

Self-Control and Social Bonds: A Combined Control Perspective on Juvenile Offending

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With longitudinal data from a sample of 359 adolescent offenders, we tested three measures of social bonding (conventional moral belief, attachment, and commitment/involvement) and deviant peer association as outcomes of low self-control and as mediators of the effect of low self-control on juvenile offending. Low self-control was negatively related to each bonding measure, positively related to deviant peer association, and positively related to offending at follow-up. Its effect on offending was fully mediated by conventional moral belief and attachment. These results provide modest support for a combination of self-control and social bonding perspectives on juvenile offending.

KEY WORDS: self-control; social bonds; juvenile offending.

1. INTRODUCTION

In the general theory of crime (Gottfredson and Hirschi, 1990), propensity to engage in criminal conduct is mainly a function of a person's level of self-control. This theory contrasts sharply with Hirschi's earlier work in which crime is viewed as an outcome of weak social bonds such as poor attachment to others and low involvement in conventional activities (Hirschi, 1969). It is not yet clear whether or how these two control perspectives might be reconciled. One possibility, explored in this study, is that social bonds mediate the relationship between self-control and juvenile offending. It has also been suggested that association with deviant peers may mediate the influence of social bonds on crime (Krohn *et al.*, 1983; Marcos *et al.*, 1986). That is, people whose peers expose them

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to and reinforce criminal conduct and values are more likely both to engage in crime themselves and to have weak bonds to conventional peers (Akers, 1994). In addition, association with deviant peers may be characteristic of people with low self-control and may help to explain the effect of low self-control on crime (Gibson and Wright, 2001; Winfree and Bernat, 1998).

Theory integration can help to resolve disparate conceptual approaches in the field of criminology (Baron, 2003; Bernard and Snipes, 1996; Messner *et al.*, 1989). Through identification of dominant themes, premises, hypotheses, and findings common across different disciplines or causal propositions, theory integration may lead to an “intellectual account” (Tittle, 2000) that offers more conceptual richness and greater predictive power than any one theory individually. For reasons explained below, we believe that the self-control and social bonding perspectives might be combined into one explanatory model in which social bonds and deviant peer association are treated as processes through which low self-control exerts some of its influence on deviance. Using longitudinal data from a sample of 359 juveniles, we examined relationships between self-control, social bonds, deviant peer association, and degree of involvement in offending while under juvenile justice supervision. We also tested the degree to which social bonds and deviant peers mediate the relationship between self-control and juvenile offending.

2. BACKGROUND

Gottfredson and Hirschi (1990, p. 87) have defined self-control as the degree to which a person is “vulnerable to the temptations of the moment.” They view low self-control as a behavior pattern arising from ineffective socialization early in life. This pattern, once established, is said to be quite stable and is viewed as the primary individual-level factor explaining crime, delinquency, drug/alcohol abuse, and other forms of deviance. Several studies have found the expected relationship between low self-control and adult offending (Evans *et al.*, 1997; Grasmick *et al.*, 1993; Longshore, 1998; Longshore and Turner, 1998; Longshore *et al.*, 1996), juvenile delinquency (Polakowski, 1994; Wood, *et al.*, 1993), and other “imprudent behavior” by adults and youth (Arneklev *et al.*, 1993; Evans *et al.*, 1997; Grasmick *et al.*, 1993; Wood *et al.*, 1993).

A theory featuring self-control as the central explanatory factor for individual differences in deviant conduct departs from Hirschi’s social bonding theory, perhaps the pre-eminent control perspective in criminology (Akers, 1994). In that theory, crime is an outcome of weak conventional social bonds including low emotional attachment to others, low involvement

in conventional activities, lack of commitment to a conventional lifestyle, and low endorsement of conventional moral beliefs (Hirschi, 1969). Several studies have verified the hypothesized relationships between at least some social bonding measures on the one hand and deviant conduct by adults and juveniles on the other (Agnew, 1993; Akers and Cochran, 1985; Cernkovich and Giordano, 1992; Krohn and Massey, 1980; Krohn *et al.*, 1983). However, findings are inconsistent regarding the strength of these relationships. In some research, social bonds are related more strongly to minor crime such as petty larceny than to more serious misconduct such as theft, assault, and robbery (Agnew, 1985). Other research has suggested the opposite (Krohn *et al.*, 1983; see also Evans *et al.*, 1997; Tittle, 1995) or found no consistent pattern (Mak, 1990).

