A Multivariate Analysis of Youth Violence and Aggression: The Influence of Family, Peers, Depression, and Media Violence

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Objective To examine the multivariate nature of risk factors for youth violence including delinquent peer associations, exposure to domestic violence in the home, family conflict, neighborhood stress, antisocial personality traits, depression level, and exposure to television and video game violence.

Study design A population of 603 predominantly Hispanic children (ages 10-14 years) and their parents or guardians responded to multiple behavioral measures. Outcomes included aggression and rule-breaking behavior on the Child Behavior Checklist (CBCL), as well as violent and nonviolent criminal activity and bullying behavior.

Results Delinquent peer influences, antisocial personality traits, depression, and parents/guardians who use psychological abuse in intimate relationships were consistent risk factors for youth violence and aggression. Neighborhood quality, parental use of domestic violence in intimate relationships, and exposure to violent television or video games were not predictive of youth violence and aggression.

Conclusion Childhood depression, delinquent peer association, and parental use of psychological abuse may be particularly fruitful avenues for future prevention or intervention efforts. *(J Pediatr 2009;■:■-■).*

In the United States and most other industrialized nations, violent crimes among youth and adults have reached the lowest point in decades.[1-3] With the exception of school bullying,[4,5] arrests of youths for serious crimes have been on a steady decrease since the early 1990s.[6] Self-report victimization statistics indicate that serious forms of violence experienced by youth have lessened over the past several decades.[7] Despite this trend, youth violence can have a significant negative impact on perpetrators and victims, including negative influence on perceptions of school,[8] behavior problems,[9] school work,[10] grades, and social activities.[11]

The definition of youth violence encompasses a myriad of behaviors ranging from homicide to lesser forms of aggressive behavior such as bullying.[12] Youth violence can also include other forms of proscribed acts including aggravated assault, harassment, intimidation, sexual assault, stalking, burglary, theft, and robbery.[13]

Factors contributing to the decline in criminal youth violence beginning in the early 1990s are not yet well understood. Arguably, this highlights ongoing uncertainty and debate about the underlying causes. Many factors, such as peer delinquency,[14] family violence and discord,[15] and depression,[16] have been examined in the past. Also, neighborhood characteristics such as community disorganization including the number of youth and adult gangs have been studied, as well as biologic and psychological characteristics of youth.[17] The effect sizes for single/univariate predictors of youth violence tend to be small,[18,19] highlighting the need for multivariate analyses in predicting risk factors for youth violence.

This study seeks to examine the predictive nature of multiple risk factors in youth violence and aggression with well-validated measures of aggression (see references 20-23 for a discussion of validity and aggression measures). These relationships will be tested with a sample of youth from a Hispanic-majority city in the South of the United States.

Methods

Participants include 603 youth from a small city in South Texas aged 10 to 14 years, with a mean age of 12.35 (SD = 1.34). Most youth in this study were Hispanic in ethnicity (96.8%). This sample was approximately equal in numbers of males (n = 309 [51.2%]) and females. The current sample is a general sample of youth, not an at-risk sample. With exceptions noted below, all materials used Likert-scale items and demonstrate psychometric properties suitable for use in multiple regression and SEM analyses. All procedures were approved by university IRB and designed to meet professional and federal standards for approved

CBCL	Child Behavior Checklist
CFI	Comparative Fit Index
CTS	Conflict Tactics Scale
NFI	Normed Fit Index
NLE	Negative life events
RMSEA	Root mean square error of approximation
SEM	Structural equation modeling

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conduct with human participants. All families were provided with a detailed consent form and provided guardian consent and youth assent.

