The Structure of Problem and Positive Behavior Among American Indian Adolescents: Gender and Community Differences[1]

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Using Problem-Behavior Theory as a framework, the latent structure of problem and positive behaviors was examined within a sample of 1,894 American Indian adolescents. Support was found for a two-factor second-order structure in which problem behaviors (antisocial behavior, alcohol use, drug use, and risky sexual behavior) and positive behaviors (school success, cultural activities, competencies, and community-mindedness) represented two relatively uncorrelated aspects of behavior. Hierarchical multiple regressions demonstrated that the positive behaviors construct contributed significant incremental construct validity in the statistical prediction of psychosocial outcomes, over and above the problem behaviors. In addition, the fit of the structure was examined across gender and the four participating communities. The importance of the inclusion of positive behaviors is discussed from the standpoint of both prevention/promotion activities and the communities' perceptions. Further recommendations are made for deeper understandings of community concerns and strengths in conducting preventive/promotive research efforts.

KEY WORDS: American Indian adolescents; problem behaviors; positive behaviors; preventive/promotive research.

In recent years, the problem and risk behaviors of American Indian adolescents have received considerable attention. For instance, American Indian youths have been reported to exhibit higher levels of serious problems such as depression and suicide, substance use, and school leaving (U.S. Congress, 1990). Blum, Harmon, Harris, Bergeisen, and Resnick (1992) reported that for the majority of the psychological and physical problems of concern during adolescence, American Indian youths showed higher levels than a comparison group of white youths. At the same time, these authors also noted "As is true for most teenagers throughout the United States, the majority of American Indian youths are not faced with significant health risks" (p. 1643). One area of research that has been prominent in exploring interrelationships among adolescents has been Problem-Behavior Theory (PBT); however, the relevance of PBT has not been examined to date with American Indian adolescents. Moreover, the positive aspects of adolescent behavior in general have received little systematic attention. To address these concerns, this study had four goals: (a) to attempt to raise the discussion of positive behaviors in research literature to a level comparable to that of problem behaviors; (b) to expand work on the construct validity of both problem and positive behaviors; (c) to test empirically whether problem and positive behaviors are endpoints of a single continuum or are instead two separate constructs; and (d) to extend work on the structure of problem and positive behaviors to American Indian adolescents and to begin to examine differences in these structures by gender and community. We discuss each of these goals below; however, we begin with a brief orientation to PBT.

Problem-Behavior Theory

A number of recent research endeavors have provided evidence that adolescent alcohol use, other drug use, delinquent behaviors, and sexual intercourse may be best understood as elements of a "syndrome" of adolescent problem behaviors (Donovan & Jessor, 1978; Donovan & Jessor, 1985; Donovan, Jessor, & Costa, 1988; Farrell, Danish, & Howard, 1992; Huba, Wingard, & Bentler, 1981a). Much of the work on problem behaviors has been conducted under the rubric of Problem-Behavior Theory, spearheaded by Jessor in the 1970s (Jessor & Jessor, 1977). Underlying PBT is the dimension of conventionality–unconventionality, conceptualized as summarizing "an orientation toward, commitment to, and involvement in the prevailing values, standards of behavior, and established institutions of the larger American society" (Donovan, Jessor, & Costa, 1991, p. 52). For ex-

ample, problem behaviors are behaviors that have been defined as undesirable by society and that elicit some kind of social control response (Donovan et al., 1991). At the other end of the underlying dimension, "conventional" behaviors—or, paralleling the term "problem behavior," *positive* behaviors—include behaviors that are considered appropriate for adolescents within their particular cultures or communities.

Moving from theory to operationalization, Jessor, Donovan, and their associates have reported that getting drunk, marijuana use, delinquent behavior, and precocious sexual intercourse constitute a syndrome of problem behaviors (Donovan & Jessor, 1985; Donovan et al., 1988). These four problem behaviors have correlated positively with each other and negatively with measures of positive behavior (e.g., church attendance, grades in school). These intercorrelations have been used as evidence for this single underlying factor of conventionality–unconventionality (Donovan, Jessor, & Costa, 1993; Jessor & Jessor, 1977).

Positive Behaviors

To date, the most detailed research efforts have emphasized problem behaviors almost exclusively, neglecting the positive end of the dimension (Donovan & Jessor, 1985; Donovan et al., 1988; Farrell et al., 1992; Gillmore, Hawkins, Catalano, & Day, 1991; McGee & Newcomb, 1992). PBT is not alone in this oversight of positive or adaptive outcomes, though. Overall, research on positive behaviors such as competence remains a much less mature "sibling" of the older and more thoroughly studied maladaptive outcomes or problem behaviors (Garmezy, 1993). However, the relevance and importance of adaptive developmental outcomes to prevention and promotion is undeniable: to assess the impact of prevention and promotion efforts, we should look not simply for a decrease in pathology, but also for the enhancement of a wide variety of positive outcomes such as social and instrumental competence, community involvement, and religiosity or spirituality. In addition to a general optimism reflected in this construct, it can also suggest avenues for interventions that are more likely both to be embraced by the community and to have cost-effective and enduring impacts. As a result, we need to turn our attention to quantifying these positive outcomes so that we can begin to uncover the important *predictors* of such adaptive development. Thus, the first goal of this study was to attempt to raise the discussion of positive behaviors to a level comparable to that of problem behaviors.

Construct Validity

Most researchers who have explored the structure of problem and positive behaviors have relied on a relatively limited number of items to represent the construct. For instance, Donovan and his associates (Donovan & Jessor, 1985; Donovan et al., 1988) typically utilized only four measures: an antisocial behavior scale score, past-month's marijuana use, "number of times drunk in past month," and "ever had sex." A few researchers expanded slightly on this set (Farrell et al., 1992; Gillmore et al., 1991; Resnicow, Ross-Gaddy, & Vaughan, 1995). Items representing positive behaviors have been even more restricted, though. In Donovan and Jessor's work, at most one item of "academic achievement" and/or one item of "church attendance" have been utilized. Resnicow et al. (1995) selected five items to represent a general positive behaviors construct: attended church, read about African American history, did something fun with adult you live with, accomplished something you were proud of, and exercise or play sports. Farrell et al. (1992) utilized three items—church attendance, grade-point average, and school attendance—and a composite scale score of "eight positive behaviors (e.g., 'spent time studying for a test' and 'helped out around the house') . . . selected to represent appropriate activities relevant to the target population" (p. 706).

While such efforts are important first steps, concern arises surrounding the construct validity of the operationalizations to date. In general, construct validity requires that a measure sample from the universe of relevant observed variables as widely as theory and resources allow (Messick, 1995). Thus, the item sampling to date may not have adequately represented the universe of construct-relevant behaviors that truly make up the constructs of problem behaviors and positive behaviors. Thus, a second goal of this research was to expand work on construct validity in two ways: (a) sampling a more diverse set of both problem and positive behaviors, and examining the underlying factor structure of this expanded set of items measuring problem and positive behaviors; and (b) assessing the importance of including both problem and positive behaviors in understanding adaptive and maladaptive processes among adolescents.

