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An Empirical Assessment of Corporate Environmental Crime-Control Strategies

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CRIMINOLOGY

AN EMPIRICAL ASSESSMENT OF CORPORATE ENVIRONMENTAL CRIME- CONTROL STRATEGIES

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Corporate illegality is often attributed to greed by corporate managers and insufficient legal safeguards. Underlying this argument is an explicit critique of corporate crime regulatory systems. Yet there is little systematic investigation of the relative merits of different types or components of crime-control strategies; research comparing more punitive command-and-control strategies with self-regulatory approaches is particularly lacking. In this Article, we assess these crime prevention-and-control mechanisms in the context of individual and situational risk factors that may increase the likelihood of illegal behavior in the environmental arena. We use data drawn from two groups of business managers who participated in a factorial survey (using vignettes) measuring their intentions to participate in two types of environmental offenses. Generally, results show that the most effective regulatory levers are (1) credible legal sanctions and (2) the certainty and severity of informal discovery by significant others in the firm. We conclude by discussing the implications of our findings for regulatory policy and strategy, and for efforts to account for the role of social norms in corporate environmental compliance.

I. INTRODUCTION

As a subtype of white-collar crime, corporate crime is typically understood to involve illegal behavior by firms and their agents (executives and managers) in the pursuit of corporate benefit.¹ Criminologists recognize that even though corporations as juridical persons can be charged with illegal activity, corporations per se do not “act.” Rather, managers make decisions and act on behalf of the company. As corporate “actors,” managers also are potentially subject to sanctions for their participation in or knowledge of corporate illegality.² Enforcement provisions for environmental crime allow criminal prosecution, in addition to administrative and civil sanctions, against both corporations and responsible corporate officers.³

Most corporate crime research focuses on firm, industry, and manager

¹ See JOHN BRAITHWAITE, *CORPORATE CRIME IN THE PHARMACEUTICAL INDUSTRY* 6 (1984). This definition does not preclude the notion that self-interest may be an indirect cause and consequence of corporate crime in that managers who “problem solve” successfully, albeit illegally, may reap rewards as an aftereffect.

² See Jennifer Arlen, *The Potentially Perverse Effects of Corporate Criminal Liability*, 23 J. LEGAL STUD. 833, 834 (1994); Urska Velikonja, *Leverage, Sanctions, and Deterrence of Accounting Fraud*, 44 U.C. DAVIS L. REV. 1281, 1284 (2011).

³ See Dorothy Thornton et al., *General Deterrence and Corporate Environmental Behavior*, 27 LAW & POL’Y 262, 263–64 (2005).

attributes to differentiate offenders from nonoffenders.⁴ While this approach is a reasonable one, it often leaves out an important characteristic associated with company (and employee) compliance: the regulatory environment. Specifically, the regulatory environment influences and shapes criminal opportunities through punishment (or the threat of it) and socialization.⁵

Putatively, command-and-control policies—compliance rules imposed and “policed” by the government with an emphasis on punitive sanctions for violators—influence corporate crime because corporate managers are instrumental actors.⁶ Decisions and actions flow from a cost–benefit assessment of both the pecuniary and nonpecuniary pros and cons associated with illegal activity. If the benefits of crime are high and the risk of discovery and punishment is low, then criminal opportunities increase as actors perceive less risk associated with illegal activities.⁷

Another regulatory strategy shifts the primary mechanism of compliance away from the government to the organization itself and to individual actors within it. This approach is less reliant on formal regulation (although the government often plays a secondary role through “enforced” self-regulation) and builds on what Braithwaite has called a

⁴ See MARSHALL B. CLINARD & PETER C. YEAGER, *CORPORATE CRIME* 43–53 (1980); EDWIN H. SUTHERLAND, *WHITE COLLAR CRIME* 17–28 (1949); DAVID WEISBURD ET AL., *WHITE-COLLAR CRIME AND CRIMINAL CAREERS* 143–49 (2001); Cindy R. Alexander & Mark A. Cohen, *Why Do Corporations Become Criminals? Ownership, Hidden Actions, and Crime as an Agency Cost*, 5 J. CORP. FIN. 1, 2–5 (1999); Kristy Holtfreter, *Is Occupational Fraud “Typical” White-Collar Crime? A Comparison of Individual and Organizational Characteristics*, 33 J. CRIM. JUST. 353, 354–56 (2005).

⁵ See MICHAEL L. BENSON & SALLY S. SIMPSON, *WHITE-COLLAR CRIME: AN OPPORTUNITY PERSPECTIVE* 193–94 (2009); Henry C. Finney & Henry R. Lesieur, *A Contingency Theory of Organizational Crime*, in 1 RESEARCH IN THE SOCIOLOGY OF ORGANIZATIONS 255, 255 (Samuel B. Bacharach ed., 1982).

⁶ See generally NEAL SHOVER & ANDY HOCHSTETLER, *CHOOSING WHITE-COLLAR CRIME* 168 (2006) (developing the authors’ theory, which assumes a rational actor model, and opining that sanctions do not work because the command-and-control model is not successfully implemented); Gilbert Geis, *Is Incarceration an Appropriate Sanction for the Nonviolent White-Collar Offender?*, in *CONTROVERSIAL ISSUES IN CORRECTIONS* 152 (Charles B. Fields ed., 1999) (arguing yes).

⁷ See Mark A. Cohen & Sally S. Simpson, *The Origins of Corporate Criminality: Rational Individual and Organizational Actors*, in *DEBATING CORPORATE CRIME* 33, 36 (William S. Lofquist et al. eds., 1997) [hereinafter Cohen & Simpson, *Origins of Corporate Criminality*] (extending the economic model to incorporate nonpecuniary costs and benefits such as informal reputation sanctions); Mark A. Cohen, *Environmental Crime and Punishment: Legal/Economic Theory and Empirical Evidence on Enforcement of Federal Environmental Statutes*, 82 J. CRIM. L. & CRIMINOLOGY 1054, 1063–64 (1992) [hereinafter Cohen, *Environmental Crime and Punishment*] (providing a formal economic model of the costs and benefits of illegal corporate environmental behavior).