Negative Life Events

The Negative Life Events instrument (NLE)[24] includes the following scales used in this study: (1) Neighborhood problems (eg, How much of a problem are each of the following in your neighborhood? Vandalism, traffic, burglaries, etc; alpha in current sample = .87); (2) Negative relations with adults (eg, My parents think I break rules, My parents think I get in trouble, etc.; alpha = .95); (3) Antisocial personality (eg, It's important to be honest with your parents, even if they become upset or you get punished, To stay out of trouble, it is sometimes necessary to lie to teachers, etc.; alpha = .70); (4) Family attachment (eg, On average, how many afternoons during the school week, from the end of school or work to dinner, have you spent talking, working, or playing with your family, etc; alpha = .87); and (5) Delinquent peers (eg, How many of your close friends purposely damaged or destroyed property that did not belong to them, etc.; alpha = .84).

The NLE has been widely used, particularly in the criminal justice literature, and has demonstrated good reliability and validity.[24] Most scales described here are used as predictor variables, although those related to delinquent behaviors (described below) function as outcome variables. There are no item overlaps between subscales.

Family Environment

The Family Environment Scale[25] is a 90-item true-false measure designed to assess styles of family interaction and communication. Research on this instrument has demonstrated good internal consistency and test-retest reliability, as well as validity in distinguishing between functional families and families experiencing a variety of dysfunctions, including psychiatric and substance abuse problems and abuse. The family conflict subscale (alpha = .57) was used in this project.

Family Violence

The child's primary guardian was asked to fill out the Conflict Tactics Scale (CTS),[26] a measure of positive and negative behaviors occurring in marital or dating relationships. The CTS has been shown to have good reliability and corresponds well to incidents of dating and family violence. It is used here to get a measure of conflict and aggression occurring between the primary caregiver and their spouse or romantic partners and thus a sense of the child's exposure to domestic violence. Subscales related to physical assaults (alpha = .88) and psychological aggression (alpha = .81) were used in this study. The physical assaults subscale was found to have a significantly skewed distribution, and a square-root transformation was conducted to produce a normalized distribution.

Media Violence Questionnaire

Child participants were asked to list their 3 favorite television shows and video games, rate how often they play or view the media, and rate the media's violence level. This measure has demonstrated good reliability and validity in previous research.[27] With this study, the video game violence portion demonstrate a coefficient alpha reliability of .83, and television violence demonstrated an alpha of .71.

Depression

The withdrawal/depression scale of the Child Behavior Checklist Youth Self-Report[28] indicated child depression. This scale has no item overlaps with the aggression/rule-breaking scales described below. Coefficient alpha of the scale with our sample was .71.

Outcome Materials

Aggression. Regarding mental health, youth and their primary caregivers filled out the Child Behavior Checklist (CBCL).[28] The CBCL consists of youth self-report, parent report, and teacher report on problematic behaviors which may represent psychopathology. The CBCL is a well-researched and validated tool for measuring behavioral problems in children and adolescents. Caregivers filled out the parental version of the CBCL, whereas children filled out the Youth Self-Report on themselves. These indexes were used to indicate outcomes related to delinquency and aggressiveness. All alphas with the current sample were above .70.

Bullying. The Olweus Bullying Questionnaire[29] was used to measure bullying behaviors in this study. This measure is commonly used and well researched with good reliability and validity reported. With the current sample, alpha was .85

Delinquent Behavior. The NLE questionnaire, described above has a subscale related to general delinquency (eg, How many times in the following year have you stolen something worth more than $50, etc.). The general delinquency scale can be further divided into nonviolent (alpha = .96) and violent (alpha = .99) criminal activities.

Statistical Analyses

Main analyses consisted of hierarchical multiple regression equations. Separate hierarchical multiple regressions were run for each of the outcome measures related to pathologic aggression (parent and child versions of the CBCL aggression and rule-breaking scales, violent and nonviolent crime commission as reported on the NLE and bullying behavior). In each case, sex and depression level were entered on the first step, NLE variables (neighborhood, negative adult relationships, antisocial personality, family attachment and delinquent peers) were entered on the second step, the Family Environment Scale conflict scale was entered on the third step, CTS psychological aggression and physical assault were entered on the fourth step and television and video game violence exposure entered on the final step. Multicollinearity was examined with tolerance and VIF statistics and found to be acceptable in all cases. Highest VIF values were 2.5, and lowest tolerance values were .40, which fall within

most recommended acceptable guidelines.[30] Secondary analyses involved the use of structural equation modeling to test alternate causal models with regard to the development of pathologic youth aggression.

