Article

Crime & Delinquency
1–26

DOI: 10.1177/00111287231197402
journals.sagepub.com/home/cad
Sage

Validating Social Control, Self-Control, and Social Learning Constructs Among a Sample of Youth in Nine English-Speaking Caribbean Nations

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Abstract

Measures in international self-report surveys drawn from criminological theories have rarely been validated. Instruments that have been tested suggest that they might lack reliability and validity depending on the nation. The present study uses a large sample of school-attending youth in nine English-speaking Caribbean countries to examine the reliability and validity of three theoretical constructs—social control, self-control, and social learning—included in the Eurogang Youth Survey instrument. Our findings suggest that the theoretical constructs contained in the Eurogang Youth Survey instrument are relevant to explaining Caribbean delinquency and show adequate reliability levels. Our results also show consistency in the measurement structure of these theoretical constructs across the study nations.

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Keywords
measurement, juvenile delinquency, criminological theory, risk factors, reliability and validity, risk assessment

Introduction

The English-speaking Caribbean has received much international development attention due to persistently high rates of violence and a relative lack of formal mechanisms of social control (Harriott & Katz, 2015). In 2020, Jamaica and Trinidad and Tobago, for example, ranked in the top five nations for homicide in the Western Hemisphere, alongside Venezuela, Honduras, and Mexico (Asmann & Jones, 2021). Given this background, policymakers and citizens in the English-speaking Caribbean have voiced substantial concern about their criminal justice system's capacity to respond to violence (Harriott et al., 2012).

Some academics have argued that a significant impediment to developing and implementing effective strategies to respond to delinquency, drug use, and gang joining is a lack of information about the causes and correlates of these problems (Harriott & Katz, 2015). This omission includes testing well-developed internationally recognized criminological theories (Maguire et al., 2008; Smith & Crichlow, 2013) and Caribbean-based constructed theory (Pryce, 1976). In addition, few empirical studies have examined criminological theories in the Caribbean context, and those that have operationalized their theoretical constructs based on the assumption that they will function the same in the region. However, this assumption might not be valid because people in Caribbean countries might conceptualize constructs differently, interpret items contained in theoretical constructs differently, or the theories might relate to delinquency and crime differently because of structural and cultural differences.

To be sure, Caribbean communities are characterized by "islandness," a cultural phenomenon resulting from islanders' lifelong experiences with physical isolation, curtailed social networks, and shared beliefs, interests, and behavior (Conkling, 2007). Scott and Staines (2021) argue that because islandness necessarily results in unique forms of informal and formal social control, island communities provide a unique opportunity to test the generalizability of various concepts. Given the cultural uniqueness of the English-speaking Caribbean and its high levels of crime and violence, theory testing or validation of theoretical constructs in the region can provide valuable insights. Despite this opportunity, little prior empirical work has tested or validated criminological theories in the Caribbean (Gardner et al., 2011; Maguire, 2013; Maguire et al., 2011; Smith & Crichlow, 2013).

The present study addresses this gap by testing the reliability and validity of three dominant criminological theories—social control, self-control, and social learning—using self-report data from a large sample of school-attending youth in nine English-speaking Caribbean nations. In doing so, we test each theory's theoretical construct and concurrent validity and assess measurement invariance between countries to determine each theory's generalizability. Our study provides a unique opportunity to validate the measures of these theories in a region with a unique culture (Hickling et al., 2012) defined by multiple cultures brought together through colonization, slave trade, indentured servitude, a preference for both collectivism and hierarchy (Corbin et al., 2012), and islandness.

Literature Review

Limited prior research has examined issues of measurement validation for social control, self-control, and social learning theories to understand crime and delinquency in the English-speaking Caribbean (Gardner et al., 2011; Maguire, 2013; Maguire et al., 2011; Smith & Crichlow, 2013). Validation of theoretical constructs is essential before their use, without which we cannot disentangle whether findings are the result of national context effects (Straus, 2009) or the result of the constructs lacking cross-cultural comparability (i.e., measurement equivalence) (Davidov et al., 2014). Validation of theoretical constructs is also crucial before implementing many policies and programs (e.g., the Gang Resistance and Education Training program (G.R.E.A.T.)). As such, English-speaking Caribbean nations provide a unique opportunity to test the utility of the three noted theories in communities with a distinctively different culture. Below, we briefly discuss the foundation for each theory and the empirical support each theory has received in the English-speaking Caribbean.

Social Control Theory

Hirschi's (1960) social control theory is one of the most widely tested criminological theories (Kempf, 2019) and is frequently used to inform public policies and programs (Wortley, 2008). Social control theory posits that delinquency is more likely to occur when social bonds with family, schools, and community are weak or absent. A substantial body of literature generally shows that the presence and strength of social bonds are negatively related to crime and delinquency (Gottfredson, 2006). Despite the extensive application of social control theory to explain delinquency, summarizing research on the theory is complicated due to the varying quality of measures used to test

it. For example, while some studies operationalize attachment to parents using a single item measuring how well the respondent gets along with their parents (e.g., Liu & Miller, 2020), other studies use an index scale that combines constructs related to attachment to parents, peers, and school (e.g., Junger-Tas, 1992). Thus, variation in operationalizing critical components of the theory weakens academics' ability to validate the theory's core measures and make broader generalizations or more conclusive statements about the robustness of the theory.