“family model” of crime control.⁸

Good corporate citizens are firms whose managers, when confronted with corporate criminal opportunities, will be guided by a sense of right and wrong, by their understanding of how others are likely to view their behavior, and by the extent to which they think the discovery of these acts would bring shame on their companies.⁹

Effective self-regulation by firms (ethics programs, internal compliance mechanisms, and sensitivity to informal sanctions) should narrow criminal opportunities.

In the corporate crime literature, there has been extensive discussion and debate about different regulatory strategies but far too little systematic investigation of the relative merits of each, and few have taken into account the range of solutions that can be included in regulatory policy.¹⁰ Consequently, scholars and policymakers know very little about “what works, what doesn’t, and what’s promising” regarding corporate crime-control strategies.¹¹ In the current study, we offer some empirical insight into this question.

In this Article, we examine the prevention and control of corporate environmental crime in the context of individual and firm-level characteristics that have been linked conceptually and empirically to corporate crime. Specifically, we focus on the extent to which decisions by managers to violate environmental laws are affected by command-and-control or self-regulation prevention-and-control strategies, controlling for known risk factors for crime. This research improves on the prior literature in several ways. Much of the corporate crime literature relies heavily on official data sources. As criminologists are well aware, official observations are limited to illegal acts recorded by enforcement agents and neglect those acts that do not come to the attention of authorities. Of equal importance, these data sources do not allow researchers to learn what managers are actually thinking, leaving the intra-organizational decisionmaking process virtually uninvestigated. The current study addresses both of these issues by using data from a factorial survey to examine managerial decisionmaking within a corporate context. Our goal is to determine the extent to which regulatory strategies are effective in the

⁸ See JOHN BRAITHWAITE, *CRIME, SHAME AND REINTEGRATION* 54–68 (1989).

⁹ Sally S. Simpson et al., *The Social Control of Corporate Criminals: Shame and Informal Sanction Threats*, in *OF CRIME & CRIMINALITY: THE USE OF THEORY IN EVERYDAY LIFE* 141, 142 (Sally S. Simpson ed., 2000).

¹⁰ See NEIL GUNNINGHAM ET AL., *SMART REGULATION: DESIGNING ENVIRONMENTAL POLICY* 37–88 (1998).

¹¹ LAWRENCE W. SHERMAN ET AL., *NAT’L INST. OF JUSTICE, PREVENTING CRIME: WHAT WORKS, WHAT DOESN’T, WHAT’S PROMISING* (1996), available at <https://www.ncjrs.gov/pdf/files/171676.PDF>.

context of situational and individual pushes/pulls toward illegal behavior.

In Part II of this Article, we describe the regulatory context and review previous research on environmental noncompliance. We focus particularly on organizational and individual factors that increase the risk of crime. In Part III, we describe the current research design and research participants. Part IV contains our analysis and results. We conclude, in Part V, with a discussion of the findings, particularly their implications for successful regulatory regimes.

II. PRIOR LITERATURE

A. REGULATORY STRATEGIES AND CORPORATE OFFENDING

Regulatory strategies often overlap. Regulatory instruments and institutions are interconnected,¹² and some strategies, such as responsive regulation, are built around the argument that “regulatory policy should take neither a solely deterrent nor a solely cooperative approach.”¹³ Although it is somewhat simplistic to classify regulation into distinct types,¹⁴ Gunningham, Grabosky, and Sinclair argue that it is useful to examine both the prevention and control capacities of different regulatory strategies given that “a particular instrument which may appear attractive, when looked at on its own, may work quite differently when introduced alongside others.”¹⁵ Below, we identify the key components of two regulatory strategies (command-and-control and self-regulation) and highlight how each is expected to or has been shown to affect corporate crime prevention and control.¹⁶ In addition, we discuss the important role

¹² See GUNNINGHAM ET AL., *supra* note 10, at 37–38.

¹³ Vibeke Lehmann Nielsen & Christine Parker, *Testing Responsive Regulation in Regulatory Enforcement*, 3 REG. & GOVERNANCE 376, 376 (2009).

¹⁴ See IAN AYRES & JOHN BRAITHWAITE, *RESPONSIVE REGULATION: TRANSCENDING THE DEREGULATION DEBATE* 17–18 (1992).

¹⁵ GUNNINGHAM ET AL., *supra* note 10, at 132.

¹⁶ See Cohen & Simpson, *Origins of Corporate Criminality*, *supra* note 7, at 34–35. The regulation literature is cross-disciplinary and extensive. There are many other relevant components of regulatory policy that could be considered here, such as the influence of nongovernmental organizations and corporate gatekeepers on firm compliance. See, e.g., JOHN C. COFFEE, JR., *GATEKEEPERS: THE PROFESSIONS AND CORPORATE GOVERNANCE* 15–54 (2006); Bridget M. Hutter & Clive J. Jones, *Business Risk Management Practices: The Influence of State Regulatory Agencies and Non-State Sources* 17 (Ctr. for Analysis of Risk and Regulation at the London Sch. of Econ. and Political Sci., Discussion Paper No. 41, 2006). Other components to consider are the barriers to compliance posed by regulatory accretion. See generally J.B. Ruhl & James Salzman, *Mozart and the Red Queen: The Problem of Regulatory Accretion in the Administrative State*, 91 GEO. L.J. 757 (2003) (discussing this concept). Our aims are more modest. We wish to better understand how

of informal sanctions either as a control mechanism that can be triggered by command-and-control interventions or as complementary with self-regulatory strategies.

