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# CRIMINOLOGY

## PAST BEHAVIOR AS A MEASURE OF ACTUAL FUTURE BEHAVIOR: AN UNRESOLVED ISSUE IN PERCEPTUAL DETERRENCE RESEARCH

Donald E. Green\*

### I. INTRODUCTION

Beginning with three seminal studies in the 1960s,<sup>1</sup> deterrence theory research has continued to refine measures of certainty and severity of punishment and involvement in illegal behavior. Because deterrence is a perceptual process, aggregate-level studies focusing on official measures of threat of legal punishment and involvement in illegal behavior generally have been rejected in favor of individual-level research, thereby allowing for measures of perceptions of certainty and severity of punishment and self-reported illegal behavior.<sup>2</sup>

In the 1970s and early 1980s, most research on individual perceptions of threat of legal punishment was cross-sectional in design.<sup>3</sup> A majority of these studies, which typically employed past

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<sup>1</sup> Gibbs, *On Crime, Punishment and Deterrence*, 49 Soc. Sci. Q. 515 (1968); Jensen, "Crime Doesn't Pay": *Correlates of a Shared Misunderstanding*, 17 Soc. Prob. 189 (1969); Tittle, *Crime Rates and Legal Sanctions*, 16 Soc. Probs. 409 (1969).

<sup>2</sup> Grasmick & Green, *Legal Punishment, Social Disapproval, and Internalization as Inhibitors of Illegal Behavior*, 71 J. Crim. L. & Criminology 325 (1980).

<sup>3</sup> See Anderson, Chiricos & Waldo, *Formal and Informal Sanctions: A Comparison of Deterrent Effects*, 25 Soc. Probs. 103 (1977); Burkett & Jensen, *Conventional Ties, Peer Influence, and the Fear of Apprehension: A Study of Adolescent Marijuana Use*, 16 Soc. Q. 522 (1975); Cohen, *Sanction Threats on Violation Behavior: An Inquiry into Perceptual Variation*, in *Quantitative Studies in Criminology* 84-99 (C. Wellford ed. 1978); Grasmick & Appleton, *Legal Punishment and Social Stigma: A Comparison of Two Deterrence Models*, 58 Soc.

self-reported behavior as a measure for actual future behavior, found that threat of legal punishment was inversely related to frequency of individual involvement in illegal behavior.<sup>4</sup> More recently, however, researchers have strongly criticized cross-sectional designs for confusing the causal ordering of deterrence theory variables.<sup>5</sup>

Perceptual-level deterrence research has attempted to resolve the problem of causal ordering by employing longitudinal research designs.<sup>6</sup> Longitudinal studies allow deterrence researchers to

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SCI. Q. 15 (1977); Grasmick & Bryjak, *The Deterrent Effect of Perceived Severity of Punishment*, 59 SOC. FORCES 471 (1980); Grasmick & Green, *Deterrence and the Morally Committed*, 22 SOC. Q. 1 (1981); Grasmick & Green, *supra* note 2; Grasmick & Milligan, *Deterrence Theory Approach to Socio-Economic/Demographic Correlates of Crime*, 57 SOC. SCI. Q. 608 (1976); Jensen, Erickson & Gibbs, *Perceived Risks of Punishment and Self-Reported Delinquency*, 57 SOC. FORCES 57 (1978); Kraut, *Deterrent and Definitional Influences on Shoplifting*, 23 SOC. PROBS. 358 (1976); Meier & Johnson, *Deterrence as Social Control: The Legal and Extralegal Production of Conformity*, 42 AM. SOC. REV. 292 (1977); Minor, *A Deterrence-Control Theory of Crime*, in *THEORY IN CRIMINOLOGY: CONTEMPORARY VIEWS* 117-137 (R. Meier ed. 1977); Silberman, *Towards a Theory of Criminal Deterrence*, 41 AM. SOC. REV. 442 (1976); Teavan, *Subjective Perceptions of Deterrence*, 13 J. RES. IN CRIME & DELINQ. 155 (1976); Teavan, *Deterrent Effects of Punishment: Subjective Measures Continued*, 10 CAN. J. CRIMINOLOGY & CORRECTIONS 152 (1976); Waldo & Chiricos, *Perceived Penal Sanction and Self-Reported Criminality: A Neglected Approach to Deterrence Research*, 19 SOC. PROBS. 522 (1972).

<sup>4</sup> In fact, several perceptual deterrence studies have found this relationship even when the research controls for levels of both individual moral commitment and threat of social disapproval. *E.g.*, Bishop, *Legal and Extralegal Barriers to Delinquency: A Panel Analysis*, 22 CRIMINOLOGY 403, 415 (1984) (finding that when the effects of moral commitment and social disapproval are controlled, perceived threat of legal sanctions are inversely related to involvement in illegal behavior); Grasmick & Green, *supra* note 2, at 335 (finding that regardless of individual levels of moral commitment and social disapproval, the perceived threat of legal sanction is inversely related to involvement in illegal behavior).

<sup>5</sup> Greenberg, *Methodological Issues in Survey Research on the Inhibition of Crime*, 72 J. CRIM. L. & CRIMINOLOGY 1094, 1100 (1981) (stating that longitudinal data are needed to adequately assess the causal relationships among deterrence theory variables); Paternoster, Saltzman, Chiricos & Waldo, *Estimated Perceptual Stability and Deterrent Effects: The Role of Perceived Legal Punishment in the Inhibition of Criminal Involvement*, 74 J. CRIM. L. & CRIMINOLOGY 270, 296 (1983) [hereinafter *The Role of Perceived Legal Punishment*] (stating that instability in cross-sectional measures of perceived sanctions casts doubt on the ability of these designs to adequately test deterrence theory hypotheses).

<sup>6</sup> The following studies use a two-wave panel design: Bishop, *supra* note 4; Minor & Harry, *Deterrent and Experiential Effects in Perceptual Deterrence Research: A Replication and Extension*, 19 J. RES. CRIME & DELINQ. 190 (1982); Paternoster & Iovanni, *The Deterrent Effect of Perceived Severity: A Reexamination*, 64 SOC. FORCES 751 (1986); Paternoster, Saltzman, Chiricos & Waldo, *supra* note 5; Paternoster, Saltzman, Waldo & Chiricos, *Causal Ordering in Deterrence Research: An Examination of the Perceptions/Behavior Relationship*, in *DETERRENCE RECONSIDERED: METHODOLOGICAL INNOVATIONS* 55-70 (J. Hagan ed. 1982) [hereinafter *Causal Ordering in Deterrence Research*]; Paternoster, Saltzman, Chiricos & Waldo, *Perceived Risks and Deterrence: Methodological Artifacts in Perceptual Deterrence Research*, 73 J. CRIM. L. & CRIMINOLOGY 1238 (1982) [hereinafter *Methodological Artifacts*]; Paternoster, Saltzman, Waldo & Chiricos, *Perceived Risk and Social Control: Do Sanctions Really Deter?*, 14 LAW & SOC. REV. 457 (1983) [hereinafter *Do Sanctions Really Deter?*]; Piliavin, Gartner, Thornton & Matsueda, *Crime, Deterrence, and Choice*, 51 AM. SOC. REV. 101

identify an "experiential effect" along with a true deterrent effect.<sup>7</sup> According to Paternoster and his colleagues, experiential effects are "the effects of previously committed behaviors on current perceptions."<sup>8</sup> These researchers have criticized cross-sectional research for measuring the experiential effect of behavior on perceived sanctions because it utilizes an individual's current perceptions of threat of legal punishment and self-reports of past involvement in illegal behavior.<sup>9</sup> In contrast, researchers using longitudinal studies may isolate the effect of an individual's current perception of threat of punishment on self-reported past illegal behavior at Time 1, as well as the effect of current perceptions on self-reported involvement at Time 2. With the exception of Bishop,<sup>10</sup> recent studies indicate a strong experiential effect and a weak (if any) deterrent effect of perceived sanctions on behavior.<sup>11</sup>

In tests of deterrence theory's primary hypothesis, that threats of sanctions are inversely related to individual involvement in illegal behavior, modern deterrence theory research usually incorporates alternative explanations for deviance which are described in the social control literature. These include the informal sanctions of moral commitment to the legal norm proscribing the behavior, and

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(1986); Saltzman, Paternoster, Waldo & Chiricos, *Deterrent and Experiential Effects: The Problem of Causal Ordering in Perceptual Deterrence Research*, 19 J. RES. CRIME & DELINQ. 172 (1982).