While limited research has examined the validity of social control theory among youth in the Caribbean, prior research by Maguire et al. (2011) suggests that there might be a reason for concern. They (also see Maguire, 2013) examined risk factors of youth problem behaviors using a modified version of the Communities That Care (CTC) survey among school-aged youth in Trinidad and Tobago. The CTC instrument included items measuring critical concepts related to the social development model—an integrated theory of antisocial behavior that uses concepts of social learning, control, and differential association theory. In both studies, findings indicated that a number of the measures associated with social control theory showed weak construct validity in Trinidad and Tobago. Maguire (2013) reported, for example, that their measure of family attachment lacked construct validity. While not a full test of social control theory, the authors cautioned future researchers against directly transferring constructs used in the United States to the Caribbean.

Self-Control Theory

Gottfredson and Hirschi's (1990) general theory of crime, also known as self-control theory, hypothesizes that the underlying trait of low self-control plays a substantial role in the cause of crime and delinquent behaviors. They posit that individuals with low self-control exhibit six characteristics: impulsivity, insensitiveness, physical (as opposed to mental) activity, risk-taking, shortsightedness, and non-verbal (Gottfredson & Hirschi, 1990). Prior research provides robust support that self-control has a direct and unconditional effect on involvement in crime (Pratt & Cullen, 2000). Despite substantial supporting evidence for self-control theory, a contentious debate surrounds the conceptualization and operationalization of self-control (see Geis, 2000; Longshore et al., 2005). In addition, much of the research draws from U.S.-based samples, and relatively little is known about whether these scales remain valid in other contexts, countries, or cultures.

One of the few studies examining the validity of social control in the Caribbean was conducted in Jamaica using the Jamaican Youth Survey (JYS) (Gardner et al., 2011). Their measure of self-control included five items from

the Boxer Impulsivity Scale, which measures impulsivity and anger control. The authors reported that the internal consistency of their self-control measure was low for both males and females which required them to drop items to increase the internal reliability for their measure. Furthermore, when they examined concurrent validity through the association between self-control and aggressive behavior, the relationship was only significant for males, not females. Likewise, Smith and Crichlow (2013) examined the cross-cultural validity of Grasmick et al.'s (1993) self-control measure among a sample of university students in Trinidad and Tobago, Malta, and the United States. The authors reported that inter-item reliability was acceptable in Trinidad and Tobago, as well as in the United States and Malta; and that concurrent validity was robust, with self-control being significantly related to self-reported alcohol use, drug use, assault, theft, vandalism, and school misconduct in all three countries. The authors concluded that self-control theory is a culturally invariant explanation of crime.

Social Learning Theory

Social learning theory is considered one of the most robust theoretical frameworks for explaining delinquency (Pratt & Cullen, 2000; Pratt et al., 2010). According to social learning theory, an individual's exposure to and internalization of appropriate behaviors through "observational learning" and "instrumental learning" are important factors in understanding delinquency (Akers, 1998, p. 50). Delinquency occurs due to different associations, or the extent to which a person is exposed to definitions (i.e., attitudes) and behaviors favorable or unfavorable to offending (Akers, 1998). In addition, social learning theory contends that a self-directed person does not engage in delinquency until they have a moral justification for the behavior (Bandura, 1991). This moral justification, a self-regulated process that helps individuals justify their harmful or aggressive behavior, is termed moral attitude/disengagement. Moral attitude/disengagement allows an individual to participate in delinquency and simultaneously avoid self-sanctioning (Mazzone & Camodeca, 2019). Prior research shows that moral attitude/disengagement reduces prosocial behaviors and/or increases delinquency by promoting cognitive and affective reactions conducive to problem behavior (Bandura et al., 1996).

Social learning theory maintains its significance even in the presence of structural and socio-demographic controls and in cross-cultural studies (Wang & Jensen, 2003). However, researchers know little about the validity of social learning theoretical constructs in the English-speaking Caribbean. Maguire (2013) and Maguire et al. (2011), as noted above, conducted partial

examinations of the validity of social learning theory in the Caribbean. The research reported several factors associated with the family scales (i.e., family history of antisocial behavior, parental attitudes favorable toward antisocial behavior, parental attitudes toward alcohol and drug use) lacked construct validity (Maguire, 2013). They also reported weak construct and concurrent validity for measures related to community-level risk and protective factors for laws and norms favorable to drug use and guns, and opportunities and rewards for prosocial involvement.

The Present Study

The present study examines the validity and generalizability of social control, self-control, and social learning theories in the English-speaking Caribbean. The study extends prior research by testing the construct and concurrent validity of measures used to operationalize each theory in a region with a unique culture and history. We further evaluate whether these measures are consistently valid for each theoretical construct across the study nations. We accomplish the above through the use of the Eurogang Youth Survey instrument which has been translated into several languages and tested in various nations to better understand the generalizability and replicability of our results.

Data and Methods

Study Setting

The present study relies on data from nine English-speaking Caribbean nations: Antigua and Barbuda, Barbados, Dominica, Grenada, Guyana, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, and Trinidad and Tobago. The United Nations has designated each of these countries as small island developing states (SIDS) distinguished by "unique social, economic, and environmental challenges," including geographic remoteness, high levels of poverty, limited institutional capacity, a lack of public trust in institutions, and high "vulnerability to systemic shocks" such environmental disasters (e.g., hurricanes) (United Nations, 2021, p. 1). In addition, the region is characterized by high levels of violence, with many nations consistently reporting some of the highest rates of homicide in the world.

