DEPRESSIVE AND SUICIDAL SYMPTOMS IN INDIAN SCHOOL CHILDREN: FINDINGS FROM THE *FLOWER OF TWO SOILS*

WILLIAM H. SACK, M.D., MORTON BEISER, M.D., GLORIA BAKER-BROWN, M.A., and ROY REDSHIRT, B.S.

A recent review indicates that Indian adolescents have disturbingly high rates of both depression and suicide (Office of Technology Assessment, 1990). Although a number of known risk factors for white adolescent suicide have now been defined, their relevance for Indians has yet to be established (May & Van Winkle, see this issue). Brent, Kolko, Allan, and Brown (1990) and Kashani, Rosenberg, and Reid (1989), studying inpatient and community samples of white youth, have shown that prior depression is a powerful predictor of later suicide. However, adolescents attempting suicide and those completing suicide are probably distinct populations, each with its own pattern of risk factors (Shaffer & Fisher, 1981). Berlin (1986), Shore (1974), and Office of Technology Assessment (1990) have shown that Indian suicide rates vary widely by tribe and location. Thus, cultural factors must play some role in the development of this form of psychopathology.

Given that prior depression is an important risk factor, at least in adolescent suicide attempters, and that Indian adolescents are at high risk for affective disorders, suicide attempts, and suicide completion, a number of obvious questions follow: Are such symptoms also more prevalent in Indian latency-aged children than in their white counterparts? If present, do depressive symptoms persist? Do such symptoms erode the functional capacities of these children? Do Indian children report more symptoms of suicidal ideation in latency than white children? These questions caused us to re-examine for data generated by a large-scale study entitled the *Flower of Two Soils* in an attempt to find answers.

Methods

The *Flower of Two Soils* was an epidemiological study funded by the National Institute of Mental Health (NIMH) (MH5-R01-MH 36678-04) and the National Health Research Development Program (Health and Welfare of Canada) and the W. T. Grant Foundation (563.1179). M. Beiser, Principal Investigator, focused on the academic performance, cognitive ability, and mental health of Indian children in both the United States and Canada. Data collection occurred on four reservation/reserve and several non-Indian comparison sites from 1983 through 1992. The origi-

nal study design was intended to examine the contribution that emotional and cognitive factors make to declining academic achievement scores over time in Indian children (Sack et al. 1987).

The sample consisted initially of 973 children, roughly half of whom were in Grade 2 and the other half Grade 4, who live in culturally diverse reservation sites. These children were evaluated at three points in time (waves) by self-report, parental report, and teacher report. Following these two cohorts of children allowed us to chart children's progress from Grades 2 through 6. Study measures include both positive mental health and culturally relevant variables such as traditionality and psychopathology (Beiser, 1989; Beiser, Lancee, Crotowjec, Sack, & Redshirt, in press). Panels of community members from each locale carefully reviewed the instrument package and made useful suggestions for deletions, additions, and revisions.

Table 4–1 lists the sites from which our sample was drawn. Most major Indian cultural traditions are represented, from the northern woodlands in Canada to the desert cultures of the southwestern United States.

Table 4–1
Study Sites, Sample Size, and Attrition Rates

	Overall Attrition %	T^1	T^2	T^3
Northern Woodlands I (Manitoba)	24.6%	167	149	126
Northern Woodlands II (Manitoba)	5.8%	21	23	20
Northern Woodlands Comparison (Manitoba)	20.3%	128	110	102
Plains (South Dakota)	44.2%	249	167	139
Plains Comparison (South Dakota)	28.7%	87	72	62
Coastal (British Columbia)	29.1%	103	91	73
Desert (Arizona)	18.6%	220	199	179
Total		973	821	701

Table 4–2 depicts the depression scale, derived from the Student Observation of Self (SOS) instrument, a measure patterned after the Youth Self-Report Scale (Achenbach & Edelbrook, 1983). Similar depression scales also were constructed from the parent (Child Assessment by a Parent, CAP) and teacher report forms (Teacher Interview Form, TIF), which likewise paralleled the parental and teacher versions of the Child Behavior Checklist (CBCL) (Achenbach & Edelbrook, 1983). Scales for conduct disorder, attention deficit disorder, and anxiety disorder were generated from each of these sources as well. Their psychometric properties are similar to those of the depression scale summarized in Table 4–2 (Beiser, 1989).

