

The Zuni Life Skills Development Curriculum: Description and Evaluation of a Suicide Prevention Program

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In collaboration with the Zuni pueblo, a culturally tailored intervention program was designed using a model of social cognitive development to remediate the behavioral and cognitive correlates of suicide. The Zuni Life Skills Development curriculum was introduced in the tribal high school and evaluated using a multimethod approach including self-report, behavioral observation, and peer rating. Students exposed to the curriculum scored better than the no-intervention group at posttest on suicide probability and hopelessness. In addition, the intervention group showed greater ability to perform problem-solving and suicide intervention skills in a behavioral assessment. The effectiveness of the program and recommendations for similar prevention programs are discussed.

Suicide is the second leading cause of death for American Indian adolescents ages 10 to 19. In 1986 the mortality rate for suicide for 15- to 19-year-old American Indians was an estimated 26 deaths per 100,000 individuals compared with 10 deaths per 100,000 of the same age group in the United States (U. S. Congress, 1990). However, the incidence of suicide for all ages varies greatly among American Indian tribes. Some communities have rates more than 20 times higher than the national average, while others approximate the rate for the general population (May, 1987).

The risk profile of American Indian suicide victims is only now starting to be developed. Research across American Indian adolescent groups reveals that risk factors associated with youth suicide include reporting little family support, greater quantity and frequency of alcohol use, greater depressive symptomatology, experience of suicide ideation, or previous attempts at suicide (Manson, Beals, Dick, & Duclos, 1989). Risk factors for suicide attempts among Navajo adolescents reported by Grossman, Milligan, and Deyo (1991) also include alienation from family and

community and frequent heavy alcohol use, along with a history of physical abuse, a family history of a suicide attempt, or a history of friends who have attempted suicide.

The risk profile for Zuni adolescents is similar. Research on the suicide vulnerability among Zuni high school students showed significant correlations between suicide ideation and past suicide attempt behavior, drug and alcohol use, depression, hopelessness, stress, psychological symptomatology, negligible social support, less liking for school, and limited interpersonal communication (Howard-Pitney, LaFromboise, Basil, September, & Johnson, 1992).

In 1987 the Zuni pueblo, a reservation of approximately 9,000 tribal members located in New Mexico about 150 miles west of Albuquerque, was concerned about the rising rates of youth and young adult suicide and their perception that this increase might be associated with the fact that Zuni youth were losing touch with their traditions. Suicide is an especially distressing phenomenon for the Zuni because suicide is forbidden in their traditional culture (A. Seowtewa, personal communication, March 19, 1987). Therefore, Zuni leaders initiated the development of a suicide prevention program in their high school with the purpose of reducing the factors associated with suicidal behavior.

Life skills training is increasingly being recognized as an important preventive approach for offsetting the underlying factors of vulnerability that contribute to high-risk behavior among adolescents (Hamburg & Takanishi, 1989). These broadly focused programs are designed to teach the social competencies and life skills needed to foster positive social, emotional, and academic development. They set out to enhance protective factors such as self-esteem and to provide students with general social competence skills such as problem solving (Danish, Galambos, & Laquatra, 1983). Life and social skills training programs strive to offset the stressors associated with conflicts related to interpersonal relationships, achievement pressure, or personal loss.

Intervention with a life skills focus draws primarily on social cognitive theory (Bandura, 1986). From this perspective, suicidal behavior is attributed to direct learning or

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modeling influences (e.g., peer or community suicidal behavior) in conjunction with certain environmental influences (e.g., social support for substance abuse) and individual characteristics (e.g., hopelessness and drug use) that mediate decisions related to suicidal behavior. Social cognitive skills developed through life skills training should act to lessen the impact of these influences.

Most school-based suicide intervention programs with adolescents in the general population do not take a life skills training approach (Shaffer, Garland, Vieland, Underwood, & Busner, 1991). They are generally of brief duration and focus primarily on teaching information about suicide and risk factors, developing certain crisis intervention techniques, and subsequently, referring at-risk students (Davis, Wilson, & Sandoval, 1988; Valente & Saunders, 1987; Wodarski & Harris, 1987). Few strive to change the risk factors related to suicide through personal and social skills enhancement (Beiser & Manson, 1987).