Results

Simple bivariate correlations were run among all 7 aggression outcome measures. All correlations were significant at the $P \leq .01$ level and ranged between .19 and .80. Although nonviolent and violent criminal behaviors correlated highly with each other ($r = .75$), they correlated less well with other measures of aggression (range .19 to .32). Intercorrelations between bullying behaviors and parent- and child-reported rule breaking and aggressive behavior were strong, ranging between .32 and .80. Coefficient alpha among the 7 outcome measures was strong at .82.

Separate regression equations were run for each of the outcome measures. A general table of results, presenting standardized regression coefficients between predictor variables and outcome variables is presented in Table I. The confidence intervals for these regression coefficients are presented in parentheses in Table I for significant results. These results are described in some detail below.

The largest predictors of child self-reported aggressive and rule-breaking behavior as indicated by the CBCL were depressed mood and association with delinquent peers (Table I). Antisocial personality, negative relations with adults, conflict in the family, and parent use of psychological aggression toward romantic partners were also consistent albeit smaller predictors of self-reported youth aggression.

Parental use of psychological aggression in romantic relationships and negative relations between the child and adults in general were the most consistent and largest predictors or parent-reported youth-aggressive and rule-breaking behavior as indicated by the CBCL (Table I). Delinquent peers, depression, and antisocial personality were also consistent predictors of parent-reported problems, although their effect sizes were smaller.

With our current sample, 92 children (15.4%) reported engaging in nonviolent crimes, and 74 (12.3%) reported engaging in violent criminal behavior. Only delinquent peer associations were predictive of violent criminal behaviors, whereas delinquent peer associations and depression were predictive of nonviolent criminal activities (Table I).

Bullying behavior was best predicted by antisocial personality traits and delinquent peers (Table I). Depression, negative relations with adults, video game violence exposure, exposure to family conflict, as well as parental use of psychological abuse in romantic relationships were all also predictors albeit weaker in effect size. Positive family attachments were also very weakly predictive of bullying behavior.

Structural equation modeling (SEM) allows for testing of alternate models of data. It should be noted that SEM, in this case, uses correlational data and should not be used to imply causality. However, this can be an important tool for testing the utility of competing models of behavior. Several indexes of "good fit" such as the Normed Fit Index (NFI), Comparative Fit Index (CFI), or Root Mean Squared Error of Approximation (RMSEA) have been developed for testing SEM models. Theoretical models with NFI and CFI indexes greater than .90 and RMSEA lower than .10 are considered good fits. For the outcome, a combined/additive aggression variable was computed from the 7 outcome measures (coefficient alpha .82). We suspected that a theoretical model focusing on the most consistent predictors of youth violence in the regression equations would be the best fit. However, SEM may provide further information about which predictor variables best fit the outcome data, leading to a clearer more parsimonious model of youth violence risk. We began by splitting our sample roughly in half (n = 300 and n = 303). With the first group (n = 300) we began by testing a model with all variables that had achieved significance in any of the

Table I. Multiple regression results for multiple measures of pathological youth aggression in Hispanic children

