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A COMPARISON OF SOCIAL DEVELOPMENT PROCESSES LEADING TO VIOLENT BEHAVIOR IN LATE ADOLESCENCE FOR CHILDHOOD INITIATORS AND ADOLESCENT INITIATORS OF VIOLENCE

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This study used data from the Seattle Social Development Project (SSDP) to compare social developmental mechanisms predictive of violence at age 18 for youth who initiated violence in childhood and those who initiated violence during adolescence. The SSDP is a theory-guided longitudinal study of youth development and behavior, which has followed a panel of children since they entered the fifth grade in 1985. A multiple-group structural equation modeling approach was used to test relationships among social development model constructs hypothesized to predict violence and other forms of antisocial behavior. Analyses revealed that during adolescence, socialization pathways leading to violence at age 18 were similar for those who initiated violence in childhood and those who initiated violence in adolescence, suggesting that during adolescence, the same preventive interventions may be effective for individuals in both groups.

Longitudinal studies have shown that individuals who initiate violent behavior in childhood are at particularly high risk for serious violent offending in adolescence and adulthood (see reviews by Farrington 1998; Hawkins et al. 1998). Risk for later violent offending typically diminishes with later

ages of initiation (Elliott 1994; Thornberry, Huizinga, and Loeber 1995), although initiation of violence at any age into adolescence is associated with an increased probability for violence at subsequent ages (Farrington 1998). Elliott's (1994) analysis of data from the National Youth Survey illustrates this pattern. He found that 45 percent of youths who initiated violence by age 11 went on to commit violent offenses by their early 20s. Proportionally fewer youths (25 percent) who initiated violence between the ages of 11 and 12 committed violent offenses into adulthood. An even smaller percentage of adolescent initiators (ages 13-17) committed subsequent violent offenses. Similar results were found in Thornberry et al.'s (1995) analysis of data from the Rochester Youth Development Study. They found that 39 percent of children who initiated violence before age 9 and 30 percent of youths who initiated violence between the ages of 10 and 12 committed subsequent violent offenses, whereas only 23 percent of youths who initiated violence after age 13 engaged in later violence.

Moffitt (1993) proposes that youths who initiate violence early and then persist in offending through adolescence can be distinguished from youths who engage in violence only during adolescence on the basis of temperament and skill competencies. Moffitt suggests that early initiators have often experienced neuropsychological impairments that compromise their healthy development. Impairments are evidenced in poor reading and problem-solving skills, as well as memory difficulties, extreme inattentiveness, and impulsivity, any of which can increase risk for violence. Exposure to harmful social and environmental influences catalyzes and reinforces negative conduct.

According to Moffitt's (1993) theory, unlike early initiators who are predisposed to violence, youths who initiate violence in adolescence typically have a prosocial orientation but succumb to negative peer influences that promote violence. For those youths, violence serves to counteract feelings of inadequacy that emerge during adolescence. Violence is used instrumentally and selectively to demonstrate power and independence in situations in which benefits outweigh the costs for such behavior (Moffitt 1993). Because their antisocial behavior is directly tied to the psychological tumult of adolescence, as those youths near adulthood, violence diminishes, and other more prosocial behaviors accompany the transition into adult roles. In short, Moffitt's theory suggests that the etiology of violence is different for childhood initiators and adolescent initiators of violent behavior.

Although this study does not test Moffitt's (1993) theory, it does examine a hypothesis related to the theory. We seek here to determine whether socialization processes in the social development model (SDM) (Catalano and Hawkins 1996) similarly predict violence in late adolescence (age 18) for childhood initiators of violence (ages 10-11) and adolescent initiators of

violence (ages 12-16). The analyses do not seek to explain the etiology of violence at first onset. Rather, they focus on socialization following initiation or occurring along with initiation in a developmental sequence that eventually leads to later violence. We focus here on violence at age 18 as an outcome because of the tendency for violence to peak in prevalence at approximately that age (Elliott 1994; Herrenkohl et al. 2000).

Findings from this study are important for the design of violence prevention programs and control strategies during the adolescent developmental period. If different processes operate to promote later violence among individuals in the two groups from ages 14 to 16, then different prevention and control strategies might be needed. Alternatively, if processes leading to violence at age 18 for individuals in the two groups are similar, the same prevention and control strategies would appear to be appropriate for both groups during adolescence.

