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INTERPERSONAL AGGRESSION IN URBAN MINORITY YOUTH: MEDIATORS OF PERCEIVED NEIGHBORHOOD, PEER, AND PARENTAL INFLUENCES

Kenneth W. Griffin, Lawrence M. Scheier, Gilbert J. Botvin, Tracy Diaz, and Nicole Miller
Institute for Prevention Research, Cornell University Medical College

This study examined perceived social environment and personal control variables as predictors of interpersonal aggression in urban minority youth. Perceived environmental factors included neighborhood risk, friends' delinquency, and parental monitoring practices, which were examined as direct predictors of aggression and as indirect predictors mediated by anger control skills and risk-taking characteristics. The sample consisted of 452 primarily African-American sixth-graders attending New York City public schools. Structural equation modeling indicated that better perceived parental monitoring practices were directly associated with less aggression and had an indirect effect that was mediated by better anger control skills. Perceived neighborhood risk and friends' delinquency were directly associated with more aggression and had indirect effects that were mediated by greater individual risk-taking. Implications of these findings for prevention interventions are discussed. © 1999 John Wiley & Sons, Inc.

Interpersonal aggression and violence are major public health problems that contribute substantially to morbidity and mortality rates in the United States, particularly among youth (Koop & Lundberg, 1992). Prevalence studies show that violent criminal behavior

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Correspondence to: Kenneth W. Griffin, Ph.D., M.P.H., Institute for Prevention Research, Department of Public Health, Cornell University Medical College, 411 East 69th Street, KB-201, New York, NY 10021.

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is occurring at earlier ages (U.S. Department of Justice, 1990) and that levels of interpersonal aggression among youth are high. A recent study of over 4,500 youth attending high school found that 43% of respondents reported hitting or threatening to hit someone in the past year, 14% reported attacking someone, and 13% reported carrying a hidden weapon (Ellickson, Saner, & McGuigan, 1997). Young people are disproportionately the victims of violence as well, which can have negative consequences for both physical and mental health (Boney-McCoy & Finkelhor, 1995; Singer, Anglin, Song, & Lunghofer, 1995). Inner-city African-American youth from low-income families are the group most vulnerable to injury or death due to violence-related causes (Christoffel, 1990; Hammond & Yung, 1993). Given the scope of the problem, it is important that the risk factors that contribute to interpersonal aggression and violence are identified and that the processes by which these variables foster aggression are more fully understood. Furthermore it is important to understand the protective factors that are associated with less aggression and greater resilience among youth in high-risk environments. A better understanding of these risk and protective factors can facilitate the development of effective violence prevention programs, which are needed in many settings including poor, urban, minority communities.

Research has identified many risk factors that predict aggression and violence in children and adolescents. Individual level determinants of aggression include impulsivity (White, Moffitt, Caspi, Bartusch, Needles, & Stouthamer-Loeber, 1994), problems with attention (Loeber & Hay, 1997), and deficiencies in social information processing (Crick & Dodge, 1996; Dodge & Coie, 1987). Social environment determinants of aggression include poor disciplinary practices within the family (Patterson, DeBaryshe, & Ramsey, 1989), exposure to violence (DuRant, Cadenhead, Pendergrast, Slavens, & Linder, 1994), neighborhood disorganization (Kupersmidt, Griesler, DeRosier, Patterson, & Davis, 1995; Simcha-Fagan & Schwartz, 1986) and poverty (Cotten, Resnick, Browne, Martin, McCarraher, & Woods, 1994). Although these and related studies help to inform us of the many determinants of youth aggression, they often do not tell us the relative importance of these risk factors or how they work together to cause aggression. Furthermore, conceptual models are needed that better illustrate the processes by which environmental factors influence aggressive behavior. Violence prevention interventions based on such etiological models are likely to be the most effective. Indeed, it has been argued that progress in the field of prevention may depend on the degree to which we conceptualize the design and evaluation of prevention interventions on sound theoretical frameworks (Lorion, 1989).

Several studies suggest that interpersonal aggression and other problem behaviors occurring during adolescence have similar determinants. Smoking, problem drinking, marijuana use, early sexual activity, and antisocial behavior tend to co-occur in the same individuals during adolescence (Donovan & Jessor, 1985; Donovan, Jessor, & Costa, 1985). Fewer studies have looked at clusters of problem behaviors in minority youth, although the pattern appears to be similar (Farrell, Danish, & Howard, 1992; Resnicow, Ross-Gaddy, & Vaughan, 1995). Many of these studies of behavioral clustering are presented as tests of Problem Behavior Theory (PBT; Jessor & Jessor, 1977), which proposes that problem behaviors comprise a single behavioral syndrome of general deviance in adolescence. However, by focusing exclusively on behavioral clustering, these studies have not tested the larger conceptual framework proposed by this theory. The PBT framework suggests that perceived environmental factors influence behavior by providing support and models for engaging in a behavior (e.g., peers) as well as social controls against antisocial be-

havior (e.g., parents). According to PBT, it is the *perceived* environment rather than the actual environment that has the most immediate meaning for the adolescent and is most closely related to behavior. In addition to the perceived environment, PBT proposes that individual motivational forces shape behavior by providing an impetus to action (e.g., need for approval or excitement) along with self-control variables that regulate and inhibit behavior (e.g., behavioral control). Few past studies have adequately tested these conceptual domains of PBT as an integrated multivariate model of problem behavior, nor has PBT been tested as a model for adolescent interpersonal aggression.

