

INTERNATIONAL ARTICLE

Reducing Risk, Increasing Protective Factors: Findings from the Caribbean Youth Health Survey

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Purpose: To identify the prevalence of health-compromising behaviors, and the risk and protective factors associated with them among youth in the Caribbean, and to predict the likelihood of these outcomes given the presence or absence of the risk and protective factors.

Methods: Analyses were done on the results of a 1997-98 survey of over 15,500 young people in nine countries of the Caribbean Community. The four health-compromising behaviors studied included violence involvement, sexual intercourse, tobacco use, and alcohol use. Logistic regression was used to identify the strongest risk and protective factors, and also to create models for predicting the outcomes given combinations of the risk and protective factors.

Results: Rage was the strongest risk factor for every health-compromising behavior for both genders, and across all age groups, and school connectedness was the strongest protective factor. For many of the outcomes studied, increased protective factors were associated with as much or more reduction of involvement in health-compromising behaviors than a decrease in risk factors.

Conclusion: This research suggests the importance of strengthening the protective factors in the lives of vulnerable youth not just reducing risk. © Society for Adolescent Medicine, 2004

KEY WORDS:

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Until recently there have been limited data on the health status of youth in the Caribbean. A 1997-98 survey of over 15,500 young people in nine countries of the Caribbean economic community (CARICOM), comprised of 19 countries, provided the first comprehensive, multinational perspective [1,2]. It described youth in the Caribbean to be confronted with a range of health-compromising behaviors; many of which are initiated early. For example, Halcón et al [1] indicated that nearly one-half of all males and one-quarter of females reported having had intercourse; one in five females and 2 in 5 males reported violent behavior; and many of these behaviors begin under the age of 13 years. (e.g., one in six youth report the onset of sexual intercourse or violent behavior before that age). The present study builds on those initial analyses.

There is growing evidence both within the United States and globally that strategies incorporating positive youth development [3,4], assets [5] and/or resilience [6,7] have greater likelihood of improving the health outcomes of young people than risk-reduction alone [8]. The present analyses explore the relative risk-reduction among Caribbean youth in four health-compromising behaviors; violence involvement, initiation of sexual intercourse, tobacco use, and alcohol use, associated with both reduction in risk factors and an increase in protective factors.

Methods

Study Population

Data were obtained from the 1997 Caribbean Youth Health Survey. A total of 15,695 young people aged

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10–18 years participated from Antigua, Bahamas, Barbados, British Virgin Islands, Dominica, Guyana, Jamaica, and St. Lucia.

The sample was representative of school-going adolescents. Schools (and classrooms within schools) were randomly selected from a roster of all schools within each country and completed in school after parental consent had been obtained. On average, less than 7% of the sample frame was absent on the day of survey administration.

Consent and Confidentiality

Passive consent was used in each country, consistent with the protocols for research used by each of the respective Ministries of Education. No personal identifiers were used. Completed surveys were collected, sealed and delivered to the country coordinator. The study was approved by the University of Minnesota's Institutional Review Boards. Refusal to participate by either parent or student was negligible.

Measurement

The questionnaire consisted of 87 multiple-choice questions exploring: school performance, school environment, alcohol and other drug use, sexual and reproductive health, physical and sexual abuse, honesty, mental health and suicide, religiosity, family characteristics, relationships with others, violence, general health and nutrition.

Variables

The present analysis uses four dependent variables: violence, sexual intercourse, tobacco use and alcohol use. *Violence* was based on four items (Cronbach $\alpha = 0.79$) including: carrying a weapon to school in the last 30 days, weapon carrying at other times, ever belonged to a gang, ever stabbed or shot. *Sexual intercourse* was based on a single item dichotomized as "yes" or "no." *Tobacco use* was based on a single item with responses dichotomized as "never" vs. "other" (ranging from a few times to daily). Likewise, *alcohol use* was dichotomized from a single item: "never/a few times/monthly" vs. "weekly or daily."

Risk and protective variables included: *family connectedness* based on five questions (Cronbach $\alpha = 0.74$): "family pays attention to you, family understands you, can tell mom/dad your problems, mom/dad cares about you, other family members care."

