Determinants of Aggressive and Prosocial Behaviour Among Jamaican Schoolboys

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ABSTRACT

Purpose: This study examines risk factors for aggression among boys in Kingston, Jamaica.

Methods: One hundred and one aggressive and 101 prosocial schoolboys in grades 5–6 (mean age 11.7, SD 0.6 years) were selected by peer and teacher ratings from 10 schools in the capital city, Kingston, during 1998. They were given in-depth questionnaires, arithmetic, reading and verbal intelligence tests and their behaviour was rated. Their parents were also given a detailed questionnaire.

Results: The aggressive boys reported significantly more involvement in fights than the prosocial boys. They had lower scores on spelling/reading and verbal IQ, less ambitious aspirations and poorer quality school uniforms. They were not more likely to infer hostile intent in ambiguous situations but were more likely to respond with aggression. Aggressive boys came from poorer homes with more marijuana use, less parental affection or supervision and more family discord. They were less exposed to religious instruction, their parents had lower occupational levels and were more likely to be in common-law unions than married. They were more exposed to neighbourhood violence and were punished more often at home and at school. Logistic regression analyses were carried out to determine the independent risk factors for aggression. Exposure to neighbourhood violence, physical punishment at home and family discord were associated with increased risk; parents' being married, practising religion as a family and better school uniforms were associated with reduced risk.

Conclusions: Although community violence was a serious problem, family characteristics were also important risk factors for aggressive behaviour.

Determinantes del Comportamiento Agresivo y Prosocial entre los Escolares Jamaicanos

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RESUMEN

Propósito: Este estudio examina los factores de riesgo que influyen en la agresión entre los niños en Kingston, Jamaica.

Métodos: Ciento un escolares agresivos y 101 escolares prosociales en los grados 5–6 (edad promedio 11.7, desviación estándard 0.6 años) fueron seleccionados de acuerdo con las valoraciones de los pares y los maestros de 10 escuelas en la ciudad capital, Kingston, durante 1998. Se les aplicó cuestionarios exhaustivos, así como pruebas de aritmética y lectura, tests de inteligencia, y se clasificó su conducta. A sus padres también se les aplicó un cuestionario detallado.

Resultados: Los niños agresivos reportaron una participación en peleas significativamente mayor que los niños prosociales. Asimismo, tuvieron puntuaciones más bajas en deletreo, lectura y coeficiente de inteligencia (C.I.) verbal, mostraron tener aspiraciones menos ambiciosas, y vestían uniformes más pobres. No estaban más inclinados a inferir intenciones hostiles en situaciones ambiguas, pero si más propensos a responder agresivamente. Los niños agresivos provenían de hogares más pobres, caracterizados por mayor consumo de marihuana, menos afecto o supervisión por parte de los padres, y más discordia en la familia. Estaban también menos expuestos a la instrucción religiosa, sus padres tenían bajo nivel ocupacional, y vivían en su mayor parte más en unión consensual que en matrimonio. Estaban más expuestos a la violencia del vecindario, y recibían castigos en la casa y la escuela con

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mayor frecuencia. Se llevaron a cabo análisis de regresión logística a fin de determinar los factores de riesgo de la agresión. La exposición a la violencia del vecindario, el castigo físico en el hogar, y la discordia familiar estaban asociados con el aumento del riesgo. En cambio, padres casados en matrimonio, la práctica de la religión como familia, y mejores uniformes escolares, estuvieron asociados con la reducción del riesgo.

Conclusiones. *Aunque la violencia comunitaria constituía un serio problema, las características de la familia fueron también importantes factores de riesgo en el comportamiento agresivo.*

INTRODUCTION

Interpersonal violence is acknowledged to be a major public health problem in many countries, particularly in Latin America and the Caribbean (1). Kingston, the capital city of Jamaica, has extremely high levels of violent crimes and a homicide rate among the highest in the world. It is well established that most violent adults were aggressive children (2–5) and about half of all antisocial children become anti-social adolescents (6). One approach to reducing societal violence is to intervene to reduce childhood aggression. However, it is first necessary to understand the causes and mechanisms of aggression in the particular sociocultural context, since context may affect the relationship between risk factors and aggression (7). For example, within the United States of America (USA), moderate corporal punish-ment was not related to aggression in African American children but was in European Americans (8). However, there is little information on the factors related to aggression in developing countries in general (9) and scant information from Jamaica.