Reports of the success of life and social skills training programs with the general adolescent population are substantial for other risk behaviors such as depression (Bellack, Hersen, & Himmelhoch, 1981; Weissberg, Caplan, & Harwood, 1991), aggression (Guerra & Slaby, 1990), and substance abuse (Botvin, Baker, Renick, Filazzola, & Botvin, 1984). Life and social skills training procedures have also been implemented effectively with American Indian groups for health promotion to reduce drinking behavior (Gilchrist, Schinke, Trimble, & Cvetkovich, 1987; Schinke et al., 1988) and tobacco use (Holden, Botvin, & Orlandi, 1989; Schinke, Schilling, Gilchrist, Ashby, & Kitajima, 1987). This background suggests that life and social skills training may be a useful approach for suicide prevention.

The present study was designed to evaluate the effectiveness of a life-skills-focused suicide prevention program in reducing behavioral and cognitive factors identified as correlates of suicidal behavior. A multimethod approach for evaluating the effect of the program on the identified behavioral and cognitive factors was used and included self-report, behavioral observation, and peer ratings. We expected that when compared with the no-intervention group, participants in the life skills intervention would demonstrate lower levels of important correlates of suicidal behavior and better skills in suicide intervention and problem solving.

Method

Design

The evaluation design was quasi-experimental with two conditions, an intervention and a no-intervention condition. There were four classes in each condition, with a total of 69 students in the intervention condition and 59 students in the no-intervention condition. Neither students nor classes were randomly assigned to conditions because of institutional constraints. In consultation with Zuni school personnel, the decision was made to implement the prevention curriculum in a required course, language arts classes.

A multimethod approach was used to assess the effectiveness of the curriculum and included self-report of risk factors associated with suicide, behavioral observations of suicide intervention skills

targeted in the curriculum, and peer ratings of classmates' skills and abilities relevant to suicide intervention.

Participants

Students. One hundred and one freshman and 27 junior students taking language arts classes in the Zuni Public High School participated in the self-report evaluation of the curriculum. Juniors were included to increase sample size; sophomores were not included in the sample because they had been exposed to a pilot test of the curriculum during the previous year. The sample was 64% female and 36% male (83 girls and 45 boys), and ages ranged from 14 to 19, with a mean age of 15.9. Scores on the Suicide Probability Scale (Cull & Gill, 1988) at pretest suggested that 81% of these students were in the moderate to severe ranges. Forty percent of students reported that a relative or friend had committed suicide. With regard to their own suicide behavior, 18% reported having attempted suicide. Of those who had attempted, 79% had attempted 2 or more times, 70% tried within six months of the pretest, 17% needed a medical visit, and 22% told no one about the attempted suicide.

Teachers. Two non-Zuni female teachers were chosen to deliver the curriculum in the intervention classes on the basis of their expertise and willingness to participate in this suicide prevention effort. One non-Zuni female teacher was chosen to continue delivering the existing language arts curriculum with no-intervention classes. Two Zuni male community members (a curriculum specialist and a mental health technician) agreed to assist the program delivery as cultural resource persons. Each non-Zuni teacher was paired with a Zuni cultural resource person.

Confederate clients. Two female university students from the Menominee and Choctaw tribes participated as confederate clients in the behavioral assessment evaluation of the intervention because it was not appropriate for a Zuni student or tribal member to role-play a suicidal person because of the cultural taboo. These confederate clients had professional experience with adolescents and were actively involved in the American Indian community.

Judges. Two American Indian graduate students (one woman and one man) served as trained judges to evaluate the problem-solving and suicide intervention skills of a subsample of the participants in the behavioral assessment. Both had grown up on reservations (Lakota Sioux and Arikara) that are similar in some aspects to the Zuni pueblo.