Table 4–2
Psychometric Properties of SOS Depression Scale N = 973

	Item	Corrected Item/Total Correlation			
1.	I am unhapppy	.35			
2.	I am cranky and grumpy	.37			
3.	I feel lonely	.44			
4.	I feel I'm no good at all	.37			
5.	I feel that no one loves me	.36			
6.	I think a lot about people getting killed or in accidents	.23			
7.	I feel bad, as if I've done something wrong	.34			
8.	I'd rather be alone than with others	.26			
9.	I feel overtired	.27			
10.	My family would be better off without me	.22			
11.	I cry a lot	.33			
		Alpha Coefficients			
1.	Overall	.67			
2.	By sex:	Males	.61	Females	.68
3.	By grade	Gr. 2	.66	Gr. 4	.70
4.	By site:				
	Plain	.73			
	Desert	.56			
	Northern Woodlands I	.49			
	Plains comparison	.75			
	Northern Woodlands II	.74			
	Northern Woodlands comparison	.70			
5.	By ethnicity				
		Indian	.64	Non-Indian	.74

To render the study as culturally relevant as possible, measures of positive mental health constructs also were developed, notably in regard to community-mindedness, competitiveness, home atmosphere, school atmosphere, instrumental competence, and social competence. Their psychometric properties also have been described previously (Beiser, 1989).

Extensive demographic developmental and health information was obtained from an annual parent interview referred to as the "Biodemographic Interview." This interview was conducted in the home by research assistants hired from the community and trained by project staff.

The Biodemographic interview included a stress scale modified after one developed by Coddington (1972) but adapted for this population.

Finally, in the first year of the study, the Diagnostic Interview Schedule for Children (DISC) and DISC-P were administered at several of the sites. The DISC and DISC-P are structured interview protocols designed to be used by lay interviewers and to generate DSM-III-R diagnoses. We used the original version of the instrument constructed by Anthony Costello and his group (Costello, Edelbrook, Duncan, Kalas, & Klance, 1984). In this paper, only the items from the depression section of the DISC are reported.

While the focus of the *Flower of Two Soils* was not on depression per se, depressive symptomatology was assessed using the above instruments. Because different numbers of children comprise the samples described in the tables, the relevant totals are always included in each table described herein.

Results

Table 4–1 shows the sample size and attrition rates over the three waves of data, each one year apart, collected at the sites.[1] Attrition varied greatly across sites. At the Plains site, for example, the high attrition rate reflects the fact that families move frequently and often place their children in different schools from year to year. For reasons of confidentiality, no across-site comparisons were done. There are no differences in the composite scores of self-report, parental report, and teacher report on the anxiety and depression scales for children who dropped out and those who remained in the study at wave three. This suggests that the data from second and third waves are reasonably representative of the total sample (Beiser, 1990).

Stability of Measures

Symptoms in children are known to be less stable than in adults and vary greatly with the setting in which they are measured (Young, O'Brien, Gutterman, & Cohen, 1987). Table 4–3 summarizes the stability coefficients from year one to year two for the various scales described above. Scores for the other self-ratings of psychopathology (conduct disorder, attention deficit disorder, and anxiety) were as stable as described for depression. Stability coefficients are a bit higher among older children as compared to younger and among non-Indian as compared to Indians.

These data suggest that children with depressive symptoms do not quickly resolve over time.