In addition, Hirschi's original formulation of social bonding theory did not fully explore possible complexities in attachment and parental and peer influences. His hypothesis was that attachment *per se* promotes conformity. As summarized by Akers (1994, p. 117), "it is the fact of attachment to other people, not the character of the people to whom one is attached, that determines adherence to or violation of conventional rules." That hypothesis has been called into question by research indicating that attachment to peers is conducive to conformity only when peers are law-abiding (Akers, 1994; Matsueda and Anderson, 1998). Some studies address this problem by distinguishing between bonds to conventional others and bonds to deviant others. Crime and delinquency are less common among persons with close ties to law-abiding parents and peers; more common when close ties exist to nonconforming others (e.g., Conger, 1976; Elliott *et al.*, 1985). Other studies have dealt with peer influences by treating them as a potential mediator of the influence of social bonds. For example, Marcos *et al.*, (1986) and Massey and Krohn (1986) found that association with deviant peers partially explained the effects of social bonds on adolescent smoking and drug use (see also Burkett and Warren, 1987; Hirschi, 1969). In Agnew (1993), the relationship between social bonds and delinquency was mediated by deviant peer association. In short, an adequate test of the causal importance of social bonds requires recognition of the possibility that association with deviant others may explain the relationship between social bonds and offending.

In their 1990 book introducing the general theory of crime, Gottfredson and Hirschi advanced the argument that the link between weak social bonding and deviance may be spurious inasmuch as both are products of the same causal factor, namely low self-control. Their argument implies that nothing of theoretical importance is likely to be gained in research testing an integrated model of self-control and social bonding. However, Akers (1994) has emphasized the need to explicate the conceptual linkages, if any,

between self-control and social bonding. Other criminologists make the same point (Andrews and Bonta, 1994; Cohen and Vila, 1996). One possible link, cited by Hirschi and Gottfredson themselves (1995, p. 140), is that weak social bonds are “to some large degree products of low self-control.” That is, low self-control, as a cognitive and behavioral pattern established early in life, may have negative effects on the development of social bonds later in life. The child with low self-control may find it difficult to form and maintain stable friendships, may be more likely to associate with others who lack self-control and who are similarly deviant, may do less well in school, and may devalue conventional goals and conduct norms (Evans *et al.*, 1997; Gottfredson and Hirschi, 1990; Hirschi, 1996; Nagin and Paternoster, 1994; Oetting *et al.*, 1998). Wright *et al.* (2001) found that delinquent peer association promoted offending most strongly among those with low self-control (i.e., a social amplification effect). In addition, others may be reluctant to attach to a person with low self-control because that person may be less stable and reliable as a friend, employee, or spouse and may neglect the reciprocity expected in conventional relationships (Evans *et al.*, 1997; Gottfredson and Hirschi, 1990; Hirschi, 1996; Nagin and Paternoster, 1994). The importance of exploring the causal link between self-control and social bonds is underscored by the fact that self-control, as a trait established early in life, exerts any influence on serious offending quite distally, i.e., over a span of years. Some of that influence may be direct, reflecting an enduring propensity for deviant conduct, but it remains important to see whether any part of its influence might be exerted through causal processes involving more proximal factors.

The foregoing implies an integration of self-control and social bonding perspectives in which the relationship between low self-control and deviance is mediated at least partially by one or more social bonds. Tests of that possibility may add depth to our conceptual understanding of deviance and could help to specify the causal chain linking self-control and deviance. Although there is little empirical work on this possibility, one explicit test of such a model has been conducted. With longitudinal data from a sample of adult male criminal offenders, Longshore *et al.* (2004) tested four aspects of social bonding (attachment, involvement, commitment, and moral belief) and association with deviant peers as outcomes of low self-control and as mediators of the relationship between low self-control and drug use. Low self-control was negatively related to all four social bonds and positively related to both drug use and association with deviant peers. Moreover, the relationship between low self-control and drug use was explained by moral belief and association with deviant peers.