Responses were along a 3-point Likert scale: from "very little," "some," "a lot" (and does not apply). *Other adult connectedness* was scaled from four questions (Cronbach $\alpha = 0.67$): "how much do adults in the neighborhood care about you, friends care, teachers care, priest/minister cares." The Likert scale was the same as for family connectedness. *School connectedness* was based on two questions: "do you get along with teachers?," "do you like school?." *Religious attendance* is based on a single item exploring frequency of religious service attendance over the previous 3 months. *Religiosity* was based on two questions, including religious attendance and the extent to which you see yourself as a religious or spiritual person.

Risk variables included. Abuse was comprised of two questions on physical and sexual abuse. *Parental drug use/mental health problems*: each based on a single item exploring any history over the previous 5 years; *skipped school* is a single question with three options: "never," "once or twice," "three or more times." *Rage* was a single question: "do you ever think about hurting/killing someone?" with response options: "never," "some of the time," "almost always."

Data Analysis

All analyses were conducted separately for boys and girls as well as by age: ≤ 12 years, 13–15 years, 16–18 years of age. Logistic regression was used to assess the effect of each factor on each of the four outcome variables, always controlling for age. Logistic models were also used to predict the probabilities of each of the four outcomes occurring for adolescents in the population with increasing numbers of risk factors and protective factors. Thus, estimated probabilities were calculated when there were 0, 1, 2, and 3 protective factors present, holding the risk factors constant at their mean levels. Subsequently, the process was reversed for each outcome, holding protective factors constant and adding combinations of the three strongest risk factors as identified in the logistic regressions.

Results

Logistic regression analyses, stratified separately by gender and by age, show consistent results. *Rage* is most strongly associated with each of the dependent variables across both gender and all age groups,

Table 1. Odds Ratios for Health-compromising Behaviors and Selected Risk and Protective Factors among Caribbean Youth—Stratified by Genders

	OR (<i>p</i> value)			
	Smoking	Alcohol	Sexual activity	Violence
Risk-associated variables				
Rage				
Boys	3.54 (<.001)	4.12 (<.001)	2.77 (<.001)	7.55 (<.001)
Girls	3.88 (<.001)	6.67 (<.001)	2.93 (<.001)	7.76 (<.001)
<12	8.70 (<.001)	5.54 (<.001)	3.33 (<.001)	6.77 (<.001)
13–15	2.80 (<.001)	4.38 (<.001)	2.20 (<.001)	6.89 (<.001)
16–18	2.66 (<.001)	3.91 (<.001)	3.09 (<.001)	8.01 (<.001)
Skip school				
Boys	2.40 (<.001)	2.26 (<.001)	3.41 (<.001)	3.71 (<.001)
Girls	2.08 (<.001)	3.09 (<.001)	2.82 (<.001)	2.76 (<.001)
<12	2.85 (<.001)	4.03 (<.001)	2.93 (<.001)	6.34 (<.001)
13–15	2.11 (<.001)	1.97 (<.001)	2.28 (<.001)	3.44 (<.001)
16–18	2.20 (<.001)	2.09 (<.001)	2.85 (<.001)	2.57 (<.001)
Abuse				
Boys	1.41 (<.001)	1.37 (.004)	1.36 (<.001)	1.36 (<.001)
Girls	1.46 (<.001)	1.84 ^a (.011)	2.14 (<.001)	1.66 (<.001)
<12	2.02 (<.001)	1.18 (.496)	2.28 (<.001)	2.27 ^b (<.001)
13–15	1.46 ² (.003)	1.48 ^b (.006)	1.51 (<.001)	1.44 (<.001)
16–18	1.49 (<.001)	2.03 ^a (.007)	1.34 (.002)	1.54 ^c (.020)
Protection-associated variables				
Family connectedness				
Boys	0.73 ^d (.005)	0.43 (<.001)	0.70 (.008)	0.76 (.048)
Girls	0.37 (<.001)	0.75 ^d (.030)	0.41 (<.001)	0.69 (.010)
<12	0.40 (.004)	0.60 (.207)	0.49 (.004)	0.53 (.004)
13–15	0.58 (.002)	0.82 (.332)	0.67 ^e (<.001)	0.88 (.332)
16–18	0.89 ^d (.452)	0.75 ^d (.062)	0.59 ^d (<.001)	0.97 ^d (.834)
Religion				
Boys	0.74 (.003)	0.82 (.070)	0.76 (<.001)	0.72 (<.001)
Girls	0.53 (<.001)	0.50 (<.001)	0.78 (.002)	0.70 (<.001)
<12	0.81 (.259)	0.69 ^d (.146)	0.76 ^d (.066)	0.68 ^d (.004)
13–15	0.56 (<.001)	0.52 (<.001)	0.77 (<.001)	0.65 (<.001)
16–18	0.58 (<.001)	0.47 (<.001)	0.90 (.321)	0.49 (<.001)
School connectedness				
Boys	0.10 (<.001)	0.06 (<.001)	0.26 (<.001)	0.31 (.003)
Girls	0.05 (<.001)	0.01 (<.001)	0.04 (<.001)	0.05 (<.001)
<12	0.09 (.009)	0.03 (.001)	0.39 (.176)	0.04 (<.001)
13–15	0.05 (<.001)	0.02 (<.001)	0.06 (<.001)	0.09 (<.001)
16–18	0.19 (.020)	0.02 (<.001)	0.11 (<.001)	0.14 (<.001)