Table 4–3
T2 Stability N = 821
SOS (Child Report) Stability Coefficients

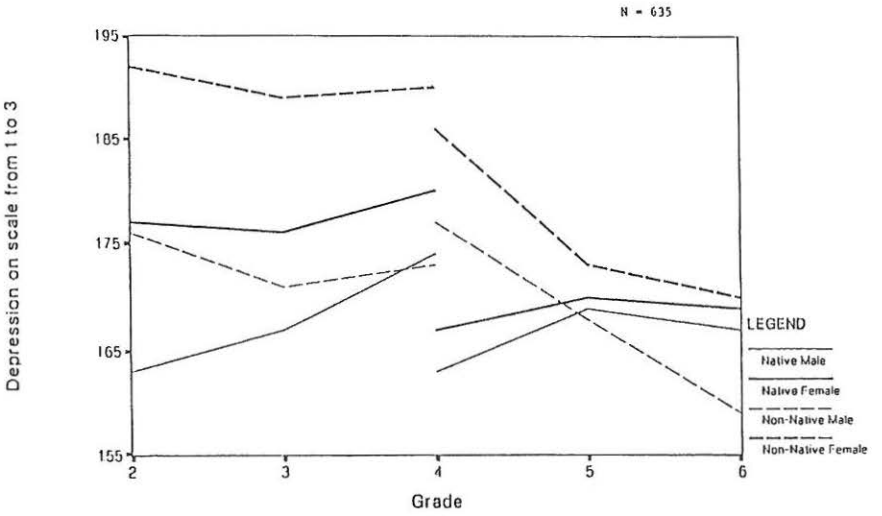
	Sex		Age		Ethnicity		Average
	Boys	Girls	Gr. 2	Gr.4	Indian	Non-Indian	
	r change	*r* change	*r* change	*r* change	*r* change	*r* change	*r* change
I. *Psychopathology*							
A. Externalizing							
1. Conduct Disorder	.36	.30	.38	.29	.34	.38	.34
2. Attention Deficit/Hyperactive	.36	.43	.35	.44	.35	.53	.39
B. Internalizing							
1. Depression	.36	.37	.36	.41	.34	.40	.38
2. Anxiety	.33	.37 I*	.33 I*	.41	.235	.39	.37
II. *Coping*							
A. Social Competence	.40	.45	.35*	.50	.38*	.60	.42
B. Instrumental Competence	.48*	.33 D*	.29*	.52	.34*		
III. *Cultural*							
A. Community-Mindedness	.34	.30	.26*	.39	.28 I*	.34	.32
B. Competitiveness	.33*	.50	.43 D***	.35	.39 D**	.42 D*	.42 D***
IV. *Other*							
A. Class Atmosphere	.32	.24	.18*	.39	.24*	.48	.28
B. Home Atmosphere	.37	.29	.27*	.40	.29*	.51 I*	.33

* $p<.05$ **$p<.005$ *** $p<.001$ D = decrease I = increase

Depressive Symptoms by Gender, Ethnicity, and Time

In order to answer questions regarding the effects of gender, ethnicity, and age on depressive symptoms, a 2x2x2x3 MANOVA was completed for the measures of depression from the SOS, TIF, and CAP. Figure 4–1 depicts mean scores on the SOS depression scale over time.

Figure 4–1
Self-rated Depression
(SDS)



Significant main effects for gender, ethnicity, and age are evident. Girls reported more depressive symptoms than boys (F (1,467) = 7.42, p < .001). Symptoms tend to decline with age, as children in Grade 2 exhibit F higher rates than those in Grade 4 (F (1,467) = 5.72, p = .017). Although there were no significant interaction effects, examination of the curves suggests that the decline with age is marked among non-Indian children, while scores tend to remain more consistent among Indian children. By Grade 6, scores for Indian children (both boys and girls) approach those of non-Indian girls.

When teacher ratings (TIFs) on these children are examined, an almost opposite profile emerges, as shown in Figure 4–2. Teachers perceive boys to be more depressed than girls (F (1,414) = 5.18, p < .03) and Indian children to be more depressed than non-Indians (F (1,414) = 4.08, p < .05). There is evidence of a halo effect. Correlations between teacher ratings of conduct disorder symptoms and anxiety symptoms (constructs that one would not expect to be highly correlated) were twice as high on the TIF as they were on the CAP. This suggests that teachers tend to rate students as all positive or all negative more often than parents.

Finally, the parents' ratings of their children's depressive symptoms show a more complex picture that is intermediate in configuration to the self-report and teacher report. Here a significant interaction effect between ethnicity and gender (F (1,2978 = 7.33, p < .005) is apparent. That is, parents report that non-Indian females show more depressive symptoms than non-Indian males, while Indian males are rated as more depressed than Indian females.