Model Testing

General Approach

The fit of a one-factor model of problem behaviors, or problem and positive behaviors together, has rarely been tested against competing mod-

els that might also—and perhaps, *better*—explain the relationships among these variables. The strongest test would be to compare a model of a single underlying problem/positive behaviors construct to one with separate problem and positive behaviors constructs. Only a few authors have included a sufficient number of positive behaviors for such a test (e.g., Farrell et al., 1992; Resnicow et al., 1995); none has rigorously tested a two-factor structure against a one-factor structure. However, the correlations reported in these studies indeed suggest that problem and positive behaviors are not simply two endpoints of a single dimension. Thus, a third goal of this research was to test explicitly a one-factor latent structure against a two-factor latent structure using the expanded set of problem and positive items, to examine the assumption of a single underlying dimension of unconventionality and the importance of considering *both* problem and positive behaviors.

Ethnic Differences

Although early thinking about PBT arose from work with mostly white, middle-class youths, later testing has expanded to include other ethnicities (Donovan & Jessor, 1985; Donovan et al., 1988; Farrell et al., 1992; Gillmore et al., 1991; McGee & Newcomb, 1992; Resnicow et al., 1995). While some have reported solid support for the syndrome of problem behaviors (Farrell et al., 1992), others suggest that a more complex structure may underlie problem behaviors (Gillmore et al., 1991; McGee & Newcomb, 1992; Resnicow et al., 1995). To date, though, none has included American Indian adolescents as a particular focus. The universality of PBT for American Indian youths is especially suspect, given some of our own work with these populations. For instance, we have found that among Indian adolescents, the use of alcohol has strong "conventional" or normative aspects in addition to its unconventional aspects. More generally, we would expect that the "unconventionality" of alcohol use may vary to some degree across a number of key groups: for example, by *history*, to the extent that alcohol use is differentially associated with some adolescent behaviors, and then with others, in different historical periods; by *ethnicity*, to the extent that alcohol use is incorporated differently in different sociocultural traditions; and by *gender*, to the extent that drinking may be more normative for males than for females (Mitchell et al., 1996; O'Nell & Mitchell, 1996).

Moreover, while a proposed model may fit adequately across a heterogeneous sample, one should not assume that that structure necessarily fits equally well for subgroups such as ethnicity or gender. To date, ethnic differences in structure or meaning for problem and positive behaviors

across subsamples have not been examined. Yet, especially among Indian nations, both historical and ongoing experiences of disruption and oppression from mainstream groups have differed dramatically across various culture groups; in addition, sociocultural integration can vary widely across tribe (Kunitz & Levy, 1994; Levy & Kunitz, 1974; May, 1982). Thus, one might anticipate differences in both the meaning and the structure of unconventionality–conventionally as well as problem and positive behaviors.

Gender Differences

Although ethnic subgroups have not been examined at all, a few studies have attempted to look at gender differences. Donovan and Jessor (1985) explicitly reported gender differences in only one study, and then only in a brief footnote: a "lack of fit with the single-factor model in three of the four male subsamples and in one of the female subsamples . . . suggests that the conforming behaviors may constitute a correlated second factor for the men" (p. 902). Farrell et al. (1992) looked at age-by-gender differences in structure, finding that a model that fit seventh-grade males and females and ninth-grade females did not fit ninth-grade males quite as well. The limited exploration of possible gender differences in problem and positive behaviors is surprising, given commonly reported gender differences in areas such as internalizing/externalizing (Chenbach & Edelbrock, 1987), school success (Cobb, 1992; Henderson & Dweck, 1990), and sexuality (Brooks-Gunn & Paikoff, 1993). Thus, a fourth goal of this research was twofold: to extend work on the structure of problem and positive behaviors to an American Indian sample and to utilize multisample confirmatory factor analyses to explore two sets of subgroup differences—gender and community.

METHOD

Sample

Communities

In working with Indian communities, protection of the confidentiality of the tribes is considered as important as that of the individual participants. Therefore, these tribal and cultural groups are described generally as South Central, Northern Plain, Southwestern, and Pueblo, consistent with the culture groups they represent. The South Central group originated

on the east coast of the United States but was transferred to the southern Midwest in the 1800s. They have a small land-base, and tribal members' ties to this land-base are often more tenuous than those of other groups in the sample. The students from this community all attended a tribally administered school in the tribal nation's capital; 63% were boarders. The Northern Plains adolescents come from a tribe that lives in relative isolation as well as considerable poverty, and has remained closely identified with their home reservation. Of the culture groups included in this sample, the Northern Plains tribes historically placed greatest emphasis on individuality and self-sufficiency. The Southwestern group represents a pastoral tradition. Currently they have a large land-base and experience unemployment rates lower than those of the Northern Plains group. Finally, the Pueblo group comprises several tribes living in the Southwest. Historically, these people had an agrarian economy and a tight-knit, community-oriented social structure. While certainly not representative of all Indian groups in the United States today, these four tribal groups allow a unique opportunity to reflect and demonstrate the differential life experiences of Indian adolescents.

Participants

Data for this study were drawn from the first full wave of the Voices of Indian Teens Project (VOICES), an ongoing longitudinal effort involving collaboration with 10 high schools located in five American Indian communities west of the Mississippi. In Fall 1993, a total of 2,804 youths completed self-report surveys, representing 74% of those students reported by the school to be enrolled as of "count week"—the date in early October at which total enrollment figures are reported to funding agencies for determination of federal educational monies.[3] Of these, 2,583 (92.2%) self-identified as being Indian and were therefore included in the sample for this study.

In addition to the exclusion of non-Indian adolescents, two other exclusion criteria were enforced. First, several of the schools included in the full sample were excluded because they are viewed locally and nationally as semitreatment facilities for youths experiencing either learning or emotional problems. This exclusion was considered important because these youths (n = 431) were clearly not representative of American Indian adolescents more generally and might bias the results. Second, we used only

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[3]During the 4 to 6 weeks between this reporting period and the data collection period, a number of schools dropped students from their rolls, due to chronic absenteeism or transfer; as a result, the participation rate noted here is conservative.

those youths with complete data (N = 1,622) to avoid the difficulties with statistical instability that can be introduced when using pairwise deletion.

To determine whether these exclusions introduced a bias, we used one-way ANOVAs to compare those included in the analyses to those who were excluded because of missing data (n = 530) on the variables involved in these analyses. Of the 33 problem and positive behavior variables, 10 of the 33 were significantly different, and in directions one might anticipate (e.g., those with missing data reported doing less well in school, using marijuana more often, starting a fist fight more often, having more negative consequences after drinking). However, given the sample size, the power of the ANOVAs was quite high. In fact, the average ω^2 across the 10 significant differences was only .0035—the differences between the two groups on average accounted for less than 0.4% of the variance. Thus, any bias introduced by using only those with complete data is likely to have been minimal.

Procedures

Parents of all youths at each school were sent a letter explaining the study; those wanting more information or refusing permission for their children to participate returned the enclosed letter signifying such in a self-addressed stamped envelope.[4] (Only 2% of the parents refused.) School-based data collection consisted of one scheduled testing day, with a follow-up day approximately 1 week later for absentees. On the day of testing in school, youths actively agreed to participate by providing informed, written assent. Youths completing the survey received compensation worth $5 (e.g., a $5 money order or gift certificate). In school, surveys were administered within one class period, lasting approximately 45 to 50 minutes. Members of the research staff were on hand at each school to facilitate administration, answer questions, and ensure confidentiality of student responses. Additionally, 2 to 3 months of community-based follow-up, conducted by research staff who were members of each community, then focused on finding those youths who could not be contacted in the schools.