Social Development Model

A multiple-group structural equation modeling approach was used to compare the power of socialization constructs in the SDM at ages 14 and 16 in the prediction of violent behavior at age 18 for youths who initiated violence in childhood and those who initiated violence later, in adolescence. The SDM is a general theory of human behavior that hypothesizes that similar developmental processes lead to prosocial and antisocial behavior (Catalano and Hawkins 1996; Hawkins and Weis 1985). The model integrates hypotheses from social control theory (Hindelang 1973; Hirschi 1969; Kempf 1993; Krohn and Massey 1980; Massey and Krohn 1986), social learning theory (Akers 1977; Akers et al. 1979; Bandura 1973, 1977; Conger 1976, 1980; Lanza-Kaduce et al. 1984), and differential association theory (Cressey 1953; Matsueda 1982, 1988; Matza 1969; Sutherland 1973; Sutherland and Cressey 1970).

The SDM posits that youths learn behaviors, whether prosocial or antisocial, from the socializing agents of family, school, religious and other community institutions, and their peers. Youths are socialized through processes involving four constructs: (1) opportunities for involvement in activities and interactions with others, (2) the degree of involvement and interaction, (3) the skills to participate in those interactions, and (4) the reinforcement forthcoming from performance in activities and interactions. When opportunities exist for a youth to become involved in activities and interactions, when his or her skills allow for active participation in those activities and interactions, and when his or her performance is rewarded consistently, a bond develops between that individual and a socializing agent. Once developed, the bond has the power to affect behavior independently by creating an informal

control on behavior. That control inhibits antisocial behavior through the establishment of a youth's "stake" in conforming to the norms and values of a socializing unit. Youths tend not to engage in behavior that is inconsistent with the standards and norms of those to whom they are bonded since the bonds themselves may be threatened if those behaviors are exposed (Brook et al. 1990; Brook et al. 1986; Kempf 1993; Krohn and Massey 1980; Marcos, Bahr, and Johnson 1986; Newcomb and Bentler 1988). Like differential association theory, the social development model hypothesizes that youths' behavior will be prosocial or antisocial depending on the predominant behaviors, norms, and values held by those to whom they are bonded. For a full exposition of the SDM, see Catalano and Hawkins (1996).

METHOD

Participants

Data are from the Seattle Social Development Project (SSDP), a longitudinal study of youth development and behavior that has followed a panel of children since they entered the fifth grade in 1985 (average age 10). Participants were recruited from 18 Seattle public elementary schools serving predominantly high-crime neighborhoods. From a population of 1,053 students, 808 (77 percent) consented to take part in the longitudinal study. Of the original study participants, 396 (49 percent) were female, 372 (46 percent) were European American, 195 (24 percent) were African American, 170 (21 percent) were Asian American, and 72 (9 percent) were individuals from other race or ethnic groups. Many participants were from low-income households. Forty-six percent of parents reported yearly incomes under $20,000 in 1985. Fifty-two percent of children participated in the school's free lunch program at some point between the fifth and seventh grades. Forty-two percent of children reported living with a single parent in 1985.

Assessments

Youths and their parents took part in annual assessments through 1991. Youths were assessed again in 1993 at age 18. Teachers also were involved in annual assessments through 1989.

Data used in this study were collected from youths at ages 14, 16, and 18. Data collected annually from youths at ages 10 through 16 also were used to define their age of violence initiation. Assessments with youths provided information about their experiences at home, in school, and in their peer groups. Youths also reported on their involvement in violent and nonviolent

delinquency and substance use. In addition, parents and teachers reported on youths' behaviors and social interactions at home and in school using the Child Behavior Checklist (Achenbach and Edelbrock 1983). Parents responded to additional survey questions about their own behavior and the behavior of other family members. Participation rates across study waves were consistently high; 96 percent of youths were surveyed at age 14, 95 percent at age 16, and 94 percent at age 18 in 1993.

Measures

VIOLENCE AT AGE 18

The dependent construct, violence at age 18, was measured with four indicators of self-reported behavior in the past year. Those indicators referred to the number of times in the past year youths had (1) picked a fight, (2) hit someone with the intent of hurting him or her, (3) beaten someone so badly he or she required medical attention, or (4) threatened someone with a weapon. At age 18, approximately 18 percent of youths had "picked a fight," 28 percent had "hit someone with intent to hurt," 9 percent had "beaten someone badly," and 7 percent had "threatened someone with a weapon." The natural logarithm of scores on each variable was used to reduce skewness. Those scores were then standardized. Higher scores indicate more violence.