While some researchers have noted that Caribbean culture is complex and difficult to define (Corbin et al., 2012), the region is culturally distinctive in many important ways. For example, its culture is influenced by centuries of former occupation and colonization by nations including England, Spain, and France, and more recent neo-colonization by the United States (Knight,

2019). While all English-speaking Caribbean countries gained independence from England by 1983, they remain politically, economically, and socially connected through existing social and cultural intuitions, customs, and migratory patterns. They also share a historical reliance on slavery and indentured servitude that resulted in ethnic-based social and economic stratification (Chase, 2019), as well as generational trauma, which some argue is responsible for much of its violence problem today (Sutton & Ruprah, 2017).

English-speaking Caribbean culture is unique in that it emphasizes informal and formal collectivism. Communities are close-knit, where residents help each other in times of need. Independence movements in these nations were led by people who previously mobilized workers and attempted to organize trade unions, resulting in newly formed governments emphasizing social justice and fairness in employment practices (Corbin et al., 2012). At the same time, many scholars have noted that there are cultural distinctions between each of the English-speaking nations. These distinctions are primarily the consequence of the geographic distance between nations, which span from the north in Antigua and Barbuda, about 300 miles from Puerto Rico, to Guyana, located on the northern coast of South America. Cultural distinctions are also the consequence of variation in the size of each nation's population—ranging from 46,000 residents in St. Kitts and Nevis to 1.3 million in Trinidad and Tobago.

Instrument Development

The Eurogang Working Group developed the survey instrument used in the present study, which was used as part of a larger project focused on Troublesome Youth Groups (TYGs) in the Caribbean. The Eurogang Youth Survey instrument was created by a group of more than 40 academics from 13 countries to collect data on the scope and nature of TYG problems from school-aged youth (Esbensen & Maxson, 2012). The instrument has been translated from English to six other languages and used in France, Germany, the Netherlands, Norway, Russia, and the United States (Weerman et al., 2009). The instrument contains several items measuring respondents' individual and family characteristics, school involvement, delinquency, gang membership, and questions that cover major criminological theories, which are discussed below.

Data

The target population for the study was Form 5 secondary-school-aged youth who attended public schools. In seven nations—Antigua and Barbuda,

Barbados, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines—all enrolled Form 5 students in the nation were included in the sampling frame. Given the large number of schools in Guyana ($n = 115$) and Trinidad and Tobago ($n = 135$), we randomly selected schools for participation. Each nation's school-level sample size was calculated with a margin of error of 5% at a level of 95% confidence. Based on these calculations, a sample of 89 schools in Guyana and 99 schools in Trinidad and Tobago were required to participate in the study. Overall, school-level response rates were high. Of the 341 schools approached, 306 agreed to participate for a school-level response rate of 89.8%. At the individual level, all students in each school were given the survey instrument. They were informed they could return an incomplete survey if they did not want to participate, or they could not answer specific questions if they did not want to answer a question. Among the 27,063 enrolled students, 18,312 completed the survey for a response rate of about 68%. At the national level, response rates ranged from about 63% to 87%.

Prior to analysis, we limited our sample to those between 15 and 18 years old and excluded respondents who did not answer any survey questions. Thus, our final sample is 17,605 school-enrolled youth. The average age of the sample is approximately 16 years old, with the youngest respondents on average being from Barbados (15.7 years old) and the oldest on average being from Dominica (16.5 years old) and St. Vincent and the Grenadines (16.5 years old). Our sample includes more females than males across all nations. The Guyana sample was comprised of the greatest proportion of females (61.8%), and the sample from St. Kitts and Nevis was comprised of the lowest proportion of females (52.8%). Afro-Caribbean is the dominant ethnicity in Antigua and Barbuda, Grenada, St. Kitts and Nevis, comprising over 70% of each nation's sample.[1] Over 50% of participants in Dominica, St. Lucia, and St. Vincent and Grenadines are Afro-Caribbean. In Guyana, most of the sample is Afro-Caribbean (34.4%) or East Indian (32.5%). Similarly, in Trinidad and Tobago, about 32% of respondents are Afro-Caribbean, and 37% are East Indian. See Supplemental Appendix A for respondent demographic characteristics by nation.

Measures

Table 1 displays the items, response categories, mean, standard deviation, and proportion of missing values for each theoretical construct.[2] First, the social control scale contains three subfactors: parental/family attachment, parental monitoring, and school commitment. The parental/family attachment scale contains six items (e.g., your parents/guardians know all of your

Table 1. Item Descriptive Statistics ($n = 17{,}605$).

Theories	Sub-factors	Item		Response	Mean	*SD*	Missing
Social control	Parental/family attachment	PA1	Your parents/guardians know all of your friends	1 = None of the time 2 = Some of the time 3 = Most of the time 4 = All of the time	2.52	0.90	1.1%
		PA2	You can talk to your parents/guardians about anything		2.55	1.00	1.0%
		PA3	Your parents/guardians don't try to understand your problems[a]		2.92	0.93	2.5%
		PA4	Your parents/guardians always trust you		2.86	0.93	1.0%
		PA5	You always ask your parents/guardians for advice and guidance		2.37	1.00	0.8%
		PA6	Your parents/guardians praise you when you do well		3.06	0.99	0.6%
	Parental monitoring	PM1	When you go someplace, you leave a note for your parents/guardians or call them to tell them where you are	1 = None of the time 2 = Some of the time 3 = Most of the time 4 = All of the time	2.88	1.04	0.6%
		PM2	Your parents/guardians know where you are when you are not at home or at school		3.25	0.85	0.7%
		PM3	You know how to get in touch with your parents/guardians if they are not home		3.60	0.69	1.1%
		PM4	Your parents/guardians know who you are with if you are not at home		2.96	0.92	1.1%
	School commitment	SC1	Homework is a waste of time[a]	1 = Strongly disagree 2 = Disagree 3 = Agree 4 = Strongly agree	3.14	0.89	0.6%
		SC2	You try hard in school		3.31	0.68	0.7%
		SC3	Education is so important that it is worth it to put up with things about school that you don't like		3.24	0.82	2.7%
		SC4	In general, you like school		2.85	0.89	0.9%
		SC5	Grades are very important to you		3.44	0.71	1.0%
		SC6	You usually finish your homework		2.74	0.77	0.9%
		SC7	If you had to choose between studying to get a good grade on a test or going out with your friends, which would you do?	1 = Definitely/Probably go with friends 2 = Uncertain 3 = Definitely/Probably study	2.68	0.63	1.1%