Measures

Self-report survey. A set of suicide vulnerability, hopelessness, depression, and self-efficacy scales made up the self-report survey. Suicide vulnerability was assessed with the Suicide Probability Scale, a 36-item, 4-point Likert instrument used to measure hopelessness, hostility, negative self-evaluation, and suicidal ideation (range = 30–147). High reliability, along with supportive validity estimates and factor analyses, has been reported (Cull & Gill, 1988). In this study sample, Cronbach's alpha was .88.

Feelings of hopelessness were assessed by the Hopelessness Scale (Beck, Weissman, Lester, & Trexler, 1974), a 20-item true-false inventory used to assess negative expectations about the future (range = 0–20). This scale is reported to have a high degree of internal consistency and adequate validity estimates and factor analyses (Beck et al., 1974). Cronbach's alpha was .76 for this study.

Depression was measured by a five-item, 7-point scale taken from the Indian Adolescent Health Survey (Greer, 1988). Scores

may range from 5 to 35. This instrument was field tested on more than 1,000 American Indian adolescents and screened by a national steering committee to ensure that the instrument was relevant and applicable to American Indian students (Blum, Harmon, Harris, Bergeisen, & Resnick, 1992). Cronbach's alpha was .83 for this study.

Students' self-efficacy for a number of skills taught in the curriculum was measured on 7-point Likert scales. Specific skills included suicide prevention skills (6 items; Cronbach's alpha = .84), active listening (8 items; Cronbach's alpha = .79), problem solving (2 items; $r = .84$), anger management (2 items; $r = .46$), and stress management (2 items; $r = .59$). The latter two reliabilities were considered unacceptably low, and these variables were excluded from further analysis.

Behavioral observation. Judges rated the suicide intervention and problem-solving skills of intervention and no-intervention students using ten 6-point Likert scale items ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). They rated the extent to which students were able to (a) demonstrate suicide intervention skills (elicit a promise from the peer not to act on suicidal intentions until talking with someone first, express willingness to accompany the peer to a resource person, not agree to keep a secret about the peer's suicidal intentions, and display effective crisis intervention skills) and (b) engage in problem solving (fully understand the peer's problems, elicit information about the causes of the problem, help the peer identify his or her strengths, help the peer solve his or her problem, suggest resources to solve the problem, and successfully intervene in the problem situation). Cronbach's alpha across the two role-play ratings was .84 for suicide intervention skills and was .91 for problem solving.

Peer ratings. The same 10 items used in the behavioral assessment were slightly reworded for use in the peer assessment. Peers were asked to rate their classmates on the extent to which they were able to intervene in a suicidal situation (4 items; Cronbach's alpha = .78) and problem solve (6 items; Cronbach's alpha = .93).

Procedure

Zuni life skills curriculum. The Zuni Life Skills Development (ZLSD) curriculum developed for this study (LaFromboise, 1991) was structured around 7 major units: (a) building self-esteem; (b) identifying emotions and stress; (c) increasing communication and problem-solving skills; (d) recognizing and eliminating self-destructive behavior such as pessimistic thoughts or anger reactivity; (e) receiving suicide information; (f) receiving suicide intervention training; and (g) setting personal and community goals. These skills and this knowledge are relevant to a broad scope of adolescent risk-taking behaviors including substance abuse, sexual activity, and violence. The curriculum was presented approximately three times per week over 30 weeks during the school year.

A unique feature and strength of the curriculum was that it was specifically tailored to be compatible with Zuni norms, values, beliefs, and attitudes; sense of self, space, and time; communication styles; and rewards and forms of recognition. Extensive community input was solicited during the development of the curriculum to examine key aspects of helping and problem solving in Zuni culture and to establish community support for implementation of the curriculum. The curriculum included an initial statement from Zuni leaders to remember that the life they were given is the most important possession they have. Students also became engaged in a historical review of ways American Indians as a people have coped with stress (Pine, 1981), culture-specific man-

ifestations of psychological symptoms associated with suicide (Manson, Shore, & Bloom, 1985), and the impact of self-destructive behavior on community well-being.