SDM CONSTRUCTS

The portion of the SDM tested in this study is shown in Figure 1. Measures of prosocial and antisocial opportunities, prosocial and antisocial involvement, skills for interaction, and prosocial and antisocial rewards were measured at age 14 (8th grade for students progressing normally through school) with reports from youths, as well as reports from parents and teachers. The prosocial and antisocial bonding constructs were measured at age 16 (10th grade for students progressing normally through school) with data from those same sources. A construct that reflects belief in the moral order also was measured at age 16. Three indicators formed each latent construct in the model. Whenever possible, items in each construct represented four different domains of influence—community, school, family, and peer—to provide an across-domain composite picture of youths' social development. Influences from different domains were combined in a single indicator of a theoretical construct to provide greater consistency among the indicators of that construct (Bollen and Lennox 1991; Newcomb 1990).

The composition of each SDM construct is summarized in Table 1. Indicators for each latent construct were based on a combination of standardized

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Figure 1: Social Development Model (SDM)

Prosocial opportunities → Prosocial involvement → Prosocial rewards → Prosocial bonding → Belief in the moral order → Violence (age 18)

Skills for interaction

Antisocial opportunities → Antisocial involvement → Antisocial rewards → Antisocial bonding

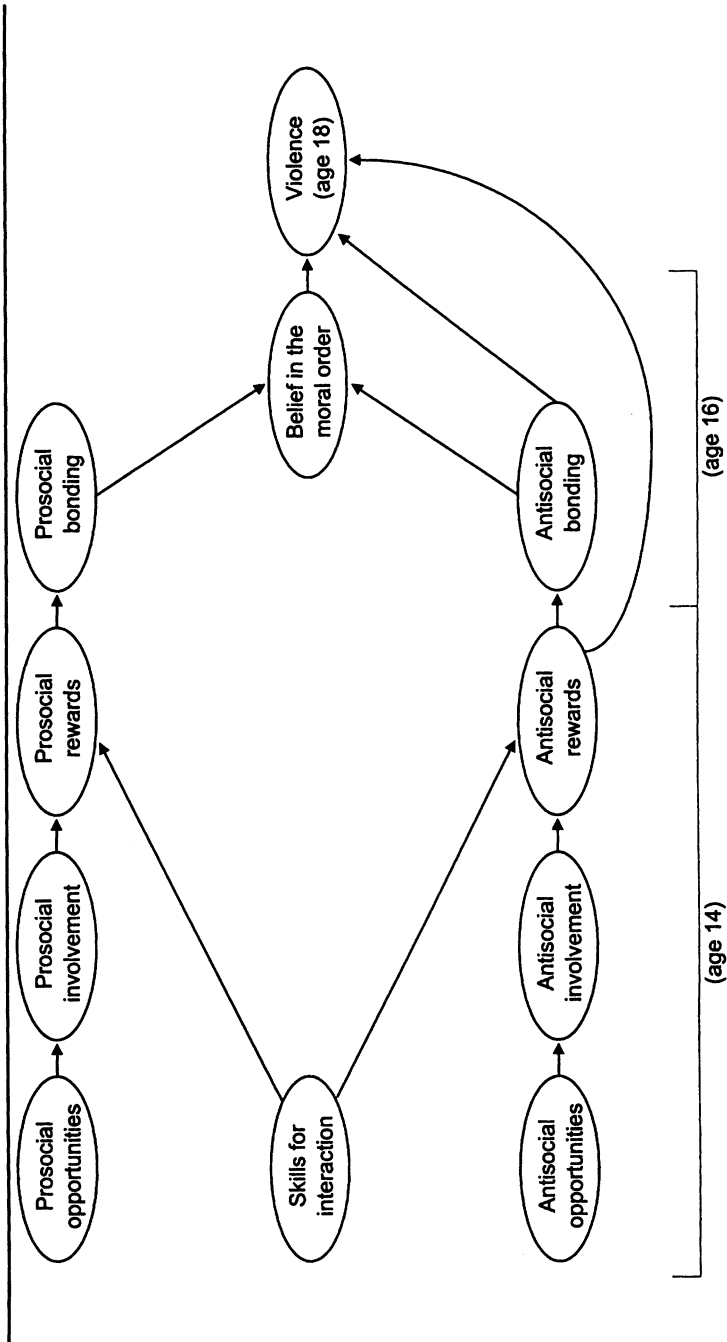(age 14)   (age 16)

