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The Influence of Family Characteristics on Problem Behaviors in a Sample of High-Risk Caribbean Adolescents

Special Issue Guest Editor's Note: *In this article the authors examine family risk factors that impact adolescents' social decision making and behavior. This article builds on the paired article, "Neurological Bases of Executive Function and Social-Emotional Development: Typical and Atypical Brain Changes" (this issue, pp. 108–119), in which Barrasso-Catanzaro and Eslinger present an overview of the role of the prefrontal cortex in supporting emotional and social behavior as well as moral judgment.*

ABSTRACT

Drawing on the social development model, the authors examine family risk and protective factors thought to influence problem behaviors among adolescents. They estimate the impact of family risk and protective factors on a variety of antisocial and health risk behaviors. Data are drawn from a sample of nearly 2,500 adolescents attending high-risk schools in Trinidad

and Tobago, a developing nation in the eastern Caribbean. The findings show that certain family risk factors play a more consistent role in shaping adolescent problem behaviors than others. In particular, adult history of antisocial behavior and parental attitudes favorable toward antisocial behavior and substance use emerge as the most robust risk factors. In accordance with previous research, family protective factors exerted only a minimal influence on behavioral outcomes. This finding confirms the need for additional theory and research on the protective factors that help reduce problem behavior among adolescents, particularly in developing nations.

A growing scientific literature focuses on a variety of risk and protective factors thought to influence adolescent problem behaviors, including antisocial conduct, substance use and abuse, and other risky behaviors. One of the most well-known frameworks for thinking about the risk and protective factors that influence problem behaviors is the *social development model*, an integrative theory that includes ideas from social learning theory, control theory, and differential association theory (Brewer, Hawkins, Catalano, & Neckerman, 1995; Catalano & Hawkins, 1996; Hawkins & Catalano, 1992; Sullivan & Hirschfield, 2011). The social development model specifies four domains of risk and protective factors thought to affect adolescent

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development: (a) communities, (b) schools, (c) families, and (d) peers. Research has found that all of these domains influence adolescent behavior, including a wide range of risky, illegal, and otherwise problematic behaviors.

Drawing on this body of research, in the present study we examined the extent to which measures of risk and protective factors derived from the social development model influence adolescent problem behaviors. The study is based on survey data from a sample of youth in Trinidad and Tobago, a developing nation struggling with social problems associated with gangs, violence, crime, and substance use among both youth and adults (e.g., Katz & Fox, 2010; Kuhns & Maguire, 2012; Maguire, Willis, Snipes, & Gantley, 2008; Wells, Katz, & Kim, 2010). Although all four of the domains specified by the social development model play key roles in the lives of adolescents, our specific focus in this article is on family risk and protective factors. Family issues are routinely cited in the media and in policy discussions as part of the reason for the increase in gang-related violence in Trinidad and Tobago (Townsend, 2009; "When Fear Rules the Land," 2010). Given the proximate influence of families on adolescent behavior, it is expected that measures of family risk and protective factors will be associated with a variety of behavioral outcomes.

FAMILY RISK AND PROTECTIVE FACTORS

The family environment is the most profound influence on child development through adolescence in multiple domains of functioning (Institute of Medicine, 2009). An evidence base has established a relationship between exposure to certain deleterious child-rearing conditions and behavioral self-regulation (Caspi, Taylor, Moffitt, & Plomin, 2000; Goodnight et al., 2012). The quality of the home child-rearing environment appears to be particularly impactful because of its implications for the proximal influences of family functioning, parenting, and enriching experiences that directly affect child development. In the absence of nurturing family conditions, children are more likely to manifest poorly developed social skills, cognitive deficits, and behavioral problems (Byford, Kuh, & Richards, 2012; El Nokali, Bachman, & Votruba-Drzal, 2010; Heckman, 2006; Wasserman, Miller, Pinner, & Jaramillo, 1996).

Adolescence is a particularly vulnerable developmental period because of challenges associated with newfound autonomy, peer pressures, and the relative prematurity of cognitive skill systems that support effective decision making and problem solving. Certain family dynamics can provide youth with the scaffolding to resist impulses and avoid harmful consequences, whereas others can increase developmental risk, endangering the prospects for youth to achieve a healthy future (Farah et al., 2008; Gunnar & Donzella, 2002; Landry, Smith, Swank, & Guttentag, 2008; Shonkoff, 2003; Shonkoff et al., 2012). According to the social development model, families are one of the key socializing units from which children learn prosocial or antisocial norms, values, and behaviors (Hawkins, Van Horn, & Arthur, 2004).