PERCEIVED ENVIRONMENT, PERSONAL CONTROL, AND AGGRESSION

Environmental factors such as neighborhood disorganization, poverty, and criminal activity have been shown to be important in the etiology of adolescent problem behavior (e.g., Fitzpatrick, 1997; Gottfredson, McNeil, & Gottfredson, 1991; Simcha-Fagan & Schwartz, 1986; Wills et al., 1996). For example, early onset of aggression and violence has been found to occur primarily in economically disadvantaged neighborhoods, and less so in more stable areas (Kupersmidt et al., 1995; Loeber & Wilkstrom, 1993), although the mechanisms are not entirely clear. Low socioeconomic status (SES) neighborhoods are sometimes characterized by high adult unemployment, high rates of mobility, and a lack of informal social networks and controls, which may have a negative effect on adolescent development (Elliott, Wilson, Huizinga, Sampson et al., 1996) and contribute indirectly to greater rates of delinquency in some individuals (Yoshikawa, 1994). Others have pointed out that the concept of neighborhood may be viewed as consisting of both the physical setting and an individual's perception of how they fit in (Dembo, Allen, Farrow, Schmeidler, & Burgos, 1985), or how dangerous the neighborhood is (Shumow, Vandell, & Posner, 1998). For example, a study of inner-city minority youth found that substance use could be predicted by subjects' perceptions of neighborhood risk, as indicated by beliefs about the prevalence of drug using, gang involved peers and the availability of drugs in one's neighborhood (Blount & Dembo, 1984). Thus, if a young person perceives that aggression and other problem behaviors are normative and adaptive in terms of survival in their neighborhood, this may provide an incentive to increase risk-taking, anger expression, and other externalizing behaviors in order to gain acceptance by others in the community that values these behaviors.

The peer group is another important social influence factor that is related to delinquent behavior in adolescents (Paetsch & Bertrand, 1997; Snyder, Dishion, & Patterson, 1986). Through social learning processes, association with a deviant peer group is likely to foster attitudes and beliefs that promote aggressive behaviors, as well as provide opportunities to learn and practice these new behaviors (Akers, Krohn, Lanza-Kaduce, & Radosevich, 1979). Studies have shown that high levels of involvement with delinquent peers can lead aggressive boys to higher levels of serious delinquency during adolescence (O'Donnell, Hawkins, & Abbott, 1995), especially for those boys who were only moderately aggressive to begin with (Vitaro, Tremblay, Kerr, Pagani, & Bukowski, 1997). In some cases, adolescents may increase levels of aggressive behaviors in order to gain approval and acceptance among peers (e.g., starting fights over what appear to be trivial issues). Thus, adolescents within delinquent peer groups may observe more impulsive behavior and angry outbursts, perceive that these behaviors are highly valued, and develop attitudes favorable towards anger expression, risk-taking, and aggression.

However, despite a variety of potential obstacles faced by inner-city minority youth (e.g., poverty, exposure to crime, etc.), most of these youth maneuver successfully through adolescence. The literature on resilience illustrates how youth raised in unfavorable environments manage to develop competence in a variety of life domains (Luthar & Zigler, 1991; Masten, Best, & Garmezy, 1990; Masten & Coatsworth, 1998), and thus is clearly relevant to urban minority youth. Masten et al. (1990) have pointed out that youth who experience chronic adversity fare better when they have a positive relationship with a competent adult. Therefore, one of the most important protective factors for resilience among high-risk youth may be good parenting, including close parental monitoring, frequent communication, and regular daily involvement. Attentive and effective parents may increase resiliency in children and adolescents by instilling appropriate values and norms regarding conventional behavior. Furthermore, those with good parental monitoring and related skills may help the adolescent avoid involvement with delinquency and aggression by keeping track of the child's whereabouts and by instilling relevant coping skills that enable the adolescent to control anger, deal with frustration, and use other self-management strategies. Good parental monitoring practices are also likely to teach children limit setting and accountability for their own behavior. Conversely, poor family management practices, such as a lack of parental monitoring, unclear behavioral limits, and inconsistent or overly harsh discipline have been found to be associated with elevated rates of adolescent delinquency and aggression (DiLalla, Mitchell, Arthur, & Pagliocca, 1988; Florsheim, Tolan, & Gorman-Smith, 1996; Gorman-Smith, Tolan, Zelli, & Huesmann, 1996; Loeber & Dishion, 1983; O'Donnell et al., 1995; Paschall, Ennett, & Flewelling, 1996; Patterson & Stouthamer-Loeber, 1984).

The present study examined several risk and protective factors for interpersonal aggression in a sample of urban minority adolescents, using the general framework of PBT. Three categories of variables were assessed to test the explanatory value of PBT for interpersonal aggression: 1) perceived environmental factors that may provide a social context for aggressive behavior (perceptions of neighborhood risk, friends' delinquency, and parental monitoring); 2) personal control variables that may tap the personal motivational forces that shape aggressive behavior (anger control skills and risk-taking); and 3) interpersonal aggression. It was hypothesized that variables from both the perceived environment and personal control domains of PBT would directly predict interpersonal aggression and that the effects of the perceived environment variables would be mediated by personal control factors. In accordance with PBT, the focus of the study is on the *perceived* rather than *actual* environment, thus youths' self-report data is used to test the hypothesized model.