^a Parental drug use.

^b Parental violence.

^c Parental mental health problems.

^d Other connectedness.

^e Attends religious services.

followed by skipping school and history of abuse. School connectedness was the strongest protective factor, with family connectedness and religious attendance/religiosity having a roughly equivalent protective association (Table 1).

Violent Behavior

For violent behavior, we started by holding protective factors constant at the mean level reported

across the population (Table 2). When none of the three leading risk factors (abuse, skipping school and reported rage) were present, 21.9% of males and 8.4% of females reported violence involvement. As risk factors were added into the model, self-reported violence involvement increased. When all three factors were present, reported violence involvement rose to 91.4% among males and 76.7% among females. The increases were equally dramatic for each of the three age groups studied.

Table 2. Violence: Probability of Violence Involvement in Relationship to the Presence of *Risk Factors* (Holding Protective Factors Constant)

Number of risk factors present	Risk Factors			Predicted Probabilities				
	Abuse ^a	Skips school	Rage	Gender		Age in yrs		
				Males %	Females %	≤ 12 %	13–15 %	16–18 %
0	low	low	low	21.9	8.4	9.9	15.7	15.9
1	high	low	low	27.5	13.3	20.0	21.2	22.5
1	low	high	low	51.0	20.3	41.0	39.1	32.7
1	low	low	high	67.9	41.7	42.6	56.2	60.2
2	high	high	low	58.5	30.0	61.2	48.0	42.8
2	low	high	high	88.7	66.4	82.4	81.5	80.0
2	high	low	high	74.1	54.3	62.7	64.9	70.0
3	high	high	high	91.4	76.7	91.4	86.4	85.7

^a Parental violence: ≤ 12 yrs; Abuse: 13–15; Parental Mental Health Problems: 16–18.

When the analyses are reversed (Table 3) and risk factors are held constant, we see that 68.1% of males and 75.9% of females reported violent behavior when no protective factors were present. With the addition of each of the protective factors into the model, the likelihood of violence involvement declines. School connectedness was the single most powerful protective factor associated with violence reduction; from 68.1% to 39.9% for males and 71.9% to 11.6% for female adolescents. When all three protective factors are entered into the model, violence involvement falls to 26.7% for males and 5.8% for females. The relative reduction of violence involvement as a result of the three protective factors was significantly greater for females than males.

Sexual Intercourse

The second set of analyses explored the relative risk and protective factors associated with ever having

had intercourse. Again, we initially held protective factors constant and sequentially added the three predominant risk factors associated with initiation of sexual intercourse (Table 4). When none of the risk factors are present, males were more than twice as likely to report ever having had sexual intercourse: 35.8% compared with 13.8%. As the number of risk factors rose, so too did the likelihood of Caribbean youth reporting ever having had intercourse. When all three risk factors are present, the spread between the two genders had shrunk.

When risk factors are held constant and the three key protective factors are modeled, again, we see school connectedness to be the single strongest factor associated with reporting not having had intercourse (Table 5). Conversely, religious attendance had the weakest single affect on reported sexual initiation; as with violence, we see less of an overall reduction in risk of early sexual initiation for males compared with females when all three protective factors are

Table 3. Violence: Probability of Violence Involvement in Relationship to the Presence of *Protective Factors* (Holding Risk Factors Constant)

Number of Protective Factors Present	Protective Factors			Predicted Probabilities				
	Family Connectedness ^a	Religious Attendance ^b	School Connectedness	Gender		Age in yrs		
				Males %	Females %	≤ 12 %	13–15 %	16–18 %
0	low	low	low	68.1	71.9	79.6	76.4	74.7
1	high	low	low	61.9	63.9	72.5	67.7	59.3
1	low	high	low	60.7	64.1	67.1	74.0	74.2
1	low	low	high	39.9	11.6	13.2	21.9	33.0
2	high	high	low	54.0	55.2	58.1	64.7	58.7
2	low	high	high	32.4	8.4	7.4	19.7	32.4
2	high	low	high	33.6	8.3	9.4	15.3	19.5
3	high	high	high	26.7	5.9	5.1	13.7	19.1

^a Family Connectedness: ≤ 12 yrs and 13–15; Other Connectedness: 16–18.