TABLE 1:   Summary Descriptions of Social Development Model (SDM) Constructs

SDM Construct	Construct Refers to the Following
Prosocial opportunities	Whether youths knew where to join clubs in their communities
	Whether youths had opportunities to learn new skills and play sports
	Whether youths' neighborhoods had nice parks and playgrounds
	Whether youths had opportunities at school to take part in class and extracurricular activities
	Whether youths had opportunities to interact with their parents and participate in family decisions
Antisocial opportunities	Whether youths had been invited to join gangs
	Whether neighborhood kids tended to get in trouble with police
	Whether youths personally knew adults who got drunk, used drugs, and seriously broke the law
	The amount of crime in neighborhoods
	The percentage of students at school who used alcohol and marijuana
	Whether youths had siblings who used alcohol and drugs, belonged to gangs, and seriously broke the law
	Whether youths' best friends got into serious trouble with teachers
	Whether parents set clear rules at home and monitored youths' behavior
Prosocial involvement	How often youths spent time with other families and adults in their neighborhoods
	Youths' frequency of church attendance and membership in community groups
	Whether youths took part in class and extracurricular activities and had friendly conversations with their teachers
	Youths' frequency of interacting with prosocial parents (i.e., those who reported alcohol use in moderation or no use and did not smoke marijuana)
	Time spent with prosocial friends (those who did not use alcohol or marijuana or break the law)
Antisocial involvement	Whether youths were involved in gangs or had antisocial friends
	Whether youths were involved in family substance use (e.g., lighting a cigarette or pouring a drink for a family member)
	Frequency of "doing what feels good regardless of the consequences"
Skills for interaction	Whether youths were able to refuse involvement in a range of antisocial behaviors (e.g., shoplifting, skipping school, and alcohol use)
	Whether youths reported skills for completing prosocial activities, such as following directions, concentrating, and completing assigned tasks
Prosocial rewards	Whether youths were recognized and reinforced by people in their neighborhoods and whether they felt safe in their neighborhoods
	Whether teachers and prosocial parents complimented youths on doing things well and whether parents "put them down" (reverse coded)

(continued)

TABLE 1: Summary Descriptions of Social Development Model (SDM) Constructs

SDM Construct	Construct Refers to the Following
	Whether youths enjoyed being with prosocial friends and whether those friends were helpful and supportive
Antisocial rewards	Youths' likelihood of being picked up by the police
	The likelihood of youths being seen as "cool" or their getting excitement from and "feeling good" if they beat up somebody or stole
	Whether youths would be caught and punished for skipping school and for drinking alcohol
	Whether youths' parents generally let them get away with misbehavior
	Whether youths thought drinking alcohol was a way to make friends
	Whether parents calmly discussed what they had done wrong when youths had misbehaved (reverse coded)
Prosocial bonding	Whether youths liked and wanted to stay in their neighborhood
	Whether youths liked their teachers, their school, and their classes
	Whether youths shared with, wanted to emulate, and volunteered to help their prosocial parents
	Whether youths shared with, wanted to emulate, and would "stick by" their prosocial friends
Antisocial bonding	Whether youths wanted to emulate, stick by, and share feelings with antisocial friends (i.e., those who used alcohol or marijuana or broke the law in other ways)
Belief in the moral order	Whether youths would let other students copy their exams at school
	Whether youths thought it was okay to cheat, as well as the importance of telling the truth to parents
	Whether youths thought it was okay for someone their age to use marijuana, cigarettes, and alcohol
	Youths' beliefs about the acceptability of doing things that were not right to "get ahead" or "get away with it"

scores of individual items. All coding was done so that higher scores reflect more of the construct.

Analysis

IDENTIFYING CHILDHOOD AND ADOLESCENT INITIATORS OF VIOLENCE

Youths were identified as having initiated violence in childhood (ages 10-11), having initiated violence in adolescence (ages 12-16), or not having initiated violence by age 16. Congeneric measures, based on responses from multiple informants, were used to assess initiation at all ages from 10 through 16.

Because violent behaviors diversify and become more serious as youths grow older (Loeber 1990, 1996; Loeber and Hay 1997), violence was assessed more comprehensively in the SSDP after age 12. Thus, measures of violence initiation in this study were generally based on a larger number of indicators at later ages. For example, at age 10, violence initiation was based on four indicators. Those indicators included reports from youths about their having hit a teacher or having picked a fight in the past year (three or more fights were required before a youth was considered having engaged in violence on that indicator) and reports from parents (from the Child Behavior Checklist) about whether a child had gotten in many fights and whether he or she had tended to physically attack other people. At age 12, violence initiation was based on seven indicators. Those indicators included reports from youths and parents, as well as reports from teachers about youths' violent behavior in school. At age 16, reports from youths and parents formed nine indicators of violence initiation (teachers were not assessed after age 14). Youths reported not only on whether they had hit a teacher or picked a fight but also on whether they had hit someone with the intent to hurt the person, used a weapon or force to get money, or hit a parent. A full listing of items used to define age of violence initiation in this study is available from the first author.