<sup>7</sup> *Causal Ordering in Deterrence Research*, *supra* note 6, at 58.

<sup>8</sup> *Id.* at 56.

<sup>9</sup> *Id.* at 56. A second methodological concern for perceptual deterrence research is the assumption of cross-sectional research that perceived threat of legal punishment is a relatively stable social phenomenon. That is, because most cross-sectional studies use past behavior as a proxy for actual future behavior, they must assume that individual perceptions of threat of legal punishment remain relatively stable both before and after the point at which the behavior is measured. In fact, several recent panel studies have suggested that perceptions of threat of legal punishment do vary over time. *E.g.*, *Causal Ordering in Deterrence Research*, *supra* note 7 (found instability in their measure of perceived threat of legal sanction); Minor and Harry, *supra* note 6 (found instability in their measure of perceived threat of legal sanction); Piliavin, Gartner, Thornton & Matsueda, *supra* note 6 (reported instability in their measure of perceived risk); Saltzman, Paternoster, Waldo & Chiricos, *supra* note 6 (reported instability in their measure of perceived threat of legal sanctions).

<sup>10</sup> Bishop, *supra* note 4 reported a significant inverse relationship between perceived threat of legal sanction and involvement in illegal behavior.

<sup>11</sup> *The Role of Perceived Legal Punishment*, *supra* note 5, at 296 (found little support for deterrence theory variables); *Causal Ordering in Deterrence Research*, *supra* note 7 (report no significant deterrence effects); Piliavin, Gartner, Thornton & Matsueda, *supra* note 6 (reported that perceived risk of formal sanction was not significantly related to involvement in illegal behavior); Minor & Harry, *supra* note 6 (found no evidence for an inverse relationship between perceptions and behavior); Saltzman, Paternoster, Waldo & Chiricos, *supra* note 6 (reported weak deterrent effects for perceived certainty and involvement in illegal behavior).

threat of social disapproval for engaging in illegal behavior.<sup>12</sup> Although previous cross-sectional studies found that deterrence theory variables compare favorably with these informal sanction variables,<sup>13</sup> more recent panel studies indicate that informal sanctions are primary inhibitors to a variety of self-reported illegal behaviors.<sup>14</sup> These recent findings suggest that future deterrence theory research should include alternative explanations for individual involvement in illegal behavior.

## II. THE SOCIAL PROBLEM OF DRUNKEN DRIVING

Both popular literature and scientific research discuss the adverse effect of alcohol consumption on an individual's driving abilities.<sup>15</sup> More recently, however, drunken driving has received considerable attention by the general public, the mass media, and perhaps not surprisingly, local, state, and federal levels of government.<sup>16</sup> Much of the credit for this public interest is attributable to the strong lobbying efforts of citizen groups such as Mothers Against Drunk Driving (MADD), Remove Intoxicated Drivers-USA (RID), and Students Against Drunk Driving (SADD).<sup>17</sup> As a result, many facts and figures on the drunken driving problem have been highly publicized. Some examples include: 1) 25,000 deaths occur annually in the United States due to alcohol-related traffic accidents;<sup>18</sup> 2) between fifty and ninety percent of all night-time fatal

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<sup>12</sup> See Grasmick & Green, *supra* note 2 (tested for interaction among formal and informal sanctions); *Do Sanctions Really Deter?*, *supra* note 6 (explicit causal model including these variables); Bishop, *supra* note 4 (additive and interactive models which included both formal and informal sanctions).

<sup>13</sup> Grasmick & Green, *supra* note 2 (found that formal sanctions were primary inhibitors of involvement in illegal behavior); Grasmick & Green, *supra* note 3 (found that regardless of levels of moral commitment, perceived threat of legal punishment was significantly inversely related to involvement in illegal behavior).

<sup>14</sup> *The Role of Perceived Legal Punishment*, *supra* note 5, at 296 (found informal sanctions were primary inhibitory variables for the social control process); Bishop, *supra* note 4 (found support for the importance of both formal and informal sanctions for the social control process).

<sup>15</sup> J. GUSFIELD, *THE CULTURE OF SOCIAL PROBLEMS: DRINKING-DRIVING AND THE SYMBOLIC ORDER* (1981) (discusses the role of popular literature and scientific research in defining the social problem of drunken driving); H. ROSS, *DETECTING THE DRINKING DRIVER: LEGAL POLICY AND SOCIAL CONTROL* (1982) (examines legal policies aimed at deterring drunken driving).

<sup>16</sup> *The War on Drunk Driving: Getting Tough with the Killers of 26,000 Americans a Year*, Newsweek, Sept. 13, 1982, at 34-39.

<sup>17</sup> *Id.* at 36; J. JACOBS, *DRUNK DRIVING: AN AMERICAN DILEMMA* xv-xvii (1989).

<sup>18</sup> UNITED STATES DEPARTMENT OF JUSTICE, NATIONAL INSTITUTE OF JUSTICE REPORT, *JAILING DRUNK DRIVERS: IMPACT ON THE CRIMINAL JUSTICE SYSTEM* (Nov. 1984) [hereinafter *JAILING DRUNK DRIVERS*]. In light of these overwhelming statistics, it is important to note Gusfield's assessment of the problem in his recent work on the culture of social

traffic accidents involve intoxicated motorists;<sup>19</sup> and 3) the annual monetary loss from drunken driving accidents in the United States is estimated at between twenty-one to twenty-four billion dollars.<sup>20</sup>

As is the case with any issue that is perceived to be a problem by policy makers and the public at large, legislative action is one of the most common societal responses.<sup>21</sup> In the case of drunken driving, legislation has taken several forms over time. It first established criminal penalties for the behavior.<sup>22</sup> More recently, legislation has increased the certainty and severity of punishment for drunk driving, as well as its celerity, particularly in the area in which the present study was conducted.<sup>23</sup> In other words, a deterrence model of criminal law has been increasingly employed by policy makers to deal with the social problem of drunken driving.<sup>24</sup>

Recently, Ross suggested that future deterrence research survey random samples of adult populations to determine the extent to which recent efforts have effected individual perceptions of threat of sanction for drunken driving.<sup>25</sup> Surprisingly, to date, no adult panel deterrence study has attempted to assess the degree to which perceived certainty and severity of legal punishment inhibit an individual's involvement in drunken driving behavior.

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problems. See J. GUSFIELD, *supra* note 15, at 1-23. According to Gusfield, these so-called "facts" can be viewed as part of the rhetoric used by those concerned with drinking-driving behavior to define and treat the phenomenon as a public problem. Furthermore, with respect to the issue of social control, Gusfield emphasizes that this communication process plays a primary role in creating the sense of public concern and moral authority necessary to manage this particular form of human behavior. Based on these definitions of the phenomenon, drinking and driving has increasingly been viewed as a major social problem in this country that must be addressed.

<sup>19</sup> H. ROSS, *supra* note 15, at xiv; *Study Finds Drinking in 91% of Fatal Traffic Accidents*, Minneapolis Star & Tribune, Jan. 9, 1984, § A, at 3.

<sup>20</sup> JAILING DRUNK DRIVERS, *supra* note 18.

<sup>21</sup> J. JACOBS, *supra* note 17, at xvii-xviii; JAILING DRUNK DRIVERS, *supra* note 18.

<sup>22</sup> J. GUSFIELD, *supra* note 15, at 112 (discusses the origin of laws against drunken driving); J. JACOBS, *supra* note 17, at xiv (discusses some of the first laws against drunken driving).