Different family conditions and dynamics introduce various combinations of risk and protective factors that directly influence emergent neurobiological networks throughout childhood and adolescence (Byford et al., 2012; El Nokali et al., 2010; Heckman, 2007; Wasserman et al., 1996). These networks subserve the social and behavioral skills necessary for adaptive functioning and self-regulation of behavior and emotion (see Barrasso & Eslinger, 2016). Identifying the influence of specific family risk and protective factors on adolescent problem behavior is critical for many purposes, including early detection of at-risk youth and the design and implementation of interventions that target the specific proximal conditions that influence youth behavior. Fortunately, neurobiological systems and the executive cognitive and emotion-regulatory functions they support are malleable and potentially responsive to targeted interventions (Stuss, 2011; Tracy & Osipowicz, 2011; Venkatakrishnan & Sandrini, 2012).

MEASURING FAMILY RISK AND PROTECTIVE FACTORS

An emerging body of empirical research has sought to measure risk and protective factors among adolescents. Many of these measures are based on data from the Communities That Care (CTC) youth survey, a popular school-based instrument used throughout the United States and a handful of other developed nations (Beyers, Toumbourou, Catalano, Arthur, & Hawkins, 2004; Fairington, 2004; Jonkman,

Junger-Tas, & van Dijk, 2005). The survey is based on the social development model and contains a battery of questions designed to measure risk and protective factors across the model's four domains: communities, schools, families, and individuals/peers (Hawkins et al., 2004).

The original CTC measurement model for the family domain consisted of five risk factors (poor family management; family conflict; parental attitudes favorable toward antisocial behavior; parental attitudes favorable toward alcohol, tobacco, and drug use; and family history of antisocial behavior) and three protective factors (family attachment; family opportunities for prosocial involvement; and family rewards for prosocial involvement; Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002). This measurement model has now been tested several times in the United States (see Arthur et al., 2002; R. R. Glaser, Van Horn, Arthur, Hawkins, & Catalano, 2005; Hawkins et al., 2004). These tests have found that various adjustments needed to be made to the model, including splitting some scales and combining others. At the same time, measures of problem behaviors were positively associated with family risk factors and negatively associated with family protective factors, as hypothesized. Research from the United States forms the primary evidence base on the validity of the CTC family risk and protective factor measures.

With the exception of one study, conducted by Maguire (2013), little is known about the validity of these measures in developing nations. (A recent study of the CTC risk and protective factors concluded that the model fit the data well for a sample of adolescents in Iran [Baheiraei et al., 2014]. However, the authors did not account for discriminant validity. Within the family domain, for instance, four factor correlations exceeded .9, a clear indicator of discriminant validity problems.)

Maguire (2013) tested the validity of the CTC family risk and protective factor measures using data from a sample of youth in Trinidad and Tobago. The analysis revealed that the original CTC model had weak construct and concurrent validity. After discarding some problematic items, a revised model was developed with eight dimensions, including five risk factors and three protective factors. The effects of these measures were then tested on three outcomes: (a) illegal drug use, (b) illegal gun possession,

and (c) gang membership. Although two risk factors (poor family management and adult history of antisocial behavior) had consistent effects in the expected direction across all three outcomes, the effects of six other risk and protective factors were mixed. The findings suggested that the risk and protective factors thought to influence problem behaviors "may not be universal across different contexts and behavior types" (Maguire, 2013, p. 1496). Moreover, the family *protective* factors had consistently weak effects on the three behavioral outcomes. On the basis of this finding, Maguire concluded that "more work needs to be invested in conceptualizing and measuring the protective factors that promote resilience in the face of the various risk factors faced by adolescents" (p. 1495).

Because most of the research on CTC risk and protective factors comes from the United States, little is known about the quality or applicability of these measures elsewhere. (Most research using data from the CTC youth survey has taken place in developed nations, including Australia, Canada, the Netherlands, the United Kingdom, and the United States [Arthur et al. 2007; Beyers et al., 2004; Fairington, 2004; Flynn, 2008; R. R. Glaser et al., 2005; Hemphill et al., 2014; Jonkman et al., 2005]. Recently the survey has also been administered in developing nations, with published research emerging from Colombia [Obando, Trujillo, & Trujillo, 2014], Croatia [Mihic, Novak, & Basic, 2010], Iran [Baheiraei et al., 2014], Thailand [Wongtongkam, Ward, Day, & Winefield, 2014], and Trinidad and Tobago [Katz & Fox, 2010; Maguire, 2013; Maguire, Wells, & Katz, 2011]).

Establishing valid and reliable measures of risk and protective factors is especially important in the developing world, where risk factors are abundant and the capacity of governments to protect youth is often severely limited. In the present study we reexamined data from school-age youth in Trinidad and Tobago using the revised family risk and protective factor measures developed by Maguire (2013). This study builds on the previous one by examining the influence of family risk and protective factors on nine additional outcomes for the same sample of youth: (a) acting on a dare, (b) drinking alcohol, (c) fighting, (d) selling drugs, (e) minor theft, (f) serious theft, (g) robbery, (h) attacking someone with the intention of seriously hurting him or her, and (i) breaking and entering. Widening

the range of problem behaviors may reveal additional insights about the influence of family risk and protective factors on adolescents in Trinidad and Tobago.