(continued)

Table 1. (continued)

Theories	Sub-factors	Item		Response	Mean	*SD*	Missing
Self-control	Impulsivity	IMP1	I often act on the spur of the moment without stopping to think	1 = Strongly disagree 2 = Disagree 3 = Agree 4 = Strongly agree	2.42	0.84	3.8%
		IMP2	I don't devote much thought or effort to preparing for the future		1.97	0.93	2.0%
		IMP3	I often do whatever brings me pleasure here and now, even at the cost of some distant goal		2.58	0.94	2.7%
		IMP4	I'm more concerned with what happens to me in the short-run than in the long-run		2.31	0.94	2.7%
	Risk-seeking	RS1	I like to test myself every now and then by doing something a little risky	1 = Strongly disagree 2 = Disagree 3 = Agree 4 = Strongly agree	2.79	0.91	2.2%
		RS2	Sometimes I will take a risk, just for the fun of it		2.72	0.94	1.6%
		RS3	I sometimes find it exciting to do things for which I might get in trouble		2.34	0.99	1.5%
		RS4	Excitement and adventure are more important to me than security		2.19	0.92	2.0%
Social learning	Commitment to delinquent peers	PP1	If your group of friends was getting you into trouble at home, how likely is it that you would still hang out with them?	1 = Not at all likely 2 = A little likely 3 = Somewhat likely 4 = Likely 5 = very likely	1.95	1.16	1.3%
		PP2	If your group of friends was getting you into trouble at school, how likely is it that you would still hang out with them?		1.83	1.13	1.4%
		PP3	If your group of friends was getting you into trouble with the police, how likely is it that you would still hang out with them?		1.37	0.93	1.5%
	Moral attitudes/ disengagement	MAD1	It is ok to lie if it keeps your friends from getting into trouble with parents, teachers or the police	1 = Strongly disagree 2 = Disagree 3 = Agree 4 = Strongly agree	2.32	1.03	1.8%
		MAD2	It is ok to take little things from a store without paying for them since stores make so much money that it will not hurt them		1.44	0.78	1.1%
		MAD3	It is ok to get into a physical fight with someone if they are threating to hurt your friends or family		2.58	1.14	1.4%

[a]Indicates reversely coded item.

friends) with response ranges from 1 = none of the time to 4 = all of the time. One item (i.e., your parents/guardians don't try to understand your problems) was reverse-coded. The parental monitoring scale consists of four items (e.g., when you go someplace, you leave a note for your parents/guardians or call them to tell them where you are) with response ranges from 1 = none of the time to 4 = all of the time. The school commitment scale contains seven items (e.g., you try hard in school). Responses ranged from 1 = strongly disagree to 4 = strongly agree, with one exception which ranged from 1 = definitely/probably go with friends to 3 = definitely/probably study. One item was also reverse-coded. Higher scores indicate higher levels of parental/family attachment, parental monitoring, and school commitment.

Second, the self-control scale contains two subfactors: impulsivity and risk-seeking. The impulsivity scale has four items (e.g., I often act on the spur of the moment without stopping to think) with response ranges from 1 = strongly disagree to 4 = strongly agree. The risk-seeking scale contains four items (e.g., I like to test myself every now and then by doing something a little risky) with response ranges from 1 = strongly disagree to 4 = strongly agree. Higher scores on both scales represent higher levels of impulsivity and risk-seeking.

Third, we measure social learning through two subfactors: commitment to delinquent peers and moral attitude/disengagement. The commitment to delinquent peers scale contains three items (e.g., if your group of friends was getting into trouble at home, how likely is it that you would still hang out with them?) with response ranges from 1 = not at all likely to 5 = very likely. The moral attitudes/disengagement scale has three items (e.g., it is okay to lie if it keeps your friends from getting into trouble with parents, teachers, or the police), with response ranges from 1 = strongly disagree to 4 = strongly agree. Higher scores on both scales indicate higher levels of commitment to delinquent peers and moral attitudes/disengagement.

In addition, we use six self-reported delinquent behaviors as correlates of the theoretical constructs: violent behavior, property crime, alcohol use, marijuana use, drug selling, and gang involvement (see Supplemental Appendix B). Each outcome variable was coded with a "1" if a respondent reported engaging in the delinquent behavior in the past 12 months and a "0" if they reported not engaging in the behavior in the past 12 months. Gang membership was recoded as a "1" if a respondent reported currently being a gang member and a "0" if they reported not being in a gang. We also include a delinquency variety score by summing each delinquent behavior (mean = 3.87, standard deviation = 3.23, range = 0–15). The descriptive statistics for each measure are presented in Supplemental Appendix B.

