Social Bonds as Predictors of Recidivism Among Multiple Alcohol-Related Traffic Offenders Participating in an Ignition Interlock License Restriction Program in Maryland

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Abstract
The existing literature on alcohol-related traffic offenses includes demographics of adults with multiple alcohol-related traffic offenses but fails to address why recidivism occurs. Criminological theories, such as Travis Hirschi’s social bond theory, may be utilized to explain the crime of alcohol-impaired driving. Social bond theory maintains that those individuals with strong attachments, involvements, commitments and beliefs will be less likely to engage in criminal and delinquent behavior. The current study applies Hirschi’s social bond theory to a population of adults with multiple alcohol-related traffic offenses and investigates the association between social bonds and recidivism.

Introduction
Alcohol-impaired driving continues to be a nationwide public health problem despite efforts to prevent the behavior. In 2000, 40% (N = 16,653) of all traffic fatalities were alcohol-related (1). Sanctions aimed at the offender include license suspension/revocation, fines, incarceration, community service and conditional licensing. Other sanctions aimed at controlling impaired driving target the offender’s vehicle. Vehicle sanctions include registration suspension, license plate markings, ignition interlock, impoundment and immobilization (2). Both types of sanctions, individually and combined, fail to deter hard-core alcohol-impaired drivers from recidivating. The existing literature describes adults with multiple alcohol-related traffic offenses but fails to apply social theories to research findings (3, 4). Social bond theory, a criminological theory of social control, attempts to explain involvement in crime and delinquency (5). Investigating the relationship between social bonds and recidivism among adults with alcohol-related traffic offenses may help to explain impaired driving in this population.

Social bond theory maintains that four social bonds inhibit (but do not necessarily prevent) a person from committing delinquent acts. The four elements of social bond theory are attachment, involvement, commitment and belief. Attachment can be defined as a bond of affection for conventional persons and institutions such as family, peers and school. Involvement in conventional activities presumes that if a person is busy with these activities, he or she will be less likely to commit criminal or delinquent acts. Commitment refers to a desire to commit oneself to conventional actions and goals such as employment and school. Belief refers to the belief in and acceptance of conventional activities, values and laws.
When social bonds are weak, an individual is free to commit delinquent or criminal acts because he or she does not have as much invested in society as a person with strong social bonds. Social bonds are only effective when an individual recognizes and values the benefits of compliance with conventional goals and desires to ward off the sanctions for noncompliance. In the original test of social bond theory, Hirschi found that weak social bonds were associated with an increased involvement in crime and delinquency among high school students (5). Several studies support social bond theory as a predictor of delinquency among youths (6-8) and adults (9-12). The current study applies Hirschi’s social bond theory to adults with multiple alcohol-related traffic offenses to explore whether there is an association between social bonds and recidivism.

**Methods**

We analyzed data on 1,377 Maryland adults with multiple alcohol-related traffic offenses who participated in a randomized trial of an ignition interlock license restriction program (13, 14). Multiple offenders were drivers who had committed two or more alcohol-related traffic violations in the previous 5 years or three or more such violations in the previous 10 years. The study included drivers with revoked or suspended licenses who applied for relicensure to the Maryland Motor Vehicle Administration (MVA) and were approved for relicensure by the Medical Advisory Board (MAB). Alcohol-related events occurring over a 7-year period (1993-2000) were abstracted from Maryland driver records after personal identifying information had been deleted. Time until the first alcohol-related event after study enrollment was used for the analysis. Data on drivers’ four social bonds (attachment, involvement, commitment and belief) were abstracted from the Social History Abstract administered by MVA and completed by the offender close to the time of study enrollment.