<sup>23</sup> J. JACOBS, *supra* note 17, at xvii; D. GREEN, E. SHAPIRO, J. WILLIAMS, A. RODGERS & J. CLEARY, ANALYSIS OF THE EFFECTS OF RECENT CHANGES IN MINNESOTA'S DWI LAWS—PART II: PERCEPTIONS OF MEMBERS OF THE DWI CONTROL SYSTEM, REPORT TO THE MINNESOTA HOUSE OF REPRESENTATIVES 6-14 (1985); *Drunken Driving: Tougher Laws Get Some to Forgo One for the Road and Drunken Driving: More Lose Licenses in State; Fewer Lose Lives*, Minneapolis Star & Tribune, July 2, 1983, § B, at 1; *Drunken Drivers' Chances of Jail Have Risen . . . But It Depends on Who Is the Judge*, Minneapolis Star & Tribune, Nov. 13, 1983, § A, at 1.

<sup>24</sup> Lanza-Kaduce & Bishop, *Legal Fictions and Criminology: The Jurisprudence of Drunk Driving*, 77 J. CRIM. L. & CRIMINOLOGY 358 (1986) (discussion of the use of law to define and control drunken driving).

<sup>25</sup> H. ROSS, *supra* note 15, at 108.

### III. THE STUDY

#### A. GENERALLY

This study contributes to individual-level deterrence research by incorporating methodological improvements, suggested by past studies,<sup>26</sup> which better determine the factors explaining individual involvement in drunken driving. For example, previous studies have found that self-referent measures<sup>27</sup> of perceived threat of punishment are better predictors of self-reported involvement in illegal behavior than are other-referent<sup>28</sup> measures.<sup>29</sup> Accordingly, this study used self-referent measures of formal sanctions.

As mentioned earlier, previous research has also encouraged alternative explanations for deviance.<sup>30</sup> This study included the two most frequently cited alternative explanations for involvement in illegal behavior: 1) moral commitment to the legal norm against the illegal behavior; and 2) the threat of social disapproval for having engaged in illegal behavior.

A handful of perceptual deterrence studies have attempted to assess the extent to which socio-demographic characteristics influence an individual's perceptions of sanctions and involvement in illegal behavior.<sup>31</sup> Several of these studies have found that respondents' perceptions and behavior are influenced by some aspects of their socio-demographic profiles.<sup>32</sup> To further assess the

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<sup>26</sup> See *supra* notes 1-6 and accompanying text for a discussion of prior studies.

<sup>27</sup> *Methodological Artifacts*, *supra* note 6 (defined self-referent measures as those which ask respondents to consider their own perceptions of certainty and severity of legal sanctions).

<sup>28</sup> *Id.* Paternoster and his colleagues defined other-referent measures of perceived threat of legal punishment as ones that obtain respondents' estimates of the chances of persons other than themselves being arrested or punished for involvement in illegal behavior or both.

<sup>29</sup> For a more detailed comparison of these two measures of perceived threat of legal sanctions, see *id.*

<sup>30</sup> Grasmick & Green, *supra* note 2, at 325; *Do Sanctions Really Deter?*, *supra* note 6, at 459.

<sup>31</sup> C. TITTLE, SANCTIONS AND SOCIAL DEVIANCE: THE QUESTION OF DETERRENCE (1980) (detailed analysis of numerous socio-demographic correlates of perceptions and behavior); Richards & Tittle, *Gender and Perceived Chances of Arrest*, 59 SOC. FORCES 1182 (1981) [hereinafter Richards & Tittle, *Gender*] (impact of gender on perceptions and behavior); Richards & Tittle, *Socioeconomic Status and Perceptions of Personal Arrest Probabilities*, 20 CRIMINOLOGY 329 (1982) [hereinafter Richards & Tittle, *Socioeconomic Status*] (impact of socio-economic status on perceptions and behavior); *Methodological Artifacts*, *supra* note 6 (importance of gender for the social control process); Piliavin, Gartner, Thornton & Matsueda, *supra* note 6 (role of age, gender, race, education, and employment factors in the social control process).

<sup>32</sup> *Methodological Artifacts*, *supra* note 6 (reported a modest correlation between gender and perceived risk); Piliavin, Gartner, Thornton & Matsueda, *supra* note 6 (reported significant age and race effects for two of three samples examined); Richards & Tittle, *Gen-*

extent to which these variables might differentially effect social control processes, this research included several socio-demographic characteristics and social indicators previously found to be related to the incidence of drunken driving.<sup>33</sup>

This study incorporated several additional methodological refinements. This panel study employed a random sample of adults from a general population. With the exception of two recent studies using adult offender populations,<sup>34</sup> most panel study findings are based on samples of high school and college students.<sup>35</sup> Moreover, a recent review of panel deterrence studies noted that youthful samples may be more likely to evidence experiential effects of past behavior on current perceptions.<sup>36</sup>

Although deterrence researchers have carefully selected the illegal behaviors studied, tailoring them to the population from which the samples were obtained, the variable—respondents' opportunity to engage in the prohibited conduct—has generally been ignored in

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*der, supra* note 31 (found that women perceived higher chances of arrest than do men); Richards & Tittle, *Socioeconomic Status, supra* note 31 (found that lower-status respondents perceived higher arrest risks than do upper-status respondents).

<sup>33</sup> For a more detailed discussion of studies which found a significant relationship between age and drunken driving, see Hyman, *The Social Characteristics of Persons Arrested for Driving While Intoxicated*, 4 Q. J. STUD. ALCOHOL 138 (Supp. 1968); Mosher, *Server Intervention: A New Approach for Preventing Drinking Driving*, 15 ACCIDENT ANALYSIS & PREVENTION: AN INT'L J. 483 (1983); Vingilis, *Drinking Drivers and Alcoholics: Are They from the Same Population?*, 7 RES. ADVANCES ALCOHOL & DRUG PROBS. 299 (1983). For more detailed information on studies concerning the relationship between race and drunken driving, see Cospser & Mozersky, *Social Correlates of Drinking and Driving*, 4 Q. J. STUD. ALCOHOL 58 (Supp. 1968); Hyman, *supra*; Vingilis, *supra*. For a more detailed discussion of studies on the relationship between gender and drunken driving, see Argeriou & Paulino, *Women Arrested for Drunken Driving in Boston*, 37 J. STUD. ALCOHOL 648 (1976); Vingilis, Adlaf & Chung, *Comparison of Age and Sex Characteristics of Police-Suspected Impaired Drivers and Roadside-Surveyed Impaired Drivers*, 14 ACCIDENT ANALYSIS & PREVENTION: AN INT'L J. 425 (1983). For more detailed information on studies on the relationship between marital status and drunken driving, see Argeriou & Paulino, *supra*; Cospser & Mozersky, *supra*. For more detailed information on studies on the relationship between drinking frequency and drunken driving, see Argeriou & Paulino, *supra*; Cospser & Mozersky, *supra*; Hyman, *supra*; Norstrom, *Law Enforcement and Alcohol Consumption Policy as Counter-Measures Against Drunken Driving: Possibilities and Limitations*, 15 ACCIDENT ANALYSIS & PREVENTION: AN INT'L J. 513 (1983); Vingilis, *supra*. For more detailed information on studies on the relationship between driving behavior and drunken driving, see Vingilis, *supra*.

<sup>34</sup> Murray & Erickson, *Cross-Sectional Versus Longitudinal Research: An Empirical Comparison of Projected and Subsequent Criminality*, 16 Soc. Sci. Res. 107 (1987); Piliavin, Gartner, Thornton & Matsueda, *supra* note 6.

<sup>35</sup> Bishop, *supra* note 4; Minor & Harry, *supra* note 6; *Causal Ordering in Deterrence Research, supra* note 6; *The Role of Perceived Legal Punishment, supra* note 5; *Do Sanctions Really Deter?*, *supra* note 6; *Methodological Artifacts, supra* note 6; Saltzman, Paternoster, Waldo & Chiricos, *supra* note 6.

