

Perceived Social Support Inventory (PSSI; Procidano & Heller, 1983) is a 40-item self-report questionnaire designed to measure the respondent's satisfaction with perceived social support received from friends and family. The PSSI has been shown to be a homogenous measure with Cronbach's alpha close to .90 among college students (Procidano & Heller, 1983). It also demonstrates moderate construct validity with other symptom scales (e.g., California Psychological Inventory, Interpersonal Dependency, Multiple Affect Adjective Checklist) with correlation coefficients ranging from .10 to .40 (Procidano & Heller, 1983). For each item, the response indicative of perceived social support was scored a +1 so that scores ranged from 0, indicating no social support, to 20, indicating maximum perceived social support, as provided by family or friends. For this study the indefinite response category was eliminated and adolescents were required to respond YES, or NO to items.

Self-Esteem Scale is a seven-item scale used by Oetting and Beauvais (1984) and was included in the survey to permit examination of the importance of this variable in mental health screening efforts. Self-esteem is considered an important core personality variable throughout the human life span. Low self-esteem is considered a predisposing condition to mental health risks and is often one of the symptoms of diagnosable mental disorders, such as major depressive disorder according to DSM-III criteria.

Diagnostic Interview Schedule for Children (DISC; Costello, Edelbrock, Dulcan, Kalas, & Klaric, 1984) is a structured, standardized interview developed for epidemiologic purposes. The reliability of the DISC, measured by diagnostic agreement between psychiatrists and by lay interviewers both using the DISC was measured by the degree of concordance between DISC-generated diagnoses and those resulting from psychiatric interview. The concordance rates range between 79 and 96 percent.

INTERVIEWERS

The selection criteria for the diagnostic interviewers included: (a) previous training and experience in mental status interviewing; (b) bachelor's or master's degrees in clinical, school, or counseling psychology, or social work; and, (c) well-developed professional skills necessary to establish good rapport with Indian youth. Interviewers

participated in a "Diagnostic Interviewing Seminar," led by an experienced DISC interview trainer in which they received intense didactic and practicum training in interviewing procedures and the DISC response format. Interviewers were continuously supervised in the field and participated in several group meetings in which they presented and discussed difficult diagnostic interview issues.

Four Native American interviewers with extensive experience and knowledge of the Indian population and familiarity with the boarding school itself were trained in using the DISC.

PROCEDURE

All Ss were administered the CES-D as a screening instrument along with the other scales to measure stressful life events, self-esteem, and social support. Within five weeks of the original screening, Ss were interviewed using the Diagnostic Interview Schedule for Children (DISC; Costello et al., 1984). Interviews were conducted in private offices in the school setting or in private areas of the dormitory living environment. Interviews were conducted during school hours and in the evenings after school or on weekends.

Survey objectives and questionnaire instructions were read to all subjects prior to the survey administration. Informed consent was obtained from the subjects prior to

participation. Subjects completed the questionnaires within a 50-min class sesssion. Questionnaires were carefully checked for incompleteness, random responses, and invalidating characteristics. Incomplete questionnaires were eliminated from the screening data.

Treatment of files and records were in accordance with the ethical standards of the American Psychological Association (APA).

RESULTS

The discriminant variables used to classify depressed vs non-depressed American Indian adolescents are described in Table IV. The criterion measure for classifying depressed and non-depressed groups is a diagnosis generated by the Diagnostic Interview Schedule for Children (DISC) that meets full criteria of depression in the DSM-III classification. Means and standard deviations for these variables on the total sample of 95 are presented in Table V. Table VI gives the means and standard deviations for males and females, separately. Table VII presents the means and standard deviations separately for the depressed group and non-depressed group. The sample contained 19 depressed subjects, nine males and ten females; 76 non-depressed subjects were in the sample, 34 males and 42 females.