1. *Command and Control*

In command-and-control strategies, legal authorities dictate the terms of compliance, relying on the threat of formal legal sanctions to achieve compliance with those terms.¹⁷ High detection risk coupled with certain and severe punishments should deter most offenders. Empirically, however, the story is more complicated than this. Some research supports the contention that punitive sanctions affect firm and plant behavior, but findings overall are mixed. Cohen, for instance, finds that Coast Guard inspections and monitoring reduce spills at the firm level (a general deterrence effect) and that the frequency of inspection is more important than sanction severity.¹⁸ Simpson, Garner, and Gibbs find little evidence that sanctions of any type (e.g., inspections, informal or formal interventions) associated with Clean Water Act enforcement inhibit reoffending (i.e., specific deterrence).¹⁹ Plant-level studies more consistently show a specific deterrence effect associated with Environmental Protection Agency (EPA) monitoring and enforcement, and a recent review of the empirical literature on enforcement, conducted by Gray and Shimshack, finds both specific and general deterrence associated with environmental monitoring and enforcement.²⁰

specific mechanisms associated with two regulatory strategies affect the way managers think and may behave. In this regard, our work helps to fill an empirical deficit noted by Hutter and Jones:

We know that the sources of regulation and risk management are diversifying, as are the tools and techniques employed to manage and regulate risks. What we do *not* have is much empirically informed research about the range of sources influencing the business world and in particular the weighting of influence exercised by them.

Hutter & Jones, *supra*, at 1.

¹⁷ See Clifford Rechtschaffen, *Deterrence vs. Cooperation and the Evolving Theory of Environmental Enforcement*, 71 S. CAL. L. REV. 1181, 1187–90 (1998).

¹⁸ Mark A. Cohen, *Empirical Research on the Deterrent Effect of Environmental Enforcement and Monitoring*, 30 ENVTL. L. REP. 10245, 10246 (2000).

¹⁹ See SALLY S. SIMPSON ET AL., WHY DO CORPORATIONS OBEY ENVIRONMENTAL LAW? ASSESSING PUNITIVE AND COOPERATIVE STRATEGIES OF CORPORATE CRIME CONTROL 2 (2007), available at <https://www.ncjrs.gov/pdffiles1/nij/grants/220693.pdf>.

²⁰ See generally Cohen, *supra* note 18, at 10246 (providing evidence that environmental monitoring and enforcement serves both specific and general deterrence functions); Wayne B. Gray & Mary E. Deily, *Compliance and Enforcement: Air Pollution Regulation in the U.S. Steel Industry*, 31 J. ENVTL. ECON. & MGMT. 96 (1996) (discussing how mill compliance with air pollution regulations was associated with substantial regulatory activity—inspections or other enforcement actions); Wayne B. Gray & Jay P. Shimshack,

Scenario-based survey research, which largely focuses on environmental and other forms of corporate offending (e.g., bribery, sales fraud, price-fixing), shows that current and prospective managers report reasonably high expectations that corporate crimes will be discovered by legal authorities and that ensuing sanctions will be costly, particularly when individuals (as opposed to the company) are targeted.²¹ Thus, command-and-control strategies based on discovery and punishment should lower corporate offending. But once again, the relationship is far from straightforward. In one study, threats of formal sanctions are mediated through individual characteristics such as morality²² and outcome expectations.²³ Formal punishments are less relevant once informal consequences are included in the analysis.²⁴

2. Self-Regulation

Self-regulatory approaches (typically offered as a complementary strategy in conjunction with government-enforced regulation) presume that prosocial norms and values coupled with effective internal compliance systems (e.g., clear accountability, communication of expectations, effective monitoring, and appropriate reprimands when violations occur) will secure compliance.²⁵ Braithwaite's "family model" of self-regulation

The Effectiveness of Environmental Monitoring and Enforcement: A Review of the Empirical Evidence, 5 REV. ENVTL. ECON. & POL'Y 3 (2011) (providing a summary of the empirical literature on the impact of environmental monitoring and enforcement on plant/facility-level compliance); Benoît Laplante & Paul Rilstone, *Environmental Inspections and Emissions of the Pulp and Paper Industry in Quebec*, 31 J. ENVTL. ECON. & MGMT. 19 (1996) (discussing how both the inspection and threat of inspection have a strong negative impact on plant-level pollution emissions); Wesley A. Magat & W. Kip Viscusi, *Effectiveness of the EPA's Regulatory Enforcement: The Case of Industrial Effluent Standards*, 33 J.L. & ECON. 331 (1990) (discussing how water pollution inspection and enforcement have a strong effect on pollution and rates of compliance); Louis W. Nadeau, *EPA Effectiveness at Reducing the Duration of Plant-Level Noncompliance*, 34 J. ENVTL. ECON. & MGMT. 54 (1997) (explaining that the EPA is effective at reducing the length of time plants are out of compliance).

²¹ See SALLY S. SIMPSON, *CORPORATE CRIME, LAW, AND SOCIAL CONTROL* 35–44 (2002).

²² See Raymond Paternoster & Sally Simpson, *Sanction Threats and Appeals to Morality: Testing a Rational Choice Model of Corporate Crime*, 30 LAW & SOC'Y REV. 549, 554 (1996).

²³ See N. Craig Smith, Sally S. Simpson & Chun-Yao Huang, *Why Managers Fail to Do the Right Thing: An Empirical Study of Unethical and Illegal Conduct*, 17 BUS. ETHICS Q. 633, 638–39 (2007).

²⁴ See Lori A. Elis & Sally S. Simpson, *Informal Sanction Threats and Corporate Crime: Additive Versus Multiplicative Models*, 32 J. RES. CRIME & DELINQ. 399, 414–17 (1995).

²⁵ See David B. Spence, *The Shadow of the Rational Polluter: Rethinking the Role of Rational Actor Models in Environmental Law*, 89 CALIF. L. REV. 917, 993–98 (2001).

rejects the economically rational conception of the firm and its managers found in command-and-control approaches to crime control.²⁶ Instead, company self-regulation also accounts for the notion of organizational social responsibility and the prosocial norms and ethical values of company managers. Thus, managers' perceptions of the ethical climate of a firm should affect their own offending intentions.