Figure 4–2
Teacher-rated Depression

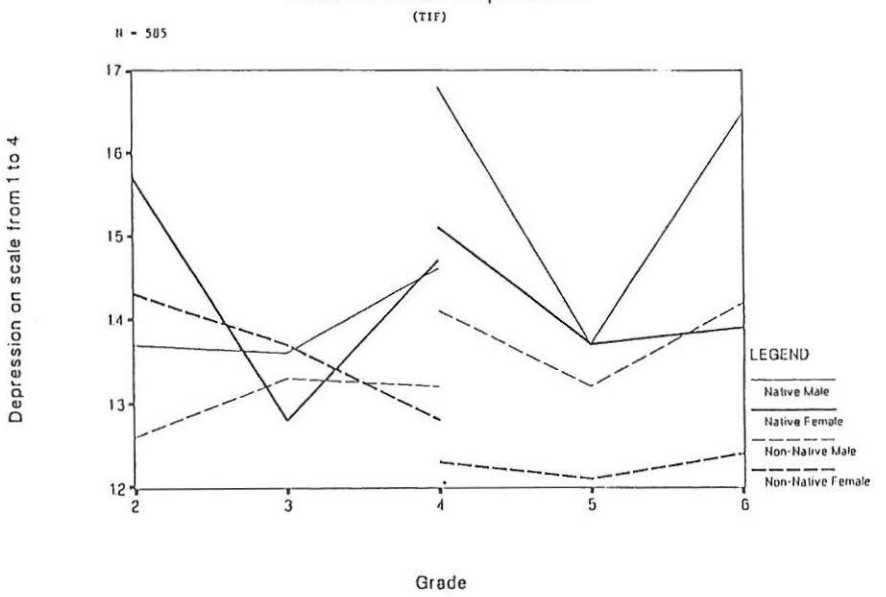


Figure 4–3
Parent-rated Depression

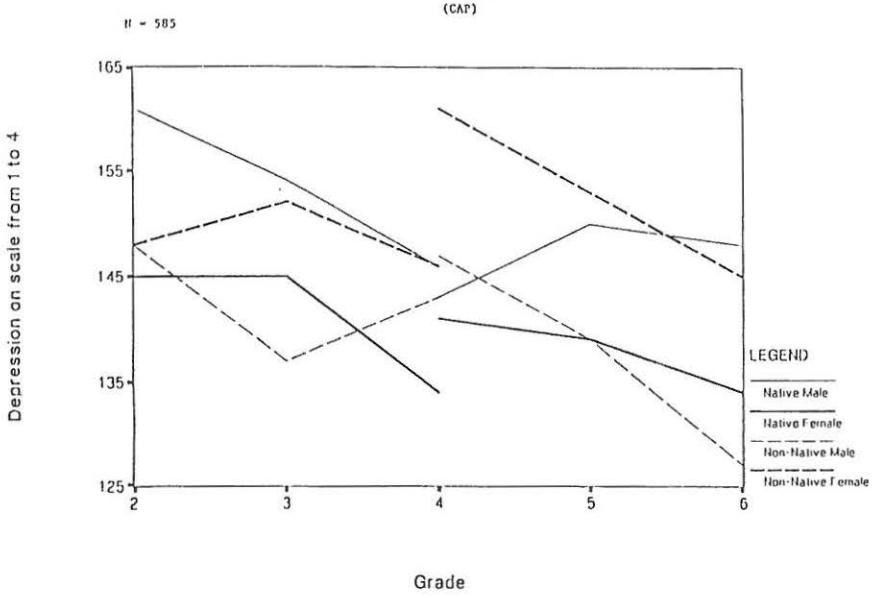


Table 4–4
Persistent Depression

Sex		χ^2 6.6	p level 0.01
Background Factors: Parent			
Biological mother is primary caregiver		–3.9	0.01
Mother did not breast feed		–2.4	0.035
Mother went to a boarding school		–2.88	0.005
Hospitalization of a parent		–2.6	0.01
Complications during pregnancy		–2.07	0.046
Problems with alcohol during pregnancy		–2.48	0.02
Father went to a boarding school		–3.20	0.002
Change in father's job — less time at home		–4.43	0.000
Home Atmosphere Scale:	W_1	–2.2	0.04
	W_2	–2.32	0.03
	W_3	–2.24	0.03
Stress Scale:			
Number of stressful events in period preceding Wave 2		3.19	0.002
Total stressful events across all 3 waves		3.19	0.002
Death of subject's pal		3.25	0.002
Child hospitalized		2.38	0.002

Predictors of Depressive Symptoms

Which developmental, family, and stress variables predict depressive symptoms in this sample? Ninety-nine children (13% of the sample) scored in the top 20% on two of the three SOS ratings. This group was labeled as a "persistently depressed" subsample. A univariate analysis of variance was then performed on a range of factors that might potentially relate to depression. Table 4–5 summarizes those variables that correlated at a significance of at least $p = 0.05$ with assignment to this "persistently depressed" subsample. (The hazard of Type 1 errors is a real threat to this kind of analysis, but the preliminary and exploratory nature of the process was felt to justify its use.)

