

LATENT CLASS ANALYSIS OF RISK BEHAVIORS AMONG BAHAMIAN YOUNG ADOLESCENTS: RELATIONSHIP BETWEEN VALUES PRIORITIZATION AND LATENT CLASS

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To explore an association between values and risk behaviors among early adolescents, baseline data from 689 Bahamian youth (median age = 10) were collected from the Portrait Values Questionnaire (Schwartz et al., 2001) and The Bahamian Youth Health Risk Behavioral Inventory. Latent class analysis identified three classes of youth in differing patterns of risk behavior: (7.8%) high levels of drug and delinquency risk behaviors; (2.8%) high levels of sexual risk behavior; (89.4%) low risk takers. Results showed low risk takers included more females, while at least twice as many males comprised the two risk behavior classes. ANOVA found Benevolence, Conformity, Security, Tradition and Universalism values were associated with low risk takers, and logistic regressions for ordered categorical (ordinal) dependent variables showed both values and latent class predicted intentions for future risk behavior. Latent class analysis and values assessment are discussed as tools to guide adolescent risk-reduction interventions.

Keywords: youth, risk behavior, values, latent class, delinquency, sexual risk, drug use, Bahamas.

Values are motivational constructs that represent goals or criteria individuals use to identify, validate and guide their behavior (Schwartz, 1992; Schwartz & Bilsky, 1987). Important in this conceptualization of values is the articulation of their distinct contribution towards determining overt behavior, and their relatively stable motivational characteristics throughout the developmental lifespan (Bardi & Schwartz, 2003; Rokeach, 1973). Research examining the correlation between value-prioritization and specific real-life behaviors suggests values may play a role in mediating various behaviors, even in the absence of awareness. For example, endorsing values related to tolerance of people (universalism values) correlated highly with the willingness for Israeli Jews to interact with Israeli Arabs (Sagiv & Schwartz, 1995), and among male college students, heavy drinkers compared to light drinkers/abstainers were more likely to endorse hedonism and stimulation values (Dollinger & Kobayashi, 2003). This substantial and growing research supports the concept of universally recognized values and their general relationship with behavior. However, the research has focused primarily on adults and older adolescents, rather than on early adolescents. To date, the research regarding values has not explored the values-behavior relationship during this developmental period, nor has it addressed specifically the role values play in risk and protective behaviors among adolescents.

DEFINING AND IDENTIFYING VALUES ACROSS CULTURES

Values vary substantially across cultures within and among nations. In determining if certain values were recognized and used to form priorities across cultures, and whether a comprehensive list could be compiled, Schwartz and colleagues developed the Schwartz Value Survey (SVS), a 57-item values-prioritization questionnaire (Schwartz, 1992, 1994; Schwartz & Anat, 2001). SVS data from 63 nations, including the United States, suggest that a core set

of 10 motivational values can be understood as explanatory of behavior across cultures: Power (social status and control), Self-direction (independent thought and action), Achievement (personal success by demonstrating competence according to prevailing social standards), Hedonism (seeking pleasure for self), Stimulation (excitement, novelty and challenge), Universalism (tolerance, protecting the rights of all), Benevolence (helpful, loyal, honest and forgiving), Tradition (respect, commitment and acceptance of culture), Conformity (restraint of actions that might upset others or violate social expectations), and Security (safety, harmony and stability of relations and state). The results also indicate agreement on the hierarchical order of values across nations such that certain prosocial values including Benevolence, Self-direction and Universalism are consistently ranked as most important, while Power, Tradition and Stimulation are ranked lower.

To facilitate participation in values surveys by participants from cultures with less abstract cognitive abilities than those studied using the 57-item SVS, Schwartz et al. (2001) developed the 40-item Portrait Values Questionnaire (PVQ), a values assessment instrument specifically designed for use in all populations, including those groups with limited literacy. PVQ data from Black South African, Israeli, and Italian samples show patterns of hierarchical value ordering similar to those obtained using the SVS. Although the value constructs reflected in the SVS and the PVQ have been assessed in numerous countries throughout the world, they have not been assessed in The Bahamas.

BAHAMIAN HISTORY, CULTURE AND RISK BEHAVIORS

Contemporary Bahamian culture reflects its heritage of indigenous Indians, Spanish colonialists, African ancestors, and the original British settlers who arrived in the 1600s. An independent nation since 1973, The Bahamas remains one of the nations of the British Commonwealth. Although the per capita GNP is approximately \$15,000 (BBC News, 2005), wealth in the country is highly skewed; the small white population controls much of the wealth of the island. Ninety-nine percent of children attending public elementary school in Nassau are black.