Analytic Strategy

We organized our analyses to proceed in stages. First, we conduct confirmatory factor analysis (CFA) to test each theoretical construct's construct validity (i.e., internal structure).[3] Since the responses to each item represent ordered categories, we used a Weighted Least Squares Means-Variance Adjusted estimator (WLSMV, B. Muthén et al., 1997), available in Mplus 8 (L. Muthén & Muthén, 2017). The WLSMV estimator assumes that continuous latent variables give rise to the observed categorical data. Consequently, it uses a polychoric correlation matrix for model estimation (Pearson, 1894). We examine overall model fit using standard indices (i.e., root-mean-square error of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis index (TLI), and standardized root mean square residual (SRMR) to determine if the models adequately fit the data; we use standard acceptability ranges (RMSEA ≤ 0.06, CFI ≥ 0.95, TLI ≥ 0.95, SRMR ≤ 0.08; L. T. Hu and Bentler (1998, L. Hu and Bentler 1999); see also Schermelleh-Engel et al., 2003).[4] In addition, because we collected data from youth in nine countries, we account for nesting by using estimated cluster-robust standard errors with the CLUSTER command in Mplus 8. We also estimate scale reliability using the coefficient omega (ω; McDonald, 1970). This estimator provides better reliability estimates than Cronbach's alpha with categorical and skewed data (Bovaird & Koziol, 2012).[5] There is no universally accepted threshold for adequate levels of omega reliability, but some researchers suggest that omega should exceed 0.50 at a minimum, with 0.75 preferable (Watkins, 2017).

Second, we assess correlations between theoretical constructs and self-reported delinquency. Given that each theoretical construct has been used to identify youth at risk for various delinquent behaviors, we seek concurrent evidence of whether these theoretical constructs are related to several delinquency outcomes. If the correlations are in the expected directions, it provides additional support that the measure is valid. Since the items contain inconsistent ranges of response categories, we implement a highly communicative scoring method: the Percent of the Maximum Possible (POMP).[6] With POMP, the score assigned to each item is a percentage, reflecting the response's position on the scale as a percent of the maximum possible score achievable on the scale (Cohen et al., 1999). After creating the POMP, we generate mean scale scores from each latent factor. These scores are calculated by summing POMP scores for each scale and dividing by the number of items. Then, correlation coefficients are estimated.

Last, to confirm that the CFA models are consistent across countries, we evaluate whether the same general factors for the three theoretical constructs are supported in each nation, which is called measurement invariance testing.

This invariance testing involves several steps in which gradually, more restrictive levels of measurement invariance are used (e.g., Cheung & Rensvold, 1999). We conduct three levels of measurement invariance testing in the following order: configural invariance (equivalence of factor structure), metric invariance (equivalence of factor loadings), and scalar invariance (equivalence of item intercept). In terms of assessment, changes in the model fit indices are compared from one step to the next because each of the gradually more constrained invariance models is nested within the previous models. If the adjusted chi-square difference test between the two invariance models is not statistically significant, invariance of a more constrained model would be supported. However, given the sensitivity of the chi-square (χ^2) difference test with large samples, changes in RMSEA and CFI indices are also assessed (e.g., Campbell et al., 2008; Cheung & Rensvold, 1999).[7] Specifically, changes greater than or equal to 0.010 in CFI supplemented by a change greater than or equal to 0.015 in RMSEA would be interpreted as a meaningful change in fit and indicative of lack of invariance (Cheung & Rensvold, 1999).

Findings

Construct Validity. We establish three CFA models to examine the measurement properties of each theoretical construct in our sample of Caribbean countries (see Table 2).[8] First, regarding social control, a correlated three-factor solution fits the data well ($\chi^2_{(101)} = 538.986, p < .001$; RMSEA = 0.017; CFI = 0.953; TLI = 0.945; SRMR = 0.040), and it retains sufficient internal consistency ($\omega = 0.899$). Most items in each of the three theoretical constructs display moderately strong standardized factor loadings on each theoretical subfactor: parental/family attachment, parental monitoring, and school commitment (all standardized factor loadings ≥ 0.343). Correlations between subfactors are between 0.43 and 0.59. It is important to note that the item "Your parents/guardians don't try to understand your problems" (PA3) within the parental/family attachment scale was excluded from the final model because of its low association with other items (standardized factor loading = 0.049; $\chi^2_{(116)} = 541.799$, $p < .001$; RMSEA = 0.015; CFI = 0.949; TLI = 0.940; SRMR = 0.039).

Second, Table 2 presents the CFA model for self-control, showing that a correlated two-factor solution fits the data reasonably with an acceptable level ($\chi^2_{(19)} = 899.690$, $p < .001$; RMSEA = 0.054; CFI = 0.917; TLI = 0.878; SRMR = 0.042).[9] When examining internal consistency, the self-control scale's omega value suggests that it possesses adequate reliability ($\omega = 0.811$). Most items exhibit moderately strong standardized factor loadings on each theoretical

Table 2. Standardized Factor Loadings and Model Fit Indices for Each Theoretical Construct.