Each lesson contained the standard skills training techniques of providing information about the helpful or harmful effects of certain behaviors, modeling of target skills, experiential activities and behavior rehearsal for skill acquisition, and feedback for skill refinement. These four fundamental components tap a variety of different learning channels, actively engage students early in the training process, and have been shown to be congruent with American Indian ways of imparting and reinforcing knowledge (LaFromboise & Rowe, 1983). A pilot study, conducted during the previous academic year to refine curricular areas and to develop instruments for the intervention evaluation, has been described in detail by LaFromboise and Howard-Pitney (1994).

Teacher training. Teachers and cultural resource persons were taught to use the curriculum during a succession of training sessions planned around a model for implementing health education innovations (Tortu & Botvin, 1989). Training essentially mirrored the skills-building approach of the ZLSD curriculum, providing the teachers with a practical modeling experience. A teacher's manual for use with the program provided the framework for implementing the curriculum (LaFromboise, 1995).

Fidelity to the curriculum was maintained through random classroom observations by an on-site intervention coordinator, which occurred on a bimonthly basis in each intervention class.

Evaluation. Students completed a self-report survey administered by a member of the research team prior to and following the curriculum intervention. At posttest, a subsample of 62 students (28 male and 34 female students), evenly divided between intervention and no-intervention groups, was randomly selected from the total sample for participation in a 30-min behavioral evaluation. Also at posttest, peer ratings of classmates' suicide intervention and problem-solving skills were obtained.

In the behavioral observation, students were asked to enact four role-plays with a confederate client while being videotaped. Following two warm-up role-plays each student role-played two scenarios concerning adolescent suicide with the same confederate client. Both scenarios involved a situation in which suicide intervention was appropriate; however, the second role-play presented a more serious and imminent suicide threat. Role-plays were presented in counterbalanced order, and each lasted approximately 10 min.

All suicide scenarios were rated independently by two judges, blind to group assignment, who were trained as a team for 18 hr to apply the rating criteria uniformly. Training ceased once an inter-rater reliability (estimated using an interclass correlation between raters across items for each role-play) of .85 was achieved.

Peer ratings at posttest assessed peer perceptions of suicide intervention and problem-solving skills displayed by classmates in their daily interactions. Rating assignments were random; ratings were included in the analysis only if the peer indicated that he or she knew the classmate fairly well to very well. Peer ratings for a given classmate were averaged for analysis (the number of ratings per peer ranged from 8 to 10). Peers rated the skills of only half rather than all of their classmates to avoid the unreflective responses that might result from a highly repetitive task.

Results

Attrition to Posttest

There were 128 students measured at pretest. By posttest time 8 months later, we were able to measure 98 (76%) of

the original set of students. This rate is in line with other school-based research in which sample size is reduced because of students dropping out of school, moving, or being absent on the days of testing. In addition, because of the isolated setting of the Zuni pueblo, we were able to conduct posttesting over 2 days only.

Given the loss of 30 students by posttest, it is important to learn whether these students were different in any way from the 98 students who completed the posttest. We conducted a between-groups comparison of the descriptive variables assessed at pretest (gender, age, grade, suicide probability, suicide attempt, and other suicide history variables). These tests indicated that the 30 students lost to follow-up were not significantly different on these variables from the 98 students who completed both pre- and posttests.

Equivalence of Intervention Groups at Pretest

Examination of the pretest scores for the intervention and no-intervention classes indicated that students in the no-intervention classes initially were significantly more positive on a number of important variables (see Table 1). For example, no-intervention classes were significantly less suicidal ($p < .002$) and hopeless ($p < .006$). This nonequivalence between intervention and no-intervention groups posed a problem for interpretation of outcome effects.

To create more equivalent groups at pretest, we chose a strategy to approximate randomization, thus allowing us to interpret more confidently the intervention outcomes. Using this approach, we matched students from the two conditions at pretest on the two clinically important measures that were different, suicide probability and hopelessness. We first classified each student using four levels of scores on hopelessness and six levels of scores on suicide probability. We then created a Hopelessness \times Suicide probability matrix and placed each student in the correct cell. For each intervention participant, we randomly selected a matched comparison participant whose scores fell in the same cell of the matrix. There were 31 pairs of students matched in this procedure.