At the close of the twentieth century, The Bahamas (population approximately 303,600) had the highest annual incidence of AIDS in the English-speaking Caribbean, although strong prevention efforts have successfully reduced the HIV seroprevalence to about 3% (Thompson, 2005). The disease is especially prominent among young adults and, with over 60% of the population under 25 years of age, is the leading cause of death among those 15 to 44 years of age for both genders and the leading cause of death among males of all ages (UNAIDS, 2006). The Bahamian Ministry of Health has identified substance abuse, particularly among young male adults, as a significant issue for the country both

in its own right and as a contributor to the HIV/AIDS epidemic (Gomez et al., 2002).

PURPOSE OF STUDY

In this study we administered the PVQ to a population of Bahamian adolescents to examine the relationship of values with adolescent sexual, delinquency and drug-related risk behaviors and behavioral intentions/expectations for future risk behavior among a younger population than previously studied and in a nation where the instrument has not been evaluated. Since there exists substantial research establishing the covariance among risk behaviors in adolescents and early adolescents from an ethnic minority (e.g., Shrier, Emans, Woods, & DuRant, 1997; Viner et al., 2006), we applied latent class analysis (LCA) to conceptualize patterns of risk behavior and to examine whether or not the youth at baseline were a diverse heterogeneous population (Hagenaars & McCutcheon, 2002). We hypothesized that LCA would identify emergent latent classes of youth according to shared patterns of risk behavior, such as low vs. high risk takers (e.g., Li et al., 2000; Stanton et al., 2007). We predicted that Universality and Security would be associated with youth engaging in lower rates of delinquent, sexual and drug use behaviors and that Stimulation, Power and Hedonism would be associated with higher rates of risk behavior and intention. We anticipated that there would be gender-based and age differences in values prioritization, and, given the young age of these subjects and our expectation that relative rates of risk behaviors would be low, we anticipated that Tradition and Conformity would be associated with lower rates of risk participation. Finally, to model the ability of values and self-reported engagement in risk behaviors to predict future risk behavior, we have reported the relationship between values, latent class, and intentions/expectations according to logistic regression.

METHOD

PARTICIPANTS

Data were obtained from Bahamian sixth-grade students as the baseline to a randomized, controlled evaluation of an HIV prevention intervention and an environmental promotion (control) intervention. Selection of subjects began by inviting 25 elementary schools on the island of New Providence to participate in a randomized trial and evaluation of two intervention programs: one addressing HIV/AIDS, and the other addressing ecology of the wetlands. The Ministry of Education had agreed that both programs would be considered to be part of the sixth-grade curriculum. The first nine schools to agree to participate were randomly assigned to one of the two aforementioned conditions. Although all sixth-grade children in the participating schools would receive either the ecology

or the HIV prevention curriculum (according to the randomization of the school) as part of the regular school curriculum, to participate in the evaluation and intervention, both the student and his/her parent had to provide assent/consent. This yielded a total sample of 785 eligible participants. Due to listwise deletion of missing data for the latent class associations, the number of participants available for statistical analysis was reduced to 689. This research was approved by the Institutional Review Boards at Wayne State University and Princess Margaret Hospital in Nassau, Bahamas.

MEASURES

Data were comprised of self-report responses to a paper-and-pencil assessment battery administered during class time and read out loud by the researcher. Two questionnaires from the assessment battery provided data for the present analyses: The Bahamian Youth Health Risk Behavioral Inventory (BYHRBI), and The Portrait Values Questionnaire (PVQ). A cultural adaptation of the Youth Health Risk Behavior Inventory (Stanton et al., 1995), the BYHRBI was developed through extensive ethnographic research and pilot testing. The BYHRBI assesses demographic information, basic knowledge, behavioral history, and perceptions, intentions and expectations regarding risk and protective behaviors. Responses to the demographic, behavioral and intention/expectation sections of the BYHRBI were used in the present study. Demographic variables included gender and age; behavioral variables included 15 dichotomous items from three categories of risk behaviors: sex, delinquency and drugs. Sex risk behaviors were assessed via the items "Have you ever had sex? That is when the boy or man puts his penis in the girl's vagina", and via a coded item "sex without a condom", created by excluding those youth who responded "yes" to the item "Have you or your partner used a condom during sex?" from those who responded "yes" to the item "Have you ever had sex?". Risk behaviors related to delinquency were assessed via six items that asked youth if they had ever repeated grades, got suspended, or played truant from school, and if they had ever carried a knife, gun or been in a fight. Risk behaviors related to drugs were assessed via seven items that asked the participants to report if they ever smoked cigarettes or marijuana, drank alcohol, used cocaine or used needles to inject illegal drugs, or had ever pushed/carried drugs or been asked to sell drugs. Finally, nine items from the BYHRBI assessed intentions/expectations to engage in the following risk behaviors along a 5-point Likert scale ranging from 1 (*very unlikely*) to 5 (*very likely*): smoke marijuana, drink alcohol, use cocaine, push drugs, have sex, use condom during sex, become infected with HIV, get an STD, or get pregnant/get a girl pregnant.