A logistic regression analysis was then performed. Only two variables were significant at the 0.05 level of significance: low scores on the home atmosphere scale and failing a grade at school on the stressor scale (two-tailed test). These variables accounted for only 7% of the

Table 4–5
Functional Correlates of Persistently Depressed Children Versus Nondepressed Children N = 585

	Depressed	Nondepressed
Teacher's ratings of instrumental competence over 3 waves	2.72*	2.90
*$\chi^2 = 7.40$, $p = < 0.01$		
Teacher's rating of social competence over 3 waves	2.98*	3.09
*$\chi^2 = 8.41$, $p = < .03$		

variance. Such findings suggest that depressive symptoms at this age are multiplicatively determined and seem to include themes of loss, failure, and aversive home circumstance. No particular pattern predominates. It also should be pointed out that the causal *direction* of these relationships is not established by this kind of analysis.

Functional Correlates of Depressive Symptoms

Do persistently depressed children show evidence of poorer functional status than those who report fewer symptoms or for shorter duration? This question was examined by looking at how teachers rated the social and instrumental competence of students who scored as persistently depressed on the SOS. The results are shown in Table 6.

Teachers rated persistently depressed children lower than the nondepressed group in both spheres.

Finally, in addition to symptoms of depression, the extent to which latency-age children experience suicidal thoughts and feelings was sought as well. The information obtained in regard to this issue derives from the SOS and the DISC. The latter was administered at wave one on two of the reservation sites and one comparison site. The SOS asks the child to indicate the extent to which he/she has had the following thought: "I think about killing myself." A significantly greater percentage of Indian than non-Indian children endorsed this item (see Table 4–6).

To the DISC interview question, "Do you think life is not worth living?" 20% of the Indian sample endorsed this question "sometimes" or "often." The questions concerning suicidal thoughts or attempts on the DISC protocol were not asked at the comparison site because of the anxiety of the lay interviewers, who refused to pose such questions. As shown in Table 4–6, 4% of Indian children indicated they had suicidal thoughts, but less than 1% (0.7%) indicated they had actually attempted suicide.

Table 4–6
DISC Depression and Suicide Items by Ethnicity

	Indian	Non-Indian
A. SOS		
I think about killing myself	109/515	35/171
$\chi^2 = 8.02$, $p = .005$		
B. DISC		
Do you think life is not worth living?	65/313	0/44
$\chi^2 = 9.8$, $p = .002$		
Have you thought about killing yourself?	12/296	—
Have you tried to kill yourself?	2/296	—

Discussion

It is important to distinguish children with depressive symptoms from those with clinical depression as defined by either DSM-III or DSM-III-R. The focus of this paper has been on the former. Data from the year-one administration of the DISC at several reservation sites yielded a diagnosis of clinical depression below 1%, a prevalence rate compatible with other studies in white populations, which typically varies from 1 to 3% (Fleming & Offord, 1990).

Since Indian adolescents have been shown to have high rates of depression (Ackerson, Dick, Manson, & Barón, 1990), suicidal attempts (Grossman, Milligan, & Dayo, 1990), and completed suicides (May & Van Winkle, see this volume), one might also expect higher rates of depressive symptoms in the latency-age group. This was not borne out. White females exhibited the highest rates of self-reported depressive symptoms, which then dropped with increasing age. Since most other studies of depression in white children have not used a longitudinal design, it is difficult to compare these findings with those. Using a cross-sectional design, Kashani et al. (1989) found no differences in rates of depressed children between 8 and 12 years of age in a sample of white children from Missouri.

The aforementioned findings are not as reassuring as they might seem at first, since several suicidal items were consistently endorsed by some Indian children. That 20% of the Indian children endorsed (either "sometimes" or "often") the item "Life is not worth living" is a sobering preliminary finding that needs to be explored and confirmed by subsequent studies. This work suggests that Indian children evidence *less* depressive symptoms but *more* suicidal thoughts than do similar white children.

Most reports describe an increase in the prevalence of depression from childhood to adolescence (Fleming & Offord, 1990). In Figure 1, the slopes of the curves for the self-report data from the SOS suggest that rates of depressive symptoms for Indian children may overtake the rates of their white counterparts with age. This trend will be examined more closely with follow-up data collected from one Indian sample at the Plains reservation site in 1991.