Given the known, significant differences on important baseline characteristics, we reasoned that an analysis using a matched paired design was the only reasonable approach despite the loss of sample size. Neither an analysis of covariance nor change scores using the full sample would correct for the fact that baseline characteristics were confounded with intervention group. For example, an analysis of covariance assumes parallel regressions for the covariates used and also assumes that the intervention and no-intervention conditions overlap sufficiently in the pretest variable distributions to permit valid adjustment for those variables. These assumptions were not met in the present data, making an analysis of covariance an invalid procedure (Neter, Wasserman, & Kutner, 1990). Thus, we chose to err on the side of lessening Type I errors at the potential risk of increasing Type II errors.

Using the 31 matched pairs of students, we again calculated the differences between the intervention and no-inter-

Table 1
Means, Standard Deviations, and *t*-Test Differences Between Intervention and No-Intervention Groups at Pretest Before Matching, Pretest After Matching, and Posttest After Matching

Measure	Unmatched pretest				Matched pretest				Matched posttest									
	Intervention (n = 57)		No intervention (n = 41)		Intervention (n = 31)		No intervention (n = 31)		Intervention (n = 31)		No intervention (n = 31)		<i>t</i>	<i>p</i> ^b				
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>						
Psychological variables																		
Hopelessness	6.4	3.4	4.4	3.3	2.80	.006	5.3	3.1	5.0	2.8	0.42	ns	3.5	2.6	4.6	2.9	1.63	.05
Suicide probability	67.0	19.7	57.4	12.6	3.11	.002	61.2	13.1	61.3	11.8	0.03	ns	54.3	11.6	58.9	13.0	1.45	.07
Depression	3.5	1.3	3.0	1.4	1.76	.08	3.6	1.2	3.2	1.4	1.28	ns	3.3	0.9	3.4	1.1	0.30	ns
Self-efficacy skills																		
Suicide prevention	4.4	1.1	4.3	1.2	0.17	ns	4.3	0.9	4.4	1.1	0.18	ns	4.7	0.8	4.7	1.2	0.02	ns
Problem solving	5.6	1.3	2.6	1.2	3.88	.001	3.6	1.3	2.6	1.2	3.18	.002	—	—	—	—	—	—
Active listening	4.3	0.9	4.3	1.0	0.04	ns	4.2	0.6	4.2	0.9	0.46	ns	4.6	0.9	4.5	1.0	0.05	ns
Anger management	4.6	1.3	4.7	1.2	0.23	ns	4.7	1.2	4.4	1.2	0.87	ns	5.1	1.1	4.5	1.5	1.92	.03
Stress management	4.3	1.2	4.7	1.4	1.45	ns	4.4	1.2	4.5	1.3	0.47	ns	4.5	0.9	4.5	1.6	0.12	ns

Note. Problem solving was dropped from the posttest analysis because intervention and no-intervention groups were different at pretest on this variable.
^a Two-tailed. ^b One-tailed.

vention groups on the study variables at pretest (see Table 1). As expected, two-tailed *t* tests indicated that intervention and no-intervention students were not significantly different from each other on suicide probability, hopelessness, depression, and measures of self-efficacy for skills. However, intervention students reported higher levels of self-efficacy for problem-solving skills than did no-intervention students, and therefore problem solving was dropped from further analyses.

As planned this procedure eliminated the differences between groups at pretest and allowed us to test our hypothesis that the curriculum intervention would improve the psychological profile and skill pattern of students. Unless otherwise indicated, all of the analyses reported below are based on the matched pairs of students selected by this procedure.

Self-Report Survey

The differences between the matched groups on posttest scores were examined using one-tailed *t* tests. Results indicated that participation in the curriculum led to significant improvements on some of the major outcome variables (see Table 1). The intervention group was less suicidal ($M = 54.34$) after taking part in the curriculum than the no-intervention group ($M = 58.86$), $t(61) = 1.45$, $p < .07$. The intervention group also showed significantly less feelings of hopelessness ($M = 3.53$) than the no-intervention group ($M = 4.67$), $t(61) = 1.63$, $p < .05$. The intervention group, however, was not less depressed ($M = 3.29$) when compared to the no-intervention group ($M = 3.37$), $t(61) = .30$, *ns*, after being exposed to the curriculum. Students' self-efficacy ratings for skills covered in the curriculum showed no intervention effect.