CULTURAL CONTEXT

We examined the influence of families on adolescent behavior in a context where these issues are particularly salient. Trinidad and Tobago is a two-island nation located south of Grenada in the eastern Caribbean, about 7 miles from the northeast coast of Venezuela. Trinidad and Tobago became one of the most prosperous nations in the Caribbean after the discovery of oil in Trinidad in 1910. The nation gained independence from the United Kingdom in 1962, but it remains part of the Commonwealth of Nations, and British influence is evident in law and government. Trinidad and Tobago has struggled with a variety of social problems in recent years, including a serious outbreak of violence. From 1999 to 2008, the annual number of homicides rose 488%, from 93 to 547 in a nation with approximately 1.3 million people. Researchers attribute this dramatic increase in violence to armed conflict between street gangs (Katz & Maguire, 2015; Maguire et al., 2008). The spread of gang violence has heightened fear among residents. One study in a high-crime community reported that “fifty-six percent of residents think the risk of being injured or killed because of crime is high, and many feel unsafe in their own neighborhood” (Johnson, 2006, p. 1). Another study reported that residents felt like “prey” because of the high levels of violence in their neighborhoods (Adams, 2012). Previous research in Trinidad and Tobago has found that family characteristics are associated with the propensity of adolescents to use drugs, join gangs, and carry illegal guns (Katz & Fox, 2010; Maguire, 2013).

The survey data set used in the present study was one of several data collection initiatives sponsored by the government of Trinidad and Tobago to help assess the nature and sources of the nation’s crime problem. Characterizing the prevailing risk and protective factors to which youth are exposed is vital for designing interventions that are culturally relevant and appropriately targeted for local conditions. In the present study we focused specifically on proximal risk and protective factors associated with family-related influences.

METHOD

Sample

In this study we used data from the Trinidad and Tobago Youth Survey (TTYYS), which was administered in the classroom to 2,552 students from 22 high-risk urban public schools in five districts between March and June 2006 (Maguire, 2013). (The target population, as determined by the Ministry of Education, was students who lived in high-risk urban areas or who attended high-risk urban public schools. Five of the nation’s eight public school districts were considered “urban school districts” by the Ministry of Education, thus eliminating three districts, including the district of Tobago. Of the 67 public schools located in the five eligible districts, 27 were identified by the Ministry of Education as being at “high risk.” We approached these 27 schools, and 22 (81.5%) agreed to participate in the study.) Participants were in Forms 3 and 5, which are roughly the equivalent of the eighth and tenth grades in the United States. Respondents ranged in age from 10 to 19 years, with a mean age of 15.4 (96.3% of respondents were 14–17 years old). About 41% of respondents were African and 23.7% were East Indian, compared with national population totals of 37.5% African and 40% East Indian (and 20.5% mixed ethnicity). (Local authorities explained that our sample underrepresented East Indian children because the distressed communities in which the school districts represented in this study are located are more heavily populated by people of African descent.) Nearly 60% were female. For 94.2% of respondents, English was the primary language spoken at home. We excluded several cases because of missing or problematic data, leaving 2,376 useable survey responses. (At the end of the survey, all respondents were asked “How honest were you in filling out this survey?” If respondents did not answer the question [$n = 63$] or indicated “I was not honest at all” [$n = 22$], their responses were excluded. If respondents admitted using the nonexistent drug phenoxydine, their surveys were also excluded [$n = 91$]).

Instrumentation

The TTYYS was originally modeled after the 2006 Arizona Youth Survey (Bach Harrison, LLC, 2006), which borrowed its measures

of risk and protective factors from the CTC youth survey. Although Trinidad and Tobago is an English-speaking nation, local education officials recommended modifying the instrument slightly to reflect local vernacular. The final instrument had 238 items, including those intended to measure 16 risk factors and 13 protective factors falling within four domains: (a) community, (b) school, (c) family, and (d) peer/individual. The instrument also contained items intended to measure a variety of self-reported delinquent, antisocial, and health-risk behaviors.

Analysis

Using confirmatory factor analysis, Maguire (2013) developed measures of five family risk factors and three family protective factors based on 31 items from the TTYS. Responses to these items were treated as indicators of a smaller set of unobserved latent variables representing different dimensions of family risk and protection. (The original CTC model contained 38 survey questions addressing family risk and protective factors, but three of those items were not used in the TTYS, including two on cigarette smoking and one on severe alcohol or drug problems in the family.) The items contained between two and five ordinal response options representing levels of risk or protection. Descriptive statistics for these 31 items are presented in Table 1.