Theoretical constructs	Item	Factor loadings	Model fit					
			χ^2	*df*	RMSEA	CFI	TLI	SRMR
Social control theory								
Parental/family attachment	PA1	0.527	538.986*	101	0.017	0.953	0.945	0.040
	PA2	0.672						
	PA4	0.706						
	PA5	0.778						
	PA6	0.588						
Parental monitoring	PM1	0.713						
	PM2	0.737						
	PM3	0.388						
	PM4	0.687						
School commitment	SC1	0.473						
	SC2	0.551						
	SC3	0.343						
	SC4	0.505						
	SC5	0.651						
	SC6	0.626						
	SC7	0.570						
Self-control theory								
Impulsivity	IMP1	0.424	899.690 *	19	0.054	0.917	0.878	0.042
	IMP2	0.338						
	IMP3	0.618						
	IMP4	0.513						
Risk-seeking	RS1	0.635						
	RS2	0.809						
	RS3	0.704						
	RS4	0.635						
Social learning theory								
Commitment to delinquent peers	PP1	0.794	86.437*	8	0.024	0.989	0.980	0.017
	PP2	0.891						
	PP3	0.824						
Moral attitudes/ disengagement	MAD1	0.741						
	MAD2	0.557						
	MAD3	0.585						

*$p < 0.05$.

subfactor: impulsivity and risk-seeking (all standardized factor loadings $\geq$0.338). The correlation between impulsivity and risk-seeking is 0.53.

Third, Table 2 also displays the CFA model of the social learning construct and suggests that a correlated two-factor solution fits the data well ($\chi^2_{(8)} = 86.437$,

$p < .001$; RMSEA=0.024; CFI=0.989; TLI=0.980; SRMR=0.017). The omega coefficient suggests that the social learning scale is reliable ($\omega = 0.877$). The majority of items exhibit moderately strong standardized factor loadings on each subfactor: commitment to delinquent peers and moral attitude/disengagement (all standardized factor loadings ≥ 0.557), and the correlation between these two subfactors is 0.45.

Concurrent Validity. Table 3 presents the point-biserial correlations between each theoretical construct and self-reported delinquency. Overall, each theoretical construct is significantly related to self-reported delinquency outcomes in theoretically expected directions, supporting each measure's concurrent validity. These findings also indicate supportive evidence of concurrent validity. Specifically, social control is significantly and negatively related to all six delinquency outcomes and the delinquency variety score at $p < .001$. Increased social control was significantly related to a lower likelihood of engaging in violent behavior, property crime, alcohol use, marijuana use, drug selling, and gang involvement. Within the social control scale, parental/family attachment has the strongest negative association with property crime, followed by alcohol use and violent behavior. Parental monitoring has the strongest negative association with property crime, followed by marijuana use and violent behavior. School commitment has the strongest negative association with property crime and marijuana use, followed by drug selling.

Second, self-control is significantly and positively associated with all six delinquent behaviors and the delinquency variety score at $p < .001$. In other words, increased impulsivity and risk-seeking are significantly related to an increased likelihood of engaging in delinquency. Both impulsivity and risk-seeking have the strongest positive association with property crime.

Third, social learning is significantly and positively associated with all six delinquent behaviors and the delinquency variety score at $p < .001$. Increased commitment to delinquent peers and moral attitude/disengagement are significantly related to an increased likelihood of engaging in violent behavior, property crime, alcohol use, marijuana use, drug selling, and gang involvement. Within the social leaning scale, commitment to delinquent peers has the strongest positive association with marijuana use and drug selling, followed by property crime. Moral attitude/disengagement has the strongest positive association with property crime, followed by violent behavior.

Measurement Invariance Across Countries. Table 4 presents model fit statistics for each theoretical construct by country. Overall, our results suggest that the measurement models for social control, self-control, and social

Table 3. Correlation Between Theoretical Constructs and Self-Reported Delinquency.

Theoretical constructs	Violent behavior	Property crime	Alcohol use	Marijuana use	Drug selling	Gang involvement	Delinquency variety score
Social control	−0.27	−0.32	−0.25	−0.29	−0.23	−0.13	−0.43
Parental/family attachment	−0.18	−0.20	−0.18	−0.16	−0.10	−0.05	−0.23
Parental monitoring	−0.24	−0.32	−0.21	−0.27	−0.22	−0.15	−0.41
School commitment	−0.20	−0.24	−0.16	−0.24	−0.21	−0.11	−0.34
Self-control	0.24	0.27	0.20	0.22	0.17	0.16	0.35
Impulsivity	0.13	0.17	0.08	0.12	0.10	0.12	0.20
Risk-seeking	0.25	0.27	0.23	0.24	0.17	0.14	0.36
Social learning	0.30	0.33	0.22	0.32	0.29	0.20	0.50
Commitment to delinquent peers	0.16	0.19	0.13	0.21	0.21	0.13	0.32
Moral attitudes/disengagement	0.31	0.33	0.23	0.29	0.25	0.19	0.47

Note. Point-biserial correlation coefficients are estimated for each individual self-reported delinquency outcome, and Pearson's correlation coefficients are estimated for the delinquency variety score. All the coefficients are significant at $p < .001$.

Table 4. Model Fit Indices of Theoretical Constructs by Country.