A modified version of the PVQ, consisting of 39 items scored along a 6-point Likert scale from 1 (*not at all like me*) to 6 (*very much like me*), was administered to assess 10 core values: Benevolence (4 items); Universalism (6 items); Self-

direction (4 items); Stimulation (3 items); Hedonism (3 items); Achievement (3 items); Power (3 items); Security (5 items); Conformity (4 items) and Tradition (4 items). Items were combined to yield a mean score for each values factor.

DATA ANALYSIS

First we used chi-square to investigate the relationship between gender, age and the 15 risk behaviors. Next we explored the psychometric properties of the modified PVQ in this population via estimates of internal reliability, factor structure and model fit. After assessing reliability of the 10-factor scale and each factor using Cronbach's alpha measure of internal consistency, factor structure and model fit were estimated via confirmatory factory analysis (CFA) with gender and age included in the model as covariates. To evaluate model fit that is not biased by sample size, the Root Mean Square Error of Approximation (RMSEA) was selected. Unlike the chi-square statistic, the RMSEA adjusts for parsimony in the number of parameters estimated, and a RMSEA less than .05 indicates an excellent fit (Loehlin, 1998).

In the third analytical component, latent class analysis (LCA) was used to identify participants with similar patterns of risk behavior (Hagenaars & McCutcheon, 2002). LCA provides the probability of a particular participant belonging to an unobserved latent class by assessing the pattern of observed responses. Latent classes were calculated by maximum likelihood analysis using an Estimation-Maximization algorithm in which 500 multiple start values for estimated model parameters were considered (McLachlan & Peel, 2000). The most parsimonious model (1-class) was fit first followed by sequentially increasing the number of classes to five latent class models, with the choice of best fitting model based on three criteria: the Bayesian Information Criterion (BIC) statistical fit index (Raftery, 1995/2004), with lower values indicating better model fit (Li & Nyholt, 2001); the Lo-Mendell-Rubin likelihood ratio test (LMR-LRT) for mixture distributions (Lo, Mendell, & Rubin, 2001), with a significant LMR-LRT (i.e., $p < .05$) indicating a model with k classes significantly improved over a model with $k-1$ classes; and entropy, in which values approaching 1 indicate clear delineation of classes (Celeux & Soromenho, 1996).

Finally, after the best-fitting latent class model was identified, chi-square and ANOVA with covariates were used to determine the association between demographic variables, values, and class membership. To test whether or not LCA predicted the intention/expectation for future risk behavior, and to investigate the degree to which values predicted intentions/expectations when controlling for latent class, multiple logistic regressions for ordered categorical (ordinal) dependent variables were conducted (Hosmer & Lemeshow, 2000). CFA, LCA and logistic regressions were implemented using Mplus version 4.2

software (Muthen & Muthen, 1998-2007). SPSS 11.5 was used for all other statistical procedures.

RESULTS

CHARACTERISTICS OF YOUTH

Table 1 shows characteristics of the 689 young adolescents available for statistical analysis. The sample was comprised of more females than males (55.7% vs. 44.3%), and approximately two-thirds of the participants were 10 years old. Overall, approximately one-third and one-quarter of the young adolescents in the study participated in delinquent activities or used any drug, respectively. They reported fighting more than any of the other 6 delinquent behaviors investigated, and of the 7 drug risk behaviors, alcohol was identified as the drug used most often. Of the 28 (4.1%) who reported having sex, 23 (3.4%) were males and 19 (2.8%) had sex without a condom. Chi-square analysis found 8 of the 15 risk behaviors had gender differences (more males than females), and 4 had age differences (more younger than older).