<sup>36</sup> Williams & Hawkins, *Perceptual Research on General Deterrence*, 20 LAW & SOC. REV. 543, 554 (1986).



deterrence theory research.<sup>37</sup> Some legal scholars maintain that individuals who are most likely to engage in illegal behavior should be subjects of deterrence theory research.<sup>38</sup> In response, this study included in its sample only those individuals who have the opportunity to engage in the illegal behavior of concern. Only those persons who indicated that they both drink alcoholic beverages *and* drive a motor vehicle at least occasionally were included in the analysis.

The panel study also included the variable of perceived severity of legal punishment. With the exception of a recent study by Paternoster and Iovanni which focused on high school students and found no significant deterrent effects,<sup>39</sup> no other adult panel deterrence study has included this important deterrence theory variable. Moreover, Paternoster and Iovanni's findings conflict with several previous cross-sectional studies with adult samples which found perceived severity to be an important predictor of involvement in illegal behavior.<sup>40</sup>

Finally, in light of these methodological refinements and the mixed results from previous research, this study compared results based on both the traditional cross-sectional approach to deterrence theory research and the currently preferred panel designs. Consequently, this study helps resolve the continuing controversy in perceptual deterrence research over appropriate measures of individual involvement in illegal behavior.

## B. METHODOLOGY

### 1. *The Sample*

The first wave of data was collected in the Fall of 1983, by the Minnesota Center for Social Research, with the support of the Department of Sociology at the University of Minnesota. A random sample of 550 adults was obtained by using the random digit dialing method.<sup>41</sup>

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<sup>37</sup> *Methodological Artifacts*, *supra* note 6.

<sup>38</sup> F. ZIMRING & G. HAWKINS, *DETERRENCE: THE LEGAL THREAT IN CRIME CONTROL* 131 (1973).

<sup>39</sup> Paternoster & Iovanni, *supra* note 6.

<sup>40</sup> Grasmick & Bryjak, *supra* note 3; Grasmick & Green, *supra* note 2; Grasmick & Green, *supra* note 3.

<sup>41</sup> This method was based on an exhaustive list of telephone exchanges for the metropolitan area with the last three digits in the number assigned randomly. The procedure allowed for individuals with unlisted numbers and individuals who have moved since available directories were published to have had a chance to be included in the sample. The list of telephone exchanges was provided by the Minneapolis Star and Tribune Company, who uses the list for the Minnesota Poll.

The sample was stratified according to the population of each of the seven counties in the Twin Cities metropolitan area. For households with more than one adult resident, several versions of a selection grid, based on the number of potential respondents in the household and their gender, was randomly used to assure that all eligible respondents had an equal chance of being selected. Staff members called phone numbers selected for inclusion in the survey, and either interviews were completed at that time, or appointments were made to conduct the interview.<sup>42</sup> In an attempt to maintain a representative sample, supervisory personnel called respondents who initially refused to participate in the survey and assured them of confidentiality in order to obtain their participation in the survey. Those who declined to participate after the second contact were considered refusals.

As previously stated, all respondents were first asked several screening questions to determine if they drank alcoholic beverages and drove a motor vehicle at least occasionally. This procedure generated 376 respondents who had the opportunity to engage in the offense of drunken driving.<sup>43</sup> Respondents who indicated that they either did not drink alcoholic beverages or drive a motor vehicle were not asked the remaining questions of the study and were therefore excluded from our analysis.<sup>44</sup>

Upon completion of the interview, a staff member asked each respondent to participate in the second wave of the study in the Fall of 1984.<sup>45</sup> Of the 376 respondents interviewed, 310 respondents were willing to participate again. During the second wave of data collection, another 65 respondents were eliminated from this group because they either refused to participate or their phone numbers were not in operation and no forwarding number was available, or they did not answer the phone after calls on six consecutive inter-

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<sup>42</sup> Numbers that were not in operation, places of business, and those with no response after six interviewing shifts were eliminated.

<sup>43</sup> A description of the question sequence used to obtain the opportunity sample is available from the author upon request.

<sup>44</sup> The initial response rate for the 550 respondents in the random sample, collected in conjunction with a larger omnibus survey of this metropolitan area, was 70%. However, due to the screening process previously described, 174 respondents were not included in the sample because 126 respondents indicated that they never drink alcoholic beverages, and another 48 respondents indicated that although they drink alcoholic beverages, they never drive a motor vehicle.

<sup>45</sup> The appropriate temporal lag between measures of perceptions and behavior is an empirical issue perceptual deterrence research has not resolved. To date, no data exists to indicate that the one year temporal lag employed in this research would result in conclusions due to methodological artifact. However, if such data is forthcoming, our conclusions would be subject to such a critique. See Williams & Hawkins, *supra* note 36.

viewing shifts. Respondents were asked the same questions again at the second wave of data collection. The response rate for the panel sample was sixty-five percent.<sup>46</sup> This rate compares favorably to those obtained in other panel deterrence studies.<sup>47</sup>

The representativeness of our panel respondents to the general population of the area was assessed in Table 1 by comparing selected demographic characteristics of our sample to those obtained from the 1980 Census.<sup>48</sup> The mean age for both the census data and the panel sample was approximately forty-one years.

Some differences for gender and race distributions merit further discussion. For example, fifty-three percent of the panel sample was male, while only forty-four percent of the general population was male. However, rather than posing an analytical problem, this finding confirms that screening the sample for individuals who both drink alcoholic beverages and drive motor vehicles was successful. Second, available research indicates that men are consistently overrepresented in the drinking and driving population.<sup>49</sup> In contrast, our panel sample underrepresents minority group members, although a white/non-white breakdown of the panel sample closely approximates a similar population distribution in the 1980 census data.<sup>50</sup> Consequently, this factor limits the degree to which this study may generalize its findings concerning the impact of sanctions on the behavior of particular minority groups.<sup>51</sup>

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<sup>46</sup> The response rate was based on the number of completed interviews divided by the sum of the number of completed interviews, refusals to interview, and eliminations. However, a response rate for the panel, computed from eligible respondents after gathering the initial sample, results in a more favorable completion rate. Based on the 310 potential respondents at the start of the second wave of data collection, the number of completed interviews divided by the number of completed interviews plus refusals and eliminations results in a completion rate of 79%.

<sup>47</sup> See Bishop, *supra* note 4 (reported a response rate of 74%); Saltzman, Paternoster, Waldo & Chiricos, *supra* note 6 (reported a response rate of 51%).

<sup>48</sup> UNITED STATES BUREAU OF CENSUS, POPULATION CHARACTERISTICS FOR THE STATE OF MINNESOTA (1980).

<sup>49</sup> See R. JONES & K. JOSCELYN, ALCOHOL AND HIGHWAY SAFETY: A REVIEW OF THE STATE OF KNOWLEDGE (1978). Washington: U.S. Department of Transportation, National Highway Safety Administration.

<sup>50</sup> UNITED STATES BUREAU OF CENSUS, *supra* note 48. For the logit regression analysis to follow, this category is dichotomized as white/non-white. Combining the percent black and percent other categories results in a racial distribution of 95.5% white and 4.5% non-white for the panel sample. This compares favorably to the 1980 Census distribution of 95% white and 5% non-white distribution.

<sup>51</sup> The problem of underrepresentation of these groups in criminological research is not unique to this particular study. See LaFree, *Official Reactions to Hispanic Defendants in the Southwest*, 22 J. RES. CRIME & DELINQ. 213, 214 (1985).

**TABLE 1**  
**COMPARISON OF AGE, SEX AND RACE DISTRIBUTIONS FOR TWIN CITIES METROPOLITAN AREA AND PANEL SAMPLE**

	1980 Census Data for the Twin Cities Metropolitan Area	Twin Cities Panel Sample
<b>AGE</b>		
Mean age for adults 18+	41.37	40.54
<b>SEX</b>		
Percent Male	44%	53%
Percent Female	56%	47%
<b>RACE</b>		
Percent White	95.0%	95.5%
Percent Black	2.0%	3.7%
Percent Other*	3.0%	.8%

\*Includes American Indians, Hispanics, Asians, mixed and/or no dominant racial identification.