Evidence suggests that managers who believe that the corporate culture is tolerant of illegality are more likely to violate regulations.²⁷ Similarly, a recent meta-analysis found that ethics codes supported and enforced by top management have a positive, significant effect on ethical decisionmaking and conduct within companies.²⁸ Research also indicates that a positive compliance culture at the firm level may be transmitted from a parent company to the plant level.²⁹

3. Informal Sanctions

Informal sanctions (e.g., extralegal costs) are regulatory levers associated with both firm self-regulation and command-and-control strategies, depending on the mechanism that inhibits crime. Negative publicity is a case in point. Multiple sources of negative publicity can affect corporate (and manager) actions or outcomes, including: environmental activism,³⁰ mandatory firm disclosure,³¹ or formal charges.³² Generally, studies support the notion that bad environmental news affects a firm's reputation and market performance. However, the literature is mixed as to when in the legal process reputational damage is most salient (notice of pending charges, case announcement, processing, or case resolution).³³

²⁶ See BRAITHWAITE, *supra* note 8, at 133–40.

²⁷ See Paternoster & Simpson, *supra* note 22, at 556. In addition, managers with lower ethical standards and managers ordered to do so are more likely to violate regulations. See SIMPSON, *supra* note 21, at 41–42.

²⁸ Natalie Marie Schell-Busey, *The Deterrent Effects of Ethics Codes for Corporate Crime: A Meta-Analysis* 85 (2009) (unpublished Ph.D. dissertation, University of Maryland, College Park) (on file with Digital Repository at the University of Maryland, College Park).

²⁹ See Gray & Deily, *supra* note 20, at 100.

³⁰ See Neil Gunningham et al., *Social License and Environmental Protection: Why Businesses Go Beyond Compliance*, 29 *LAW & SOC. INQUIRY* 307, 318, 322 (2004); Robert A. Kagan et al., *Explaining Corporate Environmental Performance: How Does Regulation Matter?*, 37 *LAW & SOC'Y REV.* 51, 71–72 (2003).

³¹ See Shameek Konar & Mark A. Cohen, *Information As Regulation: The Effect of Community Right to Know Laws on Toxic Emissions*, 32 *J. ENVTL. ECON. & MGMT.* 109, 110 (1997).

³² See Wallace N. Davidson III et al., *Stock Market Reactions to Announced Corporate Illegality*, 13 *J. BUS. ETHICS* 979, 985 (1994).

³³ *Id.*

whether stock prices are differentially responsive to civil, criminal, or regulatory moving agents;³⁴ or even if negative stock reactions are best understood as “reputational” costs delivered by the market or costs primarily imposed by the legal community.³⁵

When reputational damages stem mainly from formal legal proceedings, this can be seen as part of a deterrence strategy. However, informal sanctions also impose stigmatic, commitment, and attachment costs for managers who violate the law.³⁶ These effects may be a direct consequence of formal sanctions³⁷ or completely unrelated to formal proceedings. In a study of corporate offending intentions, Elis and Simpson found inhibitory effects associated with the certainty of internally imposed informal sanctions (shame) and externally imposed informal sanctions (loss of respect from family, friends, and business associates).³⁸ Importantly, the threat of both individual and firm reputational damage had an inhibitory effect. But these effects were independent of and tended to trump formal sanction risks (which were relatively unimportant sources of deterrence).

Although the literature is slim and contradictory, there is evidence that firm-level stigmatic consequences trickle down to responsible managers.³⁹ In a study of all SEC and DOJ enforcement actions brought between January 1978 and September 2006 against 788 firms in which financial misrepresentation occurred, Karpoff, Lee, and Martin report that 93% of all executives and 96% of other employees identified as legally responsible for the behavior were fired “for reasons that are directly related to their misconduct.”⁴⁰ Job loss was more likely when misconduct was particularly costly to shareholders and when offenders faced strong governance

³⁴ See Bruce Mizrach & Susan Zhang Weerts, *Does the Stock Market Punish Corporate Malfeasance? A Case Study of Citigroup*, 3 CORP. OWNERSHIP & CONTROL 151, 153–54 (2006) (serving as an example of how reputational consequences can flow from different moving agents).

³⁵ See Jonathan M. Karpoff et al., *The Reputational Penalties for Environmental Violations: Empirical Evidence*, 48 J.L. & ECON. 653, 665–68 (2005).

³⁶ See Raymond Paternoster, *The Deterrent Effect of the Perceived Certainty and Severity of Punishment: A Review of the Evidence and Issues*, 4 JUST. Q. 173, 210 (1987) (citing Kirk R. Williams & Richard Hawkins, *Perceptual Research on General Deterrence: A Critical Review*, 20 LAW & SOC’Y REV. 545, 568 (1986)).

³⁷ See Kirk R. Williams & Richard Hawkins, *The Meaning of Arrest for Wife Assault*, 27 CRIMINOLOGY 163, 166 (1989).

³⁸ See Elis & Simpson, *supra* note 24, at 410–11.

³⁹ See Cindy R. Alexander, *On the Nature of the Reputational Penalty for Corporate Crime: Evidence*, 42 J.L. & ECON. 489, 523 (1999); Jonathan M. Karpoff et al., *The Cost to Firms of Cooking the Books*, 43 J. FIN. & QUANTITATIVE ANALYSIS 581, 605–07 (2008).

⁴⁰ Jonathan M. Karpoff et al., *The Consequences to Managers for Financial Misrepresentation*, 88 J. FIN. ECON. 193, 204 (2008).

structures.⁴¹ From this literature, we expect that command-and-control as well as self-regulatory strategies will benefit from accounting for the informal stigmatic costs to the individual.

B. RISK FACTORS FOR CORPORATE OFFENDING

There are many different empirically identified “risk factors” for corporate crime. These factors are important in our study because effective regulation should minimize the likelihood of criminal behavior in the face of pressures and predilections. Below, we summarize some of the known risk factors for corporate environmental crime with the caveat that many of these same risk factors also are associated with offending by companies more generally.