Cronbach's alpha coefficients, indicating item consistency (Cronbach, 1970), for the measured psychosocial and stressful life event scales are summarized in Table VIII. All alphas are acceptable with the exception of PSS-FR which has a low coefficient of .46, indicating poor item consistency.

TABLE IV

VARIABLE DESCRIPTION

<u>Variable</u>	<u>Description</u>
Depression	Criterion measure (Depression or Dysthymia)
Gender	Male or Female
PSS-FA	Perceived Support from Family
PSS-FR	Perceived Support from Friends
Esteem	Self-Esteem
CES-D	Depressive Symptoms
Academic Demands	Stressful Life Events
Interpersonal Conflicts and Tensions	Stressful Life Events
School Environment/ Discipline	Stressful Life Events
Loss of Cultural Supports	Stressful Life Events
Social Rejection/ Peer Pressure	Stressful Life Events

TABLE V

MEANS AND STANDARD DEVIATIONS

	M	SD
PSS-FA	14.45	4.85
PSS-FR	13.36	3.48
Esteem	14.72	4.98
CES-D	18.07	9.11
Academic Demands	24.79	12.15
Interpersonal Conflicts	19.34	10.30
School Environment	15.15	9.78
Cultural Supports	18.57	10.63
Peer Pressure	11.59	7.29

TABLE VI

MEANS AND STANDARD DEVIATIONS
FOR MALES AND FEMALES

	Male		Female	
	M	SD	M	SD
PSS-FA	13.69	4.83	15.14	4.82
PSS-FR	13.00	2.96	13.65	3.85
Esteem	13.98	5.17	15.48	4.73
CES-D	15.00	8.84	20.62	8.60
Academic	25.71	11.80	24.03	12.49
Interpersonal Conflicts	17.12	9.03	21.17	10.98
School Environment	13.87	9.75	16.20	9.78
Cultural Supports	18.59	11.43	18.55	10.03
Peer Pressure	10.81	7.50	12.24	7.11

TABLE VII

**MEANS AND STANDARD DEVIATIONS OF
PREDICTOR VARIABLES FOR
DEPRESSION DIAGNOSIS**

Predictor Variable	Depressed		Non-Depressed	
	M	SD	M	SD
Model 1				
PSS-FA	13.21	6.40	14.87	4.25
PSS-FR	12.47	3.56	13.54	3.40
Esteem	16.75	4.97	17.39	4.17
CES-D	23.00	10.67	16.84	8.30
Academic Demands	26.89	12.23	24.26	12.15
Interpersonal Conflicts	22.63	10.35	18.51	10.19
School Environment	16.53	9.96	14.80	9.78
Cultural Supports	21.65	12.65	17.80	10.01
Peer Pressure	13.42	7.91	11.11	7.06

TABLE VIII

SCALE RELIABILITY

Scale	Cronbach's Alpha
PSS-FA	.68
PSS-FR	.46
Esteem	.89
CES-D	.86
Academic Demands	.88
Interpersonal Conflicts	.88
School Environment	.85
Cultural Supports	.88
Peer Pressure	.82

The discriminating variables were divided into two sets. Set one consisted of psychosocial variables: gender, self-esteem (Esteem), depressive symptoms (CES-D), perceived support from friends (PSS-FR) and family (PSS-FA). Set two consisted of stressful life events scales: Academic Demands, Interpersonal Conflicts, School Environment, Cultural Supports, and Peer Pressure. To test the incremental and combined contribution of the two sets of variables used to discriminate between depressed and non-depressed American Indian adolescents, hierarchical discriminant analysis was computed using three models. Model 1 contained Gender, Esteem, CES-D, PSS-FA, PSS-FR, Academic Demands, Interpersonal Conflicts, School Environment, Cultural Supports, and Peer Pressure. Model 2 contained Gender, Esteem, CES-D, PSS-FA, and PSS-FR. Model 3 contained Academic Demands, Interpersonal Conflicts, School Environment, Cultural Supports, and Peer Pressure.