Measures

Extensive focus group work within the communities helped guide the selection and modification of the measures discussed here. In addition, be-

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[4]This procedure of "active refusal" was approved in advance at many levels, including the home institution's Institutional Review Board, consortium institutions' Institutional Review Boards, and each participating school and community.

cause of classroom time constraints, the VOICES measures underwent extensive pilot-testing to permit measure reduction prior to the commencement of the full study; measures that were shortened during this process are noted below. Means and standard deviations of both problem and positive behavior variables are presented in Table I. In addition, to explore the importance of considering both problem and positive behaviors, we also identified six psychosocial variables—representing both maladaptive and

Table I. Item-Level Statistics, Full Sample ($N = 1,622$)

Item	Range	M	SD
Started a fist fight	1–5	1.75	1.14
Shoplifted from a store	1–5	1.55	1.11
Damaged property	1–5	1.44	1.02
Stayed out all night	1–5	2.12	1.48
Lied to parents or dorm aides	1–5	2.29	1.51
Quantity/frequency of alcohol use (z score)	-.78–2.51	-0.04	0.81
Negative consequences of alcohol use	1–4	1.17	0.36
Problem drinking behavior	1–4	1.45	0.63
No. of times used marijuana in the past month	0–31	4.05	7.96
No. of times used inhalants in the past month	0–31	0.55	2.67
No. of drugs ever tried	0–7	1.22	1.42
No. of drugs used in past month	0–7	0.91	1.25
Ever had sexual intercourse	0–1	0.51	0.50
Had sexual intrercourse in past month	0–1	0.30	0.46
No. of times used condom in past month	1–4	0.90	1.42
No. of times used other birth control in past month	1–4	1.03	1.56
Grade-point average	1–4	2.67	0.77
How well do you do in school	1–5	3.30	0.74
Do schoolwork carefully	1–4	2.81	0.89
Live by the Indian way	1–4	2.92	0.92
Speak tribal language	1–4	2.70	0.95
Participate in traditional activities	1–4	2.88	1.01
Make other kids feel comfortable	1–4	2.84	0.89
Find lots of fun things to do in free time	1–4	2.79	0.91
Good at creative things	1–4	2.49	1.04
Make others laugh	1–4	2.72	0.97
Good at sports and athletic games	1–4	2.62	1.01
Make friends with people	1–4	3.07	0.87
Visit older relatives	1–4	2.39	0.91
Try to help others	1–4	2.53	0.88
Please the elders in the community	1–4	2.43	0.95
Visit elders	1–4	2.19	0.94
Volunteer to help elders	1–4	1.98	0.93

adaptive psychological functioning—that were theorized to have differential relationships with problem and conventional behaviors. All variables were computed as average-item scale scores; when item metrics differed within a scale, individual items were converted to z scores prior to the computation of the average-item scale score.

Problem Behaviors

Antisocial Behavior. Five items were selected from Donovan et al.'s (1988) 10-item general deviance scale. The 10 items were grouped into five pairs: aggression, stealing, vandalism, lying, and acting without permission; within each pair, that question reflecting the more serious behavior was selected. Asking about the past 6 months, the 5 final items ($\alpha = .73$) were "started a fist fight or shoving match," "shoplifted from a store," "damaged or marked up public or private property," "stayed out all night without permission," and "lied to your parents, grandparents, or dorm aides about where you had been or whom you were with." Responses ranged from 1 (*never*) to 5 (*5 or more times*).

Alcohol Use. Items representing alcohol use included quantity/frequency items as well as items measuring negative consequences following drinking and commonly utilized indicators of serious problem drinking. Six questions were included concerning the level of the youth's use of alcohol during the previous month: (a) number of days the youth drank; (b) the usual number of drinks when drinking; (c) the greatest number of drinks at one time; (d) the number of times drunk; (e) self-perception of drinking (light, moderate, or heavy drinker); and (f) experience of drinking binges (yes or no). On the basis of earlier pilot work noted above (Mitchell et al., 1993), 14 items of the 25-item alcohol subscale of the Diagnostic Interview Schedule for Children (DISC-2.1, Shaffer et al., 1993) were selected to tap both negative consequences and indicators of serious problem drinking. The format was altered from a verbal administration format to a self-administered measure; response categories ranged from 1 (*rarely or never*) to 4 (*almost always*). Two additional questions were created to reflect problems with family and friends, due to drinking. We utilized all of the above items in a three-component structure of alcohol use (Mitchell et al., 1996): quantity/frequency, negative consequences following drinking, and problem drinking behaviors ($\alpha = .87$).

Drug Use. Four indicators of drug use ($\alpha = .76$) were utilized. Two were single items: "number of times used marijuana in the past month" and "number of times used inhalants in the past month"; response sets for both questions ranged from 0 to 31 times. In addition to these two drugs,

youths were asked about use of five other groups of substances: crack or cocaine, solvents, amphetamines or speed, barbiturates or downers, and other drugs. Using all seven groups, two composite variables were created to represent the breadth of drug experimentation and use: "number of drugs *ever* used" was calculated by counting the number of drugs the youth had endorsed as having ever used; "number of drugs used during the past month" counted only those endorsed as used in the past month.

Sexual Behavior. Four indicators (α = .88) of sexual behavior were included. "Ever had sexual intercourse" and "had sexual intercourse during the past month" were both yes/no questions. "Number of times used condoms in the past month" and "number of times used *other* birth control in the past month" were answered from 1 (*almost always*) to 4 (*never*). All items were coded so that higher response categories represented more risky sexual behavior. Answers of those who reported never having had sex or not having had sex in the past month were recoded to 0.

Positive Behaviors

School Success. Indicators of school success included three items (α = .66): self-reported grade-point average, rated from 1 (*mostly Ds and Fs*) to 4 (*mostly As*); "Compared with your classmates, how well do you do in school?," rated from 1 (*much below average*) to 5 (*much above average*); and "I do my schoolwork carefully," rated from 1 (*rarely or never*) to 4 (*almost always*).

Cultural Activities. In earlier work, "church attendance" has served as a proxy for positive behaviors; however, our earlier work within these Indian communities suggested that the idea of church attendance as a proxy for spirituality is not generally appropriate. More appropriate is the idea of participating in cultural activities in the community. Three items (α = .73) concerning Indian cultural activities were utilized: "Do you live by or follow the Indian way," "Do you speak your tribal language," and "Do you participate in traditional practices"—all rated from 1 (*not at all*) to 4 (*a lot*).

Competencies. Competencies are almost by definition an important aspect of positive behaviors. Adapted from a measure created for the Adolescent Pathways Project (Seidman, Aber, Allen, & Mitchell, 1994), questions tapped six social and instrumental competencies (α = .82): making other kids feel comfortable, finding fun things to do in free time, being good at creative things, making others laugh, being good at sports and athletic games, and making friends with people. All responses ranged from 1 (*rarely or never*) to 4 (*almost always*).

Community-Mindedness. Being involved in community activities is an important aspect of life in many Indian communities (Mitchell, 1997). We included five items (α = .87) to measure this construct: the frequency of visiting older relatives, trying to help others, pleasing the elders in the community, visiting elders, and volunteering to help the elders. Response categories ranged from 1 (*rarely or never*) to 4 (*almost always*).