	Outcome variables						
Predictor variable	CBCL aggression (child)	CBCL rule-breaking (child)	CBCL aggression (parent)	CBCL rule-breaking (parent)	Nonviolent crimes NLE	Violent crimes NLE	Bullying behavior
Male sex	−.02	.10* (.02, .18)	−.02	.04	.03	.02	−.05
Depression (CBCL)	.36* (.29, .43)	.27* (.19, .34)	.13* (.05, .21)	.12* (.04, .20)	.11* (.03, .19)	.06	.10* (.02, .18)
Neighborhood	−.03	−.07	.01	.03	.07	.05	.06
Negative adult rel.	.15* (.07, .23)	.15* (.07, .23)	.16* (.08, .24)	.11* (.03, .19)	.06	.04	.10* (.02, .18)
Antisocial personality	.12* (.04, .20)	.17* (.09, .25)	.10* (.02, .18)	.09* (.01, .17)	.06	.08	.26* (.18, .33)
Family attachment	−.02	−.09* (−.01, −.17)	−.06	−.09* (−.01, −.17)	−.04	−.02	.10* (.02, .18)
Delinquent peers	.21* (.13, .29)	.30* (.23, .37)	.09* (.01, .17)	.15* (.06, .22)	.17* (.09, .25)	.17* (.09, .25)	.22* (.14, .30)
FES conflict	.13* (.05, .21)	.08* (.00, .16)	.09* (.01, .17)	.06	.06	.06	.09* (.01, .17)
CTS psychological aggression	.12* (.04, .20)	.08* (.00, .16)	.17* (.09, .25)	.11* (.03, .19)	.02	−.01	.15* (.07, .23)
CTS physical assault	−.06	−.02	.03	.12* (.04, .20)	−.04	−.01	−.07
Television violence	.00	.00	.00	−.05	−.04	.03	.05
Video game violence	.06	.01	.03	.03	−.03	−.02	.11* (.03, .19)

Numbers in parentheses represent 95% confidence interval for standardized regression coefficients. Confidence intervals included only for significant results.
*Significant at $P \leq .05$ or better.

regression equations to be most inclusive. We then began a destructive approach, removing variables with poor standardized path estimates. The final model supported the regression results with only depression, delinquent peers, and parental/guardian use of psychological abuse in relationships exerting influence on aggressive behavior directly or through an intermediary antisocial personality variable. Sex also remained in the model, exerting influence on antisocial personality traits. This final model had an NFI of .95, CFI of .97, and RMSEA of .06, indicating a good fit to the data. We then confirmed this model on the second group (n = 303) with whom it achieved an NFI of .99, CFI of .99, and RMSEA of .01, indicating a good fit to the data. This model is presented in the **Figure** (available at www.jpeds.com) with path estimates from the confirmatory group. Bivariate correlations between all measures are presented in **Table II** (available at www.jpeds.com).

Discussion

Across most measures of youth violence and aggression, depressed mood and delinquent peer associations were the most consistent and strongest predictors. These variables may be particularly promising for intervention and prevention. At-risk youth may benefit from programs that provide opportunities for positive peer associations and increased self-efficacy, providing positive outlets for stress. Negative relations with adults, parental/guardian use of psychological abuse in romantic relationships and antisocial personality traits were all also relatively consistent, although weaker, predictors of aggressive and violent behavior. Although negative relations with adults and family conflict were fairly consistent predictors of youth aggression SEM analyses suggested that the best-fit model did not include these variables. The most parsimonious model of youth violence, at least for the current sample, would focus primarily on other factors, particularly depression, delinquent peers, and parental psychological abuse as reported on the CTS. Family attachment also did predict some outcomes, but not others, and displayed a pattern of results that was inconsistent and relatively small in effect size.

Variables that were not consistent predictors of youth aggression also warrant some discussion. Parental or guardian use of domestic violence in romantic relationships was not significant for any of the outcomes studied here. One explanation may be that parents are less likely to generalize their use of physical force on romantic partners onto their children, whereas psychological cruelty in romantic relationships does relate to parents' treatment of their children. Alternatively, it may be that psychological abuse is generally more damaging than is physical abuse. Media violence exposure variables, television violence and video game violence, were also not generally predictive of youth violence. Only in the case of bullying was video game violence a significant predictor, and effects were negligible. Television violence exposure was not predictive of any form of youth aggression. Although much debate remains on the role of media violence on youth aggression, our results support the view voiced by some that efforts to regulate media violence may not be particularly helpful in reducing youth violence.[31-35] Finally, positive family relations were also a fairly inconsistent predictor of youth aggression.