Behavioral Observation

Of the original 62 students who were selected for the role-play assessment, 28 came from the matched paired sample. Analyses were conducted on this subsample of the matched pairs, because the 62 students were randomly drawn from the list of all participants at pretest and showed the same characteristics in regard to nonequivalence of

psychological risk factors at pretest. A comparison of the randomly selected subsample to the full 31 matched paired sample on gender, age, grade, and pretest scores on hopelessness and suicide probability showed no statistical differences, indicating that this subsample was representative of the 31 matched pairs.

Posttest differences for intervention ($n = 14$) and no-intervention groups ($n = 14$) on skills displayed during the suicide intervention role-plays were assessed using a repeated measures analysis. Table 2 presents the cell means and significant findings for the two sets of repeated measures, suicide intervention skills, and problem-solving skills. A significant main effect was found for treatment group for both skills measures. Intervention students demonstrated a higher level of suicide intervention skills ($M = 4.67$) than no-intervention groups ($M = 3.86$), $F(1, 26) = 10.09$, $p < .004$; intervention students also demonstrated a higher level of problem-solving skills ($M = 4.78$) than no-intervention students ($M = 4.39$) that was marginally significant, $F(1, 26) = 3.52$, $p < .07$. In addition to the main effect for treatment group on problem solving, there was also a significant main effect for role-play scenario's such that students demonstrated higher levels of problem-solving skills in the more mild suicide scenario ($M = 4.77$) than in the more serious suicide scenario ($M = 4.40$), $F(1, 26) = 9.65$, $p < .005$.

Peer Ratings

Consistent with the behavioral analyses, this peer-rating analysis was conducted on the subsample of 28 students included in the 31 matched pair sample. Posttest differences in peer perceptions of classmates' suicide intervention and problem-solving skills showed no significant effects for intervention group using *t*-test procedures.

Discussion

This study evaluated the effectiveness of a culturally compatible, school-based life skills curriculum for the prevention of American Indian adolescent suicide. We found

Table 2
Repeated Measures Test for Behavioral Observation of Two Skills Using Students From the Matched Paired Sample

Measure	Intervention ($n = 14$)		No-intervention ($n = 14$)		Significant effect
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Suicide intervention					
Role-play 1	4.63	0.65	4.05	0.84	Main effect for group ^b
Role-play 2	4.71	0.84	3.66	0.89	
Problem solving					
Role-play 1	4.89	0.53	4.64	0.66	Main effect for group ^a
Role-play 2	4.67	0.64	4.14	0.70	Main effect for role-play ^b

^a Marginally significant at $p < .07$. ^b Significant at $p < .01$.

that merging a social cognitive, life skills approach with peer helping was effective in reducing some of the risk factors and increasing some of the protective factors associated with suicide. Curriculum outcomes were assessed using a multimethod approach to include the perspectives of students, peers, and trained American Indian observers regarding the factors chosen for measurement. Two of the three methods of measurement show statistically significant effects, and the methods combined suggest that the curriculum had a beneficial impact on risk and protective factors for suicide.

Self-report data measured psychological risk factors and self-efficacy for protective skills. Two of the three risk factor variables measuring negative cognitive-affective states showed improvement in response to the curriculum. Hopelessness, the major mediating variable associated with suicide (Dixon, Heppner, & Rudd, 1994), was lower for students who received the curriculum than for students who did not. We are also reasonably confident that the level of suicide probability was lower for students who participated in the program. Depression was the only cognitive-affective variable not to be affected by the curriculum. Neither of the two self-reported self-efficacy measures (suicide intervention and active listening) retained in analyses showed a positive effect for the curriculum.