Psychosocial Variables

Anxiety. Anxiety has been shown to have some relationship to problem behaviors, such as substance use. For example, Orive and Gerard (1980) found that lower anxiety was correlated to greater substance use; Swaim, Oetting, Edwards, and Beauvais (1989) found a positive zero-order correlation, as well as a strong indirect path to drug use, mediated by anger and peer drug associations. This study used nine stem items (α = .78) of the Anxiety module of the DISC 2.1 (Shaffer et al., 1993), which asked about having a variety of feelings in the past 6 months; responses were either yes (1) or no (0).

Depression. Depression may be a cause or a result—or both—of problem behaviors. It may also represent a "turning in" or internalization in contrast to the "acting-out" or externalization of problem behaviors (Achenbach & Edelbrock, 1987; Harlow, Newcomb, & Bentler, 1986; Hartka et al., 1991). In this study, depression was measured using the 7-item "depressed affect" subscale of the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). This subscale of the CES-D has demonstrated the greatest concurrent validity of the CES-D subscales with a diagnosis of depression; it has also been shown to be robust in Indian (Beals, Manson, Keane, & Dick, 1991) and other samples (Golding & Aneshensel, 1989; Radloff, 1977, 1991). Responses asked about the past week and ranged from 0 (*rarely or none of the time*) to 4 (*most or all of the time*); internal consistency was high (α = .89).

Sensation-Seeking. In viewing problem behaviors as risky behaviors, sensation-seeking has been implicated as an important correlate among teens (Huba, Newcomb, & Bentler, 1981b). We utilized six items adapted from Zuckerman's (1979) measure, as shortened for an adolescent sample by Huba et al. (1981b), including such items as "I like wild parties" and "I would like to try parachute jumping" (α = .74). Responses ranged from 1 (*disagree*) to 5 (*agree*).

Self-Esteem. Although self-esteem has demonstrated inconsistent relationships with problem behaviors, it is commonly considered an important marker of satisfactory development. We utilized six items of the Rosenberg

(1979) Self-Esteem Scale (α = .79); the response set ranged from 1 (*disagree*) to 5 (*agree*).

Personal Mastery. Within Euro-American samples, personal mastery or internal locus of control has been related to more positive outcomes (e.g., Pearlin & Schooler, 1978). This measure was a composite of Pearlin and Schooler's mastery scale and Levenson's (1981) internality items (α = .69); the response set ranged from 1 (*disagree*) to 5 (*agree*).

Social Support. Support from peers and family has been found to predict problem behaviors—especially in instances where family support is low and peer support is high (e.g., Wills & Vaughan, 1989). We selected six items (α = .85) from the Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988): two items asked about support from a special person; two from family; and two from a friend. Responses ranged from 1 (*disagree*) to 5 (*agree*).

Ethnographic Component

In addition to the quantitative aspects of this study, two anthropologists conducted ethnographic investigations in the two largest communities. Through repeated use of both adolescent and adult key informants, the anthropologists worked to understand the local meanings of problem and positive behaviors among adolescents within the community. As a result, the anthropologists were able to inform important aspects of the quantitative study. For example, they were able to provide feedback throughout the measure development period, from initial construct selection to specific wording of individual items. They also reviewed results for interpretability and, when necessary, consulted their key informants to help with particular interpretations and implications of the quantitative results.

RESULTS

We assume that the reader has a general understanding of the basics of confirmatory factor analyses and structural equation modeling; for those who are less familiar with *multisample* confirmatory factor analyses using structural equations, we present a summary in the Appendix. In this study, we first used confirmatory factor analysis (CFA) within the full sample to test an expanded second-order two-factor model, using nested models to examine the question of the unidimensionality of problem and positive behaviors. With a set of hierarchical regression analyses, we next examined the incremental validity (Sechrest, 1963) of positive behaviors in conjunc-

tion with problem behaviors in predicting psychosocial adaptation and maladaptation. We then conducted two sets of multisample CFAs, to explore the goodness-of-fit for this expanded two-factor model across gender and community.

Full-Sample Confirmatory Factor Analysis

Figure 1 shows the fit and loadings for the two-factor structure of the expanded problem and positive behavior constructs. This bidimensional factor model represented a significant improvement in the fit over a one-factor (i.e., unidimensional) model, $\Delta\chi^2(1) = 50.17; p < .05$. The comparative fit index (cfi) met the standard cutoff criterion of .90, suggesting that the structure provided a satisfactory fit for the observed data. (More precisely, the fit of the second-order structure need not be rejected.)[5] All first-order factor loadings were statistically significant, although Inhalants had a loading (.38) quite a bit lower than the other loadings on the first-order Drug Use factor. Second-order loadings were all significant, as well. However, the loading for Sexual Intercourse (.38) was lower than the other loadings on problem behavior; School Success (.38) and Cultural Activities (.35) also loaded quite a bit lower on positive behaviors. Finally, the correlation between the two second-order factors was significant, but very small (-.19).

Validity Analyses

The results of the CFAs reported above supported a two-factor structure underlying problem and positive behaviors; however, if maintaining two separate components provides no significant and meaningful discrimination, the utility of two separate factors is questionable. To examine this issue, we first standardized all variables to adjust for different response metrics; we then created unit-weighted, average-item scale scores for each of the six problem and positive behavior constructs. We then examined the extent to which the positive behaviors added predictive utility above and beyond the problem behaviors in concurrent prediction of measures of psychosocial adaptation and maladaptation. Using hierarchical multiple regres-

[5]Some authors suggest that a nonsignificant χ^2 statistic indicates an appropriate model fit. However, χ^2 statistics are related to sample size; as a result, χ^2 statistics based on large samples are often significant even in the face of very small differences between observed and expected matrices (Hoyle, 1995). Thus, although the χ^2 tests are presented, we discuss only comparative fit indices, as providing discriminating guidance about goodness-of-fit with large samples.
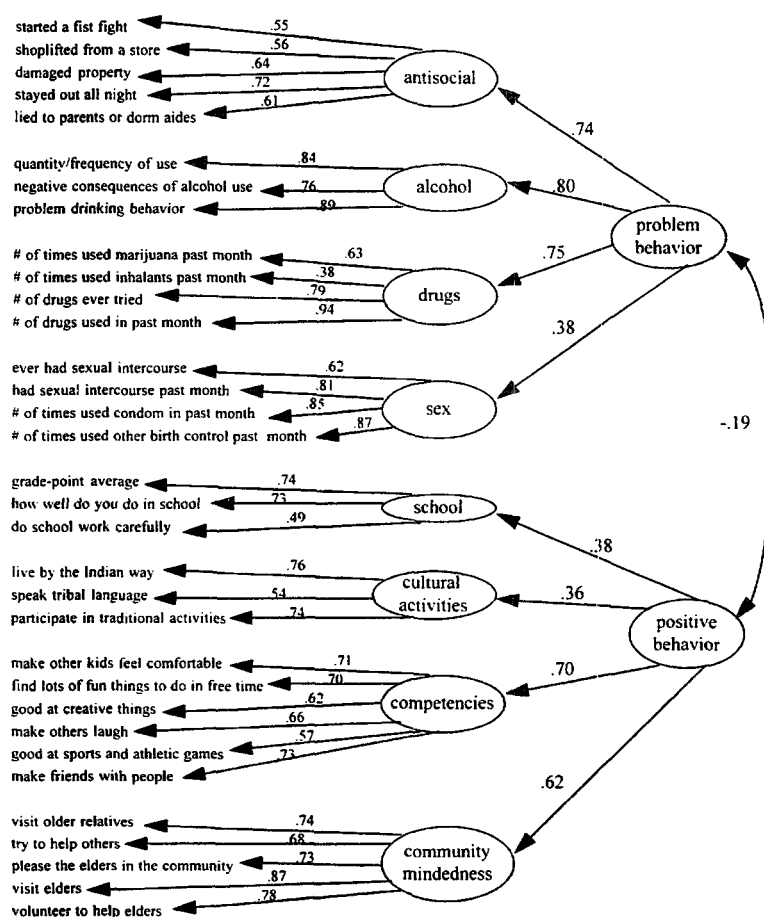
Fig. 1. Expanded Problem–Behavior structure: full sample.