Wright *et al.* (1999), using cohort data from the Dunedin Multidisciplinary Health and Development Study (see Silva and Stanton, 1996),

found that low self-control in childhood predicted weak social bonds and greater criminal involvement later in life. The authors also found that both social bonding and adolescent delinquency predicted adult offending, and the effect of self-control on offending was largely mediated by social bonds. Analyses of Kentucky Youth Survey data found that the effect of self-control (or “constraint”) on drug use in adolescents was explained by school attachment (Jones *et al.*, 2002). Evans *et al.* (1997) also support an integrative view of self-control and social bonding. In a sample drawn from the general population of a midwestern city, self-control was lower among people with poor attachment to others, low involvement with others, weak “attachment to church” (interpretable as a measure of commitment), and strong endorsement of “internal criminal values” (interpretable as weak endorsement of conventional moral belief). When regressed on low self-control plus these bonding factors and number of criminal friends, offending was independently associated with low self-control, the moral belief factor, and criminal friends. This finding suggests, but does not directly demonstrate, that the relationship between low self-control and offending may have been mediated partially by at least one bonding factor (moral belief) and by deviant peer association. However, the study was cross-sectional—as has usually been true in research on social bonding (Kempf, 1993); low self-control and social bonds were not tested as predictors of offending occurring subsequently. Moreover, these findings were based on a general population sample in which criminal involvement was not extensive. Evans *et al.* argued that bonding factors might have emerged as stronger correlates of offending if the sample had been more deeply involved in crime. In addition, because the sample was composed entirely of adults, the study offers no insight into the possible mediating role of social bonds in juvenile offending.

The analysis reported here is based on longitudinal data from a sample of juveniles with extensive prior involvement in deviant conduct. We examined relationships between low self-control, social bonds, deviant peers, and involvement in offending. We also tested social bonds and deviant peers as mediators of the relationship between low self-control and offending. Deviant peer association was included because the effect of social bonds on offending may be mediated partly by peer influences (Conger, 1976; Evans *et al.*, 1997; Longshore *et al.*, 2004; Marcos *et al.*, 1986; Massey and Krohn, 1986). Deviant peers may therefore have a role to play in a combined control perspective; it may help to explain the effect of low self-control, social bonds, or both. Measures of self-control, social bonds, deviant peer association, and prior offending were collected in a baseline interview. Subsequent offending was measured in a follow-up interview 6 months later.

3. METHOD

3.1. Sample

The paper is based on data collected between 1991 and 1995 for an evaluation of five Treatment Alternatives to Street Offending (TASC) programs, one of which served adolescent offenders in a southeastern U.S. city. TASC programs assess the drug treatment needs of offenders, refer offenders to drug treatment or drug education as needed, and monitor their status. Treatment may be in lieu of, or an adjunct to, routine probation. Offenders who participated in the evaluation completed a baseline interview and, six months later, a follow-up interview. Evaluation results are reported in Anglin *et al.* (1999), Longshore, *et al.* (1998), and Turner and Longshore (1998).

Data required for this analysis were complete for a sample of 359 adolescents, of whom 257 were males (74%) and 92 were females (26%). The racial/ethnic breakdown was 55% African Americans; 32% non-Hispanic Whites; and 13% others, mostly Hispanics. Ages ranged from 12 to 18 (mean = 16.0). Most cases had extensive histories of delinquency. Almost two-thirds (62%) had at least two prior felony convictions, and two-thirds (66%) were 14 years or younger when first arrested. Most (87%) had been incarcerated at least once. Cases with complete data did not differ with respect to age, sex, or scores on the self-control measure. African Americans were more likely, and non-Hispanic Whites less likely, to have complete data. We adjusted for race/ethnicity as well as age and sex by a procedure described below.

3.2. Measures

Items intended to capture the constructs of interest were factor analyzed in SAS by means of maximum likelihood estimation and direct quartimin rotation. Items that formed reliable and distinct factors corresponding to the intended constructs were retained in confirmatory factor analyses and employed as factor indicators in subsequent analyses. Factor loadings from the confirmatory factor analysis are shown in Table I.

3.2.1. Low Self-Control

Low self-control was measured with three multi-item indicators: impulsivity, based on four self-report items (e.g., “you act on the spur of the moment without stopping to think”); risk seeking, based on four self-report items (e.g., “you will take a risk just for the fun of it”); and volatile temper, based on four self-report items (e.g., “you lose your temper pretty easily”). Response options were: never, rarely, sometimes, often, and almost always.