It should be noted that the effect sizes for all predictors were fairly small. This highlights the danger of focusing narrowly on single risk factors for youth violence. The interplay between multiple risk factors for youth violence and aggression is clearly complex and likely additive in nature. Although we have sought to examine a number of important risk factors, it should be noted that many other risk factors related to schools, families, peers, and communities may bear examining. Research on youth violence and aggression has increasingly used multivariate statistics, and this trend is positive. Only through increased use of multivariate analyses will research be able to discern which risk factors are most important in influencing the aggressive behavior of youth. It is recommended that such multivariate designs make increasing use of molecular genetics techniques where feasible, because such techniques would be useful in delineating the interplay between genetic and social risks for youth violence and aggression.

It is worth noting a limitation to the generalizability of our findings. Our sample involved a Hispanic-majority sample. On one hand, we view this as a strength, because most previous research on youth violence and aggression has involved Caucasian-majority samples. Thus our results extend this field into a comparative underserved population. However, generalizing the results from our study to other ethnic groups should be undertaken with caution.

Our results provide some understanding of the interplay between risk factors for youth violence. From our results, several risk factors (depression, delinquent peer associations) appear to be potentially fruitful targets for intervention or prevention efforts. We hope that our results may guide further clinical and public policy efforts with regard to youth violence. ■

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Table II. Bivariate correlations between all measures

Correlations	Sex	Depression	Neighborhood	Low adult support	Antisocial personality	Positive family	Delinquent peers	Conflict child	Parent psyche agg	Parent physical assault	Television	Video games	Aggressive CBCL	Rule breaking CBCL	Aggressive CBCL parent	Rule breaking CBCL parent	Nonviolent crimes	Violent crimes	Bullying
Sex																			
Pearson correlation	1.000	.061	−.079	−.007	−.084*	.057	−.001	.063	.085*	.046	−.185†	−.474†	.014	−.094*	.021	−.033	−.010	−.021	−.007
Significance (2-tailed)		.134	.053	.870	.039	.165	.985	.120	.038	.261	.000	.000	.739	.021	.612	.421	.799	.615	.856
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603
Depression																			
Pearson correlation	.061	1.000	.162†	.329†	.157†	−.222†	.310†	.248†	.185†	.120†	.099*	.054	.549†	.466†	.306†	.292†	.222†	.172†	.282†
Significance (2-tailed)	.134		.000	.000	.000	.000	.000	.000	.000	.003	.015	.188	.000	.000	.000	.000	.000	.000	.000
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603
Neighborhood																			
Pearson correlation	−.079	.162†	1.000	.270†	.191†	−.027	.189†	.112†	.060	.042	.033	.059	.155†	.125†	.138†	.147†	.155†	.127†	.205†
Significance (2-tailed)	.053	.000		.000	.000	.503	.000	.006	.144	.303	.420	.146	.000	.002	.001	.000	.000	.002	.000
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603
Low adult support																			