sion, scale scores for those constructs typically utilized in PBT—antisocial behavior, alcohol use, drug use, and sexual behavior—were entered as a first block, followed by the scale scores of the positive behaviors of school success, cultural activities, competencies, and community-mindedness as a second block. As shown in Table II, the problem behavior variables in the first block provided a significant increment in the R^2 for each equation; however, in every case, the second block of positive behaviors also explained statistically significant increments in variance—even *after* the problem behaviors had been accounted for. Moreover, in predicting the more

Table II. Validity Analyses: Hierarchical Multiple Regression

	Block 1					Block 2				
Criterion variable	R^2	Antisocial behavior[a]	Alcohol use	Drug use	Sexual behavior	R^2	School success	Cultural activities	Competence	Community-mindedness
Anxiety	$.05^b$	$.21^b$	$.08^b$	$-.01$	$-.03$	$.02^b$	$.08^b$	$.03$	$-.14^b$	$.02$
Depression	$.09^b$	$.17^b$	$.15^b$	$.02$	$.03$	$.01^b$	$-.06$	$-.04$	$-.09^b$	$-.01$
Sensation-seeking	$.15^b$	$.16^b$	$.12^b$	$.15^b$	$.07^b$	$.02^b$	$-.01$	$.02$	$.17^b$	$.04$
Self-esteem	$.01^b$	$-.03$	$-.09^b$	$.02$	$.06^b$	$.09^b$	$.18^b$	$-.03$	$.19^b$	$-.03$
Personal mastery	$.06^b$	$-.07^b$	$-.17^b$	$.01$	$.03$	$.16^b$	$.16^b$	$-.04$	$.29^b$	$.06^b$
Social support	$.03^b$	$-.06^b$	$-.06^b$	$-.04$	$.06^b$	$.14^b$	$.11^b$	$.02$	$.24^b$	$.19^b$

[a] β at last step.
[b] $p < .05$.

adaptive psychosocial outcomes (self-esteem, personal mastery, social support), the positive behaviors explained more than twice as much of the variance as did the problem behaviors. It should be noted that although these constructs provided support for the possible importance of both problem and positive behaviors, these relationships were all concurrent, and therefore do not necessarily carry information about *causal* relationships.

Multisample Confirmatory Factor Analyses

Given the satisfactory fit of the two-factor second-order structure, and the apparent utility of including both problem and positive behaviors, we then turned to an examination of differences in the factor structure that might exist within two demographic subgroups: gender and community.

Gender

The multisample CFA across gender provides a first example of the multisample CFA.[6] As summarized in Table III, seven constraints were released. (In this table, those loadings that were *not* significantly different across the groups have a numerical entry in the Constrained B column; one then interprets the columns entitled Unconstrained B, with a different B for each group.) Looking at the unconstrained Bs for those seven constraints, both "shoplifted" and "damaged property" loaded higher for males on the first-order Antisocial Behavior construct. On the first-order Alcohol Use construct, females had a slightly lower loading of "negative consequences of alcohol use" and a slightly higher loading of "problem drinking" behavior. Males had a higher loading of "past-month marijuana use" on the first-order Drug Use construct. Females had a slightly higher loading of "careful schoolwork" on the first-order "School Success construct." Finally, the first-order construct of Sexual Intercourse was more strongly related to the second-order Problem Behavior construct for males than for females.[7]

[6]In the multisample analyses, the cfi approached but did not quite reach the .90 criterion. The inclusion of correlated errors among correlated items increases this criterion above .91; however, such an activity may capitalize on chance variation within this sample. As a result, we have *not* included such parameters to be estimated and instead draw inferences concerning the fit of the model across the samples from $\Delta\chi^2$ tests.

[7]This analysis demonstrates the potential differential interpretation of βs and Bs. If one interpreted only βs, "past-month's marijuana use" would appear to be similar across gender; "careful schoolwork" would make males appear to be *more* related to the latent construct of School Behavior.

Table III. Final Multisample Test: Gender

Item	Constrained B	Unconstrained B		β	
		M	F	M	F
Started a fist fight	1.00			.51	.54
Shoplifted from a store	—[a]	1.19	0.82	.62	.45
Damaged property	—[a]	1.28	0.89	.66	.55
Stayed out all night	1.84			.74	.70
Lied to parents or dorm aides	1.60			.68	.59
Quantity/frequency of use	1.00			.84	.84
Negative consequences of alcohol use	—[a]	0.42	0.37	.75	.76
Problem drinking behavior	—[a]	0.80	0.86	.91	.89
No. of times used marijuana past month	—[a]	4.58	3.84	.62	.62
No. of times used inhalants past month	0.81			.40	.36
No. of drugs ever tried	0.99			.83	.75
No. of drugs used in past month	1.00			.96	.94
Ever had sexual intercourse	0.25			.59	.64
Had sexual intrercourse past month	0.30			.75	.87
No. of times used condom past month	1.00			.83	.88
No. of times used other birth control past month	1.10			.83	.90
Grade-point average	1.00			.66	.77
How well do you do in school	0.96			.65	.75
Do schoolwork carefully		1.05	1.20	.58	.47
Live by the Indian way	1.00			.78	.75
Speak tribal language	0.73			.55	.53
Participate in traditional activities	1.06			.75	.72
Make other kids feel comfortable	1.00			.72	.71
Find fun things to do in free time	1.00			.71	.68
Good at creative things	1.01			.64	.61
Make others laugh	1.01			.70	.47
Good at sports and athletic games	0.91			.61	.63

[a]Loadings significantly different across groups.

Communities

Not surprisingly, moving from a two-group analysis to a four-group analysis introduces much greater complexity. In all, 21 cross-group equality constraints were suggested as problematic. The constraints to be released fell into four groups. First, first-order constraints for two items were released across *all* communities: "problem drinking," on the first-order construct of Alcohol Use, and "past-month's marijuana use," on the first-order Drug Use construct. Clearly, these two items represented the most consis-

tent differences across the communities. As shown in Table IV, youths from the Pueblo communities had the highest loading of "problem-drinking" on the Alcohol Use construct, followed by those from the Southwestern, Northern Plains, and finally South Central communities. With "past-month marijuana use," Southwestern youths had the highest loading, followed by Northern Plains, Pueblo, and South Central youths.

Second, *second*-order factor loadings for five items were released across just two communities: Southwestern and Pueblo. For Pueblo youth, Antisocial Behavior was more strongly related to problem behaviors, and Drug Use was slightly less strongly related to problem behaviors, than in the other sites. In addition, Cultural Activities was less related to positive behaviors among Pueblo youths. For Southwestern youths, Alcohol Use, Sexual Intercourse, and Drug Use were less strongly related to problem behaviors than for any of the other communities.