We began by replicating the confirmatory factor analysis on these 31 items reported by Maguire (2013). This resulted in a set of latent variables measuring eight family risk and protective factors. (The model fit the data well according to several measures of fit, $\chi^2[406]=701.4$, $p<.0000$; comparative fit index [CFI]=.985; Tucker–Lewis Index [TLI]=0.983; root-mean-square error of approximation [RMSEA]=.017; weighted root-mean-square residual [WRMR]=1.42. Although it is routine to report the chi-square test in structural equation models, it is discounted here because it is often too strict with large samples [Bowen & Guo, 2012]. For RMSEA, .06 to .08 usually constitutes “acceptable” fit, and .01 to .06 constitutes “close” fit [Browne & Cudeck, 1993; Hu & Bentler, 1999]. For CFI and TLI, values of .95 or greater indicate close fit [Hu & Bentler, 1999]. For WRMR, simulation evidence suggests that values below 1 are indicative of good fit [Yu, 2002]. Here,

the model fits the data well according to CFI, TLI, and RMSEA. The WRMR is inflated, but this measure’s performance has not been widely studied, and some evidence suggests that it may be overly sensitive for some types of models [Hsu, 2009]).

Because the results of this analysis have already been published, we do not report factor loadings here due to space limitations. The item numbers associated with each factor are listed in the Appendix. The following analysis treats measures of these eight risk and protective factors as independent variables in a multivariate structural equation model containing multiple dependent variables measuring behavioral outcomes. Controls for age, sex, and race/ethnicity are also included in the model.

We examined the effects of these independent variables on nine outcomes of acting on a dare, drinking alcohol, fighting, selling drugs, minor theft, serious theft, robbery, attacking someone, and breaking and entering. All of the outcomes are binary, with 1 indicating that the respondent had engaged in the behavior and 0 indicating that he or she had not. Frequencies for each item, as well as the time frame for each question, are listed in Table 2. For eight of the outcomes, respondents were asked whether they had engaged in these behaviors *during the past year*. For the question about alcohol, respondents were asked if they had drunk more than a few sips *during their lifetime*.

To estimate the model, we selected the robust mean- and variance-adjusted weighted least squares (WLSMV) estimator in Mplus (L. Muthén & Muthén, 1998–2007). Simulation research shows that this estimator performs well in models with categorical outcomes, including those with skewed distributions (Flora & Curran, 2004; B. Muthén, du Toit, & Spisic, 1997). (In the measurement portion of the model, the indicators of each risk and protective factor are either dichotomous or ordinal polytomous variables. In the structural portion of the model, the behavioral outcomes are all dichotomous variables.) A complication that arises in data from school-based samples is clustering. Thomas and Heck (2001, p. 520) argued that complex sampling can produce samples that are a “severe distortion” of the population from which they were drawn. Failing to account for clustering can result in biased estimates of standard errors and chi-square test statistics (Asparouhov & Muthén, 2006; B. O. Muthén & Satorra, 1995).

Table 1. Descriptive Statistics for 31 Family Risk and Protective Items

Item	Coding scheme	Min	Max	Mdn	M
Questions with subcomponents					
How wrong do your parents feel it would be for YOU to:					
Q13A. Drink beer, wine, or hard liquor (for example vodka, whiskey, or gin) regularly?	4	1	4	1	1.55
Q13B. Smoke marijuana?	4	1	4	1	1.08
Q13C. Steal something worth more than \$30?	4	1	4	1	1.14
Q13D. Draw graffiti, write things, or draw pictures on buildings or other property (without the owner's permission)?	4	1	4	1	1.48
Q13E. Pick a fight with someone?	4	1	4	1	1.51
About how many adults (over 21) have you known personally who in the past year have:					
Q24A. Used marijuana, crack, cocaine, or other drugs?	3	0	4	3	2.22
Q24B. Sold or dealt drugs?	3	0	4	1	1.81
Q24C. Done other things that could get them in trouble with the police, like stealing, selling stolen goods, mugging, or assaulting others, etc. . . . ?	3	0	4	1	1.78
Q24D. Gotten drunk or high?	3	0	4	4	2.69
Have any of your brothers or sisters ever:					
Q26A. Drank beer, wine or hard liquor (for example vodka, whiskey, or gin)?	2	0	1	1	0.94
Q26B. Smoked marijuana?	2	0	1	0	0.57
Q26C. Taken a handgun to school?	2	0	1	0	0.38
Q26D. Been suspended or expelled from school?	2	0	1	0	0.62
Stand-alone questions					
Q35. My parents (or those who you consider to be your parents) notice when I am doing a good job and let me know about it.	5	0	3	2	1.71
Q36. How often do your parents tell you they're proud of you for something you've done?	5	0	3	1	1.46
Q47A. The rules in my family are clear.	1	1	4	4	3.15
Q47B. People in my family often insult or yell at each other.	1	1	4	2	2.45
Q47C. When I am not at home, one of my parents knows where I am and who I am with.	1	1	4	4	3.28
Q47D. We argue about the same things in my family over and over.	1	1	4	3	2.51
Q47E. If you drank some beer, wine, or hard liquor (for example vodka, whisky, or gin) without your parents' permission, would you be caught by your parents?	1	1	4	2	2.46
Q47F. My family has clear rules about alcohol and drug use.	1	1	4	4	3.21
Q47G. If you carried a handgun without your parents' permission, would you be caught by your parents?	1	1	4	4	3.08
Q47H. If you skipped school would you be caught by your parents?	1	1	4	3	2.98
Q47I. Do you feel very close to your mother?	1	1	4	4	3.17
Q47J. Do you share your thoughts and feelings with your mother?	1	1	4	3	2.75
Q47L. Do you share your thoughts and feelings with your father?	1	1	4	2	2.21
Q47M. Do you enjoy spending time with your mother?	1	1	4	3	3.17
Q47N. Do you enjoy spending time with your father?	1	1	4	3	2.85
Q47P. Do you feel very close to your father?	1	1	4	3	2.63
Q47S. People in my family have serious arguments.	1	1	4	2	2.36
Q47T. Would your parents know if you did not come home on time?	1	1	4	3	3.04