Table I. Confirmatory Factor Analysis

Factor	Standardized factor loadings
Low self -control	
Impulsivity	0.45
Risk seeking	0.48
Volatile temper	0.49
Attachment	
Fighting	0.69
Complaining	0.83
Boredom	0.42
Beliefs	
Things called offending don't hurt	0.28
Okay to sneak into game/movie	0.61
Okay to sell alcohol to minors	0.69
Commitment/involvement	
Like school	0.69
Grades important	0.64
School aspirations	0.34
Deviant peers	
Friends like to drink	0.75
Friends use drugs	0.75
Friends cause trouble	0.58
Friends do things against law	0.76
Friends get into fights	0.51
Prior offending	
Number of property offenses (# logged)	0.75
Number of personal offenses (# logged)	0.66
Follow-up offending	
Number of property offenses (# logged)	0.81
Number of personal offenses (# logged)	0.41

When necessary, item scores were reversed so that higher values represent lower self-control ($\alpha = 0.54$). Evidence on the psychometric properties of this self-control measure has been reported by Longshore *et al.* (1996).

Some research has found distinctive relationships between deviant conduct and self-control subfactors including risk seeking, impulsivity, and volatile temper (Arneklev *et al.*, 1993; Longshore *et al.*, 1996). However, self-control can defensibly be analyzed as a unidimensional construct (Arneklev *et al.*, 1993; Evans *et al.*, 1997; Grasmick *et al.*, 1993; Piquero and Rosay, 1998), and a unitary measure of self-control is appropriate in an analysis testing hypotheses derived from a theory in which self-control is viewed as a unitary construct (Nagin and Paternoster, 1993).

3.2.2. Attachment

Attachment was measured by three items regarding negative affect experienced "when you are around other members of your family." Items

ask how often these occur: (1) "fighting or loud arguments," (2) "complaining about one another," and (3) "boredom." Response options were: never, sometimes, about half the time, usually, and always. Scores were reversed so that higher values indicate stronger attachment ($\alpha=0.51$).

3.2.3. *Commitment/Involvement*

Commitment is conceptualized as stake in conformity or devotion to conventional lines of action (Nagin and Paternoster, 1994). Typically it is measured on the basis of educational or job aspirations, subjective importance of job or schooling, and/or religiosity (Akers, 1994). Involvement, the temporal aspect of bonding, is often measured on the basis of time spent on homework, at a conventional job, at religious services, or in conventional extracurricular activities. There is considerable conceptual overlap between these two aspects of social bonding; thus, they are difficult to separate empirically (Conger, 1976; Hirschi, 1969; Kempf, 1993; Krohn *et al.*, 1983; Massey and Krohn, 1986). Following Krohn *et al.* (1983), we combined commitment and involvement into a single measure. Because the sample was composed of juveniles, we used three school-related indicators: liking for school (options ranged from "dislike a lot" to "like a lot"), importance of getting good grades ("very unimportant" to "very important"), and educational aspirations (ranging from no interest in more schooling to an interest in earning a college degree). Higher values indicate greater commitment/involvement ($\alpha=0.56$).

3.2.4. *Conventional Moral Belief*

This bond represents adherence to a general belief that the rules of conventional society are binding. Our belief measure was based on endorsement of four items: (1) "many things called offending do not really hurt anyone;" (2) "when parents set down a rule, children should obey;" (3) "it is okay to sneak into a ballgame or movie without paying;" and (4) "even though it is against the law, it is okay to sell alcohol to minors." These items were employed in Marcos *et al.* (1986) and Massey and Krohn (1986). Response options were: strongly disagree, disagree, undecided, agree, and strongly agree. Scoring was reversed when necessary so that higher values represent stronger endorsement of conventional moral belief ($\alpha=0.52$).

3.2.5. *Deviant Peer Association*

To measure the deviant peer factor, we used five indicators: (1) "how many of your friends like to drink," (2) "how many of your friends use illegal drugs," (3) "how many of your friends like to do things against the

law,” (4) “how many of your friends get into arguments or fights,” and (5) “how many of your friends like to cause trouble.” Response options were: none, some, about half, most, or all. Higher values indicate more deviant peer association ($\alpha = 0.81$). Notably, this measure of deviant peer association is not based on a simple count of deviant peers. By measuring deviant peer association as a (non-numerical) proportion of deviant friends to total friends, we accounted for the fact that social networks can include conventional as well as deviant friends in varying proportions and that ties to deviant friends may not contribute to misconduct if such ties are outweighed by conventional ones (Marcos *et al.*, 1986).