TABLE 1
FREQUENCY OF DEMOGRAPHIC VARIABLES AND SELF-REPORTED BEHAVIORS AS
PERCENTAGE OF TOTAL

	Total	Male	Female	9	10	11	12	13	14
Total (<i>N</i> = 689)	100.0	44.3**	55.7	2.0**	61.8	28.3	6.7	1.0	0.1
Male (<i>n</i> = 305)	100.0	100.0	0.0	0.7**	55.7	32.8	9.5	1.0	0.3
Female (<i>n</i> = 384)	100.0	0.0	100.0	3.1**	66.7	24.7	4.4	1.0	0.0
Mean Age	10.43	10.55**	10.34	-	-	-	-	-	-
Sexually active	4.1	3.4**	0.7	0.0**	1.5	1.6	0.9	0.0	0.1
Had sex without condom	2.8	2.1**	0.7	0.0**	1.0	0.8	0.9	0.0	0.1
Repeated grades	21.0	11.6**	9.4	0.0**	1.7	15.0	3.9	0.3	0.1
Suspended from school	1.9	1.5*	0.4	0.0	1.3	0.6	0.0	0.0	0.0
Played hooky	3.5	1.6	1.9	0.1	1.8	1.5	0.1	0.0	0.0
Carried knife	3.6	3.3**	0.3	0.0	1.3	2.0	0.3	0.0	0.0
Carried gun	1.5	0.7	0.8	0.0	0.9	0.6	0.0	0.0	0.0
Fought	32.4	18.0**	14.4	0.3	18.3	10.9	2.8	0.1	0.0
Smoke cigarettes	2.3	1.0	1.3	0.0**	1.5	0.6	0.1	0.0	0.1
Drink alcohol	23.9	11.6	12.3	0.4	13.6	7.7	1.9	0.3	0.0
Smoke marijuana	0.3	0.3	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Use cocaine	0.6	0.3	0.3	0.1	0.3	0.1	0.0	0.0	0.0
Use needles for drugs	0.4	0.3	0.1	0.0	0.3	0.1	0.0	0.0	0.0
Pushed/carry drugs	1.2	1.2**	0.0	0.0	0.3	0.9	0.0	0.0	0.0
Asked to sell drugs	1.5	1.2*	0.3	0.0	0.7	0.6	0.1	0.0	0.0

Note: ** or * $p < .01$ or $p < .05$, respectively, chi-square difference within gender or age

TABLE 2
CONFIRMATORY FACTOR ANALYSIS OF THE 10-FACTOR VALUES MODEL WITH GENDER AND AGE COVARIATES

Factors/Items	Loading	Factors/Items	Loading
Benevolence ($\alpha = .71$) ^a		Self-direction ($\alpha = .60$)	
boys	-.102	boys	.103
age	-.082	age	-.017
helpful	.635**	creativity	.416**
loyal	.608**	choosing own goals	.544**
supportive	.596**	curious	.665**
forgiving	.566**	independent	.594**
Stimulation ($\alpha = .61$)		Power ($\alpha = .65$)	
boys	.077	boys	.126*
age	-.044	age	-.008
varied life	.582**	wealth	.517**
daring/risk-taking	.577**	social power	.658**
likes surprises	.640**	authority	.779**
Achievement ($\alpha = .59$)		Hedonism ($\alpha = .37$)	
boys	.092	boys	.057
age	-.096	age	-.143*
successful	.548**	self-indulgent	.483**
ambitious	.594**	seek pleasure	.302**
capable	.627**	enjoying life	.595**
Conformity ($\alpha = .71$)		Tradition ($\alpha = .67$)	
boys	-.050	boys	.000
age	-.163**	age	-.097
obedient	.627**	moderation	.565**
self-discipline	.614**	devout	.652**
honoring parents	.664**	time-honored	.632**
politeness	.717**	humble	.569**
Universalism ($\alpha = .78$)		Security ($\alpha = .74$)	
boys	-.055	boys	.006
age	-.111*	age	-.059
equality	.507**	family security	.460**
broadminded	.546**	national security	.648**
protect environment	.638**	clean & organized	.621**
world peace	.641**	healthy	.658**
social justice	.682**	stable social order	.637**
unity with nature	.640**		

Notes: ^a Internal consistency for 10-factor values scale: $\alpha = .94$

** or * = $p < .01$ or $p < .05$, respectively, factor loadings.

CFA tests of model fit: $\chi^2 = 1352.300$, $df = 699$, $p = .000$; CFI = .904; TLI = .888; RMSEA (90% confidence interval) = .047 (.043-.051); SRMR = .052.