^b Other Connectedness: ≤ 12 yrs; Religious Attendance: 13–15 and 16–18.

Table 4. Sexual Intercourse: Probability of Sexual Involvement in Relation to the Presence of *Risk* Factors (Holding Protective Factors Constant)

Number of Risk Factors Present	Risk Factors			Predicted Probabilities				
	Abuse	Skips School	Rage	Gender		Age in yrs		
				Males %	Females %	≤12 years %	13–15 %	16–18 %
0	low	low	low	35.8	13.8	10.5	25.1	41.5
1	high	low	low	43.1	25.4	21.2	33.7	48.8
1	low	high	low	65.5	31.1	25.7	43.3	66.9
1	low	low	high	60.7	31.9	28.1	42.5	68.7
2	high	high	low	72.0	49.0	44.0	53.7	73.1
2	low	high	high	84.0	56.9	53.4	62.7	86.2
2	high	low	high	67.7	50.0	47.2	52.8	74.6
3	high	high	high	87.7	73.8	72.3	71.8	89.4

entered in the model (a change of 35.1% for males and 74.5% for females).

Tobacco

First we hold the protective factors constant by standardizing at the mean protective level for the sample and add the three risk factors one at a time. The three leading risk factors for tobacco are: (a) abuse (but for those 13–15 years of age parental violence); (b) skipping school and (c) rage. What we see from Table 6 is that when protective factors are held constant and there are none of the three leading risk factors present, cigarette smoking is reported by 7.6% of male and 4.8% of females. When we look by age it ranges from 2.3% of the youngest age groups to 8.7% among the oldest teens. When we add risk factors, the percent of teens reporting cigarette smoking starts to rise in a linear fashion so that when all

three risk factors are present 49.6% of males and 37.0% of females report cigarette smoking.

When we switch analyses and hold risk factors constant at their mean levels and none of the protective factors are present, we see that 51.3% of males and 66.6% of females report cigarette smoking (Table 7). Again, the range by age is from 35.2% in the youngest group to 67.4% among 13–15-year-olds. As the three leading protective factors are added sequentially, cigarette smoking begins to decline for both males and females and for all age groups. The greatest single factor associated with decline in smoking for both males and females is seen when school connectedness is added into the model, reducing smoking from 51.3% to 9.1% among males and from 66.6% to 9.8% among females. Overall, when the three protective factors are simultaneously added into the model, there is a 10-fold reduction in smok-

Table 5. Sexual Intercourse: Probability of Sexual Involvement in Relation to the Presence of *Protective* Factors (Holding Risk Factors Constant)

Number of Protective Factors Present	Protective Factors			Predicted Probabilities				
	Religious Attendance ^a	Family Connectedness ^b	School Connectedness	Gender		Age in yrs		
				Males %	Females %	≤ 12 %	13–15 %	16–18 %
0	low	low	low	79.0	84.8	41.7	85.1	90.8
1	high	low	low	74.1	81.4	35.2	81.5	89.9
1	low	high	low	72.4	69.8	26.1	79.3	85.3
1	low	low	high	49.2	19.6	21.6	23.7	51.3
2	high	high	low	66.6	64.4	21.2	74.8	83.9
2	low	high	high	40.2	9.1	12.0	17.3	38.2
2	high	low	high	42.4	16.0	17.3	19.4	48.6
3	high	high	high	33.9	7.3	9.4	13.9	35.7

^a Other Connectedness: ≤ 12 yrs; Religiosity: 13–15 and 16–18.

^b Family Connectedness: ≤12 yrs; Religious Attendance: 13–15 and 16–18.