3.2.6. Offending

At baseline and follow-up, juveniles were asked to estimate how many of eleven types of offenses they had committed in the prior six months. Interviewers inquired about these offenses by use of common-sense phrases such as “committed or attempted sex by force” (rape) and “broke into a house, building, or car in order to take something” (burglary). This procedure has successfully been used in other self-report studies of offending (see Anglin *et al.*, 1999; Marquis, 1981). Property offenses included arson, burglary, theft, motor vehicle theft, forgery, and larceny. About 27% of the sample reported committing a property offense at least once in the past 6 months. Personal offenses included rape, homicide, assault, robbery of a business, and robbery of a person. At follow-up, about 41% reported at least one personal offense in the past 6 months. The number of property offenses (log transformed) and number of personal offenses (log transformed) served as indicators of the offending factor ($\alpha = 0.58$). We used log transformations to reduce skewness in the distribution of scores for these indicators.

3.3. Analysis

Given our purposes, we wished to focus on predictors drawn from the two control perspectives. Thus, before proceeding with causal modeling, we adjusted for four other variables that might have influenced juvenile offending: age, sex, race/ethnicity, and group assignment (TASC or not). Although TASC assignment was not associated with reductions in offending at the juvenile TASC program (see Anglin *et al.*, 1999), juveniles sent to TASC did receive more services than those simply placed on probation. In addition, despite the lack of significant differences in offending outcomes between TASC and non-TASC cases, it remains possible that TASC juveniles might have been somewhat more likely to underreport offending

because of fear of further sanction or study demand characteristics. We partialled age, sex, race/ethnicity, and TASC participation from the dataset in order to remove their influence from the entire system of theory-relevant variables, as in Newcomb and Bentler (1988) and Longshore *et al.* (2004). It was necessary to partial out these influences rather than include them directly in the model because of the large size and complexity of the model. Partialing out these variables assured that the findings are not distorted by linear effects of these demographic differences. This was done by regressing each theory-relevant variable on age, sex, race and TASC participation as predictors, subtracting the predicted value from each variable to calculate the residual, and adding the mean value of each variable to the residual. Age, sex, and race/ethnicity were self-reported. TASC participation was measured as a design variable (TASC = 1).

Using the two-step approach recommended by Anderson and Gerbing (1988) and the Mplus statistical modeling program (Muthen and Muthen, 1998), we used confirmatory factor analysis to test the adequacy of the proposed measurement model and relationships among the latent factors. Each hypothesized factor predicted its proposed indicators, and factors were allowed to intercorrelate (Tabachnick and Fidell, 2001). Next we tested a structural equation model in which (1) low self-control predicted attachment, commitment/involvement, and belief, (2) the four preceding factors predicted deviant peer association, and (3) all five factors predicted offending. We also controlled for prior offending by allowing baseline offending to predict follow-up offending. We did not allow correlated error between predictors. Paths were dropped from the initial model if they were not significant.

The closeness of our hypothetical model to the empirical data was evaluated through goodness-of-fit indexes, one of which is the χ^2 /degrees of freedom ratio. A χ^2 value no more than twice the degrees of freedom in the model generally indicates a plausible, well-fitting model inasmuch as large sample sizes make it difficult to obtain nonsignificant χ -squares. In addition, the Comparative Fit Index (CFI), which ranges from 0 to 1, indicates the improvement in fit of the hypothesized model compared to a model of complete independence among the measured variables (Bentler, 1995). Values of 0.9 and higher are desirable and indicate that at least 90% of the covariation in the data was reproduced by the hypothesized model (Bentler and Stein, 1992). Inasmuch as multivariate kurtosis was large (normalized Mardia's coefficient = 11.85), we relied on the Satorra-Bentler χ^2 and Robust CFI as appropriate fit statistics, taking nonnormality into account (Bentler and Dudgeon, 1996; Byrne, 1994; Tabachnick and Fidell, 2001).