PSYCHOMETRIC PROPERTIES OF THE PORTRAIT VALUES QUESTIONNAIRE

Table 2 depicts the psychometric properties of the PVQ. Measures of internal consistency found the full scale possessed excellent reliability, ($\alpha = .94$), and

alpha exceeded .60 for 7 of 10 value scales (range = .61 to .78). CFA with gender and age added as covariates revealed that the 10-factor model fit the data extremely well ($\chi^2 = 1352.300$, $df = 699$, $p < .001$, RMSEA = .047, 90% confidence interval = .043 - .051) with significant factor loadings for each values item ($p < .01$). Gender was significant on the Power values subscale (males endorsed Power more than females), and age was significant on the values Conformity, Universalism, and Hedonism (each endorsed more by younger participants).

LATENT CLASS ANALYSIS OF RISK BEHAVIOR

Fitting a single latent class to the 15 risk behaviors resulted in a BIC of 3956.9. When a second latent class was added, model fit was significantly improved (BIC = 3804.2, LMR-LTR = 254.9, $p = .0008$) with an entropy value of .82 suggesting relatively clear delineation of classes. Adding a third latent class improved model fit over the two-class solution (BIC = 3801.3, LMR-LTR = 106.4, $p = .008$) with well-defined classes (entropy = .91). Model fit did not improve either by increasing the number of classes to four (BIC = 3869.6, LMR-LTR = 35.9, $p = .073$, entropy = .73), or by increasing the number of classes to five (BIC = 3953.0, LMR-LTR = 21.0, $p = .174$, entropy = .78). All additional analyses were completed using the three-class solution.

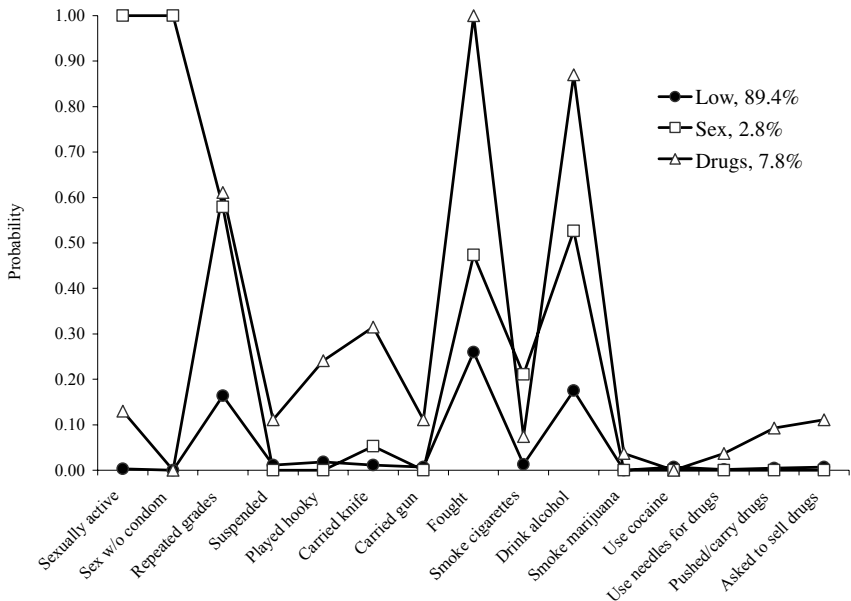


Figure 1. Conditional probability of risk behavior among Bahamian ($N = 689$) youth at baseline.

As shown in Figure 1, the low latent class accounted for 89.4% ($n = 616$) of the sample and was distinguished from the other classes by being composed of young adolescents who possessed low probabilities of engaging in risk behavior. The sex latent class accounted for 2.8% ($n = 19$) of the sample and consisted of youth with a high probability of being sexually active and engaging in sex without a condom. This group had a moderate probability of fighting (0.47), repeating grades (0.58), and drinking alcohol (0.43). The drugs latent class represented 7.8% ($n = 54$) of the sample; the probability of engaging in drug risk behaviors was higher than the other classes, with alcohol use being the dominant drug (probability = 0.87). Those in the drugs class also possessed the highest probability of delinquency risk behaviors (e.g., fought = 1.00, repeated grades = 0.61, carried a knife = 0.31).

TABLE 3
RELATIONSHIP BETWEEN DEMOGRAPHIC VARIABLES, VALUES, INTENTION/EXPECTATION TO ENGAGE IN RISK BEHAVIOR AND LATENT CLASS MEMBERSHIP