Finally, the remaining constraints were quite community-specific. With "past-month's use of contraception other than condoms," Southwestern youths were higher than the other sites, and "speaking the tribal language" was least related to Cultural Activities among Southwestern youths. For Southwestern youths, "ever had sexual intercourse" was most strongly related to the Sexual Intercourse construct; Pueblo youths were slightly lower; South Central and Northern Plains youths had the lowest loadings. Southwestern youths had the highest loading of "past-month's sexual intercourse," with Northern Plains and South Central slightly lower, and Pueblo youths the lowest. For Pueblo youths, "stayed out all night" was less strongly related to other items on the Antisocial Behavior construct. Finally, for both Pueblo and Northern Plains youths, "past-month's inhalant use" was more strongly related to other aspects of Drug Use than for the other two communities.

DISCUSSION

The Structure of Problem and Positive Behaviors

Most of the goals of this study focused on various approaches to expanding and extending the utility of PBT, focusing on the construct validity of the problem and positive behavior constructs. We accomplished this in several ways: (a) utilizing multiple measures of the four most commonly utilized problem behavior constructs (antisocial behavior, alcohol use, drug use, and sexual behavior); (b) including multiple measures of four age- and population-appropriate positive behavior constructs (school success, cultural activities, competencies, and community-mindedness); (c) testing

Table IV. Expanded Problem-Behavior Structure, Final Multisample Test: Community

Item	Constrained B	Unconstrained B				β			
		SC	NP	S	P	SC	NP	S	P
Started a fist fight	1.00					.55	.47	.51	.62
Shoplifted from a store	0.99					.51	.51	.55	.62
Damaged property	0.98					.50	.59	.66	.65
Stayed out all night	—[a]	1.80	1.80	1.80	1.52	.76	.67	.70	.72
Lied to parents or dorm aides	1.48					.63	.56	.57	.68
Quantity/frequency of use	1.00					.85	.82	.81	.84
Negative consequences of alcohol use	0.39					.73	.79	.74	.74
Problem drinking behavior	—[a]	0.70	0.82	0.87	0.93	.86	.91	.92	.90
No. of times used marijuana past month	—[a]	2.92	4.46	4.64	4.25	.58	.60	.66	.63
No. of times used inhalants past month	—[a]	0.46	0.93	0.46	1.08	.37	.39	.30	.40
No. of drugs ever tried	0.97					.78	.79	.80	.85
No. of drugs used in past month	1.00					.96	.94	.96	.96
Ever had sexual intercourse	—[a]	0.19	0.19	0.37	0.25	.60	.54	.68	.65
Had sexual intercourse past month	—[a]	0.31	0.31	0.38	0.27	.83	.83	.84	.78
No. of times used condom past month	1.00					.88	.82	.82	.87
No. of times used other birth control past month	—[a]	1.08	1.08	1.37	1.08	.86	.85	.88	.89
Grade-point average	1.00					.71	.77	.78	.73
How well do you do in school	0.94					.70	.74	.73	.70
Do schoolwork carefully	0.74					.49	.48	.50	.46
Live by the Indian way	1.00					.71	.63	.81	.72
Speak tribal language	—[a]	0.86	0.86	0.55	0.86	.65	.54	.51	.55
Participate in traditional activities	1.07					.67	.64	.79	.71
Make other kids feel comfortable	1.00					.75	.70	.71	.67
Find fun things to do in free time	1.02					.69	.71	.74	.66
Good at creative things	1.03					.62	.61	.64	.59
Make others laugh	1.03					.69	.65	.68	.63
Good at sports and athletic games	0.94					.58	.58	.60	.63
Make friends with people	1.02					.75	.75	.73	.71

[a]Loadings significantly different across groups.

nested unidimensional and bidimensional models of the underlying structure of problem and positive behaviors; (d) exploring the additional predictive power that might accompany the inclusion of both problem and positive behaviors in understanding psychosocial adaptation; and (e) examining these issues within a new sample. A series of confirmatory factor analyses provided support for a two-factor second-order structure, in which items loaded on individual first-order problem- and positive-behavior constructs. These first-order constructs loaded in turn on one of two second-order constructs of problem or positive behaviors, which were not strongly related to each other. Finally, positive behaviors—which have been too often overlooked in both PBT and the broader psychological literature—added unique and important information in predicting measures of psychosocial adaptation.

From these analyses, we drew three conclusions that have direct implications for PBT and the operationalization of problem and positive behaviors. First, a broader sampling of both problem and positive behaviors does not contraindicate a latent structure of problem and positive behaviors, *providing a sufficiently complex latent structure is permitted*. In other words, both a first- and second-order level of constructs are necessary to explain both the variance that is *shared* within individual problem and positive behaviors and the variance that is *unique* to the individual problem and positive behaviors. Second, contrary to one of PBT's basic suppositions, positive and problem behaviors do not appear to fall at opposite ends of the single dimension stretching from conventionality to unconventionality. While the correlation between the two second-order constructs was statistically significant, it was extremely small—accounting for less than 4% of the total variance. In effect, these adolescents were neither "good" kids nor "bad" kids; as a group, they represented a complex mixture of both problem and positive behaviors. Finally, as we move toward prevention and promotion efforts, we will clearly miss important aspects of adaptation if we focus only on problem behaviors. With a richer approach to measurement that includes both problem behavior and positive behaviors, we are much better positioned to understand processes underlying not only maladaptive behavior but also those that lead to adaptive outcomes.

Subgroup Analyses

Another goal of this study was to explore the structure of problem and positive behaviors within gender and community subgroups. However, little quantitative work in the structure of problem and positive behaviors has been conducted in American Indian communities. Thus, while the find-

ings of gender differences have some precedence in the broader developmental literature, we leave that comfort as we move to a discussion of community-level differences.

Gender Differences

While seven significant differences emerged across gender, the most interesting differences occurred with alcohol use, school success, and sexual activity. First, for girls, "problem drinking" was more closely related to the second-order alcohol use factor than it was for boys. This may reflect others' findings that girls are generally more attuned to internal signals (e.g., drinking more than one intended or feeling hung over) whether referring to psychological symptomatology, such as depression or anxiety, or alcohol use. On the other hand, "negative consequences following drinking" was more strongly related to the second-order alcohol use factor for boys than for girls. In the same vein, then, perhaps the boys connect more external signs—such as fighting with friends or school grades dropping—with higher levels of drinking (Achenbach & Edelbrock, 1987). Second, "do schoolwork carefully" was more closely related to school success for girls than for boys. Others have reported that girls tend to attribute their successes in school to their own hard work whereas boys tend to attribute their school successes to greater intellectual ability (Cobb, 1992; Henderson & Dweck, 1990). Finally, the second-order loading of sexual behavior on problem behaviors for girls was lower than for boys. This difference may reflect the different meanings given to boys and girls about sexual intercourse. For example, Brooks-Gunn and Paikoff (1993) noted that "Sexual desire is seen as paramount for boys and is ignored for girls" (p. 187). Also, since the sexual behavior construct is made up primarily of risky sexual behaviors (e.g., not using birth control), this lower relationship with other problem behaviors among girls may reflect the fact that the consequences of unprotected sexual intercourse are far higher for girls than for boys—and for a girl, engaging in other problem behaviors is motivated differently than is putting oneself at risk for a pregnancy.

Community Differences

Here, we note interesting differences and speculate about what might underlie the observed community differences in three areas: substance use, sexual behavior, and cultural activities.