Looking first at firm characteristics, some research has found financial strain (measured in different ways) to significantly increase the likelihood that firms, plants, and managers will violate environmental laws and/or increase pollution levels.⁴² In vignette studies specifically, after controlling for individual-level predictors, managers are significantly more likely to engage in price-fixing, bribery, fraud, or EPA violations if the act will give the organization an edge over foreign competition or the act will result in substantial savings for the firm.⁴³ When firm profits are slowing or declining, managers and employees may resort to criminal practices to attain performance goals.⁴⁴

In other studies, however, firm profit either is unrelated to environmental (and occupational health and safety) violations⁴⁵ or has a positive effect on offending.⁴⁶ Simpson, for example, finds that managers’ intentions to offend were higher when the firm was depicted as growing its sales.⁴⁷ Thus, offending may be related to both financial decline and

⁴¹ *Id.* at 194.

⁴² See CLINARD & YEAGER, *supra* note 4, at 128–29; Cindy R. Alexander & Mark A. Cohen, *New Evidence on the Origins of Corporate Crime*, 17 *MANAGERIAL & DECISION ECON.* 421, 421 (1996); Kagan et al., *supra* note 30, at 51–90; Marie McKendall et al., *Corporate Governance and Corporate Illegality: The Effects of Board Structure on Environmental Violations*, 7 *INT’L J. ORG. ANALYSIS* 201, 203 (1999).

⁴³ See Paternoster & Simpson, *supra* note 22, at 557–59.

⁴⁴ See generally Neal Shover & Kevin M. Bryant, *Theoretical Explanations of Corporate Crime*, in *UNDERSTANDING CORPORATE CRIMINALITY* 141, 154 (Michael B. Blankenship ed., 1993).

⁴⁵ See Charles W. L. Hill et al., *An Empirical Examination of the Causes of Corporate Wrongdoing in the United States*, 45 *HUM. REL.* 1055, 1070–71 (1992).

⁴⁶ See Marie A. McKendall & John A. Wagner, III, *Motive, Opportunity, Choice, and Corporate Illegality*, 8 *ORG. SCI.* 624, 625–26, 638 (1997).

⁴⁷ See SIMPSON, *supra* note 21, at 126.

growth. Corporate observers suggest that a lack of predictability may underlie both of these situations, especially if the change is unexpected or rapid in nature.⁴⁸

The literature also predicts a link between intra-organizational structures and offending. Within companies, decisions follow particular lines of communication and responsibility. Managers have shown a tendency to obey authority, even when ordered to behave unethically or violate the law.⁴⁹ This is true especially for middle-level managers who are responsible for carrying out orders but who have relatively little decisionmaking authority vis-à-vis top management.⁵⁰

Although organizational characteristics are often associated with corporate crime because they provide opportunity, context, or motivations for offending, as mentioned previously, managers—not companies—make decisions. Managerial decisions might be affected by individual norms⁵¹ and differences in traits such as impulsivity, hubris, desire for control, Machiavellianism, and self-serving bias.⁵² Although evidence on the link between corporate crime and low self-control⁵³ is weak at best,⁵⁴ empirical findings support an association between some of these other individual traits and illegality and/or other negative business outcomes.⁵⁵

⁴⁸ MICHAEL E. PORTER, *COMPETITIVE STRATEGY: TECHNIQUES FOR ANALYZING INDUSTRIES AND COMPETITORS* 324 (1980).

⁴⁹ HERBERT C. KELMAN & V. LEE HAMILTON, *CRIMES OF OBEDIENCE: TOWARD A SOCIAL PSYCHOLOGY OF AUTHORITY AND RESPONSIBILITY* (1989).

⁵⁰ See MARSHALL B. CLINARD, *CORPORATE ETHICS AND CRIME: THE ROLE OF MIDDLE MANAGEMENT* 21–23 (1983).

⁵¹ See Michael P. Vandenbergh, *Beyond Elegance: A Testable Typology of Social Norms in Corporate Environmental Compliance*, 22 *STAN. ENVTL. L.J.* 55, 63–67 (2003).

⁵² See Paul Babiak et al., *Corporate Psychopathy: Talking the Walk*, 28 *BEHAV. SCI. & L.* 174, 190 (2010).

⁵³ See MICHAEL R. GOTTFREDSON & TRAVIS HIRSCHI, *A GENERAL THEORY OF CRIME* 180–201 (1990) (discussing white-collar crime); Travis Hirschi & Michael Gottfredson, *The Significance of White-Collar Crime for a General Theory of Crime*, 27 *CRIMINOLOGY* 359, 360–62 (1989).

⁵⁴ See WEISBURD ET AL., *supra* note 4, at 187–88; Michael L. Benson & Elizabeth Moore, *Are White-Collar and Common Offenders the Same?: An Empirical and Theoretical Critique of a Recently Proposed General Theory of Crime*, 29 *J. RES. CRIME & DELINQ.* 251, 260–63 (1992); Sally S. Simpson & Nicole Leeper Piquero, *Low Self-Control, Organizational Theory, and Corporate Crime*, 36 *LAW & SOC'Y REV.* 509, 531–33 (2002).

⁵⁵ See Katherine A. DeCelles & Michael D. Pfarrer, *Heroes or Villains? Corruption and the Charismatic Leader*, 11 *J. LEADERSHIP & ORGANIZATIONAL STUD.* 67, 69–70 (2004); Matthew L. A. Hayward & Donald C. Hambrick, *Explaining the Premiums Paid for Large Acquisitions: Evidence of CEO Hubris*, 42 *ADMIN. SCI. Q.* 103, 106–10 (1997); Nicole Leeper Piquero, M. Lyn Exum & Sally S. Simpson, *Integrating the Desire-for-Control and Rational Choice in a Corporate Crime Context*, 22 *JUST. Q.* 252, 268–72 (2005).

In sum, the body of evidence regarding the specific levers of corporate crime control is limited and inconclusive. Importantly, little is known about how effective different regulatory strategies or components are in the context of known or suspected risk factors—both organizational and individual. To address this issue, we rely on data drawn from a factorial survey administered to two samples of corporate employees. The first sample includes corporate managers recruited as part of a National Institute of Justice (NIJ)-funded study on corporate environmental noncompliance. The second sample includes employees of public and private companies, drawn from a broader sample of the population. Both sets of participants responded to web-based surveys that depicted two hypothetical scenarios designed to assess individuals' propensity to engage in significant pollution violations (e.g., discharging toxins into waterways) and less serious environmental offenses (e.g., ignoring an EPA compliance order).