Many family and social background variables have been identified as risk factors for childhood aggression in de-veloped countries. These include characteristics of the rela-tionship between the primary caretaker and the child, such as a lack of warmth and attention, inadequate parental super-vision (10, 11), a permissive attitude toward aggression, parent's failure to exhibit pride in or affection toward the child (5), physical punishment (8, 12), the presence of family conflict (13, 14), parents being unmarried or living in broken homes (5, 14), having a large number of siblings and low socioeconomic status (15). Television viewing has also been implicated in promoting aggressive behaviour (16).

Aggressive children tend to have different social infor-mation processing (4). They also have academic difficulties (17, 18) and poor language development (19). In addition, levels of violence vary by neighbourhood (20) and exposure to neighbourhood violence affects children's aggression (21). In order to identify the child, family and neighbourhood characteristics that were associated with aggression in 11-year old Jamaican boys, a case control study was conducted comparing aggressive with prosocial boys in Kingston schools.

SUBJECTS AND METHODS

Participants

Ten schools were randomly selected from among the government primary and "all age" schools in urban Kingston. In order to identify the most aggressive and prosocial boys, the class teachers in all grades 5 and 6 classes were asked to rate the behaviour of each of the boys in their class on two scales. The aggressive scale comprised three items with a possible total score of 3 to 12. Teachers indicated with a three point response scale (very true = 3, somewhat true = 2, not true = 1) how much the behaviours 'curses a lot' and 'has a short temper' were true of each boy, and with a 4-point response scale (hardly ever fights = 1, fights every term = 2, fights every month = 4, fights every week = 6) on how frequently each boy fought. The last item was weighted because fighting was considered more serious than the other items. The prosocial scale had a possible score of 3 to 9. It comprised three items on a 3-point response scale (not at all like him = 1, somewhat like him = 2, very much like him = 3) indicating how much the behaviours '*works well* with others', 'is *helpful to others*', and '*hardly ever fights*' were true of each boy. For the peer ratings, each of the children in grades 5 and 6 were given a short private interview and asked to nominate three boys in their class who '*fight a lot'* and three boys who '*hardly ever fight*'. The nominations for each category were summed for each boy. In order to be selected as aggressive, a student had to score above ten on his teacher's aggressive scale and below six on her prosocial scale, as well as be among the top 25% of nominees for fighting in his class and receive more peer nominations for '*fights a lot'* than '*hardly ever fights*'. This method has been used successfully in studies elsewhere (9, 22) and has been demonstrated to be internally consistent and reliable over time (23).

In order to be selected as prosocial, a student had to score below 7 on the aggression scale and above 6 on the prosocial scale, as well as receive more peer nominations for '*hardly ever fights*' than '*fights a lot*'. One hundred and one aggressive boys were identified and matched by class with 101 boys who were identified as prosocial. If there was more than one possible prosocial match for an aggressive boy, the one with the highest prosocial score was selected.

Measures

Parent questionnaire: The homes of all selected boys were visited and their caretakers given an interviewer administered questionnaire. The following information was sought: parental characteristics, frequency of showing affection to son, knowing son's whereabouts, family praying and attending church, methods and frequency of punishment, family structure, use of alcohol or drugs in the home, and the presence of violence in the neighbourhood. The possession of certain household items (stove, television, cable access, radio, refrigerator, video player, motorcycle, number of cars, buses or trucks) was observed and a possessions' score devised giving one point to each item. Sanitation and water supply were also observed and a score developed, and a crowding score, people per room, calculated.