Table 6. Cigarette Smoking: Probability of Cigarette Smoking by in Relation to the Presence of *Risk* Factors (Holding Protective Factors Constant)

Number of Risk Factors Present	Risk Factors			Predicted Probabilities				
	Abuse ^a	Skips School	Rage	Gender		Age in yrs		
				Males %	Females %	≤ 12 %	13–15 %	16–18 %
0	low	low	low	7.6	4.8	2.3	7.7	8.7
1	high	low	low	10.4	6.8	4.6	10.8	12.4
1	low	high	low	16.5	9.4	6.3	14.9	17.3
1	low	low	high	22.5	16.2	17.1	18.9	20.1
2	high	high	low	21.7	13.2	12.0	20.4	23.8
2	low	high	high	41.1	28.7	37.0	33.0	35.7
2	high	low	high	29.0	22.1	29.4	25.4	27.4
3	high	high	high	49.6	37.0	54.3	41.8	45.4

^a Abuse: ≤ 12 yrs and 16–18; Parental Violence: 13–15.

ing among males and a 30-fold reduction among females.

Alcohol

For alcohol, the risk factors were predominantly the same as for cigarette smoking; however, parental drug use emerged as a leading risk for adolescent females. Again, as protective factors are held constant there is a steady rise as risk factors are sequentially added into the model (Table 8). When abuse and parental drug use are added into the model as the sole risk factor for males and females, there is only a modest increase in alcohol use, from 5.8% to 7.8% for boys and from 3.0% to 5.4% for girls. The greatest single increase in alcohol use for males and females is seen when rage is added into the model; when all risk factors are present, alcohol use rises to 43.9% for males and 53.9% for females.

When risk factors are held constant and no protective factors are present, 62.1% of males and 78.7% of females report drinking on at least a weekly basis (Table 9). As was true for cigarette smoking, school connectedness is associated with the greatest single factor reduction for both males and females to 8.6% and 2.1%, respectively. When all three factors are added into the model there is an overall reduction of approximately 20 times for boys and a reduction from 78.7% to less than 1% for girls. Equally dramatic changes are seen for each age group.

Discussion

Across the four behaviors studied, certain risk and protective factors emerge. Specifically, teens who reported having experienced abuse, those who skip school, and youth who indicate that they almost

Table 7. Cigarette Smoking: Probability of Cigarette Smoking by in Relation to the Presence of *Protective* Factors (Holding Risk Factors Constant)

Number of Protective Factors Present	Protective Factors			Predicted Probabilities				
	Religious Attendance	Other/Family Connectedness ^a	School Connectedness	Gender		Age in yrs		
				Males %	Females %	≤ 12 %	13–15 %	16–18 %
0	low	low	low	51.3	66.6	35.2	67.4	45.6
1	high	low	low	43.7	51.3	30.6	53.5	32.5
1	low	high	low	43.3	42.3	17.9	54.5	42.6
1	low	low	high	9.1	9.8	4.6	10.0	13.4
2	high	high	low	36.0	28.0	15.1	40.0	29.9
2	low	high	high	6.8	3.8	1.9	6.1	12.1
2	high	low	high	6.9	5.4	3.7	5.8	8.2
3	high	high	high	5.1	2.1	1.5	3.5	7.3

^a Other Connectedness: boys; Family Connectedness: girls; Family Connectedness: ≤ 12 yrs and 16–18; Other Connectedness: 13–15.

Table 8. Drinking: Probability of Alcohol use in Relation to the Presence of *Risk* Factors (Holding Protective Factors Constant)

Number of Risk Factors Present	Risk Factors			Predicted Probabilities				
	Abuse/Parental Drugs*	Skips School	Rage	Gender		Age in years		
				Males %	Females %	≤ 12 %	13–15 %	16–18 %
0	low	low	low	5.8	3.0	2.0	4.7	7.8
1	high	low	low	7.8	5.4	2.4	6.8	14.6
1	low	high	low	12.2	8.7	7.7	8.9	15.1
1	low	low	high	20.2	17.1	10.3	17.8	24.9
2	high	high	low	16.0	14.9	8.9	12.6	26.4
2	low	high	high	36.4	38.9	31.6	29.9	40.9
2	high	low	high	25.7	27.4	11.9	24.2	40.1
3	high	high	high	43.9	53.9	35.2	38.7	58.4

*Abuse: boys; Parental Drug Use: girls; Abuse: ≤ 12 yrs; Parental Violence: 13–15; Parental Drug Use: 16–18.

always think about hurting or killing someone are much more likely to report each of the four negative outcomes: violence involvement, sexual intercourse, cigarette use, and alcohol use. Other recurrent risk factors relate to parental violence and drug use. The finding that abuse is a persistent risk factor across nearly every group and outcome is consistent with the findings from the United States where Borowsky et al [9] found a strong association with suicide attempts. Likewise, U.S. data from the National Longitudinal Study of Adolescent Health show strong associations between physical/sexual abuse and smoking, violence and emotional distress [10].