Note. Coding Scheme 1: 1 = NO!, 2 = no, 3 = yes, 4 = YES!. Coding Scheme 2: 0 = No, 1 = Yes. Coding Scheme 3: 0 = 0, 1 = 1, 2 = 2, 3 = 3-4, 4 = 5+. Coding Scheme 4: 1 = very wrong, 2 = wrong, 3 = a little bit wrong, 4 = not wrong at all. Coding Scheme 5: 0 = never or almost never, 1 = sometimes, 2 = often, 3 = all of the time. Min = minimum; Max = maximum; Mdn = median; M = mean; Q = question.

Table 2. Frequencies for Nine Adolescent Problem Behaviors

Behavior type	Time frame	% No	% Yes
1. Done something dangerous because someone dared you to do it? [ACT ON DARE]	Past year	84.9	15.1
2. Drank more than just a few sips of alcoholic beverages (beer, wine, or hard liquor)? [DRINK ALCOHOL]	Lifetime	27.3	72.7
3. Got in a physical fight on school property? [FIGHT]	Past year	70.0	30.0
4. Sold illegal drugs? [SELL DRUGS]	Past year	96.9	3.1
5. Stolen or tried to steal something worth less than \$300? [MINOR THEFT]	Past year	89.0	11.0
6. Stolen or tried to steal something worth more than \$300? [SERIOUS THEFT]	Past year	94.2	5.8
7. Used a weapon or force to get money or other material items from someone? [ROBBERY]	Past year	95.8	4.2
8. Attacked someone with the intention of seriously hurting them? [ATTACK]	Past year	78.4	21.6
9. Gone into or tried to go into a building to steal something? [BREAK & ENTER]	Past year	93.9	6.1

We adjusted the standard errors and chi-square values for school-based clustering using the methods available in Mplus. (Mplus makes two adjustments for clustering due to complex sampling [Asparouhov & Muthén, 2006]. It adjusts the chi-square test of model fit using a correction factor similar to the approaches proposed for robust chi-square testing by Satorra and Bentler [1988] and Yuan and Bentler [2000], and it adjusts the standard errors of the parameter estimates using a Huber–White sandwich procedure.) The largest variance inflation factor was 2.4, suggesting that multicollinearity was not problematic.

RESULTS

We regressed nine binary outcomes onto eight family risk and protective factors and four controls. Standardized probit coefficients that estimate the effects of the independent variables on each behavioral outcome are listed in Table 3. With eight risk and protective factors and nine problem behaviors, Table 3 contains 72 coefficients that estimate the effects of family risk and protective factors on problem behaviors. Of the 45 coefficients associated with *risk* factors, 26 of them (57.8%) are significantly different from 0, all in the expected direction. The only risk factor with significant effects on all nine problem behaviors was parental attitudes favorable toward antisocial behavior, alcohol, and drug use. Adult history of antisocial behavior had a significant effect on eight of the nine behavioral outcomes (the only outcome not associated was acting on a dare). Two of the risk factors—family conflict and sibling history of antisocial behavior—each exerted significant

effects on only four of the nine outcomes. Finally, poor family management was significantly associated with only one of the nine outcomes (selling drugs). Of the 27 coefficients in Table 3 that are associated with protective factors, only one is statistically significant (3.7%). This is about what we would expect to find on the basis of chance alone. Overall, the family protective factors did not appear to be associated with the behavioral outcomes examined here.