Pearson correlation	−.007	.329†	.270†	1.000	.306†	−.147†	.382†	.229†	.133†	.109†	.043	.129†	.427†	.425†	.332†	.297†	.211†	.181†	.341†
Significance (2-tailed)	.870	.000	.000		.000	.000	.000	.000	.001	.008	.295	.001	.000	.000	.000	.000	.000	.000	.000
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603
Antisocial personality																			
Pearson correlation	−.084*	.157†	.191†	.306†	1.000	−.177†	.414†	.268†	.139†	.155†	.033	.094*	.354†	.418†	.274†	.282†	.202†	.206†	.429†
Significance (2-tailed)	.039	.000	.000	.000		.000	.000	.000	.001	.000	.421	.021	.000	.000	.000	.000	.000	.000	.000
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603
Positive family																			
Pearson correlation	.057	−.222†	−.027	−.147†	−.177†	1.000	−.076	−.335†	−.072	−.138†	.016	−.011	−.205†	−.254†	−.187†	−.206†	−.111†	−.089*	−.033
Significance (2-tailed)	.165	.000	.503	.000	.000		.063	.000	.076	.001	.698	.792	.000	.000	.000	.000	.006	.029	.424
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603
Delinquent peers																			
Pearson correlation	−.001	.310†	.189†	.382†	.414†	−.076	1.000	.216†	.156†	.133†	.071	.112†	.472†	.525†	.292†	.322†	.274†	.263†	.443†
Significance (2-tailed)	.985	.000	.000	.000	.000	.063		.000	.000	.001	.081	.006	.000	.000	.000	.000	.000	.000	.000
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603
Conflict child																			
Pearson correlation	.063	.248†	.112†	.229†	.268†	−.335†	.216†	1.000	.206†	.190†	.081*	.039	.356†	.313†	.271†	.248†	.165†	.153†	.259†
Significance (2-tailed)	.120	.000	.006	.000	.000	.000	.000		.000	.000	.046	.338	.000	.000	.000	.000	.000	.000	.000
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603
Parent psyche agg																			
Pearson correlation	.085*	.185†	.060	.133†	.139†	−.072	.156†	.206†	1.000	.719†	.002	−.024	.244†	.212†	.289†	.292†	.068	.056	.215†
Significance (2-tailed)	.038	.000	.144	.001	.001	.076	.000	.000		.000	.956	.551	.000	.000	.000	.000	.093	.167	.000
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603
Parent physical assault																			
Pearson correlation	.046	.120†	.042	.109†	.155†	−.138†	.133†	.190†	.719†	1.000	−.035	−.015	.164†	.154†	.190†	.241†	.044	.059	.132†
Significance (2-tailed)	.261	.003	.303	.008	.000	.001	.001	.000	.000		.395	.709	.000	.000	.000	.000	.276	.149	.001
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603
Television																			
Pearson correlation	−.185†	.099*	.033	.043	.033	.016	.071	.081*	.002	−.035	1.000	.471†	.104*	.085*	.049	.004	−.023	.046	.144†
Significance (2-tailed)	.000	.015	.420	.295	.421	.698	.081	.046	.956	.395		.000	.011	.036	.232	.917	.575	.257	.000
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603
Video games																			
Pearson correlation	−.474†	.054	.059	.129†	.094*	−.011	.112†	.039	−.024	−.015	.471†	1.000	.133†	.140†	.068	.068	.006	.043	.177†
Significance (2-tailed)	.000	.188	.146	.001	.021	.792	.006	.338	.551	.709	.000		.001	.001	.095	.094	.884	.293	.000
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603
Aggressive CBCL																			
Pearson correlation	.014	.549†	.155†	.427†	.354†	−.205†	.472†	.356†	.244†	.164†	.104*	.133†	1.000	.779†	.571†	.517†	.263†	.271†	.471†
Significance (2-tailed)	.739	.000	.000	.000	.000	.000	.000	.000	.000	.000	.011	.001		.000	.000	.000	.000	.000	.000
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603