Variable	Odds Ratio (95% CI)	Low $n = 616$ M (SD)	Sex $n = 19$ M (SD)	Drugs $n = 54$ M (SD)
# of males (% within class)	--	253 (41.1) ⁺⁺	14 (73.7)	38 (70.4)
Age	--	10.39 (.69) ^{**}	11.11 (1.10)	10.70 (.60)
Benevolence	--	4.21 (1.19) ^{**}	3.59 (1.12)	3.71 (1.41)
Universalism	--	4.30 (1.12) ^{**}	4.00 (1.00)	3.49 (1.18)
Self-direction	--	4.11 (1.12)	3.98 (1.23)	4.07 (1.28)
Stimulation	--	4.28 (1.27)	4.57 (1.03)	4.06 (1.48)
Achievement	--	4.35 (1.22) [*]	4.37 (1.07)	3.80 (1.51)
Power	--	3.67 (1.41)	4.16 (1.14)	3.79 (1.59)
Security	--	4.46 (1.13) [*]	4.04 (.90)	3.98 (1.34)
Conformity	--	4.53 (1.17) ^{**}	3.82 (1.24)	3.50 (1.28)
Tradition	--	4.20 (1.16) ^{**}	3.87 (1.09)	3.56 (1.25)
Hedonism	--	3.98 (1.14)	3.96 (1.03)	3.87 (1.36)
Use Marijuana	1.78 (1.31-2.42) ^{##}	1.73 (.98)	1.72 (1.13)	2.46 (1.21)
Push Drugs	1.95 (1.44-2.65) ^{##}	1.64 (.94)	1.82 (.88)	2.33 (1.18)
Drink Alcohol	2.56 (1.89-3.47) ^{##}	1.93 (1.12)	2.35 (1.11)	3.17 (1.20)
Use Cocaine	2.06 (1.51-2.83) ^{##}	1.64 (.93)	1.78 (.94)	2.41 (1.13)
Have Sex	2.32 (1.69-3.17) ^{##}	1.78 (1.04)	3.00 (1.50)	2.71 (1.38)
Use Condom	1.22 (.92-1.62)	3.08 (1.53)	3.06 (1.64)	3.61 (1.33)
HIV Infection	1.65 (1.20-2.26) ^{##}	1.72 (.98)	1.94 (.94)	2.23 (1.20)
STD Infection	1.76 (1.30-2.39) ^{##}	1.74 (.98)	1.76 (.97)	2.40 (1.04)
Pregnancy	2.45 (1.78-3.36) ^{##}	1.82 (1.02)	2.22 (1.35)	2.79 (1.23)

⁺⁺ $p < .01$ Chi-square. ^{**} or ^{*} $p < .01$ or $p < .05$, respectively, ANOVA test difference between latent classes with gender and age included as covariates. ^{##} $p < .01$ odds ratio (95% CI) from logistic regression for ordered categorical dependent variables with gender and age entered as covariates.

TABLE 4
ODDS FOR INTENTION/EXPECTATION TO ENGAGE IN RISK BEHAVIOR AS PREDICTED BY VALUES

Values	Use Marijuana	Drink Alcohol	Use Cocaine
Benevolence	1.07 (0.99-1.16)	1.05 (0.99-1.13)	1.01 (0.93-1.08)
Universalism	0.98 (0.92-1.04)	0.92 (0.87-0.98)*	0.96 (0.90-1.02)
Self-direction	1.01 (0.95-1.09)	1.02 (0.96-1.09)	1.00 (0.93-1.07)
Stimulation	1.06 (0.98-1.15)	1.00 (0.93-1.08)	1.06 (0.98-1.14)
Achievement	0.92 (0.84-0.99)*	0.97 (0.89-1.06)	0.98 (0.89-1.07)
Power	1.08 (1.01-1.15)*	1.12 (1.05-1.19)**	1.07 (1.01-1.15)*
Security	0.87 (0.82-0.94)**	0.94 (0.88-0.99)*	0.90 (0.84-0.97)**
Conformity	1.00 (0.93-1.07)	0.98 (0.91-1.04)	0.94 (0.88-1.01)
Tradition	1.02 (0.95-1.10)	1.01 (0.95-1.09)	1.12 (1.04-1.21)**
Hedonism	0.94 (0.86-1.02)	0.99 (0.92-1.08)	0.93 (0.85-1.01)
Values	Push Drugs	Have Sex	Use Condom
Benevolence	1.03 (0.96-1.11)	1.04 (0.97-1.12)	0.96 (0.90-1.03)
Universalism	0.93 (0.88-0.99)*	0.93 (0.87-0.99)*	0.98 (0.93-1.03)
Self-direction	1.03 (0.96-1.10)	1.00 (0.94-1.07)	1.07 (1.00-1.13)*
Stimulation	1.03 (0.96-1.11)	1.05 (0.98-1.13)	1.01 (0.95-1.08)
Achievement	0.91 (0.83-0.99)*	0.93 (0.85-1.02)	1.02 (0.94-1.10)
Power	1.10 (1.03-1.17)**	1.08 (1.02-1.15)*	0.99 (0.94-1.05)
Security	0.92 (0.86-0.99)*	0.90 (0.84-0.97)**	1.00 (0.94-1.06)
Conformity	1.01 (0.94-1.09)	1.00 (0.93-1.08)	1.03 (0.97-1.10)
Tradition	1.08 (1.00-1.17)*	1.08 (1.00-1.16)*	1.00 (0.94-1.06)
Hedonism	0.96 (0.88-1.04)	1.04 (0.95-1.12)	1.02 (0.95-1.10)
Values	Get Pregnant	Get HIV	Get STD
Benevolence	0.97 (0.91-1.04)	1.00 (0.93-1.07)	1.07 (1.01-1.15)
Universalism	0.94 (0.89-1.00)*	0.99 (0.93-1.05)	0.99 (0.93-1.05)
Self-direction	1.01 (0.95-1.08)	0.99 (0.92-1.06)	1.03 (0.96-1.11)
Stimulation	1.00 (0.92-1.07)	1.08 (1.00-1.16)*	0.97 (0.90-1.05)
Achievement	0.98 (0.89-1.07)	0.97 (0.88-1.05)	0.98 (0.89-1.06)
Power	1.04 (0.98-1.10)	1.00 (0.94-1.06)	1.03 (0.96-1.09)
Security	0.95 (0.89-1.01)	0.91 (0.85-0.98)*	0.91 (0.85-0.97)**
Conformity	1.01 (0.94-1.08)	1.01 (0.94-1.08)	0.99 (0.93-1.06)
Tradition	1.09 (1.01-1.17)*	1.05 (0.98-1.13)	0.97 (0.91-1.04)
Hedonism	1.03 (0.95-1.11)	0.97 (0.90-1.05)	0.98 (0.90-1.07)