We also carried out supplemental analyses to determine whether family risk and protective factors were associated with summary measures representing four broader categories of problem behavior. These included an overall measure of problem behavior based on the sum of all nine behavioral outcomes, a measure of criminal behavior based on the sum of eight outcomes (excluding acting on a dare), a measure of engagement in violence based on the sum of three outcomes (fighting, robbery, and attacking someone), and a measure of involvement with drugs and alcohol based on the sum of two outcomes (drinking alcohol and selling drugs). Table 4 contains standardized ordinal probit coefficients that estimate the effects of the independent variables on each behavioral outcome. (Another option would have been to use count models based on the Poisson distribution, such as Poisson or negative binomial regression. We attempted to estimate the model using Poisson regression, but we were unable to generate estimates because this is a maximum-likelihood method that becomes computationally intractable when a model contains many latent variables. The model tested here has eight latent variables.) The results presented in Table 4 suggest that the risk factors are more

Table 3. Probit Results for the Effects of Risk and Protective Factors on Nine Problem Behaviors

Behavior type	Act on dare	Drink alcohol	Fight	Sell drugs	Minor theft	Serious theft	Robbery	Attack	Break & enter	Sig.coeffs.
Factor 1: Poor family management	.104	.107	-.030	.239**	.086	.016	.029	.053	.034	1/9
Factor 2: Adult history of antisocial behavior	.048	.245***	.093**	.361***	.129***	.134**	.161**	.247***	.222***	8/9
Factor 3: Family conflict	.174***	.070*	.046	.032	.158**	.106	.056	.106***	.082	4/9
Factor 4: Sibling history of antisocial behavior	.031	.098**	.009	.175**	.043	.083	.134*	.064	.073*	4/9
Factor 5: Parental attitudes favorable toward antisocial behavior, alcohol, and drug use	.220***	.262***	.142**	.168*	.205***	.268***	.291***	.254***	.330***	9/9
Factor 6: Maternal attachment	.010	-.014	-.087	.106	-.002	-.119	-.041	-.027	-.002	0/9
Factor 7: Paternal attachment	-.022	-.026	.000	.091	.019	.061	.008	.042	.064	0/9
Factor 8: Family rewards for prosocial involvement	.044	.001	-.022	.070	-.076	-.082	-.021	-.029	-.126**	1/9
Age	-.028	.154***	.007	.125*	.017	.082	.068	.027	.098*	3/9
Sex (male = 1)	.178**	.019	.356***	.283***	.261***	.308***	.229***	.141***	.219***	8/9
Race/ethnicity (African = 1)	-.048	-.019	.076**	-.029	.063	.027	.021	-.029	-.041	1/9
Race/ethnicity (Indian = 1)	-.076*	-.196***	-.118***	-.085	-.117**	-.037	-.136*	-.192***	-.116*	7/9

Note. Sig. coeffs. = significant coefficients.
 * $p < .05$. ** $p < .01$. *** $p < .001$.

consistently associated with summary measures of problem behavior than measures of specific problem behaviors. For instance, family conflict had a statistically significant effect on only four of the nine problem behaviors (44.4%) in Table 3, but it had a significant effect on all four of the summary measures (100%) in Table 4. With five risk factors and four summary measures of problem behavior, Table 4 contains 20 coefficients that estimate the effects of risk factors on problem behavior. Of these, 17 (85%) were statistically significant. Consistent with earlier findings, the protective factors did not have any significant effects.

DISCUSSION

Some of the family risk factors assessed in this study appear to have significant negative effects on antisocial and health risk behaviors in this sample of Caribbean youth. Consistent with the social development model, parental attitudes toward antisocial behavior and substance use, as well as the presence of adults in the lives of these youths, who reportedly engage in antisocial behavior, exerted particularly potent effects. The effects of other risk factors were less consistent. In this study we also sought to test the influence of protective factors that may insulate or protect these juveniles from antisocial behavior and unhealthy lifestyles; however, the

protective factors did not have a significant effect on any of the problem behaviors we examined. The lack of a relationship between the protective factors and behavioral outcomes suggests that the CTC measures, even with modifications made in the present study, are not tapping into the protective aspects of families for youth in Trinidad and Tobago. Although the CTC youth survey has been used internationally, this study raises questions about the extent to which it is able to capture the most influential family dynamics that serve to buffer adolescents from the risk factors they face. Instruments designed for use in the United States and other developed nations may need to be adapted for use in developing nations in which youth are often exposed to risky environments. It may be necessary to tailor instruments designed to measure risk and protective factors to the cultural contexts in which they will be administered. Because the science of measuring adolescent risk and protection is still in its infancy, particularly in the developing world, the extent to which such measures are universal is not yet clear. Testing these measures across a wide variety of contexts would contribute greatly to the literature.