	Social control				Self-control				Social learning			
Countries	χ^2	*df*	RMSEA	CFI	χ^2	*df*	RMSEA	CFI	χ^2	*df*	RMSEA	CFI
Antigua & Barbuda	293.906*	101	0.054	0.942	861.360*	19	0.093	0.948	20.300*	8	0.047	0.995
Barbados	597.852*	101	0.050	0.943	211.518*	19	0.103	0.914	19.251*	8	0.026	0.998
Dominica	297.126*	101	0.053	0.946	296.215*	19	0.093	0.926	35.500*	8	0.068	0.989
Grenada	253.961*	101	0.040	0.958	102.742*	19	0.105	0.895	10.246	8	0.017	0.999
Guyana	1,005.187*	101	0.052	0.929	308.483*	19	0.067	0.959	63.769*	8	0.044	0.992
St. Kitts & Nevis	228.939*	101	0.057	0.926	126.645*	19	0.078	0.938	16.010*	8	0.047	0.992
St. Lucia	556.154*	101	0.050	0.940	172.116*	19	0.109	0.910	16.208*	8	0.023	0.998
St. Vincent & the Grenadines	373.127*	101	0.053	0.932	259.814*	19	0.080	0.951	6.551*	8	0.000	1.000
Trinidad & Tobago	1,603.682*	101	0.054	0.950	190.815*	19	0.118	0.899	57.159*	8	0.034	0.998

Note. χ^2 statistics are significant at $^*p < .05$.

learning subscales identified above demonstrate acceptable model fit for all nine Caribbean countries (i.e., configural invariance is supported). Specifically, the results show factor structural equivalence for each theory's subscales across the nine Caribbean nations. The only exceptions were for the self-control scale in Grenada and Trinidad and Tobago, which shows poor model fit.

Except for the self-control scale in Grenada and Trinidad and Tobago, we tested metric invariance to examine whether the factor loadings are consistent for each theoretical construct across the countries. Changes in model fit indices for the three theoretical constructs supported metric invariance ($\Delta\chi 2$ not statistically significant, $\Delta RMSEA < 0.015$, $\Delta CFI < 0.010$), indicating that the item factor loadings are consistent for each country. Then, given support for metric invariance, scalar invariance was tested to examine whether the measurement intercepts of the three theoretical constructs are consistent across the nine countries. We found supportive evidence of scalar invariance except for the social learning scale for Barbados and Guyana ($\Delta\chi^2 = 350.078$, $\Delta df = 13$, $p < .001$; $\Delta RMSEA = 0.023$; $\Delta CFI = 0.022$).

Overall, the results suggest that the three theoretical constructs are consistent across Caribbean countries with few exceptions. Specifically, the self-control scale for Grenada and Trinidad and Tobago showed poor model fit, and the social learning scale for Barbados and Guyana does not support scalar invariance. Therefore, interpretation of results using these measures should be cautious, especially when comparing latent means between countries.[10]

Discussion and Conclusion

The present study used self-report data from over 18,000 youth attending 306 schools across nine Caribbean nations to test the measurement validity of three criminological theories—social control, self-control, and social learning. Adequate theory testing using validated measures beyond the United States, Canada, and Europe is important for understanding their validity and generalizability to different cultures, especially those in the Global South, where formal social control mechanisms are often less stable and effective. To be sure, developing and implementing effective strategies to respond to the high levels of violence in the English-speaking Caribbean requires information about the causes and correlates of delinquency, drug use, and gang involvement.

Our findings support the relevance of social control, self-control, and social learning concepts in explaining youth delinquency in the Caribbean. We found construct and concurrent validity for each theoretical construct, except for the parental attachment scale, where one item was removed to

increase the scale's validity. We also found that each theoretical construct was significantly related to our six problem behaviors in the expected directions. Beyond validity, our findings showed overall consistency in measuring these constructs across the study nations. This finding is important because it increases future researchers' ability to compare these measures across English-speaking Caribbean nations and develop regional responses to crime.

The results also suggest that these three theories are strongly associated with problem behaviors in the Caribbean, especially violent behavior, property crime, and marijuana use. For example, our social learning sub-components, moral attitudes/disengagements, and commitment to delinquent peers exhibited point-biserial r coefficients between .13 and .33, which is equivalent to Cohen *d* effect sizes of .23 to .65, varying by type of delinquency and sub-component. These findings provide preliminary support for the theory's explanatory power for understanding delinquency. They also provide preliminary support for programs and policies that leverage these theories as part of their intervention strategy. Future research, however, is needed to further understand the process, pathways, and strength of the relationships.

In addition to the above, while more research is needed to determine the validity of other key concepts covered by the Eurogang Youth Survey instrument, such as gang membership, our findings support the utility and use of the Eurogang Youth Survey instrument in the English-speaking Caribbean. In addition to addressing a number of the methodological problems associated with cross-national research, the instrument provides researchers with a readily accessible, off-the-shelf solution for data collection related to gangs, delinquency, and violence in a region where these issues are particularly pressing. Rather than continually reinventing the wheel, which has been done in the past, future intervention efforts in the region might consider using the Eurogang Youth Survey instrument to inform efforts to respond to youth problem behavior.

While our findings provide important insight into the validity of social control, self-control, and social learning theories, this study may be limited as we did not test the full set of theoretical constructs proposed by each theory and instead, we used limited items that were included in Eurogang Youth Survey instrument. Therefore, future research is needed to further examine the measurement structure using alternative measurement models (e.g., second-order models) for each theoretical construct. In addition, we are limited by the cross-sectional nature of our data to test the predictive validity of these measures. The Caribbean lacks substantial investment in necessary, reoccurring criminological data collection. Investment in research and evaluation is crucial for nations to monitor progress and change over time and ensure interventions address their stated goals. This gap is particularly true for

longitudinal data, which would allow us to extend our theoretical testing to proposed causal explanations.