III. METHODS

Factorial surveys combine experimentally manipulated hypothetical scenarios (vignettes) with survey questions to measure respondents' intentions, decisions, attitudes, or judgments.⁵⁶ These designs, unlike more traditional survey techniques, allow researchers to manipulate a full range of circumstances that may affect a decision—essentially taking into account “the complexity and richness in the way people approach decisions and evaluations.”⁵⁷ The design also avoids some of the temporal ordering and perceptual instability problems associated with other research designs.⁵⁸ Vignette surveys can be less threatening methods of data collection than self-report surveys when the subject matter is sensitive, such as when respondents are queried about unethical, criminal, or deviant behavior. Although vignettes have been used extensively in the social sciences⁵⁹ and

⁵⁶ See PETER HENRY ROSSI & STEVEN L. NOCK, MEASURING SOCIAL JUDGMENTS 9–13 (1982).

⁵⁷ Edward D. Weber et al., The PC Vignette Generating Program (1988) (on file with the University of Massachusetts Social and Demographic Research Institute, Amherst, MA).

⁵⁸ See Linda Saltzman et al., *Deterrent and Experiential Effects: The Problem of Causal Order in Perceptual Deterrence Research*, 19 J. RES. CRIME & DELINQ. 172, 174 (1982).

⁵⁹ In criminology, vignette studies were used to evaluate the appropriateness of corporate crime punishments, see Joan L. Miller et al., *Felony Punishments: A Factorial Survey of Perceived Justice in Criminal Sentencing*, 82 J. CRIM. L. & CRIMINOLOGY 396, 396–415 (1991); public perceptions of white-collar crime seriousness, see James Frank et al., *Sanctioning Corporate Crime: How Do Business Executives and the Public Compare?*, 13 AM. J. CRIM. JUST. 139, 139–41 (1989); and offending intentions, see Steven Klepper & Daniel Nagin, *The Deterrent Effect of Perceived Certainty and Severity of Punishment Revisited*, 27 CRIMINOLOGY 721, 729 (1989); George Loewenstein et al., *The Effect of Sexual Arousal on Expectations of Sexual Forcefulness*, 34 J. RES. CRIME & DELINQ. 443,

business to collect useful information about topics such as survey participation⁶⁰ and consumer preferences,⁶¹ they also have some drawbacks. Critics have raised concerns about: the link between reported intentions and actual behavior and whether the relationship is sensitive to the respondent's sex and the situation analyzed;⁶² the extent of social desirability bias in responses, especially in the constant-variable value vignettes where all respondents read identical scenarios;⁶³ whether there are "order" effects;⁶⁴ and whether scenario-based research is valid and reliable,⁶⁵ among other issues. Poorly considered dimensions and components of the scenarios contribute to validity problems.

In this study, to increase data validity, we draw extensively from the empirical and theoretical literatures to identify relevant attributes and levels for the vignettes. We also asked environmental professionals and people in business to review drafts of the vignettes and the instrument was revised accordingly.⁶⁶ We experimentally rotated vignette items within the scenario dimensions to lessen social desirability bias. To minimize the biasing effect of vignette order, we randomly allocated items to respondents and asked them to imagine themselves in the position of the vignette actor.⁶⁷ Order effects are more likely when respondents have little

445 (1997); Paternoster & Simpson, *supra* note 22, at 558; N. Craig Smith et al., *supra* note 23, at 645.

⁶⁰ See Robert M. Groves et al., *A Laboratory Approach to Measuring the Effects on Survey Participation of Interview Length, Incentives, Differential Incentives, and Refusal Conversion*, 15 J. OFFICIAL STAT. 251 (1999).

⁶¹ See Alice Grønhøj & Tino Bech-Larsen, *Using Vignettes to Study Family Consumption Processes*, 27 PSYCHOL. & MARKETING 445 (2010).

⁶² See Stefanie Eifler, *Evaluating the Validity of Self-Reported Deviant Behavior Using Vignette Analyses*, 41 QUALITY & QUANTITY 303, 306–10 (2007); M. Lyn Exum et al, *Self-Reported Intentions to Offend: All Talk and No Action?*, 37 AM. J. CRIM. JUST. 523, 534 (2011).

⁶³ See generally Gerald F. Cavanaugh & David J. Fritzsche, *Using Vignettes in Business Ethics Research*, in 7 RESEARCH IN CORPORATE SOCIAL PERFORMANCE AND POLICY 279–93 (Lee E. Preston ed., 1985); Maria F. Fernandes & Donna M. Randall, *The Nature of Social Desirability Response Effects in Ethics Research*, 2 BUS. ETHICS Q. 183 (1992).

⁶⁴ See Katrin Auspurg & Annette Jäckle, *First Equals Most Important?: Order Effects in Vignette-Based Measurement* 19–20 (Inst. for Soc. and Econ. Research, Working Paper No. 2012-01).

⁶⁵ See Stefanie Eifler, *Validity of a Factorial Survey Approach to the Analysis of Criminal Behavior*, 6 METHODOLOGY 139, 140 (2010); James Weber, *Scenarios in Business Ethics Research: Review, Critical Assessment, and Recommendations*, 2 BUS. ETHICS Q. 137, 145–46 (1992).

⁶⁶ See Kelly D. Wason et al., *Designing Vignette Studies in Marketing*, 10 AUSTRALASIAN MARKETING J. 41, 53 (2002).

⁶⁷ See *id.* at 41–43.

knowledge or care little about the topic.⁶⁸ Our study explicitly sampled environmental experts (discussed below), and we asked respondents to report on their experiences with and attitudes about depicted behaviors as part of the survey. Although the jury is still out, research also has shown a reasonable correlation between reported intentions and behavior.⁶⁹ Given the sensitive subject matter (corporate offending) as well as our attention to methodological concerns in the design of the instrument, we believe the factorial survey method is a reasonable and valid approach to our research question.