Because our interest was in comparing childhood and adolescent initiators, youths who did not initiate violence by age 16 ($n = 172$) were dropped from analyses for this study. Thus, analyses were based on 635 of the original 808 SSDP participants. Of those 635 youths, 315 were classified as childhood initiators and 320 were classified as adolescent initiators of violence.

TREATMENT OF MISSING DATA

Missing data in longitudinal research are common (Graham et al. 1997). Over the course of a multiwave study, responses may be lost due in part to high sample attrition. In the SSDP, very few participants were lost from the study, as previously noted. Nevertheless, we took steps to minimize biases in parameter estimation that can result from missing data.

In this study, we used the AMOS program (Arbuckle 1995) for handling missing data. The AMOS program relies on a raw maximum-likelihood procedure to address missing data problems in structural equation modeling. Unbiased parameter estimates and reasonable standard errors are obtained using the missing data feature in AMOS. However, the current version of AMOS does not calculate goodness-of-fit indices when data are missing. Thus, to obtain fit statistics, data were run first through the EMCOV.EXE program (Graham, Hofer, and Piccinin 1994), which also uses a maximum-likelihood procedure to estimate missing data and generate a conditioned

covariance matrix. The original sample size of 808 was provided to AMOS to derive conservative fit statistics.

MULTIPLE-GROUP STRUCTURAL EQUATION MODEL APPROACH

A multiple-group structural equation modeling approach was used to compare social developmental mechanisms predictive of violence at age 18 for childhood and adolescent initiators of violence. This involved several analysis steps in which models based on SDM constructs were tested for equivalence across the two groups. These steps were sequential in that model comparisons became more detailed as the analysis progressed. First, a confirmatory factor analysis was run to examine whether factor loadings and factor intercorrelations in the SDM were similar for the two groups. Next, an unconstrained multiple-group structural equation model was run to assess consistency in the directional relationships among SDM constructs for the two groups. Finally, a constrained multiple-group structural equation model was run in which factor loadings and path coefficients were set to be equal for the early and adolescent initiator groups. The final model assessed consistency in the form of the SDM and also strength of predictor relationships.

In both the unconstrained and constrained models, gender and race were controlled. This was done to account for differences across groups in the prevalence of violence at age 18. A single dummy variable was used to represent gender; three dummy variables were used to represent race (African Americans, Asian Americans, and "others" were compared separately with European Americans).

Overall model fit in each case was assessed by examining the Nonnormed Fit Index (NNFI) (see Bentler 1993), also known as the Tucker-Lewis Index (Tucker and Lewis 1973), and the Comparative Fit Index (CFI) (see Bentler 1990), which indicate an adequate fit with values around .90 or greater (Newcomb 1990, 1994). The residual mean square error of approximation (RMSEA) also was used. RMSEA values around .05 or less indicate a close model fit (Browne and Cudeck 1993). Significant reductions or improvements in model fit were assessed with chi-square tests.

RESULTS

Measurement Model

As a beginning step, a multiple-group confirmatory factor analysis was run to examine factor loadings and factor intercorrelations among SDM constructs for the two groups (childhood and adolescent initiators). All factor

loadings were allowed to vary freely, and factor variances were constrained at 1.00 to identify the metric of the construct. All factor intercorrelations were freed; four pairs of indicator error terms were allowed to correlate freely to account for parallel items contained in the corresponding indicators.

The measurement model fit the data well for both groups: $\chi^2 = 1147.05$, $df = 936$, NNFI = .94, CFI = .95, and RMSEA = .03. All factor loadings were significant and in the expected direction (see Table 2). Factor intercorrelations also were in the expected direction for the two groups (see Table 3). As shown, prosocial constructs were positively correlated, as were antisocial constructs. Antisocial and prosocial constructs were negatively correlated. Correlations, means, and standard deviations for all measured variables are available from the first author.