METHODS

Sample Description

A total of 452 sixth-grade students from two New York City public schools participated in this study. The sample was 51% male and 49% female, and predominantly Black (90%), with smaller numbers of Hispanic (4%), Native American (2%), and White students (1%) or those of mixed or other ethnic backgrounds (3%). Over half of students (53%) lived in two-parent families, 37% lived in single parent families, and the remaining 10% lived with guardians or other relatives. The sample had a large number of economically disadvantaged youth from low SES families, as indicated by the fact that 47% of students were enrolled in the schools' free lunch program.

Procedure

Recruitment of schools was accomplished by contacting school districts in a borough of New York City and meeting with district superintendents and middle school principals from schools that were interested in participating in the study. Out of the seven schools that showed initial interest, five declined participation. Of the two schools that participated, the entire sixth grade in regular education classrooms were included in the study. Participants read and signed a consent form describing their ability to withdraw from the study at any time without consequence. The response rate for students was 86%. In terms of the representativeness of participating schools, the two schools were each about 94% black, 15% of students were newly arrived immigrants, and 59% of sixth-grade students in the schools scored at or above state minimum reading level. In comparison, New York City schools in general are 35% black, 9% new immigrant, with 69% scoring at the state reading level. Thus, relative to schools city-wide, the schools that participated in this study had higher proportion of black and immigrant students and had lower reading levels.

Students completed a self-report questionnaire that assessed a variety of attitudes, intentions, and behaviors related to interpersonal aggression. Unique identification codes were used rather than names to emphasize the confidential nature of the survey and students were assured that their responses would not be made available to school personnel, teachers, or parents. Questionnaires were administered during a regular classroom period by a team of several data collectors who were members of the same ethnic-minority groups as the participating students.

Measures

Table 1 contains a listing of the variables and items used in this study and summary descriptive statistics for each of the individual items. Scale reliabilities were estimated by Cronbach alphas, which are provided below in parentheses for each scale for the sample used in this study.

Parental Monitoring. Five items ($\alpha = 0.81$) were taken from the Family Management Scale (Catalano et al., 1993) to assess the degree to which parents monitor the behavior of their children and keep lines of communication open by talking with their children and the parents of friends. Each item had a 5-point response scale ranging from "never" (1) to "always" (5).

Friends' Delinquency. Six items ($\alpha = 0.86$) were used to assess the proportion of the respondent's friends that have engaged in delinquency over the past year (Capaldi & Patterson, 1989). Each item had a 5-point response scale ranging from "none" (1) to "all or almost all" (5) to assess how many friends engaged in each behavior.

Neighborhood Risk. Four items ($\alpha = 0.78$) were taken from a scale designed to assess the degree of gang activity and delinquency in one's neighborhood and attitudes regarding how "tough" one must be to get by in the neighborhood (Dembo et al., 1985). Each item had a 5-point response scale ranging from "strongly disagree" (1) to "strongly agree" (5).

Anger Control Skills. This 5-item scale ($\alpha = 0.83$) was used to assess the degree to which students used specific coping skills to control anger at times when they felt angry enough

Table 1. Descriptive Statistics for Measured Variables

A. Perceived Environment	*Mean*	*SD*	*Skewness*
Neighborhood Risk			
1. You have to be tough to get along in my neighborhood	2.46	1.28	0.50
2. There are a lot of gangs in my neighborhood	2.53	1.37	0.47
3. Kids who don't join a gang have it rough in my neighborhood	2.20	1.21	0.77
4. Hard to stay out of trouble growing up in my neighborhood	2.45	1.39	0.63
Parental Monitoring			
1. Parents know where I am after school	4.34	1.15	−1.09
2. Parents know where I am and what I'm doing on weekends	4.19	1.19	−0.87
3. Parents know what I'm doing when with friends	4.16	1.23	−0.88
4. Parents talk to the parents of my close friends	3.59	1.44	−0.32
5. Parents ask me what I've been doing after being with friends	3.13	1.66	−0.29
Friends' Delinquency			
1. Friends cheated on tests	2.06	1.13	1.20
2. Friends vandalized property	1.73	1.02	1.52
3. Friends stole something	1.56	0.99	2.06
4. Friends hit or threatened to hit without reason	1.75	1.11	1.62
5. Friends broke into someplace to steal	1.24	0.77	3.69
6. Friends suggested that I break the law	1.28	0.76	3.50
B. Personal Control			
Anger Control Skills			
Parcel 1: Cognitive Score	7.75	3.41	0.31
1. Tell myself I'm in control			
2. Tell myself this isn't worth fighting over			
3. Count to ten			
Parcel 2: Behavioral Score	7.78	3.53	0.28
4. Take a few deep breaths			
5. Leave the room until I am calm			
6. Do something physical like running			
Risk-Taking			
Parcel 1	8.78	3.02	−0.04
1. I would enjoy fast driving			
2. I enjoy taking risks			
3. I get bored more easily than most people			
Parcel 2	7.70	2.72	0.26
4. I would do almost anything on a dare			
5. I prefer things that involve change and variety			
6. I think life with no danger in it would be dull for me			
C. Behavioral Outcome			
Interpersonal Aggression			
1. Thrown objects at people or cars	1.40	0.87	2.67
2. Picked a fight with someone	1.77	1.14	1.55
3. Hit someone to hurt them	1.49	0.91	2.16
4. Taken something by force	1.31	0.77	3.12
5. Fought if provoked	1.63	1.00	1.83
6. Took part in group fight	1.62	1.02	1.90