** or * $p < .01$ or $p < .05$, respectively, odds ratio (95% CI) from logistic regression for ordered categorical dependent variables with latent class entered as covariate.

CLASS MEMBERSHIP ASSOCIATIONS WITH GENDER, AGE, VALUES AND FUTURE RISK BEHAVIOR

Table 3 presents latent class as a function of gender, age, and values. Latent classes differed by gender ($\chi^2 = 24.13$, 2 df , $p < .001$), with the low class comprised of more females than males (58.9% vs. 41.1%), and both the sex

and drugs classes comprised of at least two times more males than females. Classes also differed by age ($F_{2, 686} = 14.37, p < .001$), as both the sex and drugs classes were comprised of youth older than those in the low class. ANOVA tests controlling for gender and age found Benevolence, Universalism, Security, Conformity and Tradition were all endorsed more by those who were in the low class ($p < .05$), and participants in both the low and sex classes endorsed Achievement more than those in the drugs class ($p = .015$).

As predicted, logistic regression revealed that latent class membership was significantly associated with the intention/expectation for future risk behavior. Table 3 shows that the odds for all future behaviors except Use Condom increased significantly ($p < .01$). Mean scores for the four drug intention/expectation items were highest among youth in the drugs class, and the mean score for the Have Sex item was highest among participants in the sex class. Interestingly, mean scores for the sex intention/expectation items HIV Infection, STD Infection, and Pregnancy were highest among those in the drugs class.

As evident in Table 4, the odds for intention or expectation to engage in sex and drug risk behaviors decrease as young people endorse Security, Tradition and Universalism, and increase as they endorse Power. Those who endorse Stimulation have increased odds of expecting to get HIV, while those who endorse Tradition have increased odds for intending to use cocaine, push drugs, have sex or get pregnant. Finally, the probability of intending or expecting to engage in the protective behavior of using a condom increases by a probability of 1.07 ($p < .05$) with the endorsement of Self-direction.

DISCUSSION

This study investigated the relationship between values prioritization and risk behaviors among Bahamian early adolescents via three specific aims. First, we explored the psychometric properties of the PVQ to evaluate its reliability, factor structure and model fit in this population. Internal consistency for the full 39-item scale was excellent, and measures of reliability for the 10 values scales of the current PVQ are similar ($\alpha = .37$ to $.79$) to the range of alphas indexed with the original form of the PVQ (Schwartz et al., 2001). Results of CFA with gender and age added as covariates found the 10-factor model provided an excellent fit to the Bahamian youth data with factor loadings on all items significant. CFA found males endorsed Power more than females, and Conformity, Universalism, and Hedonism were endorsed more by younger adolescents in the study. These results are consistent with the following observations: younger adolescents reported low rates of risk behavior in general; Power was correlated with fighting, and males reported more fighting than females; Hedonism was correlated with alcohol use, and younger adolescents in the study reported higher rates of alcohol use

than the older participants; and Conformity and Universalism were significantly endorsed by young people reporting low rates of risk behavior.