Table IX summarizes the canonical correlations and Wilk's Lambdas for Models 1, 2, and 3. Model 1, which represents the overall contribution of both the psychosocial variables and stressful life event scales, showed a weak association between the discriminant function of these variables and depression. Model 1 accounted for 12 percent of the variance in depression but was not significant in classifying the groups $F(10,84) = 1.15$. The

TABLE IX

CANONICAL CORRELATIONS, STRUCTURE COEFFICIENTS
AND WILK'S LAMBDAS OF DEPRESSED VS.
NON-DEPRESSED AMERICAN INDIAN
ADOLESCENTS

	Canonical Correlations	Adjusted Canonical Correlations	Wilk's Lambda	F-ratio	Structure Coefficients
Model 1	.35	.23	.88	1.15a	
Gender					-.06
PSS-FA					-.40
PSS-FR					-.36
Esteem					.59
CES-D					.78
Academic Demands					.25
Interpersonal Conflicts					.46
School Environment					.20
Cultural Supports					.42
Peer Pressure					.37
Model 2	.31	.25	.90	1.88b	
Gender					-.07
PSS-FA					-.45
PSS-FR					-.40
Esteem					.66
CES-D					.88
Model 3	.20	.09	.96	0.72c	
Academic Demands					.44
Interpersonal Conflicts					.81
School Environment					.36
Cultural Supports					.74
Peer Pressure					.65

a   F(10,84)
b,c F(5,89)

overall Wilk's Lambda and canonical correlation coefficient for Model 1 were .88 and .35, respectively.

Model 2 indicated a similar relationship when only the psychosocial variables are included in the model. Model 2 has Wilk's Lambda and canonical correlation coefficients of .90 and .31, respectively, and accounts for approximately ten percent of the variance in depression. Model 3, which consisted of the stressful life event scales, accounted for even less variance, approximately four percent, and had a canonical correlation coefficient of .20.

Examining the increment of variance between the three models, it can be seen that the stressful life events scales account for only two percent of the variance in depression above and beyond the variance that is explained by the psychosocial variables. Although stressful life events account for four percent of the total variance in depression, half of this variance is already accounted for by the psychosocial variables.

Although none of the models were significant, the structure coefficients for the discriminating variables presented in Table IX indicated moderate to high similarities between the discriminating variables and the discriminant function. Structure coefficients in discriminant analysis use simple bivariate correlations and are not affected by the simultaneous relationships with other variables (Pedhazur, 1986). As a rule of thumb, it is

suggested that structure coefficients greater than .30 be
treated as meaningful. The relative magnitude of structure
coefficients is then used as an indication of relative
importance of variables on a given function or dimension.
In Model 1, PSS-FR, PSS-FA, Esteem, CES-D, Interpersonal
Conflicts, Cultural Supports, and Peer Pressure have
structure coefficients ranging from .36 to .78. The
associations imply that these variables play the largest
role in predicting depression, while School Environment,
Academic Demands, and gender contribute significantly less.
Structure coefficients for Model 2 also indicated the
strongest relationships for PSS-FR, PSS-FA, Esteem, and
CES-D. The stressful life event scales in Model 3 all have
strong similarities with the discriminant function with all
structure coefficients greater than .35. It should be noted
that gender in Models 1 and 2 has extremely low structure
coefficients, suggesting that gender is not important in
predicting depression in this sample. Table X presents the
standardized coefficients for the three models.