Note. The possible range for the anger control and risk-taking items was from 1 to 15, for the remaining items the possible range was from 1 to 5.

to hit someone. Each item had a 5-point response scale ranging from "never" (1) to "always" (5) to assess how often the respondent engages in the coping activity. The items contain both cognitive responses (e.g., "tell myself it's no big deal") and behavioral responses (e.g., "leave the room until I am calm").

Risk-Taking. Six items ($\alpha = 0.78$) were taken from the Eysenck Personality Inventory (Eysenck & Eysenck, 1975) to assess impulsive and daring behavior. Each item had a 5-point response scale ranging from "really not true for me" (1) to "really true for me" (5).

Interpersonal Aggression. Six items ($\alpha = 0.82$) were used to assess interpersonal aggression, and these were taken from an aggression scale developed by Elliott, Huizinga, and Menard (1989). The items tap the frequency of physically aggressive behaviors aimed at other people during the past year. Each item had a 5-point response scale with "never" (1), "once" (2), "2–3 times" (3), "4–5 times" (4), and "more than 5 times" (5) as response options.

Treatment of Missing Data

Multiple imputation procedures (Rubin, 1987; Shafer, 1997) were used to maximize the number of cases available for analysis with structural equation modeling (which requires complete data).[1] The NORM statistical package was used (Shafer, 1997), which was designed for multiple imputation of multivariate continuous data under a normal distributional model. The NORM program utilizes the expectation maximization (EM) algorithm to compute maximum likelihood (ML) estimates of parameters based on cases with complete data and then uses this information in a data augmentation procedure that generates multiple imputed datasets. In this study, a total of five separate imputed datasets were constructed and each dataset was analyzed using conventional statistical techniques for complete data. Finally, parameter estimates and standard errors were computed for each dataset and final point estimates, *p*-values, and confidence intervals were obtained, which were adjusted for degree of missingness. This multi-step data analytical procedure was used to prepare the variance/covariance matrix for the structural modeling portion of the analyses in the present study. Simulation studies have demonstrated that ML estimation and multiple imputation methods produce the most efficient and least biased parameter estimates for normally distributed and slightly skewed data when data are missing completely at random (Graham, Hofer, & MacKinnon, 1996).

RESULTS

Rates of interpersonal aggression were moderate in this sample: 41% of participants reported that they had picked a fight in the previous year; 38% fought if provoked; 37% participated in a group fight; 29% hit someone intending to seriously hurt them; 24% threw an object at people or cars; and 19% took something from someone by use of force in the previous year. Table 1 presents the means, standard deviations, and skewness for

[1]Analyses of nonresponse patterns showed that complete data on all study variables were available for 56% of cases; an additional 8% of cases were missing one or two items; and the remaining cases were missing three or more items. Analyses revealed that there was no association between degree of missing data and aggression levels.

the variables used in the model after imputation.[2] A series of 2 × 2 ANOVAs were conducted in order to determine whether there were significant race and/or gender differences among the independent and dependent variables. Since the vast majority (90%) of the sample was Black, Blacks were compared to the remaining racial/ethnic groups as a whole ("non-Blacks"). These analyses showed that there were no racial differences and only three small but statistically significant gender differences among all of the study variables. Boys were more likely than girls to "fight if provoked" ($M = 1.78$ vs. $M = 1.48$; $F = 9.5$, $p < 0.002$). Girls reported higher scores than boys on two parental monitoring items: "parents know where I am and what I'm doing on weekends" ($M = 4.48$ vs. $M = 3.95$; $F = 21.5$, $p < 0.0001$) and "parents know who I'm with when with friends" ($M = 4.47$ vs. $M = 3.86$; $F = 20.9$, $p < 0.0001$). Overall, gender accounted for 2.3% of the variance in the "fight if provoked" item; 3.4% of variance in the "parents know where I am" item; and 5.2% of variance in the "parents know who I'm with" item. A hierarchical regression analysis showed that gender explained a small and nonsignificant proportion of variance in aggression scores ($\Delta R^2 = 0.001$, $\Delta F = 0.818$, ns) after controlling for the main study variables. Thus, since the gender differences were of relatively small magnitude, and also because there is little theoretical reason to suspect that the predictor variables affect the outcomes differentially by gender or race, these variables were not included in the structural equations model. In addition, the small sample size and large number of hypothesized factors precluded testing models separately by race or gender (Tanaka, 1987).