(continued)

Table II. Continued

Correlations	Sex	Depression	Neighborhood	Low adult support	Antisocial personality	Positive family	Delinquent peers	Conflict child	Parent psyche agg	Parent physical assault	Television	Video games	Aggressive CBCL	Rule breaking CBCL	Aggressive CBCL parent	Rule breaking CBCL parent	Nonviolent crimes	Violent crimes	Bullying
Rule-breaking CBCL																			
Pearson correlation	−.094*	.466†	.125†	.425†	.418†	−.254†	.525†	.313†	.212†	.154†	.085*	.140†	.779†	1.000	.502†	.580†	.321†	.292†	.462†
Significance (2-tailed)	.021	.000	.002	.000	.000	.000	.000	.000	.000	.000	.036	.001	.000		.000	.000	.000	.000	.000
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603
Aggressive CBCL parent																			
Pearson correlation	.021	.306†	.138†	.332†	.274†	−.187†	.292†	.271†	.289†	.190†	.049	.068	.571†	.502†	1.000	.804†	.251†	.226†	.323†
Significance (2-tailed)	.612	.000	.001	.000	.000	.000	.000	.000	.000	.000	.232	.095	.000	.000		.000	.000	.000	.000
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603
Rule-breaking CBCL parent																			
Pearson correlation	−.033	.292†	.147†	.297†	.282†	−.206†	.322†	.248†	.292†	.241†	.004	.068	.517†	.580†	.804†	1.000	.258†	.186†	.312†
Significance (2-tailed)	.421	.000	.000	.000	.000	.000	.000	.000	.000	.000	.917	.094	.000	.000	.000		.000	.000	.000
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603
Nonviolent crimes																			
Pearson correlation	−.010	.222†	.155†	.211†	.202†	−.111†	.274†	.165†	.068	.044	−.023	.006	.263†	.321†	.251†	.258†	1.000	.751†	.277†
Significance (2-tailed)	.799	.000	.000	.000	.000	.006	.000	.000	.093	.276	.575	.884	.000	.000	.000	.000		.000	.000
No.	602	602	602	602	602	602	602	602	602	602	602	602	602	602	602	602	602	602	602
Violent crimes																			
Pearson correlation	−.021	.172†	.127†	.181†	.206†	−.089*	.263†	.153†	.056	.059	.046	.043	.271†	.292†	.226†	.186†	.751†	1.000	.311†
Significance (2-tailed)	.615	.000	.002	.000	.000	.029	.000	.000	.167	.149	.257	.293	.000	.000	.000	.000	.000		.000
No.	602	602	602	602	602	602	602	602	602	602	602	602	602	602	602	602	602	602	602
Bullying																			
Pearson correlation	−.007	.282†	.205†	.341†	.429†	−.033	.443†	.259†	.215†	.132†	.144†	.177†	.471†	.462†	.323†	.312†	.277†	.311†	1.000
Significance (2-tailed)	.856	.000	.000	.000	.000	.424	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	
No.	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	603	602	602	603

Agg, Aggression.
*Correlation is significant at the 0.05 level (2-tailed).
†Correlation is significant at the 0.01 level (2-tailed).

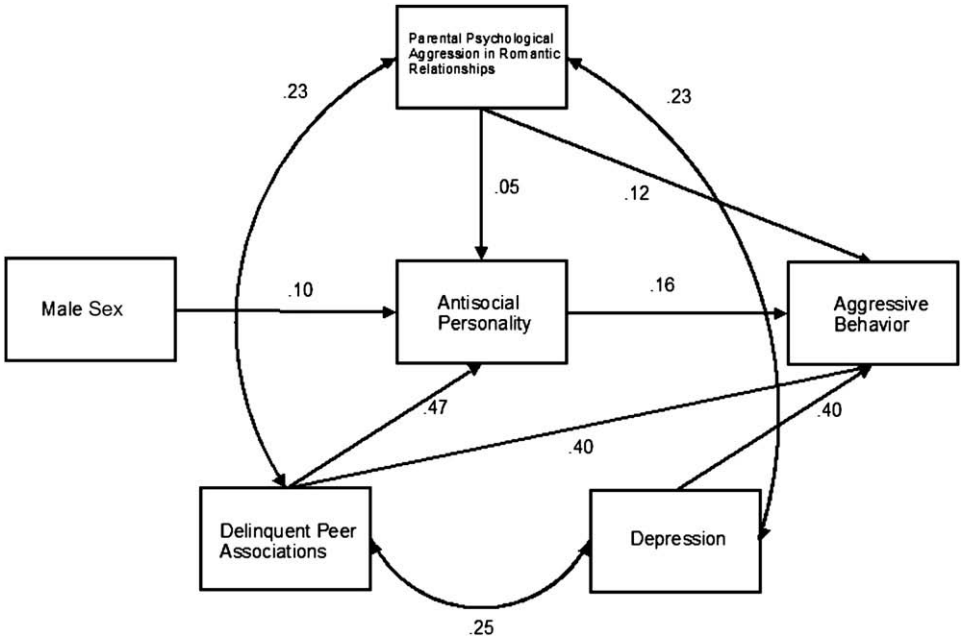

Figure. Final theoretical model of serious youth aggression.