Child questionnaire: All children were given a private interview and a vocabulary and school achievement test at school. Some of the questionnaire items were adapted from other instruments (5, 9, 13, 24). Information was sought on the boys' future aspirations, television viewing, experience of parental affection, punishments at home and school, exposure to conflict at home and to violence in the community.

Self report of aggression: The children were also asked about their own aggressive behaviour in order to validate the group selection criteria. This was asked at the end of the interview to avoid influencing the interviewer throughout the questionnaire.

Social cognition: The children's attribution and retaliation tendencies were assessed by presenting them with five hypothetical scenarios. Each scenario was an unpleasant interaction with a peer in which the subject suffered some hurt, but the peer's intention was ambiguous. The situations included being hit on the back with a ball, being knocked down on the playing field, seeing a classmate withholding his pencil or orange (possibly intending to take them) or sitting in his chair. The subject had to decide whether the peer had intentionally (score 1) or accidentally (score 0) hurt him or taken his property, giving an attribution score of 0 to 5. He then had to decide what action he would take, whether he would react physically (score 1) or not (score 0), giving a retaliation score of 0 to 5.

Verbal ability: The children's verbal ability was assessed using the Peabody Picture Vocabulary Test (25) which has been frequently used in Jamaica and has been demonstrated to be reliable and valid there (26).

Behaviour: After the interview and the vocabulary test, the researchers rated the children's behaviour during the session on four 5-point scales. The rated behaviours were speech (from no spontaneous verbalisation and extremely limited verbal responses = 0 to many spontaneous long sentences with details = 5), level of inhibition (from very withdrawn = 0 to outgoing = 5), level of movement during the interview (from barely any movement = 0 to lots of fidgeting = 5) and attention level (from easily distracted = 0 to concentrating throughout = 5).

School achievement: The children's school achievement was measured using the arithmetic and spelling scales of the Wide Range Achievement Test (27) and the Suffolk Reading Skills Test (28) which have also been used in Jamaica (29). As the tests were not standardized in Jamaica, the raw scores were used.

School uniform quality: The interviewers rated the quality of the boys' school uniforms on a 2-point scale (poor = 0, adequate = 1).

Procedure
All interviewers were university graduates who were extensively trained. Four interviewers administered the child questionnaire and two administered the parent questionnaire; all were unaware of the children's group. Interobserver reliabilities between the trainer and each interviewer were assessed in at least 20 consecutive interviews for each measure before starting data collection. The per cent agreement on the child questionnaire was 99.4% (range 80–100%) and on the parent questionnaire was 96.5% (range 94–100%). Reliability measurements were also carried out on 10% of the measurements during the data collection, and they remained similar.

Ethics
Written consent from both parents and the children were obtained before data collection started; data on questionnaires were stored in locked filing cabinets and subjects were identified only by secure identification codes (not names or addresses) on computers. The study was approved by the Ethics and Medico-Legal Advisory Panel of the Jamaican Ministry of Health and by the University of the West Indies Ethics Committee.

Data Analysis
In order to reduce the data, a number of scales were developed from items on the child questionnaires. Where there were three or more variables describing the same construct, the items were summed and internal validity assessed. If the variables did not combine into reliable scales, the results of the individual items were used in the analyses. The following scales were internally reliable (Cronbach alpha > 0.60) and were used in the analyses:

Self-report of aggression: Eight items scoring the frequency of the following behaviours, being angry, slapping, pushing or punching someone, using a knife in a fight, being in fights, being hurt in fights or hurting someone else in fights, all

scored as: often = 0, sometimes = 1, hardly ever = 2, never = 3 (Cronbach alpha = 0.80).

Exposure to neighbourhood violence score: Four items scoring whether the child personally knew someone who had been shot or stabbed, or murdered, whether he had seen fights on the street involving a knife or a gun, all scored as: yes = 1, no = 0 (Cronbach alpha = 0.60).

Family discord score: Seven items indicating whether the child heard cursing, quarrelling or shouting at home, threats issued between family members, objects destroyed in fights at home, pushing or grabbing between family members, hitting between family members, fighting with objects or knives between family members, all scored as yes = 0, no = 1 (Cronbach alpha = 0.64).