Confirmatory Factor Analysis

Prior to testing the hypothesized structural model, a confirmatory factor analysis (CFA) was conducted to assess how well the observed measures reflected the hypothesized latent constructs. The EQS computer program (Bentler, 1995) was used for the CFA and structural equation models. As shown in Figure 1, seven latent factors were specified in the measurement model, each of which contained from two to six indicator items (large circles represent factors and rectangles represent indicators or measured variables). Three of the latent factors assessed perceived environmental influences: The Parental Monitoring latent factor had loadings ranging from 0.56 to 0.86, the Friends' Delinquency latent factor had loadings ranging from 0.67 to 0.82, and the Neighborhood Risk latent factor had loadings ranging from 0.54 to 0.84. Two additional factors assessed personal control factors: Anger Control Skills and Risk-Taking. To construct indicators for the mediational factor of Anger Control Skills, we used the mean of the three cognitive items and the mean of the three behavioral items to create parcels, as recommended by MacCallum, Roznowski, and Necowitz (1992).[3] These two indicators representing cognitive and behavioral items had factor loadings of 0.90 and 0.79, respectively. For the Risk-Taking factor, two parcels were created as indicators by selecting items that balanced content and psychometric properties across parcels. The Risk-Taking latent factor had load-

[2]The means and standard deviations of the main study variables were nearly identical before and after adjusting for missing data: The majority of variables differed by 0.01 or less, with the average difference in the pre- versus post-imputation mean equal to 0.017 for variables that had a possible range of scores from 1.00 to 5.00.
[3]A parcel is the mean of a number of items used in order to reduce the total number of indicator items to a level that is manageable and appropriate given the hypothesized model and the sample size. Using parcels results in indicators with higher reliability compared to constructs with individual indicators constructed at the item level (MacCallum et al., 1992).

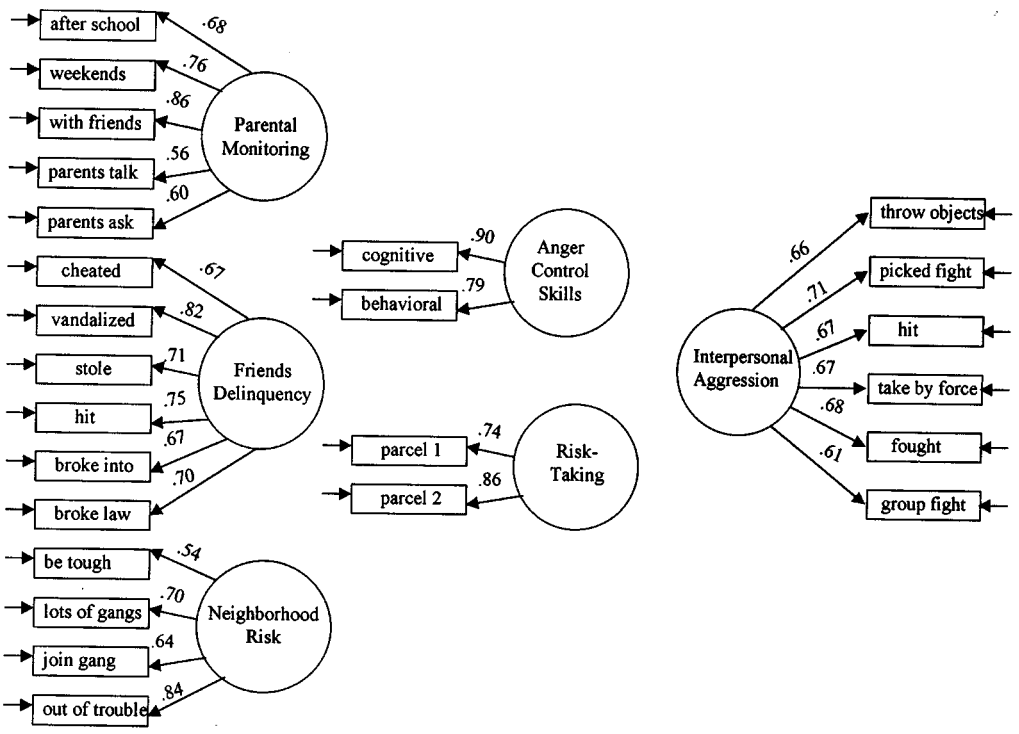

Figure 1. Confirmatory factor analysis model. *Note:* All *p*s < 0.0001.

ings of 0.74 and 0.86. The final latent factor in the model was the Interpersonal Aggression factor, which had loadings ranging from 0.61 to 0.71. Factor loadings for all latent constructs were statistically significant (*p*s < 0.001) and in the expected direction, indicating that the measurement model was properly specified and that each factor was statistically reliable based on the hypothesized model.