In an attempt to determine why the models of both
psychosocial variables and stressful life events were not
Significant in predicting depression, the intercorrelations
of these variables and their correlations with depression
were examined. The correlation matrix for all variables is
presented in Table XI. Although gender correlates highly
with CES-D and Interpersonal Conflicts, its low correlation

TABLE X

STANDARDIZED CANONICAL COEFFICIENTS

Variable	Model 1	Model 2	Model 3
Gender	-.5271	-.3959	
PSS-FA	-.1356	-.1215	
PSS-FR	.0502	.0503	
Esteem	.4424	.3618	
CES-D	.6866	.8487	
Academic Demands	-.8324		-.4612
Interpersonal Conflicts	.5408		1.0333
School Environment	.0130		-.4806
Cultural Support	.2840		.4629
Peer Pressure	.0852		.3169

TABLE XI

INTERCORRELATION MATRIX

	GENDER	PSS-FR	PSS-FA	ESTEEM	CESD	SLE1	SLE2	SLE3	SLE4	SLE5	DEPRESS
GENDER	--										
PSS-FR	.09	--									
PSS-FA	.15	.36**	--								
ESTEEM	.15	-.31**	-.03	--							
CESD	.31**	-.33**	-.38**	.48**	--						
SLE1	-.07	.00	-.04	.29*	.40**	--					
SLE2	.20*	.03	-.02	.31**	.51**	.79**	--				
SLE3	.12	.03	.14	.20	.33**	.78**	.68**	--			
SLE4	-.00	.06	.01	.15	.33**	.61**	.63**	.62**	--		
SLE5	.10	-.08	.08	.12	.43**	.59**	.63**	.68**	.67**	--	
DEPRESS	-.02	-.16	-.17	.34**	.27**	.09	.16	.07	.15	.08	--

with the criterion measure of depression is consistent with
the low structure coefficients in both Models 1 and 2.
Esteem and CES-D are significantly related to depression at
p < .005. CES-D is significantly related ($\underline{p}$ < .005) to all
the psychosocial variables and the stressful life event
scales. Esteem has significant correlations with CES-D,
Academic Conflicts, and Interpersonal Conflicts. The
stressful life events scales were not significantly related
to depression; however, these scales were highly
intercorrelated with correlations ranging from .60 to .79.

As a summary, the lack of significance of all three
models in predicting depression indicates potential
misclassifications of cases into depressed and
non-depressed groups using a combination of the
discriminating variables. Table XII reports the case
classification of American Indian adolescents with
depression and those with no diagnosis. Seventy percent of
non-depressed American Indian adolescents were correctly
classified into the non-depressed group. However, 30
percent were misclassified into the depressed group. For
those American Indian adolescents who were depressed, 63
percent were correctly identified as depressed and 36
percent were incorrectly identified. Based on the
classification percentages, the discriminant analysis
appears to function better at classifying non-depressed than

TABLE XII

CLASSIFICATION MATRIX OF NON-DEPRESSED
(NO DIAGNOSIS) VS. DEPRESSED
(DEPRESSION) GROUPS

	Non-Depressed (No Diagnosis)	Depressed (Depression)
Non-Depressed (No Diagnosis)	53 (70%)	23 (30%)
Depressed (Depression)	60 (63%)	35 (37%)

depressed American Indian adolescents. This tendency could be related to the small subject size, the at-risk nature of the study sample, and the unequal number of depressed and non-depressed subjects.

DISCUSSION

The psychosocial variables and stressful life events in
Models 1, 2, and 3 failed to contribute significantly to the
prediction of depression in American Indian adolescents.
The failure of Model 1 to account for a significant amount
of variance in predicting depression suggests that
psychosocial variables such as gender, perceived social
supports, depressive symptoms, self-esteem, and stressful
life events may not be important predictors of depression in
American Indian adolescents. However, any conclusions from
these findings without further examination of the
methodological issues such as the diagnostic criteria of
depression in DSM-III or the sample characteristics would be
seriously misleading. These concerns will be discussed
below.