Teachers rated students very differently than students rated themselves. Measurement problems continue to plague this area of inquiry, as a variety of self-report and interview instruments have been used by investigators over the past decade (Fleming & Offord, 1990). Many previous studies have shown wide variance between teacher, parent, and student self-report, regardless of the parameter studied (Young et al., 1987). Angold (1988) has noted that the borders of clinical depression, as opposed to unhappiness, remain fuzzy and uncertain, with the result that great differences in the reported rates of depression are found from studies that employ different instruments and criteria. More recently, Nurcombe and associates (1989) challenged the meaning and utility of diagnosing depression in this age group. Their data suggest that depression is a continuous spectrum of symptoms rather than a diagnostic entity per se in the latency period.

This data suggest that teachers might not be particularly good case finders when it comes to selecting children with depressive symptoms for additional assistance. Depressive symptoms during this developmental stage tend to remain hidden from the significant adults in the child's life. Yet it also is apparent that persistently depressive symptoms in these children are related strongly to how teachers rate such children in terms of their social and academic skills. Thus, future efforts at improving the education of Indian children will need to consider the less obvious consequences of depression that may plague this group of children.

Despite the lack of diagnostic consistency noted in the literature, this study suggests that depressive symptoms are not transient. The persistence of depressive symptoms also has been noted in a Dutch epidemiologic study using the CBCL (Verlhulst, Akkerkius, & Althaus, 1985). In a study of early adolescents, Garrison, Jackson, Marsteller, and McKoewn (1990) found that the best predictor of subsequent scores on the Center for Epidemiologic Studies Depression Scale (CES-D) is the previous year's score.

The univariate and logistic regression analysis conducted in this study yielded a variety of risk factors that resemble those reported in the literature for depressed children and adolescents. Numerous studies have shown family dysfunction and stressful life events to be associated with depressive symptoms (Fleming & Offord, 1990). The Home Atmosphere Scale (as reported by the child) was the most potent (if modest) predictor of depressive symptoms in our study (see Table 4). A multiplicity

of other variables associated with persistently depressed children suggests themes of loss, low self-esteem, stress, and family dysfunction. A great deal of shared variance among these variables precludes the identification of more specific predictors in the study.

Finally, this study's findings in regard to suicidal symptoms are presented as preliminary. Future efforts should seek to provide more definitive prevalence rates for such symptoms in this age group. Data on suicidal ideation from the *Flower of Two Soils* includes only two reservation sites (one Canadian and one American). The overall prevalence of 4% of Indian children endorsing suicidal thoughts i.e., "Have you thought of killing yourself?" in this study is consistent with other studies in the literature, which range from 2% to 12% (Pfeffer, 1986).

Conclusion

The *Flower of Two Soils* epidemiologic study examined the relationships among cognition, academic achievement, and psychosocial variables in culturally varied groups of Indian children from five reservations and non-Indian children from adjacent locales (Beiser, 1990). This investigation included measures of depressive symptoms as noted by parents, teachers, and students themselves. Two cohorts of children were followed for 3 years, yielding data that spans Grades 2 through 6.

Self-reports of depressive symptoms in Indian children actually were lower than those among their white counterparts. However, this pattern appears to reverse as they enter puberty and adolescence. Even though the overall rates of depressive symptoms were lower in Indian children, a subsample of Indian children consistently endorsed suicidal items at high rates.

Symptoms of depression were rated quite differently by parents, teachers, and the students themselves. Teachers' ratings appeared to be influenced by halo effects. Depressive symptoms tend to persist over time, despite greater reporter variance.

Risk factors for depressive symptoms at this age appear to be multifaceted and nonspecific. They include loss, stress, family dysfunction, and low self-esteem and resemble those previously reported in studies of white adolescents.

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Notes

1. Sites are referred to as only in their general geographic and cultural identity in order to preserve confidentiality.

Discussion

Dr. Berlin: One of the issues when talking about cluster suicides is, What does the community and the local school do with what is happening? It's very clear that the school can take an active role. It can actually identify some of the youths who seem to be vulnerable. Another critical factor is the reverberating role of modeling. There aren't very many adults for the adolescent to identify with. The thing we hear over and over on various reservations is, "What is an effective adult Indian?"