Using the Social History Abstract, attachment was measured using the following variables: marital status, years married to present spouse, number of children and whether or not the individual was living alone. High attachment was assigned to offenders who were currently married, had been married for 1 or more years, had one or more children and were not living alone. Involvement was measured by number of reported leisure activities. High involvement was assigned as three or more leisure activities. Commitment was measured using current employment status (employed/unemployed), prestige of occupation, length of current employment and annual income. High commitment was assigned to offenders who were currently employed, employed in a skilled or professional occupation, employed in their current position > 5 years and had an annual income of > $25,000. Belief was measured by religious preference. High belief was assigned if the offender stated a religious preference. Additional variables that were collected included sex, race, age at study enrollment, original study assignment (interlock or control), number of times married, years of schooling and prior alcohol-related traffic violations.

A Social Bond Scoring (SBS) mechanism was created to measure each of the four elements of social bonds. The SBS mechanism ranks (from low to high) the level of social bonds for each element of social bond theory. The level of attachment, involvement and commitment was scored as low (0 points), medium (1 point) or high (2 points). Level of belief was scored as low (0 points) or high (1 point).
The levels of the four social bonds were next summed into a single Social Bond Index (SBI). That is, \( \text{SBI} = \text{Attachment} + \text{Involvement} + \text{Commitment} + \text{Belief} \). Social bonds were described as low if \( \text{SBI} \leq 3 \), as medium if \( 4 \leq \text{SBI} \leq 5 \) and as high if \( 6 \leq \text{SBI} \leq 7 \). For instance, a person with low attachment (0 points), high involvement (2 points), medium commitment (1 point) and high belief (1 point) would receive an SBI score of 4, indicating medium social bonds.

To test the relationship between social bonds and recidivism among adults with multiple alcohol-related traffic offenses, a survival analysis using proportional hazard models was fitted to the data using the SAS PHREG procedure (15). For offenders who recidivated, the number of days from study enrollment to the alcohol-related traffic violation was calculated. Offenders who did not recidivate were censored as of December 31, 2000, the last date of observation. Anyone not observed for the entire study period (commonly referred to as lost to follow-up) was censored to the end of the study. Thirty-one offenders died and forty-three moved out of state during the study period. There were no statistically significant differences among drivers who died (Chi-Square = 0.899, d.f. = 4, \( p = 0.925 \)) or moved out of state (Chi-Square = 7.370, d.f. = 4, \( p = 0.118 \)) and assignment to the interlock or control groups. The analysis did not control for drivers who died or moved out of state during the study period, which may result in a slight overestimation of survival rates. For this analysis, the focus is not on the precise estimation of survival rates but on whether there is an association between social bonds and recidivism. Overestimating the survival rates does not affect that relationship.

**Results**

Our model examined the relationship between recidivism and SBI while controlling for number of prior alcohol-related traffic violations, assignment to the control or interlock group, sex, age group, education level, number of times married and race (Table 1).

<table>
<thead>
<tr>
<th>Variable</th>
<th>DF</th>
<th>Parameter Estimate</th>
<th>Standard Error</th>
<th>Chi-Square</th>
<th>Pr&gt;ChiSq</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBI</td>
<td>1</td>
<td>0.21584</td>
<td>0.07400</td>
<td>8.5090</td>
<td>0.0035*</td>
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<tr>
<td>Prior Alcohol Violations</td>
<td>1</td>
<td>0.26183</td>
<td>0.06643</td>
<td>15.5356</td>
<td>&lt;0.0001*</td>
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<td>Control Group</td>
<td>1</td>
<td>0.12935</td>
<td>0.09413</td>
<td>1.8884</td>
<td>0.1694</td>
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<tr>
<td>Sex</td>
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<td>0.25214</td>
<td>0.17898</td>
<td>1.9846</td>
<td>0.1589</td>
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<tr>
<td>Age Group</td>
<td>1</td>
<td>-0.33557</td>
<td>0.10906</td>
<td>9.4671</td>
<td>0.0021*</td>
</tr>
<tr>
<td>Years of Schooling</td>
<td>1</td>
<td>-0.01315</td>
<td>0.06949</td>
<td>0.0358</td>
<td>0.8499</td>
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<tr>
<td>Times Married</td>
<td>1</td>
<td>-0.08553</td>
<td>0.07802</td>
<td>1.2017</td>
<td>0.2730</td>
</tr>
<tr>
<td>Race</td>
<td>1</td>
<td>0.29296</td>
<td>0.15704</td>
<td>3.4802</td>
<td>0.0621</td>
</tr>
</tbody>
</table>

*Significant at 0.05.