Unconstrained Multiple-Group Structural Equation Model

This model examined the extent to which the structural relationships among SDM constructs were similar for the childhood initiator and adolescent initiator groups. As noted above, we controlled for gender and race in this model; paths from the one gender dummy variable and from the three race variables to the violence outcome measure were included. No constraints on parameters in the model were imposed. The path to the first indicator of each latent construct was fixed at 1.00 to identify the metric of the construct. The variances of all error and disturbance terms were freed. Covariances between the prosocial opportunities factor and the skills for interaction factor, as well as between the antisocial opportunities factor with the skills for interaction factor, were fixed at 0 for consistency with the SDM. In addition, four pairs of indicator error terms were allowed to covary to account for parallel items in the prosocial and antisocial indicators. Three pairs of disturbance terms for corresponding prosocial and antisocial factors also were allowed to covary to account for conceptual correspondence between the constructs (e.g., prosocial involvement with antisocial involvement). This model fit the data adequately, $\chi^2 (1252) = 2507.77$, NNFI = .88, CFI = .89, RMSEA = .04 (90 percent confidence interval [CI] = .038 to .042).

Constrained Multiple-Group Structural Equation Model

Having found that the structural form of the SDM was similar for childhood and adolescent initiators, we then constrained factor loadings and path coefficients to be the same for the two groups. This model (see Figure 2) also fit the data adequately, $\chi^2 (1296) = 2560.136$, NNFI = .88, CFI = .89, and RMSEA = .04 (90 percent CI = .037 to .042). The change in chi-square from the first unconstrained model was not significant, $\Delta\chi^2 (40) = 52.366, p > .05$,

TABLE 2: Factor Loadings and Z-Statistics for the Measurement Models of the Childhood Initiator and Adolescent Initiator Groups

Measures	Childhood Initiator		Adolescent Initiator	
	Factor Loading	Z- Statistic	Factor Loading	Z- Statistic
Prosocial opportunities	1.00	(r)	1.00	(r)
	.92	(9.11)	.69	(9.38)
	.69	(6.58)	.53	(6.85)
Antisocial opportunities	1.00	(r)	1.00	(r)
	.90	(12.26)	.88	(12.50)
	1.16	(12.80)	1.04	(11.83)
Prosocial involvement	1.00	(r)	1.00	(r)
	.48	(5.77)	.57	(8.33)
	.64	(7.27)	.61	(8.67)
Antisocial involvement	1.00	(r)	1.00	(r)
	.48	(5.20)	.64	(7.19)
	1.37	(10.55)	.98	(9.32)
Skills for interaction	1.00	(r)	1.00	(r)
	.78	(8.88)	.90	(8.61)
	.59	(7.40)	.91	(8.91)
Prosocial rewards	1.00	(r)	1.00	(r)
	1.10	(17.13)	1.11	(19.89)
	.82	(12.92)	.85	(15.69)
Antisocial rewards	1.00	(r)	1.00	(r)
	1.34	(8.71)	.89	(9.61)
	1.56	(9.48)	1.02	(11.24)
Prosocial bonding	1.00	(r)	1.00	(r)
	1.08	(16.52)	1.08	(20.86)
	1.01	(15.01)	.93	(17.98)
Antisocial bonding	1.00	(r)	1.00	(r)
	1.06	(34.23)	1.06	(39.99)
	1.05	(33.57)	1.06	(39.76)
Belief in the moral order	1.00	(r)	1.00	(r)
	.82	(13.71)	.91	(16.30)
	1.06	(16.12)	1.08	(18.44)
Violence at age 18	1.00	(r)	1.00	(r)
	1.12	(12.12)	.80	(10.99)
	.83	(9.72)	.58	(8.18)
	.79	(9.14)	.60	(9.80)

NOTE: (r) = reference indicator with unstandardized loading fixed at 1 to identify the metric of the factor. All factor loadings are significant at $p < .001$.

indicating that the overall fit of the model was not impaired by the constraints imposed.