Our measures of low self-control, social bonds, and deviant peer association were coterminous. The follow-up offending measure was based

on subsequent behavior, and prior offending was controlled in the model. Thus, the temporal order is clear from predictors to outcome measures but not among the predictors themselves. We do not see the latter as a major problem. In the general theory of crime, self-control is said to be established early in life and to remain stable thereafter (Gottfredson and Hirschi, 1990). In his analysis of data from the Cambridge delinquent development study, Polakowski (1994) found that self-control had indeed remained “moderately stable” across a 4-year span; see also Arneklev *et al.* (1996) and Moffitt *et al.* (1995). Thus it is logical to use a self-control measure reflecting one’s current status as an exogenous factor in an analysis in which the endogenous factors, social bonds and deviant peers, are based on data also reflecting current status.

4. RESULTS

First we examined bivariate relationships between low self-control and other factors to be included in the model. Results appear in Table II. Low self-control was strongly and inversely related to all three factors indicating strength of conventional social bonds. Juveniles with low self-control also reported a greater proportion of friends involved in deviance. Finally, offending was more common among juveniles scoring lower on self-control.

The three bonding factors and deviant peers were related to offending in the hypothesized direction. That is, conventional bonds were weaker, and deviant peer association greater, among juveniles who reported more offending.

Our next step was to test an explanatory model in which the path from low self-control to offending was mediated by attachment, commitment/involvement, conventional moral belief, and deviant peer association, while controlling for prior offending. The final model, with nonsignificant paths deleted, is shown in Fig. 1 (parameter estimates changed only slightly with removal of nonsignificant paths). Fit statistics for the model were

Table II. Correlation Matrix

	Mean	s.d.	1	2	3	4	5	6
1. Low self-control	22.35	6.37						
2. Commitment/involvement	8.01	2.76	-0.57					
3. Attachment	7.71	3.20	-0.28	0.14 ^{ns}				
4. Moral belief	11.01	2.08	-0.41	0.39	0.16 ^{ns}			
5. Deviant peers	7.45	5.11	0.43	-0.33	-0.28	-0.45		
6. Prior offending	1.68	1.90	0.48	-0.23	-0.21	-0.46	0.25	
7. Follow-up offending	1.09	1.56	0.27	-0.20	-0.23	-0.36	0.58	0.44

All correlations except those marked “ns” are significant, $p \leq 0.05$.

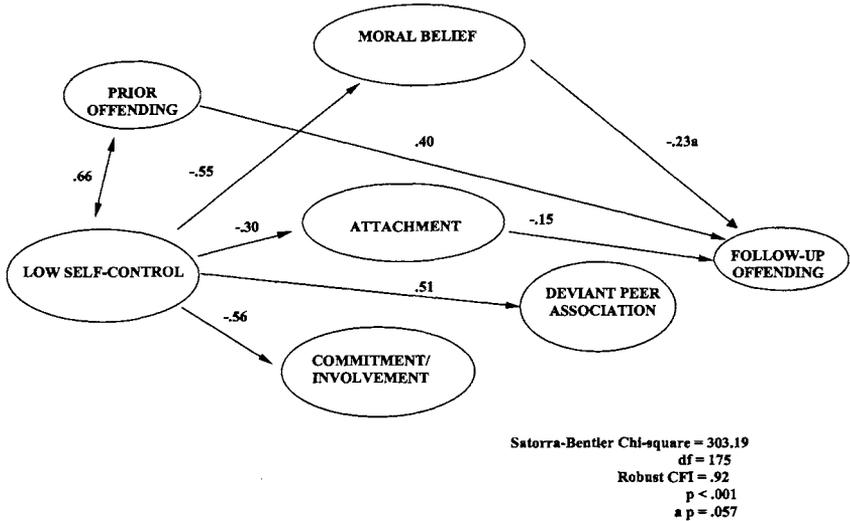


Fig. 1. Final path model.

highly favorable. The Robust CFI = 0.92; Satorra–Bentler χ^2 (df = 175, $n = 359$) = 303.19, $p = 0.001$. With control for prior offending, direct predictors of follow-up offending were attachment and conventional moral belief. The p -value for belief (0.057) fell just short of the usual criterion for statistical significance; we retained this bonding factor in the model for reasons discussed below. Low self-control had no direct effect on follow-up offending. Commitment/involvement and deviant peer association had no effect on follow-up offending. Thus the bivariate relationship between low self-control and offending was fully mediated by attachment and conventional moral belief. The model explained about 26% of the variance in offending.