Several criteria were used to evaluate the overall fit of the CFA model and subsequent structural models, including: (1) the χ^2 *p*-value, which if $p > 0.05$ indicates that there are no statistically significant discrepancies between the observed data and the hypothesized model; (2) the χ^2 to degree of freedom ratio, which should be less than 5.0 (Bollen, 1989); (3) the standardized root mean squared residual (SRMR), which should be less than 0.05; and (4) the Comparative Fit Index (CFI), an incremental fit index that specifies the amount of covariation in the data that is accounted for by the hypothesized model after adjusting for sample size. A benchmark for the CFI is that 0.90 or above indicates an excellent fit of the model to the data, whereas 1.0 indicates a perfect fit. According to these criteria, the CFA model was a good to excellent fit, χ^2 (260, $N = 452$) $= 704.9$, $p < 0.001$; $\chi^2/\text{df} = 2.7$; SRMR = 0.05; CFI = 0.90.[4]

The latent factor intercorrelations from the CFA model are shown in Table 2. Several factors were moderately to strongly intercorrelated: The strongest relationships were

[4]Although the χ^2 *p*-value was significant, indicating that additional models could be fit to the data, this is not uncommon with large models and large sample sizes (Bentler & Bonett, 1980; Marsh, Balla & McDonald, 1988). Fit indices for the CFA model and the structural equations model represent the averages across the five imputed data sets.

Table 2. Correlations among Latent Factors from Confirmatory Factor Analysis

Latent Factor	*1*	*2*	*3*	*4*	*5*
1. Parental Monitoring	—				
2. Friends' Delinquency	−0.25***	—			
3. Neighborhood Risk	−0.07	0.29***	—		
4. Anger Control Skills	0.31***	−0.05	−0.06	—	
5. Risk-Taking	−0.16**	0.30***	0.35***	−0.15**	—
6. Interpersonal Aggression	−0.34***	0.55***	0.37***	−0.27***	0.43***

Note. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

between Friends' Delinquency and Interpersonal Aggression ($r = 0.55$, $p < 0.001$) and between Risk-Taking and Interpersonal Aggression ($r = 0.43$, $p < 0.001$). However, Friends' Delinquency was not significantly correlated with Anger Control Skills, nor was there a significant relationship between Anger Control Skills and Neighborhood Risk. The Interpersonal Aggression outcome factor was moderately to strongly correlated in the expected direction with each of the six predictor factors. In summary, the CFA analysis demonstrated that the measurement model was excellent, with high factor loadings for all indicator variables, and that the outcome latent factor was significantly correlated with all six predictor latent factors.

Structural Equations Modeling

To test a formal model of the relationships between the predictor latent factors and outcome latent factor of Interpersonal Aggression, a structural equations model was tested. The formal structural equations model differs from the CFA model in that arrows representing path coefficients have been added to show the hypothesized direction of relationships among the latent factors. As recommended by MacCallum (1986), the first step involved testing a saturated model, which estimated the paths from all exogenous latent factors to each mediational construct and to the outcome latent factor, as well as the paths from the mediational factors to the outcome. In addition, the covariances among all exogenous latent factors and the covariances among the disturbance terms of the proposed mediator latent factors were estimated in testing the saturated model.

Testing the saturated model indicated that three paths between latent factors were nonsignificant and these were paths were trimmed from the model. The resulting final model is illustrated in Figure 2, and only statistically significant paths are shown. Each of the exogenous latent factors were directly associated with Interpersonal Aggression, such that better perceived Parental Monitoring was associated with less Interpersonal Aggression ($\beta = -0.15$, $p < 0.05$), greater perceived Friends' Delinquency was associated with more Interpersonal Aggression ($\beta = 0.39$, $p < 0.001$), and greater perceived Neighborhood Risk was associated with more Interpersonal Aggression ($\beta = 0.15$, $p < 0.05$). The two mediating factors also were associated with Interpersonal Aggression: Better Anger Control Skills were associated with less Interpersonal Aggression ($\beta = -0.16$, $p < 0.01$) and more Risk-Taking was associated with more Interpersonal Aggression ($\beta = 0.21$, $p < 0.01$). In terms of the hypothesized mediation of perceived environment factors by the personal control variables, several significant relationships were found. In addition to the