In addition to this limitation, we are mindful that a developing body of literature termed "Southern Criminology" has emerged over the last decade. Southern Criminology references that global knowledge in general, and criminological knowledge and theory generation more specifically, is primarily exported from North America and Western Europe and imported into Latin America, the Caribbean, and elsewhere (Carrington et al., 2016). This Northern orientation of criminology has necessarily resulted in the marginalization of "Southern" ideas, theories, and culture. Carrington et al. (2016) note that "Southern criminology aims to rectify these omissions by adding new and diverse perspectives to criminological research agendas to make them more inclusive and befitting of the world in which we live" (p. 2). With the above in mind, our research is limited by its framing of theory through the lens of the global North, which necessarily omits Caribbean specific cultural explanations that might be associated with delinquency.

While the English-speaking Caribbean has historically experienced high rates of violence, recent years have seen growing financial investments by local and international stakeholders to curb this problem. However, a relative lack of theory testing or validation of theories in the region exists to inform these efforts. The present study addressed this gap by testing the validity of three dominant criminological theories—social control, self-control, and social learning—and found support for the generalizability and validity of these concepts across nations, findings important for both future research and crime prevention.

Acknowledgments

The Eurogang working group developed the survey instrument used in the study, for which we are thankful. We would also like to acknowledge support from several individuals, including Rhea Reid, who served as project manager on the ground and led data collection efforts in each nation on behalf of the RSS, Mr. Grantley Watson, head of the RSS, who spearheaded efforts on behalf of that organization, and Keisha Linton, who assumed the role of project manager in September 2015 to lead the administration of data collection in Guyana and Trinidad and Tobago. In addition, we would like to thank to Modupe Sodeyi, Kim Ramsey, and Blanche Goring, who collected data in the original seven participating RSS nations; and to Marlon Anatol and Randy Seepersad, who led data collection efforts in Guyana and in Trinidad and Tobago, respectively; and to Lidia Nuño, who helped data collection at ASU. The contents of this document are the sole responsibility of the authors. This research was approved by the Institutional Review Board at Arizona State University (IRB Protocol # 1301008686).

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was funded by the United States Agency for International Development (USAID) under Award No. AID-538-F-14-00001 through the Regional Security System (RSS). The research was also funded in part by the ASU Foundation through a generous gift by the Watts Family.

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Supplemental Material

Supplemental material for this article is available online.

Notes

1. At the request of Barbadian school officials our measure of the respondents' ethnicity was not included in the survey administered in Barbados.
2. Not all the theoretical constructs that are proposed in each theory are tested in the current study because only a few theoretical constructs were included in the Eurogang instrument and thus available in the data.
3. We wanted to examine the goodness-of-fit between the a priori hypothesized model or factor structure and sample data comprised of observed measurement which is conducted by using CFA. The model is based on a priori information about the data structure in the form of a specific theory. CFAs were estimated based on existing criminological theories (i.e., social control theory, self-control theory, and social learning theory) and existing empirical studies that have tested these theories. Our approach was directed by Levine et al.'s (2006) approach and other empirical studies testing existing scales (e.g., Bowden et al., 2016; Lin et al., 2017).
4. The χ^2 test statistics are reported but not used to determine acceptable fit, because the test statistic is almost always significant when the sample size is large (Brown, 2006).
5. Compared to the more popular measure of internal consistency, Cronbach's alpha (α), omega (ω) does not assume that each item measures the construct equally well (i.e., essential τ equivalence; Crocker & Algina, 1986) and provides better reliability estimates of internal consistency (Bovaird & Koziol, 2012; Zinbarg et al., 2005).
6. The POMP is a scoring method that has advantages over traditional scoring methods (i.e., standardized score, item sums, average scores). In the present

study, we have different levels of Likert response formats for items within the same theoretical construct (e.g., item SC7 for school commitment). Whereas the other items in the scale have four response options, SC7 item has three response options. Given this inconsistent range of response options, the summation or averaging scoring method would bias the total score. In addition, standardized (z) scores are based on the observed data in the sample which means that the sample means and standard deviations on which standardized measures are based may be arbitrary (see Cook & Campbell, 1979).

7. Previous studies used items measured continuously and with data that were normally distributed. Since the items used in this study were measured at the ordinal level and not likely to have a normal distribution, assessments of invariance based on the above changes in model fit indices should be interpreted with caution.
8. Before we ran the CFA, we conducted an exploratory factor analysis (EFA) on all the items to assess the dimensionality without imposing any measurement structure to detect items that discriminate poorly. The result of EFA showed that seven-factor solution fit the data well ($\chi^2_{(246)} = 534.251$, $p < .001$; RMSEA = 0.009; CFI = 0.977; see Supplemental Appendix C). However, the PA3 item did not load with any subfactors so we dropped this item from the analysis. The PA1 item cross loaded with the parental/family attachment and parental monitoring scales but we kept this item in parental/family attachment scale because of its sufficient factor loading with parental/family attachment with reasonable model fit for the latent construct.
9. A TLI value of 0.878 is not ideal; however, we consider other available goodness of fit indexes and do not rely on a single index to obtain a more comprehensive assessment of the CFA model fit. The TLI can be sensitive to model complexity and sample size and as a result, it may not always provide an accurate indication of fit (Hu & Bentler, 1999; Marsh et al., 2004). Given this, we state that the self-control scale shows that two-factor solution fits the data reasonably with an acceptable level because other model fit indices (i.e., CFI, RMSEA, and SRMR) demonstrate a good model fit and are still relatively close to the acceptable range.
10. Tables of the measurement invariance analyses results are presented in Supplemental Appendix D.

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