To determine whether findings might have been affected by inclusion of the prior offending factor, we re-tested the model after deleting that factor (data not shown). Paths from low self-control to all three bonds and peer association were virtually unchanged. The path from attachment to follow-up offending was not significant in the re-tested model. However, while the path from conventional moral belief to follow-up offending had a weaker coefficient in our primary model, moral belief remained significantly related to follow-up offending and mediated the path from low self-control to follow-up offending in the model that excluded prior offending. Differences between models suggest that particular findings may depend how prior offending is handled. But the models are, in our view, consistent in

supporting an integrated model in which low self-control leads to weaker social bonding, which in turn partially mediates the effect of low self-control on offending. The primary model (i.e., the one in which prior offending is taken into account) has the advantage of focusing on the variability in offending that occurred during the follow-up period.

5. DISCUSSION

In the general theory of crime, the propensity to engage in criminal conduct is hypothesized to be mainly a function of individual differences in self-control. This hypothesis contrasts with Hirschi's earlier view that deviance results from weak social bonds (Hirschi, 1969). Using longitudinal data from a sample of juveniles with histories of involvement in serious delinquency, we explored the possibility that these two control perspectives might be combined by positing social bonds and deviant peer association as outcomes of low self-control and as mediators of the relationship between low self-control and offending.

Low self-control was related in the expected direction to the three bonding measures as well as deviant peer association. These results are consistent with a combined control perspective in which people with low self-control tend, as a result, to lack close emotional ties to conventional others, to invest less time and energy in conventional pursuits, to reject the view that prevailing moral values are binding, and to associate with others involved in deviant conduct (Evans *et al.*, 1997; Gottfredson and Hirschi, 1990; Hirschi, 1996; Nagin and Paternoster, 1994; Short, 1997).

Low self-control indirectly led to offending via an inverse effect on attachment and conventional moral belief. We included belief in the final model, despite its marginal *p*-value, for three reasons. First, it is the bond perhaps most commonly related to crime and delinquency in the existing literature (Kempf, 1993). (It is difficult to make this claim more strongly because prior research has not always tested a complete set of bonding factors and has measured each factor in divergent ways.) Thus, omission of the belief factor would have been inconsistent with both theory and prior research and might have led to misspecification of relationships involving other factors. Second, the path from low self-control to drug-related offending was fully mediated by belief in our analysis of offending in an adult male sample (Longshore *et al.*, 2004). Third, the difference between the *p*-value for belief (0.057) and the conventional criterion for significance (0.05) was trivial. Overall, these results are consistent with a combined control perspective inasmuch as social bonding, in the form of attachment and belief, appeared to mediate the effect of low self-control on follow-up offending.

6. IMPLICATIONS

The mean level of self-control may have been lower in this sample of juvenile offenders than in the general population of juveniles, and variability in the self-control and social bonding measures may have been more restricted in this sample than in the general juvenile population. Despite these unknowns, all of the bivariate relationships between self-control and social bonds were in the direction predicted by control theories and were statistically significant, as were all of the bivariate relationships between these predictors and offending. We therefore believe that the measures employed in this analysis were sound and useful for our purpose. Future research is needed to show whether the integrated model tested here is replicable in other delinquent samples and in general population samples and whether particular relationships and pathways found here are robust to analytic and measurement approaches.

We have argued that our results are consistent with a combined control perspective in two respects: low self-control predicted weaker social bonding; and two aspects of bonding, attachment and conventional moral belief, mediated the path from self-control to offending. These results are comparable to those based on a Kentucky youth survey in which the effect of self-control on drug use in adolescents was explained by attachment (Jones *et al.*, 2002).