As shown in Figure 2, with the exception of paths from the antisocial bonding factor to belief in the moral order factor, as well as from the antisocial bonding factor to the violence outcome measure—which were nonsignificant—

TABLE 3: Factor Intercorrelations

Factor	Opp+ 1	Opp– 2	Inv+ 3	Inv– 4	Skill+ 5	Rew+ 6	Rew– 7	Bon+ 8	Bon– 9	Belief+ 10	Vio-18 11
1. Prosocial opportunities		-.21**	.72***	-.25**	.40***	.79***	-.40***	.18*	-.01	.25**	-.12
2. Antisocial opportunities	-.32***		-.23**	.74***	-.45***	-.38***	.54***	-.35***	.32***	-.21**	.22**
3. Prosocial involvement	.65***	-.39***		-.29***	.48***	.64***	-.41***	.30***	-.09	.29***	-.09
4. Antisocial involvement	-.07	.72***	-.39***		-.57***	-.46***	.55***	-.32***	.35***	-.32***	.38***
5. Skills for interaction	.41***	-.59***	.50***	-.57***		.51***	-.68***	.29***	-.22**	.45***	-.12
6. Prosocial rewards	.70***	-.62***	.77***	-.50***	.54***		-.55***	.31***	-.18**	.39***	-.22**
7. Antisocial rewards	-.45***	.60***	-.44***	.50***	-.70***	-.62***		-.25***	.21**	-.40***	.20**
8. Prosocial bonding	.37***	-.40***	.38***	-.36***	.38***	.47***	-.36***		-.51***	.56***	-.22**
9. Antisocial bonding	-.10	.34***	-.17**	.36***	-.29***	-.26**	.29***	-.63***		-.33***	.10
10. Belief in the moral order	.31***	-.30***	.28***	-.24**	.43***	.35**	-.47***	.57***	-.43***		-.29***
11. Violence at age 18	-.07	.35***	-.05	.29***	-.27***	-.19**	.30***	-.21**	.18**	-.29***	

NOTE: Upper diagonal is for the childhood initiator group, and lower diagonal is for the adolescent initiator group.
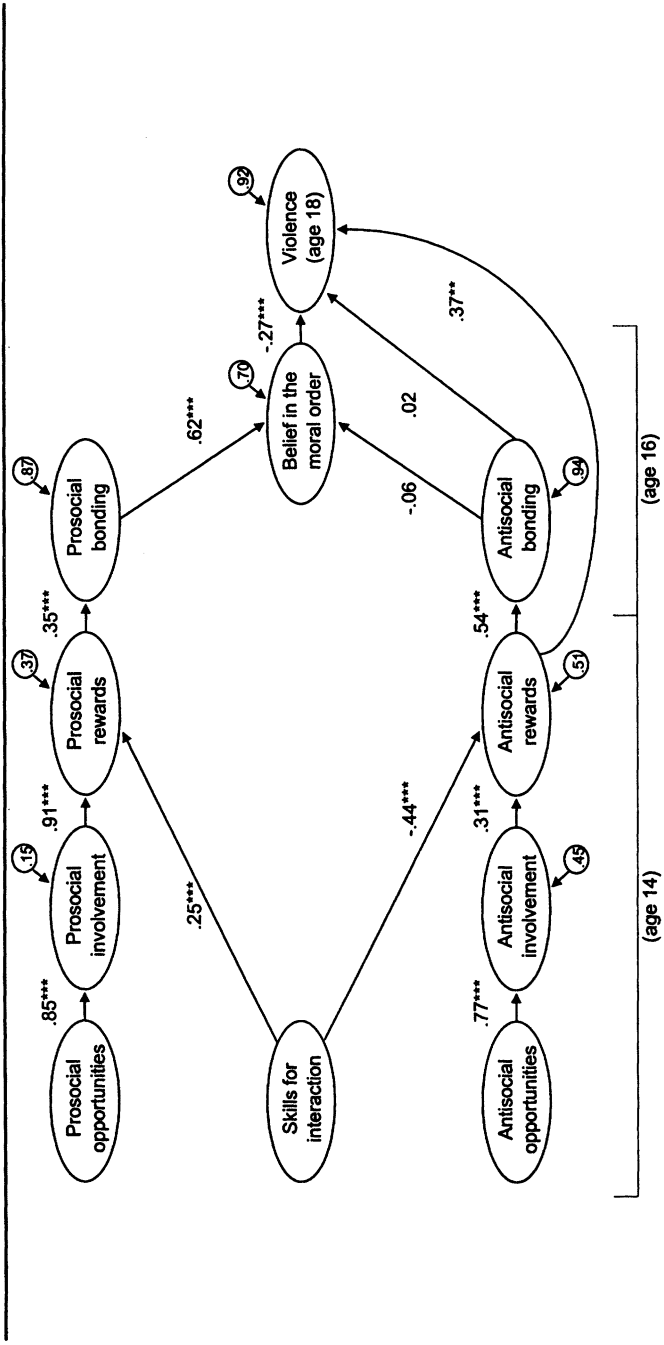*p < .05. ** p < .01. *** p < .001.