A. SCENARIO CONSTRUCTION

One of the first steps in factorial survey construction is to determine the “domain” of the judgment or decision. The vignette domain consists of dimensions believed to affect the manager’s decision to engage in corporate offending. Guided by a modified rational choice theory⁷⁰ and the corporate crime empirical literature, a number of pushes and pulls toward crime at the individual and corporate level are incorporated into the vignette design. Scenarios are created from rotated elements or levels within dimensions. To illustrate, the firm’s environmental constraints (one dimension) provide contextual information to the respondent about the economic environment in which the company is conducting its business. The type of constraint (e.g., the industry is losing ground to foreign competitors, the industry is economically healthy, the industry is economically deteriorating) is randomly assigned to each scenario. Further, management level is an intra-organizational dimension empirically linked to offending decisions. Pressures on middle managers to achieve corporate goals—often with the implicit message “by any means necessary”⁷¹—and unrealistic performance metrics⁷² create a greater likelihood of corporate crime by midlevel managers compared with top management (who generally set company goals and strategies for others to achieve). Research has also found that managers adhere to authority structures within firms.⁷³ The probability of

⁶⁸ Auspurg & Jäckle, *supra* note 64, at 1.

⁶⁹ See Greg Pogarsky, *Projected Offending and Contemporaneous Rule-Violation: Implications for Heterotypic Continuity*, 42 CRIMINOLOGY 111, 115 (2004); Harry Telser & Peter Zweifel, *Validity of Discrete-Choice Experiments Evidence for Health Risk Reduction*, 39 APPLIED ECON. 69, 72–75 (2007).

⁷⁰ See Paternoster & Simpson, *supra* note 22, at 553–57.

⁷¹ CLINARD, *supra* note 50, at 22–23.

⁷² John Braithwaite, *White-Collar Crime, Competition, and Capitalism: Comment on Coleman*, 94 AM. J. SOC. 627, 629 (1988).

⁷³ Joseph Sanders & V. Lee Hamilton, *Distributing Responsibility for Wrongdoing Inside Corporate Hierarchies: Public Judgments in Three Societies*, 21 LAW & SOC. INQUIRY 815,

corporate crime is higher for those managers affirmatively instructed to break a given rule. Thus, we varied the “locus of control” in the scenarios based on whether or not the employee was ordered by a superior to commit the offense. Finally, the ethical tone and culture of a company can affect how managers perceive corporate crime (as acceptable or not) which, in turn, may increase or decrease the anticipated rewards/costs of offending. Dimensions that rotate levels of managerial ethics, firm volunteerism, and internal compliance systems also are randomized within the scenarios. The specific dimensions of interest (and randomized levels within each) for this Article are listed in Appendix I.

The survey instrument contains two “offending” vignettes. One noncompliance scenario describes a technical violation (e.g., failure to act/comply with an environmental agency’s order) with no indication of whether it will affect pollution levels. The other depicts a more substantial pollution event (the intentional release of a toxic substance into a local waterway) that exceeds permitted levels by 200%. Sample scenarios can be found in Appendix II. The vignettes are followed by a series of questions that relate to a specific scenario, general questions that measure respondents’ opinions and beliefs, and requests for demographic/work information about the respondent and his/her current employer.

B. SURVEY ADMINISTRATION

As noted previously, the factorial survey was first pretested, redesigned, and then vetted with environmental scholars, regulators, and executives. The instrument was modified to address any remaining concerns and adopted to be administered using a web-based Internet site. Data collection occurred in two waves. The survey first was administered in companies that were part of a larger NIJ-funded grant.⁷⁴ The original research assessed patterns of environmental offending and company responses to governmental interventions (regulatory, civil, or criminal). An additional goal was to look inside the black box of the corporation by studying managers’ perceptions of corporate environmental crime and learn about their decisionmaking processes. All firms (whether participants in the vignette survey or not) were drawn from a sample of U.S.-owned companies in three basic manufacturing industries (steel, pulp and paper, and oil refining). These firms owned manufacturing sites that were designated by the EPA as “major” facilities.⁷⁵ Of the forty-eight firms

853 (1997).

⁷⁴ See SIMPSON ET AL., *supra* note 19.

⁷⁵ Whether a facility is deemed “major” or not is determined by the facility’s volume and type of wastewater, as well as its potential for discharging toxic wastes. See Peter C.

contacted to participate in this study, only three companies agreed to send the survey out to their employees. Due to technical difficulties associated with survey administration, one firm asked to withdraw from the project after data had been collected. Thus, respondents for the study are concentrated in two participating companies—one in the steel industry and the other in pulp and paper.

The low rate of participation raises concerns of bias in the data. For example, if ethical firms were more likely to participate, our results may underestimate the likelihood of offending and the relationship between it and key independent variables. To assess potential bias, we compared each participating company's average size (number of facilities owned, number of employees), market value (total stockholders' equity), compliance (total violations, violation rate per number of facilities), and enforcement record (total sanctions, total inspections, inspection rate per number of facilities) to the seventy-one nonparticipants.⁷⁶ The values for each company were taken by averaging six years of data (1995–2000). We do not provide significance tests due to the small sample size for participants ($N = 2$). One participating company is much larger and has a higher market value than the average company in the sample. It also has a better record of compliance, including a lower violation rate (.43 standard deviations below the mean for nonparticipating companies). The second participant is also somewhat larger than the average company, but has a record of compliance very similar to that of nonparticipating companies (.01 standard deviations below the mean for nonparticipating companies). Such firm-level variability gives us confidence that responding managers come from corporate environments with different environmental records—one better than and one comparable to the “typical” nonparticipating firm in the NIJ sample.