Although the hypothesized models of psychosocial
variables and stressful life events were not significant in
classifying depressed vs. non-depressed American Indian
adolescents, examining the relationships among the
discriminant variables hopefully will help explain this
nonsignificance. The psychosocial variables of
self-esteem and depressive symptoms showed significant
correlations with the criterion-measured depression (see
Table XI). These associations provide empirical support

for what has been clinically considered as the core symptoms of depression in children and adolescents. Poor self-esteem is more likely to be expressed concretely in older children, such as through comments about their own bodies. Their cognitive maturity tends to permit more self-appraisal and more internalization of others' expectations and views of them (Bemporad, 1982; Poznanski, 1980; Poznanski & Zrull, 1970). Many young American Indian adolescents have experienced severe family disruptions such as parental divorce or separation, parental negligence or abandonment, and physical abuses in the home environment. In addition, young American Indians often face major cultural changes during their adolescence and experience early transitions to unfamiliar environments outside their traditional reservations or tribes, such as boarding schools or non-boarding public schools (Beiser & Attneave, 1982; Berlin, 1987). While trying to make sense of these life stressors at an early age, many of these American Indian adolescents have not acquired the necessary coping skills to overcome these psychosocial conflicts. The persistent failure to cope with unfamiliar and stressful life situations, and the internalization of social values and expectations that conflict with the traditional culture, seriously challenge their self-esteem and personal competence.

Depressive symptoms were found to relate significantly to the criterion-measured depression in American Indian adolescents. This significant association (see Table XII) supports the concurrent validity of the CES-D scale in measuring depressive symptoms in adolescents (Lewinsohn, Hops, Roberts, & Seeley, 1988). Although the CES-D scale was not developed using indigenous criteria or standardized norms for American Indian adolescents, it has demonstrated some cross-cultural validity as a measure of depression (Kaplan, Roberts, Camacho, & Coyne, 1987; Vega, Warheit, & Meinhart, 1983).

Gender did not contribute significantly to the overall classification of depressed and non-depressed American Indian adolescents. However, gender was significantly correlated with CES-D, a depressive symptom measure, and Interpersonal Conflicts, a stressful life event scale. The correlation between gender and Interpersonal Conflicts suggests that adolescents generally struggle to develop social skills to gain greater acceptance and to build harmonious relationship with their opposite gender peers. The significant correlation between gender and depressive symptoms strongly confirms the gender differences in the prevalence of depression reported in past studies. For example, Lewinsohn, Hops, Roberts, and Seeley (1988) reported a female preponderance on all the depression measures used in their study. In addition, female

preponderance in depression was represented at all age
levels to approximately the same degree.

Perceived social support from friends and family in
American Indian adolescents also failed to predict
depression. This finding seems to contradict past research
that showed a negative correlation between social support
and adverse physical and mental health outcomes. Cohen
(1986) found that a lack of positive social relationship is
likely to lead to negative psychological states such as
anxiety or depression. Since the respondents in this study
lived in a boarding school, the minimal variation in
perceived support from family may be an artifact of being
away from home. Another factor which may account for the
nonsignificance of perceived social support from family may
lie in the lack of family support that many American Indian
adolescents have experienced in their home environments
prior to their enrollment in the boarding school. Many
American Indian adolescents enrolled at the boarding school
were court-ordered or most typically came from disruptive
home situations with multiple personal losses.

However, the lack of significance of perceived support
from friends in the prediction of depression remains
unexplained. Although Procidano and Heller (1983) reported
good concurrent validity and reliability of the Perceived
Social Support from Friends and Family scales (PSS-FR and
PSS-FA) with college students, these scales have not been

extensively standardized with mainstream or ethnic minority adolescents. At the time of the study, social support measures with appropriate norms for American Indian adolescents were not available. The PSS scales were considered suitable for this study in an attempt to generate standardized norms for American Indian adolescents. Also, the low item consistency and correlations of PSS-FR and PSS-FA with both psychosocial and SLE variables (see Tables VIII and XI) may be attributed to the complex content and language structure of the scale items. These complexities may have posed a comprehension difficulty for the subjects in this sample. Another explanation is the possible lack of specificity in the measurement of social support using perceived support measures. Adolescents may view social support in a more concrete and functional fashion than the internal readjustments that adults often make to cope with a stressful life situation (Caplan, 1981). As a measure of social support, social network and support density might be better indicators of psychological functioning of American Indian adolescents living in a boarding school. Also, resource support from family such as money may be a potent component in their psychological functioning since the majority of American Indian adolescents in the boarding schools are not employed and do not earn extra income for social activities.