SBI (contrary to the hypothesis), prior alcohol violations and younger age group (< 33 years of age) were statistically significantly related to an increased likelihood of recidivism (\( p < 0.05 \)).

Estimated survival probability curves were plotted for subjects with low, medium and high SBI values with the following covariates: three prior alcohol-related traffic violations, random
assignment to the control group, male, white or Asian, < 33 years of age, 12th grade education and one marriage.

The survival curve (Figure 1) shows that offenders with high social bonds recidivate faster than offenders with low or medium social bonds. Offenders with low social bonds recidivate more slowly than offenders with medium or high social bonds.

Figure 1: Estimated Probability of Not Recidivating by Elapsed Days to Recidivism

A second SBI was created, excluding belief, to determine whether belief had any effect on SBI as a significant predictor of recidivism. Belief was excluded because it was closer to statistical significance (p = 0.0599) than any other social bond (model not shown). The new model included SBI (exclusive of belief), number of alcohol-related traffic violations prior to study enrollment and other sociodemographic variables (age, race, years of schooling and number of
times married) as recidivism hazard predictors (model not shown). This modified index for social bonding was not statistically significantly associated with increased recidivism risk (Chi-Square = 5.25, p = 0.5121). SBI was no longer a significant predictor of recidivism after belief was removed from the model. Recidivism was significantly higher among drivers with prior alcohol-related violations and significantly lower among those above the median age. No other predictor variables had statistically significant effects on recidivism risk.

**Discussion**

This study extended Hirschi’s social bond theory to adults with multiple alcohol-related traffic offenses in an effort to explain recidivism. To date, social bond theory has been applied only to juvenile delinquency and crime, with a few studies conducting longitudinal follow-ups into young adulthood. In this respect, the current study took social bond theory beyond its realm of application by applying it to a population of habitual adult offenders with alcohol-related traffic violations. Contrary to the hypothesis, social bond theory, as applied in this study, does not explain decreased recidivism among adults with multiple alcohol-related traffic offenses. In fact, the findings suggest that stronger social bonds are positively associated with increased risk of recidivism.

One limitation of the current study is that social bonds were measured using proxy variables from an unvalidated questionnaire developed and administered by the MVA for use by the MAB. The MAB is a group of physicians who evaluate alcohol abuse/dependence and certain other medical disabilities in motorists requesting license reinstatement. The instrument was not developed with the intent of analyzing collected data for social bonds research, and the researchers did not have input into the instrument’s design. The variables used for analysis may not be accurate measures of social bonds.

A second limitation is the lack of longitudinal social bond data. Social bonds were measured only in close proximity to study enrollment, while the first instance of recidivism was tracked for up to 7 years. Social bonds change over time. Due to its naturalistic design, the current study did not account for any changes to social bonds after study enrollment.

The effect of belief on recidivism was an unexpected finding. Previous research has found evidence that religion is effective at reducing crime among both juveniles and adults (16-18). In the current study, belief was measured through religious preference (presence/absence) and was closer to being a statistically significant (p = 0.0599) predictor of recidivism (model not shown) than any other element of social bond theory. In fact, when belief was removed from the SBI, SBI was no longer a significant predictor of recidivism.

Further research is necessary to understand the relationship between social bonds and alcohol-related traffic recidivism among adult multiple offenders. Subsequent studies should develop and validate a standardized instrument to measure social bonds in this population. A longitudinal analysis is of equal importance and would provide data on social bonds as a function of time. In the current study, social bonds may have changed, and this may explain why social bonds were positively associated with recidivism. Additional research should also investigate all incidents of future recidivism (not just a first instance) and explore the relationship between religious preference and alcohol-related traffic offenses.
Acknowledgement
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References