Although the self-reported data on self-efficacy for skills showed no intervention effects, behavioral observations of these skills indicated that students had learned these skills and were able to demonstrate them. Behavioral data indicated that students receiving the curriculum had significantly better suicide intervention skills and perhaps better problem-solving skills than students in the no-intervention classes. However, peer ratings did not confirm this finding.

One possible explanation for the finding of different effects for skills depending on the method of measurement may have to do with pueblo culture. It is quite likely that rating oneself highly on ability to perform certain behaviors would be perceived as boastful or inappropriate in this culture. If this cultural injunction was operating, it may have served to depress the intervention students' ratings of their own skill level, but would not have affected their ability to demonstrate those skills in role-plays. Thus, although the self-efficacy construct had proven useful in research with the general population, our expectation regarding its utility for adolescent pueblo Indians was perhaps misguided (Spindler & Spindler, 1989).

Likewise, the lack of significant treatment differences in the peer assessment may be the result of a culturally general phenomena. That is, the social prestige in the peer social order of each student being rated was known to each rater and may have acted as a confounding variable that would obscure the expected effect.

Finally, the lack of significant findings across all of our multimethod measures may have been caused by the need to create a matched paired sample for analyses and the accompanying loss in sample size and power. Through this *matching procedure we were able to attribute observed changes more confidently to intervention*. Yet despite the small

sample size, we were still able to demonstrate certain important differences, thus showing a beneficial impact of the curriculum intervention.

Overall, our multimethod assessment showed a distinct and positive pattern that indicated the curriculum was successful in affecting a healthier psychological profile by decreasing suicidal thinking and hopelessness and improving important suicide-protecting skills. We believe that part of the effectiveness of the curriculum may be due to the fact that it was a relatively long-term comprehensive intervention. Whereas most other school-based suicide prevention curricula focus on increasing awareness, the ZLSD curriculum went far beyond teaching students to recognize the signs and symptoms of suicide to teaching students appropriate skills to both manage their own self-destructive thinking and behavior and to assist their peers in dealing with suicidal thinking and behavior.

We believe that the intervention approach taken in this study could be strengthened in several ways. First, although our intervention was long-term and implemented throughout the school year, booster sessions on suicide intervention in the senior year and in adult education and community programs are needed to maintain and reinforce change. Ideally, we would have preferred to intervene in middle school, prior to the time when the influence of the family home setting begins to collide with the rise in peer influence. Numerous reports of the effectiveness of early intervention programs in developing socially competent behavior call for continuity in life skills interventions that support children through each stage of development (Cauce, Comer, & Schwartz, 1987; Weissberg et al., 1991). Thus, we recommend earlier and continuous implementation of the curriculum.

We need to emphasize the fact that the life skills curriculum for suicide prevention was developed at the request of the Zuni tribe. This intervention was integrated into language arts classes rather than offered as a special focused course. It took place in the only Zuni high school, which means there are potential threats to validity given that treatment groups coexisted in the treatment setting during intervention. We developed the ZLSD curriculum with two goals in mind: first, to implement the intervention in a community where it was needed and, second, to evaluate its effectiveness. We attempted to alter behavior and promote healthy life skill development among students, many of whom had personal experiences with suicide. Research responding to this type of request could not be conducted under optimal experimental conditions. Within those constraints, we were able to maintain a quasi-experimental design by matching the characteristics of participants in intervention and no-intervention conditions. As the results indicate, the matching procedure was effective in creating equivalent comparison groups at baseline on the variables most directly associated with suicide behavior. Based on this carefully matched sample, we were able to demonstrate a significant curriculum effect. Nevertheless, we believe the results should be considered exploratory rather than conclusive. Of course, the generalizability of the present findings

is limited by the singularity of the Zuni pueblo that the curriculum served.

However, we are encouraged by the positive findings we were able to document in this study and attribute a large portion of the success to two important features of the curriculum: use of the life skills approach and cultural tailoring of its content. Further refinement of the content and assessment methods and more rigorous experimental conditions are needed to conclusively document the extent and type of benefit that may be attributed to a life skills approach to suicide prevention with American Indian populations.

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