Parental affection score: Three items indicating how often the mother says '*I love you*', and the mother or the father hugs the child, all scored as never = 0, sometimes = 1, a lot = 2 (Cronbach alpha = 0.70).

Differences between the aggressive and prosocial groups were first examined using *t*-test or chi-square test. Then in order to determine which variables independently predicted group membership (aggressive or prosocial) a series of stepwise logistic regressions predicting group were conducted. All variables that were significantly different between the groups were offered in the regressions except for those describing the aggressive nature of the boys such as the self-report of aggressive behaviour. Because the teachers had helped to identify the aggressive children, we did not offer the variables related to school punishments as this might have introduced bias.

Child characteristic were first examined in a logistic regression predicting group membership in which child related variables that were significantly different between the groups were offered. A second logistic regression was conducted offering the significantly different environmental variables. In a final regression, the child and environment variables that were significant in the two earlier regressions were offered together.

RESULTS
Interviews were completed for all children and their caretakers. In most cases, the parent interviewed was the mother (78%), while the father (6%) or a guardian, usually a relative, answered for the other children.

Social background: The groups were not significantly different in whom they lived with: 24% lived with both parents, 57% of them lived with their mother but not father, 6% lived with their father but not mother, the rest lived with other adults. Caretakers generally had attended but not completed secondary school and there was no significant difference in caretaker education levels between the groups.

The aggressive group came from poorer homes (Table 1). Although the degree of crowding was similar (mean, SD:

Table 1:　Home characteristics of the aggressive (n = 101) and prosocial (n = 101) boys

Characteristics		Aggressive group		Prosocial group	
		M	*SD*	**M**	*SD*
Parents' reports:					
Home possessions score*[a]		4.2	1.5	4.7	1.5
Sanitation score*[b]		5.9	2.1	6.5	1.8
Mother's occupation**[c]		2.1	0.9	2.3	1.1
Father's occupation ***[c, d]		2.7	0.8	3.0	0.6
Parents' marital status†† (%)	Married	12		31	
	Common law	31		16	
	Single	58		54	
Family goes to church/prays together ††(%)		60		74	
Parent knows son's whereabouts †† (%)		80		93	
Parental Affection Score *[e]		5.2	1.5	5.6	1.3
Someone at home uses marijuana † (%)		41		26	
Children's reports:					
Family Discord Score***[f]		9.3	2.3	8.2	2.1
Exposure to Neighbourhood Violence Score***[g]		7.0	1.2	6.4	1.0
Observer's reports:					
School uniform quality**[h]		0.3	0.5	0.5	0.5

t-test *p* < 0.05 　** *t*-test *p* < 0.01 　*** *t*-test *p* < 0.001; 　†chi-square *p* < 0.05
††chi-square *p* < 0.01, percentages rounded to nearest whole number.
[a] Sum of presence of a car, bike, television, refrigerator, radio, cable television, video recorder, stove (range 0–8).
[b] Sum of water availability score (1-water from source outside yard to 4-water from own inside pipe), toilet facilities score
　(1-no toilet or shared pit to 4-own inside flush)
[c] Scored on a scale from 1 (unskilled) to 4 (highly skilled or professional)
[d] n = 92 and n = 91 for aggressive and prosocial groups respectively
[e] Scored on a scale from 0 (little affection) to 6 (high level of affection)
[f] Scored on a scale from 0 (little discord) to 7 (high level of discord)
[g] Scored on a scale from 0 (little exposure) to 4 (high exposure)
[h] Scored on a scale 0 = poor, 1 = adequate.

aggressive group 2.5, 1.3; prosocial group 2.5, 1.4; not significant (ns), the families of aggressive children had fewer household possessions (*p* < 0 .05) and poorer sanitation ratings (*p* < 0.05). The aggressive children also had poorer quality school uniforms (*p* < 0.01).

The parents of aggressive children had lower skilled occupations (mother *p* < 0.01, father *p* < 0.001), and were less likely to be married and more likely to be in common-law unions (unmarried, living with a partner), (*p* < 0.01) than the prosocial group, while a similar proportion were single.