Second, we used LCA to identify a three-class solution representing approximately one-tenth of youth with high probabilities of drug and delinquency risk behaviors, about 3% of youth with high probabilities of sexual risk behavior, and the largest class of youth (almost 90%) with overall low probabilities of engaging in risk behaviors. The finding that both of the high risk latent classes were comprised of at least twice as many males as females is consistent with research showing that among black U.S. adolescents in grades 7 to 12, more males than females engage in sexual and other risk behavior (Halpern et al., 2004). The use of LCA allowed us to plot the relative severity of risk behavior conditional upon latent class membership.

Our hypothesis that endorsement of Universalism, Security, Tradition and Conformity would be associated with lower rates of risk behaviors was sustained. Although we did not predict the finding that Achievement and Benevolence were associated with lower risk participation, their association is logical in that several of the activities included in the high-risk latent classes would be inversely correlated with school achievement (e.g., truancy and suspension) and prosocial values (i.e., Benevolence). These associations raise the question as to what will happen as the children get older and risk behaviors become more normative; adherence to Conformity may become a risk rather than a protective factor. We also hypothesized that Stimulation, Power and Hedonism would be associated with high rates of risk behavior. Although these values were not found to be significantly related to latent class, they were associated with specific risk behaviors. For example, Power and Hedonism were correlated with fighting and alcohol use, respectively.

In our third analytical aim, logistic regression results support the contention that prior experience in a risk behavior is a strong predictor of future intention to be involved in that risk behavior (Stanton et al., 1996). The probability for intention or expectation to engage in all eight of the risk behaviors increased by a factor of at least 1.65 as these participants in the study were assigned to the high-risk latent classes. These analyses also demonstrate the utility of values assessment in predicting future risk and protective behaviors. For example, in concert with our hypothesis that the endorsement of Universalism and Security would be associated with lower rates of risky behaviors, Bahamian youth who endorsed these values, as well as Tradition, were less likely to report intention to engage in drug- and sex-related risky behaviors. Similarly, the association of Power with increased intention for drug- and sex-related intentions was also consistent with our prediction. These results were especially striking since they persisted after controlling for prior risk involvement (i.e., latent class). Finally, there appears to be a protective consequence of endorsing Self-Direction since

endorsement of this value was associated with a 1.07 times higher likelihood of expectation to use a condom during sex.

POTENTIAL LIMITATIONS

There are several potential limitations to these data. First the associations are cross-sectional and thus causation cannot be determined. Second, although the internal reliability of the full PVQ scale was acceptable, alpha values of some of the constructs were weak. This is not surprising given that the values subscales with the lowest alphas were comprised of few items (i.e., 3). Alternatively, characteristics of Bahamian culture may preclude the inclusion and exclusion of certain values. For instance, while the values subscale Spirituality was included in an early iteration of a values assessment tool (Schwartz, 1992), its exclusion from the PVQ may have limited assessment of value priorities that are important to Bahamian culture and society.

IMPLICATION OF VALUES IN RISK PREVENTION INTERVENTION RESEARCH

If validated in subsequent longitudinal data sets, these data provide a new way for targeting at-risk youth and for developing intervention messages. While researchers in school or general community-based settings have been loath to identify youth as at-risk based on prior risk behaviors for fear of stigmatizing youth, differential endorsement of specific values may enable such targeting. A values profile might allow for the identification of young adolescents for whom the standard intervention is appropriate, for whom more intensive interventions are needed, and for whom tailoring of the intervention messages is warranted.

In lieu of a restricted set of assessment and prevention strategies that are presumed to be in the best interest of the adolescent, values assessment may provide a simple, yet effective mechanism to tailor strategies to the individual (Bardi & Schwartz, 2003). Identification of the antecedents to, and consequences of, risky and protective behaviors, is an important step in the design of effective prevention. The assessment battery utilized in the current study offers prevention researchers the ability to hypothesize about some of the factors that set the scene for risky and protective behaviors, and the ability to predict the consequences of endorsing and engaging in certain values and behaviors.

This study adds the assessment of values to the arsenal of the adolescent prevention researcher. Results of this study suggest culture-based assessment of values can predict individual risk and protective factors. Our role as social scientists is to recognize the relationship between personal values and behaviors while not allowing our own values systems to obscure or redefine these relationships.

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