Substance Use. The South Central youth had lower loadings of problem drinking, marijuana use, and inhalant use on the respective first-order

constructs than did the other three communities. It may be that the processes that lead to a youth's attending this school—the majority of whom are boarders, living away from their families—may operate in some way to make these three items less related to other issues of substance use than at the other three communities. A second hypothesis focuses on the possible impact of a substance use treatment facility that is located on the campus of the South Central high school: while the youths may not be affected *directly* by the presence of that facility, the constant presence of a treatment facility may indirectly influence the substance use behavior of the youths at that site.

Sexual Behavior. The responses of the Southwestern youths were more consistent on the four items representing sexual behavior than were those of the other three sites. Although not presented here, item-level means show that fewer youths in the Southwestern community reported high endorsements of any of these four items. Most dramatic is the fact that while over one third of the youths in the other three communities reported having had sexual intercourse in the past month, only 17% of the Southwestern youth had done so. As a result, the internal consistency of the items among Southwestern youths may have been a result of the greater number of "none" answers among these youths. (In general, it should be noted that either high or low endorsements of items can result in lower loadings, due to truncated variance.) Moreover, at the second-order level, sexual activity was less strongly related to the underlying problem-behavior construct in the Southwestern community than in the other three communities—perhaps as a result of the less widespread occurrence of sexual intercourse.

Cultural Activities. Among the Southwestern youths, "speaking your tribal language" was less integrally related to other involvements in Indian culture than it was for youths in the other communities. The pattern of means was different for this community: In the other three communities, the two nonlanguage "cultural activities" items had means similar to each other, whereas "speaking your tribal language" had the lowest mean; among the Southwestern youths, all of the means were similar. However, these findings may be better explained by looking at characteristics of the community. For instance, the tribal language of the Southwestern community is widely spoken throughout the community—by young and old alike. This situation is quite unique to this community; as a result, given that a wide range of youths speak the language, that activity may be less related to other cultural activities than it is in the other communities. Similarly, Cultural Activities was less strongly related to the other positive behaviors for the Pueblo youths than for the other three communities. In this community, much attention focuses on community-wide feast days for celebra-

tion and solidarity. In effect, everyone in the community becomes involved in the celebratory activities. Thus, as with the greater exposure to the spoken tribal language in the Southwestern community, a wider variety of adolescents participate in cultural activities in general in the Pueblo communities, thus lessening the link between that construct and other more general positive behaviors.

To this point, we have focused on differences across samples. However, it is even more important to note that the four communities appear to have much more in common than they have differences: roughly 75% (25) of the 33 *item*-level equality constraints were not rejected for *any* community. In general, the South Central and Northern Plains were most like each other: only three first-order loadings—and none of the second-order loadings—were different across those two communities. The majority of the differences lay with the Southwestern and Pueblo communities. The Southwestern youths' second-order loadings for problem behaviors were consistently the lowest, implying that problem behaviors tend to be less clustered for these youths than for the youths in the other communities. Finally, practically no differences appeared across communities in the *positive* behaviors—at either the first- or second-order levels. This may imply that similarities exist across these communities in the messages adolescents receive about appropriate ways to act. The community differences existed almost without exception in ways in which adolescents were acting out. By this, we do not mean to imply any sort of "universal" structure among positive behaviors; indeed, the "culture" of these communities is made up of a number of important "subcultures," such as traditional customs and macrosystem influences such as television and radio (Bronfenbrenner, 1977). However, the similarities among the positive behaviors are striking—especially when contrasted with the differences among problem behaviors. Clearly, we need to move back to the individual communities with ethnographic investigations of valid interpretations of the findings.

Limitations

A discussion of limitations helps to put this study in its appropriate context. First, while the sample drew on youths from four diverse Indian communities—and included youths from more than 50 difference tribes— they still represent only a small portion of the diversity among Indian nations. Moreover, most of the youths were living on or near their reservations; thus, issues surrounding Indian youths living in more urban settings need to be addressed in the future, as well. In addition, we have

treated the communities here as if they were homogeneous groups; as is true of any community, though, important subgroups are likely to exist within communities, as well. For instance, not all adolescents are likely to identify equally strongly with the traditions and customs of their culture groups; thus, the structure of problem and positive behaviors might differ by ethnic identity. In general, though, other researchers need to replicate the more complex model supported here within other cultural groups. Furthermore, while this effort represents an attempt to sample more broadly from the universe of potential measures of positive and problem behaviors, other important domains still remain untapped. Moreover, the indicators chosen for the communities in this research may not necessarily be the behaviors of great concern to other communities or cultural groups; thus, the universe of items is likely to vary somewhat by culture.

Second, as with Jessor and Donovan's efforts, the data in this study were all youth self-report. As a next step, other sources of information about a youth's behavior, such as parent or teacher reports and academic records, could be helpful. We also did not examine possible interactions between community and gender, due to several small subgroups; however, it is possible that this structure might also vary by gender within community. In addition, the utility of these more fully operationalized cross-sectional relationships need to be examined in longitudinal designs, such as those of McGee and Newcomb (1992) and Osgood, Johnston, O'Malley, and Bachman (1988). Finally, we found a number of differences across samples; however, the enhanced statistical power that accompanies a large sample such as the one in this study could result in interpreting differences across samples that are *statistically* significant but not necessarily important or meaningful in the real world.

Conclusions

This work raises four central issues that need continuing attention. First, a key point of PBT has been that problem behaviors such as adolescent substance use, risky sexual behavior, and antisocial behavior are socially defined—that is, they depart from social and legal norms and are negatively sanctioned by systems of authority (Mitchell et al., 1996). Implicit in this idea is the importance of understanding the culture within which the problem and positive behaviors occur. Yet the empirical work around PBT to date has ignored the sociocultural context within which the problem and positive behaviors exist. For instance, PBT's emphasis on "unconventionality," dysfunction, and deviance casts teens who use substances as "distressed actors" whose patterns of substance use reflect a universal

"tension-reducing" response to stress and distress—ignoring cultural variation in definitions of normal and pathological uses of alcohol. In sharp contrast, our ethnographic work points to the fact that the meaning of substance use lies much more with aspects of social convention than in individual psychological factors. As O'Nell and Mitchell (1996) pointed out, such a conclusion is "tantamount to locating the non-emotive styles of Euro-American males (or conversely, the emotive styles of Euro-American females) in cultural conventions of gender, rather than in pathological psychological functioning or differential social stresses. Thus, if women talk more about feelings, it does not mean that women are more stressed or unable to cope than men who talk less about their feelings" (p. 567). Clearly, researchers need to explore systematically the culture(s) within which they are conducting their research. And we need to ascertain not only the relevance of key constructs for the populations of interest—we must also search for constructs that may have local relevance but that have been overlooked thus far in the empirical literature (O'Nell & Mitchell, 1996).

Second, we need to include both problem and positive behaviors in any research effort—either in basic research studying adolescent development or in applied research working hand in hand with preventive and promotive interventions. Although most communities are well aware of problems among their adolescents, they also know that many of their teens are succeeding. Community members want to understand not only how to circumvent the processes that result in maladaptive outcomes but also—and just as important—how to support the processes that underlie the development of successful adolescents as well. Unless researchers begin to develop reliable and valid measures of the positive outcomes, we cannot help in this effort, and we do the communities with which we collaborate a serious disservice. Along the same lines, the low correlation between positive and problem behaviors implies that prevention and promotion activities should not necessarily operate on a "hydraulic" or "see-saw" model of behavior change: The fact that an intervention might effectively prevent problem behaviors does not necessarily mean that positive behaviors will automatically begin to increase. Similarly, promotion efforts that focus only on enhancing positive behaviors may find that any increase does not necessarily result in a lowering of the frequency of problem behaviors. Instead, in light of the low interrelationships between positive and problem behaviors, the inclusion of *both* promotive and preventive efforts in any intervention would be wise.