Another purpose of this study was to determine the contribution of the five stressful life events scales (Model 3), above and beyond the psychosocial variables, in classifying depressed vs. non-depressed American Indian adolescents. The increment in variance accounted for by the five stressful life events scales was negligible, approximately two percent. This nonsignificant relationship between life stressors and depression in American Indian adolescents deviates significantly from past studies that have found a strong link with life stressors and affective disorders in adult populations (Walker & Greene, 1987). Although there has been evidence supporting the relationship between stress and depression in adults (Dohrenwend & Dohrenwend, 1981a; Paykel, 1979; Rahe, 1974), the direct effect of life stress on depression in children and adolescents has not been consistent. However, researchers have pointed out that the failure of adolescents' negative life events and the accumulation of discrete negative life events in predicting changes in their mental health outcomes does not necessarily minimize their role in the etiology of depression (Cohen, Burt, & Bjorck, 1987; Gerseten, Langner, Eisenberg, & Simcha-Fagan, 1977; Swearingten & Cohen, 1985a). The lack of association between stressful life events and depression in this study requires further examination of the stressful life events scales.

Multicollinearity among the stressful life events scales posed a serious problem by underestimating the true variance in predicting depression among American Indian adolescents. In discriminant analysis, as in multiple linear regression, high correlations among the measured variables will most likely suppress the amount of variance individual variables account for above and beyond the other variables (Pedhazur, 1986).

The lack of significance of both the psychosocial variables and the stressful life events in classifying depressed vs. non-depressed American Indian adolescents (see Table IX) requires an examination of the diagnosis of depression used as the criterion validity in this study. Retrospectively, it should be pointed out that the diagnosis of dysthymia in DSM-III was considered sufficient to classify such subjects as part of the criterion variable of major depression in this study. According to DSM-III, dysthymia has identical symptom requirements as in major depression but differs significantly with regard to symptom duration. For dysthymia, depressive symptoms need not be present every day for at least two weeks, but they must endure for a minimum of one calendar year. Another potential confounding effect is the substantial time gap of approximately four weeks between the screening and the interviewing phases. At the time of the follow-up diagnostic interview, depressive symptoms may not

be present in the subjects who originally manisfested dysthymic types of symptoms. Consequently, many subjects who reported high depressive symptoms on the screening measures but met only a dysthymia diagnosis were incorrectly classified into the non-depressed group.

Furthermore, the use of adult criteria of depression inherently complicates the assessment of children and adolescent depression. In DSM-III, a distinction is specifically made between the essential features, which are required in order to make the diagnosis, and associated features, which are not part of the diagnostic criteria. These associated features are often thought to be present, but they may not invariably be so (Hodges & Siegel, 1985). According to the Weinberg criteria (Weinberg, Rutman, Sullivan, Penick, & Dietz, 1973), dysphoric mood and low self-esteem are essential characteristics in childhood depression. In adults, dysphoric mood or loss of interest or pleasure in almost all usual activities or pastimes must be present in the DSM-III criteria for major depression (Hodges & Siegel, 1985).

This differential classification of depressive symptoms implies a potential difference between childhood or adolescent and adult depression. This variation may require different diagnostic criteria in the measurement of depression to reflect the maturational development in adolescents. Some clinical evidence has indicated a longer

phase but brief duration of depressive symptoms in
adolescents than the two-week symptom duration required in
DSM-III. In a study of a clinic sample, 48 percent of
adolescents manifested an oscillating course of major
depressive disorder episodes that lasted more than 24 months
(Ryan, Puig-Antich et al., 1987). Hodges and Siegel (1985)
believe that these constant changes in children and
adolescents are often reflected in their cognitive and
affective development which, in turn, may have important
influences on the expression of depressive symptoms at any
particular stage in the child's development.