Home environments: The home environments of the groups differed in several respects (Table 1). Families of aggressive children were less likely to pray and go to church or Sunday school (*p* < 0.01). The mothers of aggressive boys were less likely to know their child's whereabouts when the child was not at home (*p* < 0.01), and showed affection to their child less often (*p* < 0.05). Significantly more parents of aggressive children reported use of marijuana in the home (*p* <

0.05), however use of alcohol in the homes (aggressive group: 7%, prosocial group: 5%) or hard drugs (each group, 1%) was not significantly different. Aggressive children reported more frequent episodes in their homes of cursing or shouting ($p < 0.05$), hitting ($p < 0.05$), '*pushing or grabbing*' ($p < 0.05$) and the family discord score was significantly higher ($p < 0.001$).

No difference was detected between the groups in the amount of television watched: approximately half the children watched everyday and 15% had the television on in their homes all of the time.

Exposure to violence: Although both groups lived in high crime neighbourhoods, the aggressive children lived in more violent ones. More of their mothers reported that most men in their communities carried a weapon for protection (83% vs. 71%, $p < 0.05$) and more of them knew of four or more people shot in their neighbourhood that year (47% vs. 30%, $p < 0.05$). More aggressive children had seen fighting with knives or guns (45% vs. 31%, $p < 0.01$), knew someone who had been shot or stabbed (47% vs. 28%, $p < 0.01$), or had seen the body of a person killed by shooting or knifing (58% vs. 37%, $p < 0.01$). The exposure to violence score was significantly higher in the aggressive group $p < 0.001$ (Table 1).

Table 2:   Characteristics of aggressive (n = 101) and prosocial (n = 101) boys

Child characteristics	Aggressive group		Prosocial group	
	Mean	s.d.	Mean	s.d.
Age	11.8	0.6	11.6	0.6
Self report of aggression score[a] ***	25.2	6.8	19.9	5.6
Attribution score[b]	3.9	1.0	3.8	1.0
Retaliation score[c] ***	9.4	2.3	8.4	1.7
Spelling/Reading score**	62.6	32.9	75.5	34.3
Arithmetic score	29.1	6.4	30.2	6.6
Verbal intelligence score (PPVT)**	69.5	16.3	75.8	18
Aspired to be professionals (%)††	26		39	
Behaviour ratings: Verbalizations	2.8	0.9	2.6	0.8
Inhibition	3.5	0.8	3.4	0.7
Movement**	3.1	0.7	2.9	0.5
Attention	3.9	0.5	3.9	0.4

** *t*-test $p < 0.01$ *** *t*-test $p < 0.001$

†† chi-square $p < 0.01$

[a] Sum of eight aggressive behaviours scored as 0 = never to 3 = a lot
[b] Sum of attribution of five ambiguous scenarios (hit with ball, knocked down on playfield, classmate with pencil, orange, seat) each scored 0 = no hostile intent assumed to 1 = hostile intent assumed, range 0 to 5.
[c] Sum of retaliation to five scenarios (hit with ball, knocked down on playfield, classmate with pencil, orange, seat) each scored 0 = non-physical response or 1 = physical response, range 0 to 5.

Self report of aggression: The self-reported aggression rating was significantly higher in the aggressive group ($p < 0.001$) Table 2. The aggressive children reported carrying out all eight items referring to antisocial behaviours more frequently than the prosocial children.

Child characteristics: (Table 2) The groups were not significantly different in children's age (*mean ± SD*, aggressive group 11.5, 0.6; prosocial group 11.3, 0.6) or birth order, and they did not differ in attribution score (perception of hostile intent) when presented hypothetical ambiguous scenarios. However, the aggressive group had higher retaliation scores ($p < 0.001$), reporting that they would respond with physical aggression to the hypothetical scenarios more often than the prosocial group.