## 2. *The Dependent Variable-Drunken Driving Behavior*

Involvement in drunken driving behavior was operationalized by asking respondents to indicate if they had driven drunk in the past year (both at Time 1 and Time 2). Responses were coded: 0) no and 1) yes.<sup>52</sup>

## 3. *The Independent Variables*

### a. Perceived Certainty of Arrest

Previous studies have indicated that self-referent measures of deterrence theory variables are stronger predictors of self-reported illegal behavior than other-referent measures.<sup>53</sup> Accordingly, our

<sup>52</sup> The advantages of an offense specific analysis are as follows. First, by utilizing the single measure of involvement in drunken driving behavior, research may directly examine the effect of individual perceptions of formal and informal sanctions for such behavior on the self-reported data. In contrast to this technique, used in this study, other deterrence theory studies have been confounded by indexes of both perceptions and behavior for a wide range of offenses. Second, the focus of this study on a single offense allowed the screening of respondents. Accordingly, the results were not contaminated because only respondents who had an opportunity to engage in drunken driving were included in this analysis.

<sup>53</sup> For examples of self-referent measures of perceived risk, see the following: Jensen, Erickson & Gibbs, *supra* note 3; *The Role of Perceived Legal Punishment*, *supra* note 5; Paternoster, Saltzman, Waldo & Chiricos, *Causal Ordering in Deterrence Research*, *supra* note 6; *Methodological Artifacts*, *supra* note 6; *Do Sanctions Really Deter?*, *supra* note 6.

respondents' perceptions of certainty of arrest were measured by asking them to indicate the likelihood of their being arrested if they drove drunk. Responses were coded: 1) very unlikely; 2) somewhat unlikely; or 3) likely.<sup>54</sup>

#### b. Perceived Severity of Punishment

This study also employed a self-referent measure of perceived severity of legal sanctions similar to that first used by Grasmick and Bryjak.<sup>55</sup> Respondents were first asked to think about what their punishment would be if they were arrested and convicted for drunken driving. Respondents were then asked to indicate the seriousness of the impact this imagined sanction would have on their lives. Responses were coded: 1) not serious; 2) somewhat serious; and 3) very serious.

#### c. Moral Commitment to the Legal Norm

Recent deterrence research has emphasized the importance of controlling for individual levels of moral commitment when attempting to understand individual involvement in illegal behavior.<sup>56</sup> This study measured moral commitment by asking respondents if they feel it is: 1) never wrong; 2) sometimes wrong; or 3) always wrong to drive drunk. This measure is similar to that used in previous perceptual deterrence studies.<sup>57</sup>

#### d. Social Disapproval by Significant Others

Recent deterrence research also indicates the importance of controlling for threat of social disapproval when assessing deterrence theory hypotheses.<sup>58</sup> Social disapproval was measured by asking respondents if adults they know best would: 1) approve; 2)

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<sup>54</sup> The measures of the independent variables were less sophisticated than other deterrence research. This approach was necessary, however, because the study employed phone interviewing. Consequently, a streamlined response set was developed in order to provide respondents with an uncomplicated but meaningful range of responses.

<sup>55</sup> Grasmick & Bryjak, *supra* note 3.

<sup>56</sup> See Grasmick & Green, *supra* note 2 (found that moral commitment was significantly related to self-reported involvement in a wide range of illegal behaviors); *The Role of Perceived Legal Punishment*, *supra* note 5 (found the direct effect of moral commitment on behavior to be larger than that for perceived threat of legal sanction).

<sup>57</sup> Grasmick & Green, *supra* note 2, employed a measure of moral commitment virtually identical to the measure employed in this study, with the exception that the response set in this study had three categories rather than four.

<sup>58</sup> See Grasmick & Green, *supra* note 2 (found that social disapproval was significantly related to a wide range of illegal behavior); *The Role of Perceived Legal Punishment*, *supra* note 5 (reported that social disapproval was the second best predictor of their measure of illegal behavior).

neither approve nor disapprove; or 3) disapprove if they knew the respondent had driven his or her motor vehicle while drunk. This measure is also similar to that used in previous perceptual deterrence studies.<sup>59</sup>

#### e. Social Demographic Correlates of Drinking and Driving

With the exception of several recent studies,<sup>60</sup> deterrence research has generally ignored the role that respondents' social and demographic profiles play in predicting their involvement in illegal behavior.<sup>61</sup> In an attempt to assess the importance of demographic profiles for the deterrence process, this research includes the variables of age, race, sex, marital status, frequency of drinking alcoholic beverages and frequency of driving a motor vehicle.

#### 4. *The Analysis*

This study used logit regression analysis to assess the importance of both the demographic and social indicators and the inhibitory variables<sup>62</sup> for predicting respondents' past involvement in drunken driving behavior at Time 1 and Time 2. By analyzing the expected odds of a dependent variable as a function of one or more independent variables, logit models can examine the relationships between nominal level dependent variables and nominal or categorical level independent variables.<sup>63</sup>

All independent variables have been dichotomized for the logit regression analysis. There are several advantages to this method of analysis. First, for variables having three or more response categories, the logit regression technique produces two or more beta coefficients, which complicate the interpretation of the relationships among the independent and dependent variables. With dichotomized independent variables, single betas are produced and can be interpreted as the unique effect of each independent variable on the

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<sup>59</sup> See *supra* note 57; *The Role of Perceived Legal Punishment*, *supra* note 5 (measured social disapproval by asking respondents to estimate the reaction of their parents, friends, and teachers in the case of their high school student respondents).

<sup>60</sup> Richards & Tittle, *Gender*, *supra* note 31; Richards & Tittle, *Socioeconomic Status*, *supra* note 31; *Do Sanctions Really Deter?*, *supra* note 6; Piliavin, Gartner, Thornton & Matsueda, *supra* note 6.

<sup>61</sup> Examples of studies which failed to include socio-demographic characteristics include Grasmick & Bryjak, *supra* note 3 and *Causal Ordering in Deterrence Research*, *supra* note 6.

<sup>62</sup> The term inhibitory variables refers to both the formal sanction variables of perceived certainty and severity of legal punishment, and the informal sanction variables of moral commitment to the legal norm and threat of social disapproval from significant others.

<sup>63</sup> D. KNOKE & P. BURKE, *LOG LINEAR MODELS* 45 (1980).

**TABLE 2**  
**DICHOTOMIZED ITEM FREQUENCIES FOR ALL VARIABLES (N = 245)**

Item	Code	Frequency	Percent
Marital Status	0. Not Married	86	35.1
	1. Married	159	64.9
Drinking Frequency	0. Monthly or Less Often	105	42.9
	1. Weekly or More Often	140	57.1
Driving Frequency	0. Monthly or Less Often	14	5.7
	1. Weekly or More Often	231	94.3
Age	0. Less than 38	126	51.4
	1. 38 or older	119	48.6
Race	0. Non-white	11	4.5
	1. White	233	95.5
Sex	0. Female	116	47.3
	1. Male	129	52.7
Moral Commitment	0. Sometimes or Never Wrong	54	22.0
	1. Always Wrong	191	78.0
Social Disapproval	0. Approve or Neither Approve nor Disapprove	45	18.4
	1. Disapprove	200	81.6
Perceived Certainty	0. Very or Somewhat Unlikely	183	75.6
	1. Likely	59	24.4
Perceived Severity	0. Not or Somewhat Serious	96	39.3
	1. Very Serious	148	60.7
Past Drunken Driving Behavior (Time 1)	0. No	169	69.3
	1. Yes	75	30.7
Past Drunken Driving Behavior (Time 2)	0. No	179	74.0
	1. Yes	63	26.0

odds that the respondent engaged in drunk driving behavior.<sup>64</sup> Moreover, given that previous panel studies have conducted their analyses under similar coding procedures, the results of this study