At the present time, there are relatively few empirical
studies examining the developmental process in the etiology
of depression. Theoretically, the developmental perpective
is concerned with continuities and discontinuities over
time, and the psychopathologic perspective with continuities
and discontinuities over the span of behavioral variation
(Kashani, Husain, Shekim, Hodges, Cytryn, & McKnew, 1981).
Without considering the developmental changes, the
prevailing diagnostic criteria for depression in the DSM-III
are likely to overlook the symptom manifestations that may
be developmentally-related and unintentionally to suppress
the diagnosis of genuine depression in children and
adolescents.

Rutter (1988) explains that adolescents are less likely to come to attention because of subjective depression than for disturbances of behavior. Rutter (1988) also suggests that depressed adolescents are most likely to be noticed when they have been truant secondary to their dysphoria and associated symptoms of concentration difficulties, irritability and withdrawal, or after they have missed school because of somatic complaints or feelings of worthlessness. In this study, the psychosocial variables and the stressful life events correlated significantly with the depressive symptom measure (CES-D), but only Esteem and CES-D correlated with the criterion measure of depression. There is also some evidence indicating that a criterion-based measure such as the DISC shows a much lower correlation with other measured outcomes than self-reported measures. Data from an epidemiological study of adolescent depression in the community revealed that the correlations between the psychosocial variables and the self-report depression measures are substantially higher than those with the categorical dichotomy of diagnostic classification based on a diagnostic criterion measure (Lewinsohn, Hops, Roberts, and Seeley, 1988). These correlational differences suggest that the diagnostic criteria of DSM-III may not be sensitive to the profound influence of maturation and development in

the etiology of depression that are probably reflected in a less restricted time frame and symptom pattern.

Second, the preponderantly symptomatic nature of the American Indian adolescents in this sample further complicates the classification of those who were depressed or not depressed. Given the large variation in measured symptoms such as depressive symptoms, low self-esteem, lack of social support, and negative life stress among the subjects, the prediction of depression utilizing these exclusive variables may not be adequate. According to the classification of depressed vs. non-depressed American Indian adolescents in Table XII, there were adolescents who had high depressive symptoms, low self-esteem, and high life stress but were not clinically depressed. On the contrary, those adolescents who met the full diagnosis of depression at the time of the diagnostic interviews reported a lower level of symptoms in the screening measures. As discussed earlier, dysthymia which represents fluctuating and brief depressive symptoms, again, possibly accounts for these reported symptom differences. In summary, the preponderance of negative life stresses and psychological dysfunctioning in both depressed and non-depressed groups suggests that psychiatric comorbidity should be examined to determine the prevalence of depression for American Indian populations in boarding schools. For example, substance abuses of drug and

alcohol may exist more prominently with major depression in the American Indian adolescents.

The findings in this study have important implications for future research on American Indian adolescents living in boarding schools. The self-reported mental health screening scales measuring self-esteem and stressful life events demonstrate high concurrent validity when compared with CES-D (see Table XI). These scale validities may prove useful in the early detection of psychological dysfunctions in American Indian adolescents. Although the self-reported measures in this study did not fare well in predicting depression, the outcomes suggest that psychosocial correlates, other than those commonly identified, need to be examined and considered in future investigations of American Indian adolescent depression. Furthermore, studies using longitudinal design that includes multiple measurements and representative sampling are highly recommended for future studies of American Indian adolescents. Multiple measurements of psychopathology, particularly depression, will provide additional information regarding the manifestations of symptoms in American Indian adolescents, who remain a population at risk for which there is little empirical mental health data.

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