The aggressive children's combined spelling and reading scores were poorer ($p < 0.01$) than those of the prosocial children, as were their verbal intelligence (PPVT) scores ($p < 0.01$). However, the groups were not significantly different in arithmetic scores. Significantly fewer of the aggressive children wanted to be professionals when they became adults ($p < 0.05$). The aggressive children were rated as being significantly more '*fidgety*' than the controls (movement rating) ($p < 0.01$) but were similar in ratings of inhibition, attention and amount of verbalization.

Punishments: Boys in both groups experienced a high level of corporal punishment at home and school. However, the aggressive boys received more school punishments including being beaten by hand (47% *vs* 28%, $p < 0.01$) or being made to kneel or stand in uncomfortable positions (47% *vs* 24%, $p < 0.001$). The difference in beatings with a strap did not reach significant levels (aggressive 95% *vs* prosocial 88%, $p = 0.08$). The aggressive children received more beatings and other punishments at home as reported by the children and by their caretakers. Their parents were more likely to beat the child with a belt (88% *vs* 70%, $p < 0.05$), to use a stick, hose, wood or wire to beat (14% *vs* 4%, $p < 0.05$), and to beat their child if he accidentally broke something (18% *vs* 5%, $p < 0.05$). The aggressive children also reported more frequent beatings by hand in the previous week (63% *vs* 43%, $p < 0.01$).

Multivariate analyses

In order to determine which variables independently increased the risk of being aggressive, three forward stepwise logistic regression analyses were carried out. In the first analysis, the child variables that were significantly different between the groups were offered in a forward stepwise logistic regression predicting group. These were the spelling and reading score, PPVT score, future aspirations, movement rating and the retaliation (to ambiguous situations) score. Only the spelling/reading score and the movement rating were significant (Table 3).

In the second analysis, all those environmental variables that were significantly different between the groups were offered, namely: uniform score, possessions score, sanitation score, occupation of the mother, family prays together

Table 3:   Results of logistic regression analyses using child characteristics or environment variables

Characteristic/variable	Adjusted Odds	95% CI
Child characteristic*		
Spelling/reading score	0.99	0.98, 1.00
Movement rating	1.32	1.13, 1.53
R^2 = 0.10		
Environment variable**		
Exposure to violence	1.34	1.00, 1.78
School uniform score	0.44	0.23, 0.85
Family prays/ goes to church together	0.44	0.22, 0.86
Parent's marital status	0.37	0.16, 0.84
Beatings at home by hand	2.25	1.18, 4.30
Beatings at home with a belt	2.30	1.32, 6.60
R^2 = 0.28		
% correctly categorized = 68.3		

* % correctly categorized = 64.4 ** % correctly categorized = 68.3

or attends church or Sunday school, exposure to neighbourhood violence score, hand beatings at home (child report), belt beatings at home and beatings with other implements, parents would beat for an accident (all, parent report), family discord score (child report), parents knowing child's whereabouts, weapons carried in the neighbourhood, use of marijuana in the home and marital status of the mothers. Six variables were significant and 68.3% of the children were correctly placed. Exposure to violence, beatings at home by hand and belt increased the risk of being in the aggressive group, whereas mother being married, good uniform rating and family praying or going to church together reduced the risk (Table 3).

The domestic violence score entered the equation in the first step but when both hand and belt beatings entered in subsequent steps it was no longer significant.

In the third regression, the significant environmental and child variables in the above regressions were offered simultaneously. All six environmental variables remained significant while neither child variable entered the equation.

DISCUSSION

Aggressive children were compared with those reported to be prosocial and significant differences were found in child and family characteristics and exposure to violence outside the home. The identification of the aggressive group was confirmed by the children's reports of their own behaviour. They had participated in more fighting, sometimes of a serious nature, hurting others and carrying and using knives. Many studies of childhood aggression have included children with other disruptive and troublesome behaviours (23, 30), but the children in the present study were identified only by manifest aggression.