<sup>64</sup> *Id.* at 47.

are more directly comparable with prior research.<sup>65</sup> The codes and frequency distributions for all variables are presented in Table 2.<sup>66</sup>

### C. RESULTS

#### 1. *Final Logic Regression Model for Past Behavior at Time 1*

Table 3 reveals the findings for the final model which includes the significant relationships between the socio-demographic characteristics of the sample, as well as the inhibitory variables, and past self-reported drunken driving, all measured at Time 1.<sup>67</sup> Thus, this model replicates the traditional cross-sectional approach to perceptual deterrence research.<sup>68</sup> Drinking frequency is the strongest predictor of drunken driving behavior (.858;  $p < .001$ ). The informal threat variable of social disapproval is the next strongest predictor for the dependent variable (-.740;  $p < .01$ ). The coefficient associated with age is also moderately large (-.600;  $p < .001$ ), while those for marital status and gender are somewhat smaller (-.426;  $p < .05$  and .397;  $p < .05$ , respectively). Accordingly, the findings for this cross-sectional design indicate that young, unmarried males who drink frequently and perceive a low threat of social disapproval from significant others are more likely to engage in drunken driving behavior than are older, married females who drink less frequently and perceive a high threat of social disapproval.<sup>69</sup>

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<sup>65</sup> This method was chosen in order to add to the body of knowledge contained in more recent panel deterrence theory research. Moreover, preliminary analyses with the original coding schemes revealed no substantive differences from the dichotomized results. See also Minor & Harry, *supra* note 6; Saltzman, Paternoster, Waldo & Chiricos, *supra* note 6.

<sup>66</sup> The exact frequencies for the original variable codes are available from the author.

<sup>67</sup> An interaction term—the multiplicative function of two or more variables—for perceived certainty and severity of legal punishment was originally included in each model, but this analysis indicated that the term was insignificant for both models. Accordingly, only the additive effects for both certainty and severity were included, rather than an interaction term (certainty  $\times$  severity).

<sup>68</sup> See Grasmick & Bryjak, *supra* note 3, and Grasmick & Green, *supra* note 3, for examples of the traditional cross-sectional approach to deterrence theory research.

<sup>69</sup> For those unfamiliar with logit regression analysis, I S. HABERMAN, *ANALYSIS OF QUALITATIVE DATA* 294 (1978), provides a method by which ordinary least-squares (OLS) regression like coefficients can be estimated from logit models. For the cross-sectional model in this study, these coefficients are as follows: age (-1.200); marital status (-.852); gender (.794); drinking frequency (1.716); and social disapproval (-1.480).



**TABLE 3**  
**FINAL LOGIT MODEL (CROSECTIONAL) FOR INDEPENDENT**  
**VARIABLES AT TIME 1 WITH PAST BEHAVIOR AT TIME 1 (N=244).**

Independent Variables At Time 1	Past Drunken Driving Behavior At Time 1
<b>SOCIO-DEMOGRAPHIC CHARACTERISTICS AND SOCIAL INDICATORS</b>	
Age (0 = 18-38; 1 = 39-81)	-.600*** (.172)
Marital Status (0 = not married; 1 = married)	-.426* (.172)
Sex (0 = female; 1 = male)	.397* (.172)
Drinking Frequency (0 = low; 1 = high)	.858*** (.188)
<b>SANCTION THREAT MEASURES</b>	
Social Disapproval (0 = low; 1 = high)	-.740** (.205)
G2 = 45.196	df = 1 p = .506

Numbers in parentheses are standard errors of the coefficients.

\* p < .05

\*\* p < .01

\*\*\* p < .001

Previous cross-sectional studies including the dependent variable of drunken driving behavior have found an inverse relationship between perceived threat of legal punishment and self-reported past involvement in the illegal behavior.<sup>70</sup> In addition, these studies have found that perceived threat of sanction was significantly inversely related to the behavior regardless of levels of informal threat of sanctions. The present findings are not supportive of these earlier findings. Rather, threat of social disapproval is the only inhibi-

<sup>70</sup> See Grasmick & Bryjak, *supra* note 3 (reported a moderate inverse relationship between an interaction effect for perceived certainty and severity and past involvement in drunken driving); Grasmick & Green, *supra* note 2 (when controlling for the informal sanction effects of moral commitment and social disapproval, reported a significant inverse relationship between an interactive term of perceived threat of legal punishment and past involvement in drunken driving); see also Grasmick & Green, *supra* note 3 (similar findings for perceived threat of legal punishment and past involvement in drunken driving when controlling for levels of moral commitment to the legal norm proscribing the behavior).

tory variable that is significantly related to self-reported drunken driving behavior at Time 1.

There are two important distinctions between the previous studies and this research which might account for the observed differences. First, previous studies<sup>71</sup> did not screen their respondents to ensure that only those who drink and drive motor vehicles were included in the analysis.<sup>72</sup> As a result, these studies probably included "novices" who perhaps overestimated their chances of being arrested and convicted for drunken driving. Second, previous studies did not include the socio-demographic characteristics found to be significantly related to drunken driving behavior.<sup>73</sup> By controlling for the effect of these variables in this study, the relationship between legal threat and involvement is significantly reduced.

## 2. *Final Logit Regression Model for Past Behavior at Time 2*

Table 4 reveals the findings for the final model which incorporates the significant relationships between the sample's socio-demographic characteristics, social indicators, and inhibitory variables, measured at Time 1, and self-reported past drunken driving measured at Time 2.<sup>74</sup> This model employs those measures which correctly establish the assumed causal order of perceptual deterrence theory variables.<sup>75</sup> Moral commitment is the strongest predictor of this measure of drunken driving behavior (-.811;  $p < .001$ ). The coefficients associated with age and drinking frequency are moderately strong (-.582;  $p < .01$  and .631;  $p < .001$  respectively). Marital status is also related to the dependent variable of past drinking-driving behavior at Time 2, although the coefficient is not as large as those for the other socio-demographic characteristics (-.447;  $p < .01$ ).<sup>76</sup> The goodness of fit measure of  $G^2$  for this model is 7.452 ( $p$

<sup>71</sup> See Grasmick & Bryjak, *supra* note 2; Grasmick & Green, *supra* note 2; Grasmick & Green, *supra* note 3.

<sup>72</sup> BAILEY, *METHODS OF SOCIAL RESEARCH*, 96 (1978), notes that respondents may generally answer survey questions which may not apply to them in order not to appear stupid to the interviewer.

<sup>73</sup> Grasmick & Bryjak, *supra* note 3; Grasmick & Green, *supra* note 2; Grasmick & Green, *supra* note 3.

<sup>74</sup> Preliminary analyses of the data indicated a multicollinearity problem with the Time 1 and Time 2 measures of self-reported behavior; these measures of illegal behavior were highly correlated with each other, indicating that both measures represented a single common underlying dimension of involvement in drunken driving. Therefore, Time 1 self-reported behavior is intentionally omitted from this part of the analysis.

<sup>75</sup> That is, deterrence theory assumes that current perceptions affect future involvement in illegal behavior. Our panel design allows for this temporal ordering among the deterrence theory variables of perceived certainty and severity of legal punishment, measured at Time 1, and past involvement in drunken driving, measured at Time 2.

<sup>76</sup> Again, for those unfamiliar with logit models, the analogous regression coeffi-

< .761).<sup>77</sup>

**TABLE 4**  
**FINAL LOGIT MODEL (PANEL) FOR INDEPENDENT VARIABLES AT**  
**TIME 1 WITH PAST BEHAVIOR AT TIME 2 (N=242).**

Independent Variables At Time 1	Past Drunken Driving Behavior At Time 2
<b>DEMOGRAPHIC AND SOCIAL INDICATORS</b>	
Age (0 = 18-38; 1 = 39-81)	-.582** (.181)
Drinking Frequency (0 = low; 1 = high)	.631*** (.190)
Marital Status (0 = not married; 1 = married)	-.447** (.174)
<b>THREAT OF SANCTIONS MEASURES</b>	
Moral Commitment (0 = low; 1 = high)	-.811*** (.185)
G2 = 7.452	df = 1
	p = .761

Numbers in parentheses are standard errors of the coefficients.