There is also an extensive literature that suggests that young people who are disenfranchised from school, and skipping school is one such measure, have a higher risk of a host of negative outcomes [11]. Rage, on the other hand, has rarely been reported (or explored) as a risk factor. Rather, most

research in the United States explores violence involvement either as a victim or perpetrator. Rage taps a different dimension, the propensity to commit a violent act. As we have previously reported [12], one would expect it to be significantly associated with violence involvement and substance abuse in contexts outside the Caribbean.

As none of the predominant risk factors are especially surprising, neither are the leading factors associated with lower risk involvement: family connectedness, school connectedness and religiosity. These factors have been shown to be associated with less involvement with a wide range of risk behaviors in the United States as a whole [13], as well as in subpopulations of American Indian youth [14] and Latino young people [15].

Beyond the associations seen with risk and protective factors, the present analyses demonstrate that for youth in the Caribbean, risk is cumulative, as is

Table 9. Drinking: Probability of Alcohol use in Relation to the Presence of *Protective* Factors (Holding Risk Factors Constant)

Number of Protective Factors Present	Protective Factors			Predicted Probabilities				
	Religiosity ^a	Other/Family Connectedness ^b	School Connectedness	Gender		Age in years		
				Males %	Females %	≤ 12 %	13–15 %	16–18 %
0	low	low	low	62.1	78.7	42.4	71.0	82.6
1	high	low	low	57.3	64.8	33.6	66.9	77.9
1	low	high	low	41.4	73.4	30.5	56.2	69.0
1	low	low	high	8.6	2.1	2.1	3.8	7.7
2	high	high	low	36.7	57.8	23.2	51.4	62.4
2	low	high	high	3.9	1.6	1.3	2.0	3.8
2	high	low	high	7.1	1.1	1.5	3.1	5.8
3	high	high	high	3.2	0.8	0.9	1.7	2.8

^a Religiosity: 13–15 and 16–18; Family Connectedness: ≤ 12 yrs.

^b Family Connectedness: boys; Other Connectedness: girls; *Other Connectedness: ≤ 12 yrs and 16–18; Family Connectedness: 13–15.

protection. Specifically, for each of the four health risk behaviors studied, when protective influences are held constant and the predominant risk factors are added one at a time, reported risk behavior rises dramatically, especially when all three are present (e.g., over 50 percentage points for sexual initiation). Conversely, and perhaps more importantly, when risk factors are held constant and protective factors are added, there is an even more dramatic reduction in reported involvement with the health-compromising behaviors studied. But equally important is the finding that for some behaviors, reducing risk and enhancing protective factors may work differently for males and females or different age groups. We see such differences, for example, with sexual experience, where for males the greatest change occurs with risk reduction, whereas for females change occurs most when all three protective factors are entered into the model. Similarly, for smoking, with all three protective factors entered in the model, reported smoking declined 10-fold for boys and more than 30 times for girls. For alcohol use, the change is even more dramatic when all three protective factors are modeled. We also see in these analyses that females appear to be more responsive to (or reactive to) the presence of both risk and protective factors. Such gender differences have also been seen in risk and protective factors in the United States [12].

In a study comparing risk and protective factors for suicide risk among American Indian youth, Borowsky et al [13] found that increasing protective factors was associated with greater change (e.g., suicide reduction) than, conversely, was seen by reducing risk. Although the present analyses cannot make an equally strong claim across all of the four behaviors studied, for all but violence involvement the same associations held, namely youth who report none of the risk factors (holding protective factors constant) were more likely to report having had sexual intercourse and to use substances (tobacco and alcohol) when compared with peers who report having all three protective factors (holding risk factors constant at the mean level). Additionally, for Caribbean youth the greatest reduction in each of the risk behavior models was when school connectedness was entered into the model.

Conclusion

The present analyses add weight to the findings of both evaluation and behavioral researchers, suggest-

ing that attention needs to be paid to strengthening protective factors in the lives of vulnerable youth and not solely to focus on risk reduction. The issue is not that one is more important than the other; rather, it is likely that when risk reduction strategies are coupled with enhancing the key protective factors for youth, health-compromising behaviors will be significantly reduced.

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