Many variables were significantly different between the aggressive and prosocial groups. Aggressive children

were more likely to have poor reading and spelling skills, poorer verbal intelligence, lower ambitions and were more fidgety during the interview. However, in multivariate analysis of the child variables, only spelling and reading and fidgeting were significant. Poor school achievement has been documented in aggressive children in many previous studies. It is still unclear whether poor academic ability leads to frustration which in turn contributes to antisocial behaviour (31, 32) whether poor social functioning affects academic achievement, or whether a bidirectional model operates (33, 34). However, the finding suggests that providing extra assistance with remedial teaching might help to mitigate the children's aggressive behaviour.

There is a well recognized relationship between aggression and hyperactivity (30, 35). The high movement rating suggests that some of these children may have been hyperactive, but more in-depth evaluation would be required to confirm this. If confirmed that some aggressive children are hyperactive, medical treatment might help their behaviour.

Social information processing was evaluated using the model posited by Dodge and Coie (36). Both groups were equally likely to ascribe hostile meanings to ambiguous peer interactions. However, the aggressive children were more likely to generate aggressive responses. This suggests that they were limited in their abilities to generate alternate responses and more likely to anticipate positive outcomes from aggressive acts.

Although the aim of the study was to determine risk factors for aggression, the protective factors are of equal importance. The protective environmental variables that were independent predictors of group membership were mothers being married, school uniform quality and practising religion. Although most mothers of the children were unmarried, the mothers of the prosocial children were more likely to be married. Only 25% of Jamaican adults are married (37), so it is less likely that stigma played a role as might be the case elsewhere. It is likely that the married parents provided a more emotionally secure environment.

Another protective factor was better school uniform quality, which may represent the caretakers' interest in their children and education, as well as their ability to pay for uniforms. The variables which more directly measured wealth such as the number of possessions and parents' occupational status were not independent predictors of group membership. The other protective factor was practising religion which included the family praying or attending church together. Two previous studies, in the USA and Nigeria, failed to find an association between aggressive behaviour and religious attendance (9, 13). One possible reason for the discrepancy may be that we asked about practising as a family.

The independent risk factors of belonging to the aggressive group were corporal punishments and exposure to violence in the community. Both groups experienced a high level of corporal punishments at home and at school. This is

a traditional feature of Jamaican child rearing practices and occurs from an early age (38). A high level of beating at school was also described in adolescent girls (39). Although it is not illegal to use corporal punishment in Jamaican schools, the Ministry of Education advises against it. It is clear that aggressive children, who are accustomed to being beaten at home, are difficult to manage at school. However, continuing to beat them at school further aggravates the problem. Schools need special help in coping with this situation. The aggressive children were beaten more than the prosocial group both at home and at school. In Nigeria, only severe beating was predictive of aggression, not frequent beating (9), and others have suggested that corporal punishments may not be detrimental when they are dispensed in an atmosphere of warm parent-child relationships or may be differentially detrimental depending on the cultural context (8, 40).

Domestic violence was the first risk variable to enter the logistic regression. However, once punishments entered the regression, domestic violence was no longer significant. It appears that it was indirectly related to the children's aggression through the high level of physical punishment meted out to them.

All the children came from highly violent areas: 47.5% of children had seen a dead body resulting from murder, 38% had seen fighting with knives or guns and it was reported that most men in the neighbourhoods carried weapons for protection as did a high proportion of caretakers in both groups. However, the aggressive boys had been exposed to even higher levels of violence than the prosocial boys as has been shown elsewhere (20). These findings must add to society's concern not only about current levels of violence in Kingston but also about aggression in future generations.

In summary, neighbourhood violence was pervasive in these communities and was an independent risk factor for child aggression; however, family functioning was also important. Parents being married, practising religion as a family and the children having adequate school uniforms (which may indicate concern for the child and his education as well as ability to pay), were associated with reduced risk, whereas domestic violence and a high level of physical punishment were associated with increased risk. An alarming level of physical punishment was identified both at home and school. It is apparent that intervention programmes aimed at reducing aggression among school children will have to address school and parental discipline practices. School level interventions, though necessary, are unlikely to solve the problem on their own, and urgent comprehensive action needs to be taken at the child, family and society levels.

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