- \* p < .05
- \*\* p < .01
- \*\*\* p < .001

In summary, the Time 2 model indicates that young, unmarried individuals who drink frequently and are not highly committed to the norm against drunken driving will drive drunk more often than older, married individuals who drink infrequently and are highly committed to the norm against drunken driving. As previously stated,<sup>78</sup> panel studies have reported similar findings highlighting not only the importance of informal sanctions over formal ones for

coefficients for this panel model are as follows: age (-1.164); drinking frequency (1.262); marital status (-.894); and moral commitment (-1.622).

<sup>77</sup> G<sup>2</sup> refers to the value for the chi-square test which determines the ability of the model to accurately represent the data—in other words, the fit of the model to the data. It is computed from the observed versus the predicted frequencies at each cell in the data.

<sup>78</sup> See *The Role of Perceived Legal Punishment*, *supra* note 5, for a discussion of the importance of informal sanctions for the social control process. For a discussion of the role of selected socio-demographic characteristics for models of social control processes, see *Do Sanctions Really Deter?*, *supra* note 6, and Piliavin, Gartner, Thornton & Matsueda, *supra* note 6.

explanations of involvement in illegal behavior, but also the significance of selected socio-demographic characteristics of the samples.

#### D. DISCUSSION

The major finding of this study is that the primary deterrence theory variables of perceived certainty and severity of legal punishment are not significant predictors of the odds for either measure of self-reported drunken driving behavior—past behavior at Time 1 and past behavior at Time 2—among panel respondents. The findings are particularly surprising given the recent efforts to increase the deterrent effect of threat of legal punishment for the offense of drunken driving.<sup>79</sup> In spite of these efforts, the item frequencies for perceived certainty of arrest indicated that over seventy-five percent of the respondents believed that their chances for being arrested by police for drunken driving were still either unlikely or very unlikely.

It would be misleading, however, to fail to note that the legislative efforts were aimed primarily at increasing the penalties for the offense rather than increasing the certainty of detection per se.<sup>80</sup> In this regard, the recent changes in the law appear to have had some influence on the population to which they were directed. Approximately sixty percent of the panel sample did indicate that if they were arrested and convicted for the offense, the punishment they believed they would receive for engaging in the behavior would have serious ramifications for their lives.

The fact that a majority of our respondents believe that the punishment they would receive for engaging in drunken driving behavior would severely impact their lives is perhaps somewhat inconsistent with the finding that perceived threat of legal sanction was not significantly related to self-reported behavior among the sample.

However, findings from several other deterrence studies provide one plausible explanation. In a study utilizing official crime data, Tittle and Rowe<sup>81</sup> found that actual levels of certainty of arrest influence involvement in illegal behavior only after a minimum threshold effect has been reached, which they found to be approxi-

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<sup>79</sup> In addition to the social control efforts mentioned previously, see *supra* note 18, there were numerous, widely publicized "crackdowns" among local police departments throughout the Minneapolis-St. Paul metropolitan area during 1983. *Their Jobs: Get Drunks Off Streets and Highways*, Minneapolis Star & Tribune, Nov. 20, 1983, Picture Section, at 30-38.

<sup>80</sup> J. JACOBS, *supra* note 17, at xvii; Green, Shapiro, Williams, Rodgers & Cleary, *supra* note 23, at 6-13.

<sup>81</sup> Tittle & Rowe, *Certainty of Arrest and Crime Rates: A Further Test of the Deterrence Hypothesis*, 52 Soc. FORCES 455 (1974).

mately a three in ten chance of detection.<sup>82</sup> As previously stated, the findings in the present study indicated that only twenty-five percent of our panel sample perceived a likelihood of arrest if they drove drunk. Moreover, a recent analysis<sup>83</sup> utilizing official records of arrest for drunken driving and alcohol-related fatal accidents in the Minneapolis-St. Paul metropolitan area indicated that the actual likelihood of being arrested for driving while under the influence of alcohol is still approximately one in one hundred.<sup>84</sup> Although research findings are mixed on the correlation between objective and subjective measures of deterrence theory variables,<sup>85</sup> one possible interpretation of these disparate findings is that perceptions of certainty of arrest for drunken driving in the Minneapolis-St. Paul metropolitan area has not reached a minimum level necessary for legal threats of detection to be a salient factor influencing this type of illegal behavior.

In another significant cross-sectional deterrence study, Grasmick and Bryjak<sup>86</sup> found that in order for perceived threats of legal punishment to have a deterrent effect, perceptions of both certainty and severity of sanction must be high.<sup>87</sup> In other words, an interaction effect between perceptions of certainty and severity must exist before threat of sanction affects behavior. Our data did not indicate the existence of a significant interaction term for perceived certainty and severity of legal punishment. Applying Grasmick and Bryjak's results to this research, it is possible that, even though the respondents in this study believe that if arrested and convicted for the offense, their punishment would be problematic for their lives, this legal threat is not an important factor in their decision to drive drunk because they also perceive their chances of being arrested to be insignificant in the first instance. Future studies should obtain samples and select offenses for which threat of legal punishment has

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<sup>82</sup> *Id.* at 458.

<sup>83</sup> J. CLEARY, A. RODGERS, J. WILLIAMS & E. SHAPIRO, ANALYSIS OF THE EFFECTS OF RECENT CHANGES IN MINNESOTA'S DWI LAWS—PART III: LONGITUDINAL ANALYSIS OF THE POLICY IMPACTS, REPORT TO THE MINNESOTA HOUSE OF REPRESENTATIVES (1986).

<sup>84</sup> *Id.* at 33.

<sup>85</sup> See Erickson & Gibbs, *Objective and Subjective Properties of Legal Punishment and the Deterrence Question*, 25 SOC. PROBS. 253 (1978), which found that although both objective certainty of arrest and perceived certainty were inversely related to the crime rate, objective certainty of punishment was not related to the crime rate through perceived certainty. See also Parker & Grasmick, *The Effect of Actual Crimes and Arrests on People's Perceptions of the Certainty of Arrest*, 17 CRIMINOLOGY 366 (1978), which found that respondent's perceptions of certainty of arrest were related to both personal experiences with crime and those of one's acquaintances.

<sup>86</sup> Grasmick & Bryjak, *supra* note 3.

<sup>87</sup> *Id.* at 471.

reached a minimum "threshold" effect in order to adequately assess the importance of both perceptions of certainty and severity of legal punishment for theories of social control.

This study makes a significant break with earlier panel deterrence studies on two additional findings. First, the research fails to support those studies which found evidence of an "experiential effect" between perceptions and behavior.<sup>88</sup> In other words, our cross-sectional analysis indicated that neither perceptions of certainty of arrest nor severity of punishment were significantly related to past self-reported involvement in drunken driving at Time 1. Second, contrary to previous panel research on deterrence hypotheses,<sup>89</sup> our study shows that threat of social disapproval from relatives and friends has no significant effect on drunken driving behavior at Time 2.

One possible explanation for these contradictory findings is the differences between this research and earlier studies. First, this panel study was the first to test deterrence theory hypotheses for drunken driving. Second, this study employed an adult sample gathered from the general population, while all but two of the previous panel studies have utilized high school and/or college students as respondents.<sup>90</sup> It is possible that the findings presented here are unique to this offense and sample group. Obviously, future perceptual deterrence research attempting to replicate these findings for other samples will assist resolution of these conflicting results.