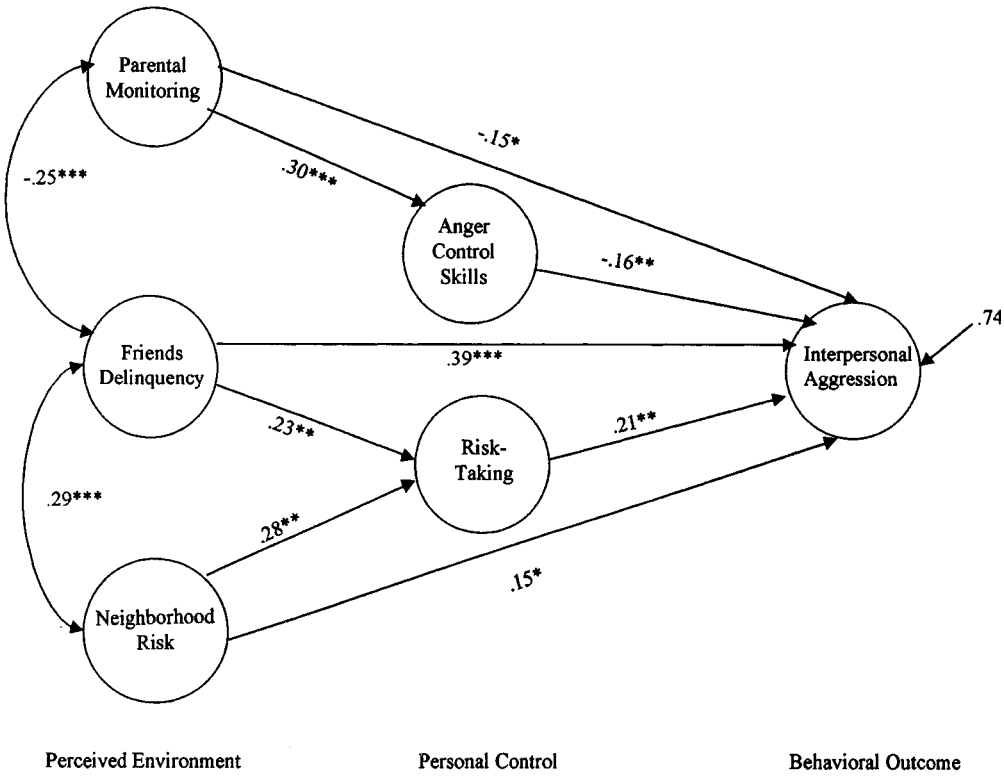

Figure 2. Structural equations model of predictors of interpersonal aggression. *Note:* Only significant paths are shown: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

direct effect of Parental Monitoring on Interpersonal Aggression, 24% of this effect was mediated by Anger Control Skills. Similar mediational effects were found with Risk-Taking: In addition to the direct association between Friends' Delinquency and Interpersonal Aggression, 11% of this effect was mediated by Risk-Taking. In addition to the direct association between Neighborhood Risk and Interpersonal Aggression, 28% of this effect was mediated by Risk-Taking. In terms of goodness-of-fit indices, there was a good to excellent fit of the model to the data, χ^2 (263, $N = 452$) = 708.9, $p < 0.001$; $\chi^2/\mathrm{df} = 2.7$; SRMR = 0.05; CFI = 0.90. Taken together, the full set of predictors explained 47% of the variance in interpersonal aggression.

In summary, the findings shown in Figure 2 indicate that each of the three exogenous latent factors representing perceived environmental influences of aggressive behavior (Neighborhood Risk, Friends' Delinquency, and Parental Monitoring,) were significantly associated with Interpersonal Aggression in the expected directions, and these relationships were mediated in part by individual differences in anger control skills (for Parental Monitoring), and risk-taking (for Friends' Delinquency and Neighborhood Risk). The model was not modified further in an attempt to improve its fit because conducting specification searches to improve the fit can capitalize on chance characteristics of the data in small samples (i.e., $N < 500$) and lead to an unstable model with limited generalizability (MacCallum et al., 1992).

DISCUSSION

The present study examined how several perceived environment and personal control variables were associated with interpersonal aggression in urban minority youth. The theoretical model guiding this research was Problem Behavior Theory, which suggests that problem behaviors reflect a general dimension of unconventionality that is rooted in perceived environmental and motivational/personality factors. Using structural equation modeling techniques, several direct associations of perceived environment factors and aggression were found, and these relationships were partially mediated by personal control factors. Overall, these findings suggest that PBT is a useful model for conceptualizing interpersonal aggression.

The results of this study showed that better perceived parental monitoring practices were associated with less aggression, as hypothesized. Furthermore, the relationship between parental monitoring and aggression was partly mediated by anger control skills, such that those adolescents that perceived better parental monitoring practices were less aggressive in part because they were better able to control angry feelings. Previous research has suggested that parental monitoring behaviors are one of the most important components of family management skills, accounting for approximately 2.5 times as much variance in delinquency scores compared to discipline, problem-solving, or reinforcement patterns within the family (Patterson & Stouthamer-Loeber, 1984). Other research has reported that parents of delinquent youth often do not know how or where their children spend their time or with whom they tend to spend time (McCord, 1979). Since the effect of parental monitoring was partly mediated by better anger control skills, the present findings suggest that when youth perceive their parents to be closely monitoring their behavior, they indirectly learn self-restraint and other impulse control skills that are associated with less aggression. It also should be noted that the various aspects of family management practices tend to be highly intercorrelated (Patterson & Stouthamer-Loeber, 1984), such that parents who closely monitor their children are likely to use discipline practices that are situationally appropriate (not overly lax or harsh). Thus there are many developmental mechanisms by which high levels of parental monitoring and involvement can reduce delinquency and aggression. For example, highly involved parents are known to set clear behavioral limits, which teaches important lessons about what is acceptable social behavior (Pakaslahti, Asplund-Peltola, & Keltikangas-Jarvinen, 1996). Moreover, highly involved parents are likely to be a strong source of social support to help the child deal with the vicissitudes of adolescence.

Another finding of the present study was that perceived friends' delinquency was associated with more aggression in adolescents, controlling for perceived neighborhood risk and parental monitoring. In addition to the direct association with aggression, the relationship between perceived friends' delinquency and aggression was partly mediated by greater risk-taking, such that those individuals who perceived that their friends engaged in delinquent behaviors were more aggressive, in part because they engaged in more risk-taking themselves. The friends' delinquency scale used in this study primarily tapped antisocial behavior such as stealing or vandalizing and only one of the six items directly assessed interpersonal aggression. This suggests that when an adolescent sees his or her friends engage in nonviolent delinquent behaviors, this has an impact on the individual's aggressive behaviors. Thus, processes other than behavioral modeling may occur within delinquent peer groups. For example, previous research has found that it is youths' positive opinions about delinquent peers (rather than their behavior) that is as-

sociated with aggressiveness (DiLalla et al., 1988). Taken together, the present findings suggest that, in addition to any modeling effects of interpersonal aggression that occur within delinquent peer groups, other processes foster the transfer of antisocial norms and maladaptive goals, such as an adolescent's positive attitudes toward delinquent friends.