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Figure 2: Constrained Multiple-Group Structural Equation Model

NOTE: χ^2 = 2560; *df* = 1296; Nonnormed Fit Index = .88; Comparative Fit Index = .89; residual mean square error of approximation = .04.

all paths in the portion of the SDM tested here were strong and in the direction specified by the model's hypotheses. On both the prosocial and antisocial paths, opportunities for involvement in activities and interactions with others predicted youths' degree of involvement and interaction in those activities and interactions at age 14. Degree of involvement, in turn, predicted perceived rewards (reinforcement), which predicted bonding to prosocial or antisocial others at age 16. Skills for interaction were positively associated with prosocial rewards at age 14 and negatively associated with antisocial rewards at that age. Having prosocial bonds at age 16 was associated with having more positive beliefs at age 16 and lower involvement in violence at age 18.

On the antisocial path, rewards coming from involvement in activities with antisocial others at age 16 predicted higher involvement in violence at age 18, whereas rewards did not predict bonding to antisocial others. As previously noted, bonding to antisocial others at age 16 was not predictive of violence at age 18. The direct path from antisocial rewards to later violence suggests that the likelihood of violence among youths in adolescence may depend less on the strength of relationship ties to other antisocial youths and adults than it does on youths' expectation that their peers would approve of antisocial behavior and on whether antisocial behavior would be noticed and punished by parents or other adults. Further discussion of this finding as it pertains to theory and intervention is less relevant to this particular study. However, it is important to note that this finding applies to both early and later initiators of violence.

In sum, the final constrained multiple-group structural equation model showed that factor loadings and structural paths in the SDM are similar in magnitude and direction for the childhood and adolescent initiator groups. No meaningful etiological differences between the two groups during adolescence were found.

DISCUSSION

This study examined the extent to which childhood and adolescent initiators of violence follow similar socialization pathways in adolescence leading to violence at age 18. Significant etiological differences between the two groups were not found; SDM constructs predicted later violence for childhood and adolescent initiators in a similar fashion. This finding has important implications for theory and for the design of preventive intervention programs.

Moffitt's (1993) theory of life course persistent offending suggests that the etiology of later violence should differ for early and later initiators of violence. Results from this study do not support that hypothesis. Instead, the structural model results suggest that youths with early and later ages of initiation follow similar developmental pathways during adolescence to violent behavior at age 18. Thus, it appears that violence in adolescence among childhood initiators of violence is no less attributable to proximal social influences on behavior than is violence in adolescence among later initiators.

The social development model (Catalano and Hawkins 1996) hypothesizes that youth violence emerges through a process of socialization that begins in childhood and extends through adolescence. Engaging in violent behavior in elementary school increases risk for violence in adolescence. From this standpoint, the SDM and Moffitt's (1993) theory are consistent. However, the SDM also hypothesizes that the continuation of violence across developmental periods occurs not because youths are predisposed to violence but because they encounter social influences that reinforce antisocial behavior. This implies that foci for intervention programs that seek to reduce violence are available well into adolescence for youths who have engaged in antisocial behavior from an early age. The findings of this study suggest that during adolescence, the same interventions may be used to reduce violence among adolescent initiators and childhood initiators of violence.

According to the SDM, efforts to curtail violence in adolescence should seek to enhance youths' skills for prosocial interactions, increase opportunities for involvement in prosocial activities, and reward involvement in those activities to strengthen prosocial bonds (Catalano and Hawkins 1996). Simultaneously, attention should focus on limiting opportunities for youths to engage in antisocial activities and to interact with antisocial peers.

Skill enhancement training with parents and with adolescents themselves is important in the control of violence. With parents, efforts should seek to improve the use of age-appropriate discipline strategies and monitoring (Brewer et al. 1995; Dishion, Patterson, and Kavanagh 1992; Patterson, DeBaryshe, and Ramsey 1989; Snyder, Dishion, and Patterson 1986). With youths, efforts should seek to strengthen social interaction and problem-solving skills to increase resistance to negative peer influences. Youths also can be taught skills to handle interpersonal conflict without turning to violence (Brewer et al. 1995; Wasserman and Miller 1998). Intervention studies have shown that these skill-building approaches can reduce risk for serious violent offending among youths with a history of violent behavior (Brewer et al. 1995; Henggeler et al. 1996; Henggeler, Melton, and Smith 1992; Wasserman and Miller 1998).

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