A more comprehensive diagnostic instrument may be more illuminating and have greater implications for intervention and policy change. Assessment batteries should account for the prevailing macro-level conditions that relate to

Table 4. *Probit Results for the Effects of Risk and Protective Factors on Four Summary Measures of Problem Behavior*

Behavior type	Overall problem behavior (9 items)	Crime (8 items)	Violence (3 items)	Alcohol and drugs (2 items)	Sig. coeffs.
Factor 1: Poor family management	-0.112*	-0.077	0.005	-0.132*	2/4
Factor 2: Adult history of antisocial behavior	0.206***	0.232***	0.158***	0.206***	4/4
Factor 3: Family conflict	0.115***	0.100***	0.063**	0.062**	4/4
Factor 4: Sibling history of antisocial behavior	0.073**	0.073**	0.051	0.089***	3/4
Factor 5: Parental attitudes favorable toward antisocial behavior, alcohol, and drug use	0.235***	0.221***	0.203***	0.177***	4/4
Factor 6: Maternal attachment	0.017	-0.006	-0.056	0.024	0/4
Factor 7: Paternal attachment	0.022	0.008	0.019	-0.009	0/4
Factor 8: Family rewards for prosocial involvement	-0.049	-0.046	-0.032	-0.012	0/4
Age	0.082**	0.085**	0.030	0.124***	3/4
Sex (male = 1)	0.253***	0.245***	0.261***	0.053**	4/4
Race/ethnicity (African = 1)	-0.007	0.014	0.024	-0.018	0/4
Race/ethnicity (Indian = 1)	-0.157***	-0.156***	-0.130***	-0.153***	4/4

Note. Sig. coeffs. = significant coefficients.

* $p < .05$. ** $p < .01$. *** $p < .001$.

antisocial behavior in specific cultural contexts. Trinidad and Tobago is a developing nation with high levels of crime, violence, and fear. Many young people there face the omnipresent lure of criminal gangs, particularly in neighborhoods where gang leaders are viewed as “community leaders.” In these areas, the informal social control provided by gangs is considered by some residents to be more potent and legitimate than the formal social control provided by police. When parents in gang-controlled neighborhoods attempt to model prosocial behavior for children, their efforts may be undermined by gang members. Fieldwork in Trinidad has revealed that some families turn to neighborhood gang leaders to discipline their children (Katz & Maguire, 2015). This occurs in a context in which gangs are more powerful and violent than U.S. street gangs (Katz, Maguire, & Choate, 2011).

In the absence of a strong family structure supportive of compliance with law and legal authorities, or the presence of adults who discourage and themselves do not engage in antisocial behavior, young people may find it difficult to envision legitimate opportunities for success in their future. The adverse conditions faced by some of the youth we studied may overwhelm the influence of family buffers and, in combination with parents and adults with antisocial attitudes and behaviors, youth may find it difficult to learn prosocial and healthy lifestyles. It is also possible in such environments that

protection is afforded not by family factors as much as it is by other factors, such as the absence of direct exposure to trauma, religiosity, well-equipped schools, after-school programs and alternative activities, intelligence/academic performance, and good nutrition (e.g., no exposure to toxic metals, balanced diet, food security, etc.). Because the present study focused on family factors, school- and community-level conditions were beyond its scope. One possibility worthy of further research is whether these factors may play a more significant role than the family in these communities. On the other hand, it is also possible that many of the protective factors traditionally studied are not sufficient to overcome the powerful influence of crime, violence, poverty, and social disorganization in the most distressed communities. Assessment instruments that account for these special circumstances to identify context-relevant protective factors that buffer the effects of these compelling influences are critical to the design of effective interventions and policies.

For an instrument to have clinical utility there should be evidence that the constructs it measures are reflective of malleable aspects of individual-level functioning and contextual conditions. Irrespective of the source of deleterious influences, the ways in which youth develop and function vary dramatically, in part, because of variation in exposure to psychosocial conditions and in part because of the ways in which

individuals orient themselves to those exposures. For example, trauma exposure is known to be a strong risk factor for antisocial behavior (Chamberlain & Moore, 2002; Kerig, Ward, Vanderzee, & Moeddel, 2009). However, some individuals are more prone to depression in response to trauma, whereas others are more resilient (Borja & Callahan, 2009). Thus, it is not sufficient to measure trauma exposure alone; one also should evaluate the individual response to that trauma as well as the context in which it occurs.

For some of the communities represented in this study, violence is pervasive and survival is paramount, particularly for adolescents. Children raised in these communities grow up observing extreme levels of antisocial behavior and violence. As part of our fieldwork in Trinidad, we have observed several homicide scenes in which children were present, including some in which they were allowed to play near the bodies of murder victims. Violence, drug selling, extreme poverty, and other manifestations of a harsh and trauma-filled environment are commonplace in some of the most distressed communities. Under these conditions, children are at very high risk for modeling these behaviors and for becoming desensitized to what would otherwise be traumatic experiential influences. As a result, we speculate that some of the adolescents surveyed here may simply be mirroring the behaviors and attitudes of their parents and other adults with whom they interact daily.