The third perceived environmental factor, neighborhood risk, was also associated with more aggression, as hypothesized. Although we did not assess objective indicators of neighborhood risk, the present findings are consistent with the predictions of social disorganization theory, which suggests that higher rates of delinquency occur in neighborhoods characterized by economic deprivation, residential mobility, and a general lack of social control mechanisms (Bursick, 1988). In addition to the direct association between perceived neighborhood risk and aggression, this relationship was mediated partly by risk-taking, such that those individuals who saw their neighborhoods as high-risk were more aggressive in part because they engaged in more risk-taking. One explanation of these findings is that children and adolescents surrounded by high-risk behaviors, including substance abuse, domestic violence, and criminal activity, may learn risk-taking and aggression through the modeling of these behaviors and the lack of models that use nonviolent conflict resolution strategies. By observing peers and adults engaging in these activities, children and adolescents in inner-city neighborhoods may come to see risk-taking and delinquent behavior (including aggression) as normative and adaptive.

In terms of correlations among the perceived environmental variables, better perceived parental monitoring practices were associated with fewer perceived delinquent friends. This is consistent with Jessor and Jessor's (1977) prediction that parental social controls are likely to have an influence on the adolescent's choice of friends and with findings that poor parental monitoring and discipline practices predict involvement with antisocial peers in early adolescence (Dishion, Patterson, Stoolmiller, & Skinner, 1991). Perceived friends' delinquency was also correlated with neighborhood risk, perhaps reflecting the greater levels of delinquency in high-risk neighborhoods.

The present study demonstrates that PBT can be applied to interpersonal aggression among minority youth and suggests that previous interventions based on PBT for substance use would be effective for interpersonal aggression. Variables related to social and personal competence appear to play a central role in the etiology and prevention of substance abuse and models of this nature have recently been expanded to aggression (Botvin & Scheier, 1997). Prevention programs for substance use have placed primary emphasis on increasing awareness of social influences promoting drug use and teaching specific techniques for resisting these pressures (Hansen, 1992). Other research has demonstrated the efficacy of a multimodal intervention approach for substance use prevention which emphasizes resistance skills training and enhancing personal and social skills (Botvin, Baker, Dusenbury, Botvin, & Diaz, 1995).

The available violence prevention literature suggests that several program components are essential for successful violence prevention efforts with adolescent populations. The best approach to prevention appears to be broad-based, focusing on building skills and targeting a variety of students, rather than focusing on isolated behaviors or individual groups of students. This is especially true since aggregating high-risk youths into intervention programs appears to be ineffective and a poor approach to prevention (Dishion & Andrews, 1995). As predicted by PBT, violence and aggression in adolescence usually coexist with additional emotional and behavioral problems (Ellickson et al.,

1997), so broad-based interventions seem most appropriate. School-based violence prevention programs should be augmented by additional modules that take place at the family level (Dishion & Andrews, 1995; Miller, 1994; Yoshikawa, 1994), including training in parenting skill as well as tips on increasing family cohesion.

This study has several limitations that should be noted. The cross-sectional design does not allow us to determine causality or the temporal sequence among the variables in this study. For example, we can not determine whether the correlation between perceived friends' behavior and one's own behavior is a result of the peer group influencing the individual or of the individual seeking out similar peers (Aseltine, 1995). Furthermore, the developmental relations between predictors could not be tested in this study. For example, parental influences may be crucial in antisocial and aggressive behavior during childhood, whereas peers become more influential in the teen-age years (Aseltine, 1995). Another limitation is that several important predictors of interpersonal aggression were not included in our model. In terms of family factors, exposure to violence within the family was not measured in this study. Such violence can potentially lead to a generational "cycle of violence" in which parents use the same inept and violent discipline practices that were used on them as children (Emery, 1989). It is also possible that exposure to violence and responses to victimization (e.g., anxiety, helplessness) may also contribute to aggression and violence. Finally, an important limitation of this study is that it was based on students' self-reports. The significant relationships among the variables measured may partly reflect shared method variance since all data was obtained by self-report questionnaire.

Despite these limitations, this study has illustrated several important points regarding interpersonal violence among urban minority adolescents. The current findings suggest that exposure to aggressive role models, poor parenting, and other negative social and environmental risk factors cannot fully explain aggression in adolescents without also knowing about relevant individual self-control variables such as anger-control and risk-taking. Future research should investigate the mechanisms by which personal control factors mediate perceived or actual social risk, and test prevention programs for interpersonal aggression based on the assumption that individuals can be taught skills that mediate the effects of such actual and perceived environmental risks. Future research should also compare individual perceptions of the environment to others' perceptions and to objective indicators of neighborhood risk in order to understand how these complex environmental factors affect youth behavior.

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