Although threat of social disapproval appears to have had an effect on the behaviors of the adult respondents for the cross-sectional model, its effect a year later, as measured by what has now become the preferred perceptual deterrence model (a panel model), appears to have diminished significantly. The data suggest that as an individual engages in drunken driving behavior over time, the reactions from the individual's significant others become less important in the individual's decision to drive drunk. This interpretation is supported by the Time 2 model which included the significant inhibitory variable of moral commitment as well as the significant relationships between socio-demographic characteristics of the sample. This model reveals that young, unmarried individuals who

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<sup>88</sup> Paternoster & Iovanni, *supra* note 6; *Causal Ordering in Deterrence Research*, *supra* note 6; *Methodological Artifacts*, *supra* note 6; *Do Sanctions Really Deter?*, *supra* note 6; Saltzman, Paternoster, Waldo & Chiricos, *supra* note 6.

<sup>89</sup> For instance, Paternoster and his colleagues found that informal social influences are the most important factors in explaining conformity. *Do Sanctions Really Deter?*, *supra* note 6.

<sup>90</sup> See Piliavin, Gartner, Thornton & Matsueda, *supra* note 6; Murray & Erickson, *supra* note 34.

drink frequently are more likely to engage in the illegal behavior. Withdrawal from friendship groups, relatives and other significant persons is a widely established phenomenon in the literature on problem drinking.<sup>91</sup> Accordingly, the data indicate that, over time, young, single individuals who are heavy drinkers drink and drive more frequently than older, married individuals who are infrequent drinkers, because the former individuals are not as strongly influenced by their significant others.

In any event, the importance of the socio-demographic characteristics of age, marital status, and drinking frequency for predicting self-reported drunken driving strongly point to the need for more research on the influence of these factors on both perceptions of threat of sanction and self-reported behavior. Several cross-sectional studies indicate that gender and other social characteristics produce differential effects for perceptual deterrence theory variables.<sup>92</sup> Future research should continue to examine the significance of these prominent sociological variables for theories of social control.

In fact, replications of this research are crucial not only to perceptual deterrence research in general, but to the remaining interpretations of these findings. To the extent that these findings are supported by other studies of adult drunken driving offenders, and for that matter, any other offender groups, future perceptual deterrence research might not be limited to the more economically, and perhaps even methodologically, costly panel designs.<sup>93</sup>

Comparing the results for both the cross-sectional and panel analyses, a broader theoretical interpretation of these results suggests that deterrence research implicates the most frequently cited theories of social control. The cross-sectional analysis indicates that threats of social disapproval, along with several socio-demographic and social indicators—age, marital status, gender, and drinking frequency—are the best predictors of the odds for involvement in drunken driving. On the other hand, the panel analysis indicates that moral commitment, along with the similar socio-demographic

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<sup>91</sup> Mills, *Does Your Moderate Drinking Indicate Psychological Dependence on Alcohol?*, in *DRINKING: ALCOHOL IN AMERICAN SOCIETY-ISSUES AND CURRENT RESEARCH* 203, 205 (J. Ewing & B. Rouse eds. 1978).

<sup>92</sup> Richards & Tittle, *Gender*, *supra* note 31; Richards & Tittle, *Socioeconomic Status*, *supra* note 31.

<sup>93</sup> See Williams & Hawkins, *supra* note 36, for a more detailed discussion on the limitation of panel designs. See Lundman, *One-Wave Perceptual Deterrence Research: Some Grounds for the Renewed Examination of Cross-Sectional Methods*, 23 *J. RES. CRIME & DELINQ.* 370 (1986), for a further discussion of the importance of cross-sectional designs for future deterrence research.

characteristics and social indicators—age, marital status, and drinking frequency—are the best predictors of the odds for drunken driving. Thus, regardless of the measure of the dependent variable, the substantive conclusions for social control theory remain the same.

In general then, informal threats of sanctions are better predictors of involvement in drunken driving behavior than are formal ones. To the extent that the findings are not unique, previous conclusions that cross-sectional data are undesirable for testing deterrence theory hypotheses are premature.

Scientific generalizations from this data to other populations, however, are not possible for several reasons. First, this sample is drawn from a single metropolitan area of the country. Therefore, the findings presented here are unique to the Minneapolis-St. Paul metropolitan area. More research is needed to compare findings from this study to those from different regions of the country. Perhaps, as has been recently suggested by Williams and Hawkins,<sup>94</sup> national samples should be considered for future perceptual deterrence research. However, to the extent that differential patterns of arrest, conviction, and sentencing exist in various parts of the country, and criminal justice literature strongly suggests that this is the case,<sup>95</sup> national analyses that fail to take these contextual variations into account may result in erroneous conclusions concerning the importance of formal and informal mechanisms of social control.

Second, as previously stated, this study focuses only on one offense: drunken driving. As such, the conclusions may be relevant for this particular offense only. Nonetheless, offense specific analyses such as this study, afford social control researchers the opportunity to refine tests of deterrence theory hypotheses. For example, by focusing solely on drunken driving behavior, this study was able to select only those respondents who had the opportunity to engage in this behavior. Future studies should continue to refine perceptual deterrence research to include opportunity factors, as well as situational ones,<sup>96</sup> in offense specific analyses.

Third, although the majority of perceptual deterrence research has been conducted with a sample size similar to ours, such a sample size prevents consideration of potential higher order interaction ef-

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<sup>94</sup> Williams & Hawkins, *supra* note 36, at 569.

<sup>95</sup> See UNITED STATES DEPARTMENT OF JUSTICE, BUREAU OF JUSTICE STATISTICS, SOURCEBOOK OF CRIMINAL JUSTICE STATISTICS—1986 (Jamieson & Flanagan eds. 1987); UNITED STATES DEPARTMENT OF JUSTICE, BUREAU OF JUSTICE STATISTICS, CORRECTIONAL POPULATIONS IN THE UNITED STATES—1986 (1989).

<sup>96</sup> See Thurman, *Estimating Social-Psychological Effects in Decisions to Drink and Drive: A Factorial Survey Approach*, 47 Q. J. STUD. ALCOHOL 447 (1986).



fects among the socio-demographic characteristics of respondents, their perceptions of formal and informal sanction, and self-reported drunken driving behavior. For example, studies taking interaction effects into account might find that perceived threat of legal punishment influences the drunken driving behavior of young, unmarried males who are heavy drinkers only when informal threats of sanctions are low. Future perceptual deterrence research obtaining larger sample sizes will be able to better assess what now appears to be a complex process by which individuals become tractable to mechanisms of social control in society.

Fourth, while this research is one of a few perceptual deterrence studies which has incorporated opportunity to engage in illegal behavior into the design, the study failed to include factors which might further identify individual motivation to engage in illegal behavior, with the possible exception of the socio-demographic and social indicator variables. Several cross-sectional studies of deterrence theory hypotheses include theoretically derived motivational variables.<sup>97</sup> For example, Scott and Grasmick's data suggest that in order for perceptions of legal threat for tax cheating to deter that illegal behavior, individuals must first be motivated to deviate.<sup>98</sup> Findings from these studies suggest that perceptions of threat of legal punishment are related to individual motivation levels and that future perceptual research should consider these factors in order to more accurately test deterrence theory hypotheses.

#### IV. CONCLUSION

In spite of the inability to generalize the findings of this research to other populations, conclusions drawn from this study suggest that future efforts continue to assess the adequacy of both cross-sectional and panel designs for tests of social control theories. The substantive conclusions of this research concerning the influence of modern deterrence theory variables on individual involvement in drunken driving remained the same regardless of the research design employed. If future studies report similar findings for other populations and offenses, deterrence researchers can have a renewed confidence in the ability of cross-sectional designs to contribute to our understanding of the processes of social control.

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<sup>97</sup> Tittle, *Sanction Fear and the Maintenance of Social Order*, 55 *SOC. FORCES* 579 (1977); Scott & Grasmick, *Deterrence and Income Tax Cheating: Testing Interaction Hypotheses in Utilitarian Theories*, 17 *J. APPLIED BEHAV. SCI.* 395 (1981).

<sup>98</sup> Scott & Grasmick, *supra* note 97, at 405.