These adverse conditions increase the propensity for antisocial behavior due to less respect for life (self or others), lack of concern for consequences, low empathy, and a need for greater physical stimulation (Gaylord-Harden, Cunningham, & Zelencik, 2011; Guo et al., 2013; McCart et al., 2007; Mrug & Windle, 2010), all of which diminish the inherent deterrent value in punishments on which justice systems rely to ensure compliance. The importance of this evidence for the present study is that trauma may play a pivotal role in the development and escalation of behavioral problems, whether the effects are seen in psychological disturbances or desensitization. Traumatic experiences compromise the emergence of important psychological and cognitive functions that subservise emotion regulation, social information processing, and interpersonal relatedness. Instruments that can gauge this individual variability are likely to lead to more specific and novel targets for intervention that focus on cognitive functioning

and other developmental indicators known to be both malleable and related to antisocial behavior. Collecting more in-depth data that can be used to establish the impact of trauma and the influence of social conditions conducive to violence on the developing brain will likely provide a compelling case for a large-scale campaign by multiple agencies and public policies to address these underlying issues.

CONCLUSION

The way in which children mirror parental/adult behavior, attitudes, and coping techniques is a prerequisite for adaptive responses to psychosocial challenges in adolescence. Social learning theory dictates that proximal exposures to antisocial orientations are likely to increase risk for antisocial behavior among youth. Psychosocial experiences appear to exert their effects through emergent social cognitive, neurocognitive, and emotional regulatory functions (D. Glaser, 2000; Post & Weiss, 1997). For example, decision making, problem solving, impulse control, emotion regulation, working memory, and a host of other executive cognitive skills are modulated by neural systems that develop in response to psychosocial experiences and exposures. Delays or deficits in the development of these systems and corresponding skills often result from adverse and stressful environments, from macro-level conditions (e.g., poverty and social unrest) to micro-level conditions (e.g., child maltreatment, poor nutrition, and ill-equipped schools). The developmental delays and deficits that result increase risk for behaviors that are essentially maladaptive, for example, impulsive and aggressive.

On the other hand, there is a great deal of variability in children's developmental outcomes in response to their social environment; for example, variability in family and parenting factors exerts differential impacts on developing regulatory skills across individuals dependent upon genetics and other experiential conditions. An understanding of the ways in which such factors influence child/adolescent social skills presents critical opportunities for intervention. Subsequent investigations to shed light on the nature of relationships between caregiver antisocial behavior and attitudes and offspring behavior may thus provide novel targets for intervention. For example, focusing on the cognitive and emotional skills needed for

adaptive decision making and to overcome the proximal influence of antisocial caregivers may exert a protective effect. Such techniques have been shown to strengthen underlying neural networks responsible for these skills (Patel, Spreng, & Turner, 2013) but have yet to be applied to the population under study herein. In the absence of interventions that target these underlying mechanisms in antisociality, conventional approaches are likely to fail. For instance, social- and neurocognitive dysfunction has been shown to interfere with the ability to digest and execute program curricula materials (Fishbein et al., 2006), potentially explaining differential outcomes in response to even the most highly regarded and efficacious programs. Programs and policies with the potential to effectively prevent risk behaviors in children who experience family stressors and trauma generally operate to enhance development of these supportive cognitive functions to improve overall resilience. Also, providing the social scaffolding that families need to provide a protective and nurturing environment works to prevent initial exposure or attenuate the effects of trauma.

In the particular environment of Trinidad and Tobago, however, the approach cannot be strictly individualized. There is a need for a community-based, system-wide response that engages a comprehensive, interactive network of service agencies and public policy makers to systematically influence social norms, provide protections and safe havens, and reduce exposure to trauma. This more comprehensive approach, in combination with skill building from an early age, has the greatest potential to improve youths' ability to self-regulate behavior and reduce the risk for developing delinquency and eventually criminality. At the same time, the resource and capacity constraints that characterize many distressed communities, particularly in developing nations, raise important questions about the conditions under which it is possible to develop and implement these crucial interventions.

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APPENDIX

LISTING OF FACTORS AND ASSOCIATED ITEM NUMBERS

Risk factors (23 items)

- Poor family management (Q47A, C, E, F, G, H, T)
- Sibling history of antisocial behavior (Q26A, B, C, D)
- Adult history of antisocial behavior (Q24A, B, C, D)
- Family conflict (Q47B, D, S)
- Parental attitudes favorable toward antisocial behavior, alcohol, and drug use (Q13A, B, C, D, E)

Protective factors (8 items)

- Maternal attachment (Q47I, J, M)
- Paternal attachment (Q47L, N, P)
- Family rewards for prosocial involvement (Q35, Q36)