However, our results were not entirely consistent with prior research modeling the effect of self-control on social bonds and adult offending. The study by Evans *et al.* (1997) suggested that the relationship between low self-control and adult offending was mediated only partially by belief and deviant peers; low self-control also had a direct path to offending. This divergence in findings may be explainable on the basis of work by Moffitt (1993), in which a crucial distinction is made between juveniles whose offending is time-limited and those among whom it persists into adulthood. Samples of juvenile offenders presumably include both types—those who will desist as they approach maturity and those who will continue to engage in offending as adults—whereas an adult sample of serious offenders is, by definition, dominated by the latter type. Thus it could be argued that the effect of low self-control on adult offending is partly direct, *i.e.*, not entirely mediated by bonding factors. The direct effect of low self-control, in this interpretation, can be said to reflect the person's enduring propensity to engage in offending—over and above any influence that low self-control has on social bonds. In contrast, a juvenile sample is likely to include many cases who do not have “an enduring propensity” and for whom offending during adolescence is primarily a function of weak social bonds (see Sampson and Laub, 1990).

In another departure from expectations based on control theory, commitment/involvement did not predict offending in the path model. It is possible that the nonsignificance of this bonding measure arose from measurement problems or is a fluke of the dataset. The commitment/involvement measure was based on negative affect regarding school-related indicators. Measures based on different indicators might have led to different results.

The nonsignificance of deviant peers in the path model was surprising. Deviant peer influences are typically a significant predictor of adult and juvenile offending (Akers, 1994). Moreover, in prior analyses of adult samples, deviant peer association partly mediated the relationship between low self-control and deviant conduct (Evans *et al.*, 1997; Longshore *et al.*, 2004). One possible explanation is a problem in the distribution of the deviant peer measure. Because our sample was composed entirely of juvenile offenders, that measure may have captured a narrower range in deviant peer association than would be found in a sample of juveniles drawn from the general population and, equally important, variability of the measure may have been restricted to the higher end of the distribution. We believe this explanation is unlikely. The mean score for deviant peer association was 7.45, indicating that respondents believed that more than half of their friends were engaged in deviant conduct. The standard deviation for the measure was 5.11. These statistics do not suggest a lack of usable variability or a serious range-restriction. Moreover, the deviant peer measure was correlated in the expected direction with low self-control, the three social bond factors, and offending. In other words, there was the expected association between deviant peer association and offending in bivariate terms. It was only when we tested deviant peers in a multivariate context that its predictive power was reduced to nonsignificance. Why would this have occurred? First, deviant peer association probably reflects self-selection to some degree. Its relationship to offending is therefore artifactual in part and would be expected to weaken when measures reflecting true causal processes are added to the analysis. Second, in differential association theory, the influence of deviant others is often measured as exposure and/or attachment to deviant peers as well as acquisition of deviant values as a result of those attachments (Baron, 2003; Foglia, 2000). The factors labeled attachment and moral belief in our analysis are surely picking up some of the influence of deviant peers. Accordingly, with these measures in the model, the relevance of mere exposure to deviant peers might be expected to fade. Third, our measure of deviant peer association did not pick up the closeness of association; deviant involvement among one's close friends may matter much more than deviance in one's wider circle (Urberg *et al.*, 2003). In short, while methodological limitations may pertain, we believe the lack of a

path from deviant peer association to offending in the multivariate model may have substantive importance and may help to sharpen future analyses testing integrated theoretical models in which deviant peer association and social bonds are tested simultaneously. In any case, while the role of deviant peers as a mediator of the effect of low self-control and other control factors remains unclear, its nonsignificance in this study is not crucial, inasmuch as our primary purpose was to examine the direct and mediating role of variables drawn from control theories.

Finally, it is important to acknowledge that we tested a one-way model in which low self-control was established early in life and had adverse effects on later social bonds, which in turn predicted the likelihood of criminal conduct. This is the model most often tested in research on control theories. But the causal process may in fact be more dynamic. Weak ties early in life may undermine the development of adequate self-control and sensitivity to others, thus setting in motion a cycle in which weak social bonds and low self-control reinforce each other (Short, 1997). The same dynamic process may hold true for the relationship of social bonds to association with conventional peers and offending (Hawkins, 1996). More variance might be explained, and more conceptual clarity achieved, in models assuming a more complex causal process. However, our one-way model did improve upon the variance explained in prior longitudinal studies of juvenile deviance. For example, bonding factors explained only about 15% of the variance in adolescent smoking, and about 2% of the variance in juvenile delinquency, in longitudinal analyses reported by Krohn *et al.* (1983) and Agnew (1985) respectively. In comparison, our model explained 26% of the variance in juvenile offending.

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