Another developmental issue is the socialization process in latency-age groups. It becomes important for the child to begin to make friends and to learn how to negotiate his/her way in the world of their own peers. Peer group influence in the adolescent society is critical.

Dr. Shaffer: I want to discuss the controversial media studies. The opportunity to study media effects in a systematic fashion arose during the height of concern about suicide prevention. We studied four TV network docudramas about adolescent suicide that were all released over a 3-month period. They were shown once only during the period under study on well-recorded dates and times. We were, therefore, able to accurately date and time an exposure by a large population to a particular stimulus.

Three of the four films were immediately followed by a statistically significant increase in suicidal deaths compared to the same period of time in previous years. There was a parallel increase in suicide attempts referred to an emergency room. When these findings were written up, they generated a lot of publicity. A replicative study was undertaken on statewide data by another investigator who had also been an advisor to one of the programs in question. This study failed to replicate our findings. That led us to undertake an additional replication in different geographic areas, where we obtained a partial replication. An explanation for the partial replications could be that there is a dose/response relationship between media exposure and imitative suicide. The broadcasts that we studied were given different emphases and different levels of publicity in different regions and, therefore, represented a range of doses. Our inability to obtain a perfect replication does not rule out a media effect.

I would like to move to the question of cultural differences in the incidence of youth suicide. There are several possible explanations for these. First, a society may have some cultural attribute that promotes suicide. Cultural attributes are, by definition, shared by a large proportion of a culture. Because suicide is rare in all countries and cultures, one must assume that if there is a culture-specific enhancing effect, it must still operate by facilitating suicide in at-risk individuals rather than operating on its own. Otherwise, the suicide rate would be much higher.

The second possibility is that a culture fails to inhibit suicide. For example, it could be that certain cultures view suicide as a sign of insanity or cowardice. These values would likely deter a suicidal person at the time of despair. If those proscriptions were not present, it would be easier for that person to commit suicide.

A third possibility is that a culture neither praises nor denigrates suicide. However, there is a confound between culture and geography, and if within a particular geographical area, suicide has become quite prevalent, the increased prevalence sustains itself. This would be because having an acquaintance who has attempted or completed suicide itself increases suicide risk and, by definition, in an area of high incidence, there are more people who have completed or attempted suicide to know.

The importance of these variations in suicide incidence regardless of whether they are culturally or geographically determined is that belief systems and exposure to suicide are likely to influence suicidal

behavior in ways that we do not yet understand. This means that we must think very carefully about what we say about suicide to young people.

I personally believe that we should be very open about the relationship between mental disturbance and the distortions of perception and understanding that are the essence of mental illness and suicidal behavior. This will help us to avoid describing suicide in terms that might encourage admiration or imitation.

Addressing Dr. Sack's and Morley Beiser's findings, it seems to me that the main thing is, you find more depression in the non-Indian than in the Indian population. You know, our studies certainly suggest that depression, at least as defined by DSM-III and DSM-III-R, is not the major risk factor for suicide. I don't think it's an inconsistent finding. I do think that there are big problems with scales most commonly used in measuring depression. Transient moments of depression are so common in adolescents and may actually mean so little that it's just a very difficult area to deal with using these kinds of measures. It has to be tethered to some measure of impairment before you know whether you're obtaining meaningful data.

Dr. Guilmet: If you try to think of culture as cognitive, you can start thinking in terms of relations between shared value structures and the individual. You also need to think about cognitive dissonance. Another way you can conceptualize the culture concept is to look at just plain modeling behavior. Can one conceptualize culture just as modeling behavior? That could work with regards to the cohort modeling phenomenon.

If we define culture in terms of values, one must consider how a particular belief influences an individual's behavior. We can be environmentalists and still pollute things. We can be religious and not act religiously.

I think of suicide as a symbolic act. How does the culture define that symbolic act? Is it negative or positive? What does it mean? What's the meaning of that act? Lastly, is it possible that there's a level of anger that can be directed inwardly or outwardly? Can culture shape how we direct anger, thereby influencing suicide and homicide rates?

Dr. Shaffer: The evidence is against that. It looks as if most suicide victims are both aggressive to others and to themselves.

Dr. Berlin: Addressing the issue you raised that suicide is a variable of mental illness, there is in certain Indian reservations a high rate of mental illness. One could therefore postulate that suicide is simply one of the variables.

Dr. Shaffer: If it reflects a high base rate of that risk factor, yes.