Third, researchers need to be in close touch with members of the communities they are working with in order to be able to pinpoint those problem and positive behaviors that are of most interest—and concern—to

them. This is especially important for those in Community Psychology. Given our interest in diversity and strengths, the importance of working within local understandings of both problem and positive behaviors cannot be overestimated. One way to accomplish this is to develop Community Advisory Committees, who are partners with the researchers from the beginning conceptualizations and the development of measures through the interpretation and dissemination of findings and the generation of recommendations for further research and intervention.

Finally, how are problem behaviors and positive behaviors configured similarly or differently across cultures? For instance, in this research, the Southwestern adolescents appeared to be quite different from those in the other three communities in the area of risky sexual behavior. Does this quantitative difference make sense *within* the community? One can only know this by returning to the community, presenting the findings, and getting the feedback of the important "actors" or "stakeholders." As noted above, one way to accomplish this is to engage community members through a Community Advisory Committee. A second powerful approach is to team quantitative researchers with ethnographers who work in the communities. In this way, many of the often artificial restrictions surrounding quantitative work can be placed within the context of a rich, community-specific understanding that can arise only from solid ethnographic work. Ethnographers can also identify ambiguities and further questions to be explored within the context of the communities. In addition, ethnographic work can highlight areas of investigation that are important from the community perspective but that may never emerge from the more mainstream research and theoretical literature. Without such collaborations, quantitatively oriented researchers risk restricting themselves to a world of numbers and numerical relations that includes at best only cursory attempts to capture community concerns.

APPENDIX

A brief discussion of one basic aspect of structural equation modeling—multisample confirmatory factor analysis (CFA)—may be useful. We assume that readers have a general understanding of the logic involved in a single-sample CFA; readers desiring a more introductory level discussion are referred to any number of good basic references (Byrne, 1994; Dunn, Everitt, & Pickles, 1993). Here, we utilized the EQS/PC program (version 3.0, Bentler, 1992); the specific steps involved in other packages (such as LISREL) may vary.

Typically, research samples are made up of subsamples which may have underlying structural differences that are of theoretical interest (e.g., boys vs. girls, Puerto Rican vs. Dominican women, younger vs. older parents). Most researchers have tested the fit of a proposed model across subsamples by fitting the model in question sequentially on each group and attempting to determine if differences exist in fit (e.g., Donovan & Jessor, 1985; Farrell et al., 1992; McGee & Newcomb, 1992). However, a *multisample* CFA addresses the issue of subgroup differences simultaneously, directly, and powerfully. One begins first by specifying the parameters or "paths" of the model to be tested, as in a single-sample CFA; one also specifies which paths should also be required or "constrained" to be equal across the groups. While *all* paths can be constrained across groups, such a test is an extremely stringent, and often theoretically meaningless, test for understanding the factor structure across groups. For example, does one's theory really specify that all error variances as well as factor loadings must be equal for the groups? In most cases, the answer is "No." In general, for such questions, one tests only whether the first- and, if relevant, second-order factor loadings are equal, by constraining only the factor loading paths to be equal across groups. In some instances, one might also be interested in examining a second level of equality across groups, as well— the equality of the latent factor variances and covariances (Byrne, 1994). For simplicity's sake, though, we here demonstrate only this first level of testing; however, one would follow the same steps at the second level, as well.

While the basic steps used in a single-sample analysis apply to a multisample analysis, one additional step is required for a multisample analysis. One first tests a *loadings-constrained model*, where all first- and second-order factor loadings are constrained to be equal across all groups. In EQS, the program then provides a single estimate for each constrained variable which best fits all groups. The multivariate Lagrange Multiplier test identifies those constraints which are not appropriate—that is, those for which forcing equality across subsamples is lessening the fit of the model.[8] One then reruns the analysis releasing those identified constraints; that analysis provides the *partially constrained model*, representing the minimum number of parameters that need to be estimated separately across groups—that is, those points of the structure where the groups differ significantly. One can then interpret those individually estimated parameters to begin to explore the subgroup differences in structure.

[8]In EQS, this can be found in the multivariate Lagrange Multiplier test; those with a significance level $p < .05$ are those targeted for release.

Two final points specific to multisample analyses should be made. First, any CFA must meet the requirements of mathematical identification.[9] Mathematically, one is simply unable to estimate both a factor's variance and all of its loadings. Instead, one must determine the scale of an unmeasured, latent factor in one of two ways: (a) standardize or fix underlying factor variances to be 1.0 (thereby *not* estimating those variances), and instead estimate all factor loadings on each factor with reference to this "standardized" latent factor; or (b) fix one loading (a "marker" variable) on each first-order factor to be 1.0. Either approach will establish a scale for the unmeasured latent factor; and in a single-sample analysis, one can choose based on the questions one wants to address. When dealing with multisample analyses, though, the better choice is always the latter—establishing a marker variable for each first-order factor. If one were instead to set the factor variances to 1.0, one has in effect standardized *within* each group (in effect, adjusting differently by group); this procedure removes the information carried by group-specific standard deviations—which may differ significantly—from the determination of the fit across groups. In addition, if one fixes the factor variances to 1.0, one cannot subsequently examine the equality of these factor variances and covariances across groups at a second level of testing, should that be of interest.

Second, a similar problem occurs with the conventions of reporting and interpreting factor loadings. In single-sample analyses, one commonly reports standardized regression coefficients (the β coefficients) to discuss differences in the relative importance of the loadings within the sample. However, βs are calculated by dividing each unadjusted regression coefficient (the B coefficient) by its standard deviation. If one interprets only the βs in a multisample analysis, one has again removed the information carried by the group-level standard deviations from any interpretations. Thus, the βs may appear more intuitively interpretable in a multisample

[9]Identification is a complex topic, which is difficult to describe in nontechnical terms. In general, though, it is the process of determining whether the parameters of the model can be estimated. It focuses on the number of variances and covariances and the number of parameters which must be estimated. One must have at least as many variances and covariances as one has parameters to be estimated. This is parallel to solving for "unknowns" in algebraic equations. In algebra, if you have more unknowns (i.e., variables to be solved for) than you have equations containing those unknowns, an infinite number of solutions is possible, and the unknowns cannot be uniquely determined. In structural equation modeling, a model with fewer variances and covariances than it has parameters is called "underidentified." If one has exactly as many variances and covariances as one has parameters to be estimated, a unique solution can be found. Such a model is called "just-identified"; and although it produces a unique solution, it is not particularly interesting because it has no degrees of freedom available to test the fit of the model. To test the fit of the model, one needs to have at least 1 more covariance than one has parameters to be estimated; such a model is "overidentified" (Kenny, 1979).

analysis and can help in looking at patterns within a subgroup; however, they may also lead to incorrect interpretations concerning across-group differences. For the same reason as noted above—possibly different standard deviations across groups—one is better advised to utilize the Bs for comparisons of relative differences across groups (Bollen, 1989). In the tables presented here, we have reported both B and β for all multisample analyses; however, in the text, we discuss only the Bs.

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