Fifty-four respondents from one company and sixteen participants from another reported on their willingness to engage in the noncompliant behaviors described in *both* scenario types, producing 140 scenarios. An additional fourteen participants reported their behavioral intentions for *one* scenario. This produced 154 cases for potential analysis. After listwise deletion of independent variables, 126 cases from seventy respondents were included in the final analysis.⁷⁷

Yeager, *Industrial Water Pollution*, 18 CRIME & JUST. 97, 122 n.37 (1993).

⁷⁶ See *infra* Appendix III, Table 1.

⁷⁷ For both samples, only seventeen people who received both scenarios failed to respond to both (fourteen in the NIJ sample; three in the TMone sample). Because eleven of these are missing additional data, these respondents ultimately are excluded from further analysis. Not surprisingly, after dropping those who completed only one scenario from the analysis and comparing the results with the full sample, there are no significant observed

Recognizing that respondents in the NIJ study were drawn from a limited sample of large manufacturers, our goal in the second study was to target a broader set of business managers and gain a larger pool of respondents than in the first study.⁷⁸ We also preferred potential respondents to have some knowledge about environmental statutes and compliance requirements. Accordingly we obtained a list of 7,292 environmental decisionmakers within a wide variety of organizations in the United States from TMone, a company that provides targeted databases for direct mail campaigns. The sampling frame list contained the individual's name as well as information about the entity for which he worked, including the organization's name, address, telephone number, and webpage (if applicable).

From December 2008 to March 2009, Vanderbilt University sent letters to potential respondents on the list indicating their selection for survey participation. The letters also provided a link to the web-based factorial survey. Of the 7,292 sent, 1,373 letters were returned as undeliverable, leaving us with a potential sample pool of 5,919. To increase response rates, Vanderbilt researchers sent out follow-up postcards about three weeks after the initial letter was sent (from January 2009 to April 2009). Seven hundred seventeen individuals logged into the survey site, for a response rate of about 12%.⁷⁹ This response rate is not atypical of that seen in previous studies on web-based surveys.⁸⁰ Low response rates

differences.

⁷⁸ There were a few minor changes between the two survey instruments. When applicable, differences between items are noted in the text.

⁷⁹ We received about thirty contacts from individuals about the surveys, including reasons for participating or not participating in the survey. Most of the contacts who indicated they would not be responding to the survey mentioned a lack of technical proficiency or not owning a computer. Many who reported not owning a computer were also retired. Some mentioned that they simply were not interested or that they did not feel like they were appropriate respondents because of their current jobs or work experiences (e.g., did not see themselves as environmental experts). We provided technical assistance to individuals who wanted to respond to the survey but had trouble accessing the website, and encouraged those who felt they were inappropriately contacted to respond with the understanding that we would consider their job description and experience when interpreting results.

⁸⁰ See generally Stephen R. Porter & Michael E. Whitcomb, *The Impact of Contact Type on Web Survey Response Rates*, 67 PUB. OPINION Q. 579, 583–84 (2003) (comparing different types of contacts and showing that response rates are relatively low regardless of delivery condition); Ashok Ranchhod & Fan Zhou, *Comparing Respondents of E-mail and Mail Surveys: Understanding the Implications of Technology*, 19 MARKETING INTELLIGENCE & PLANNING 254 (2001). Scholars have long noted that web-based surveys have certain features that reduce the likelihood of response. For instance, researchers cannot include tangible incentives that can increase participation (e.g., pens, stickers), the formatting of web surveys may make the questionnaire appear longer and less professional, respondents may

do not necessarily equate to nonresponse bias. If respondent characteristics are similar to nonrespondent characteristics, then the survey responses can reasonably be attributed to the larger target sample.⁸¹ To assess nonresponse bias, we took a random sample of 500 individuals from the 5,919 who received the invitation to participate. For each of these 500 people, we gathered additional information regarding the type of organization (publicly or privately owned corporation, government agency, NGO or civic association, law firm, private consulting firm, or other) and the type of profession (environmentally related or not), the size of the entity, and the gender of the individual. As shown in Appendix III (Table 2), we compared respondents to nonrespondents on these four dimensions, and found that the only significant difference between the two groups was organization size. Respondents came from slightly larger organizations (mean = 14.04 employees) than nonparticipants (mean = 9.59 employees).⁸² However, the similarities on the other dimensions suggest nonresponse may not be a major problem. Even so, we are cautious with our interpretation and extrapolation of findings.

C. RESPONDENT INFORMATION

Merging the two sets of respondents yields a total of 237 scenarios from 161 individuals.⁸³

feel that data integrity is not secure, and technical issues may affect responsiveness. *See id.* at 254–56; Linda J. Sax et al., *Assessing Response Rates and Nonresponse Bias in Web and Paper Surveys*, 44 RES. HIGHER EDUC. 409 (2003).

⁸¹ Sax et al., *supra* note 80, at 409–32.

⁸² The range on this variable is 1 to 370 employees. Although statistically significant, we question whether this is a meaningful difference. Both means are on the small side and if we round 9.59 up to 10, both responders and nonparticipants fall within the same business size classification according to the U.S. Census. *Statistics About Business Size*, U.S. CENSUS BUREAU (Aug. 22, 2012), <http://www.census.gov/econ/smallbus.html>.

⁸³ For comparison purposes, the demographic characteristics of each sample are shown in Table 1, *infra*. As these descriptions demonstrate, our strategy to get a broader range of respondents in the TMone sample was successful.

Table 1
*Demographics and Perceptions of Company
 Environmental Strategies, by Sample*

	NIJ Sample (N = 70)	TMone Sample (N = 91)	Total Sample (N = 161)
Marital Status	94% married	80% married	85% married
Gender	93% male	79% male	84% male
Age	Mean = 45.99	Mean = 54.47	Mean = 50.49
Education			
HS degree or equivalent	2.74%	57.29%	35.56%
Some college	5.48%	30.21%	20.00%
4-year college degree	57.53%	5.21%	26.67%
Some graduate study	13.70%	1.04%	6.11%
Graduate degree	20.55%	6.25%	11.67%
Involvement with environmental decisionmaking			
Not involved	4.29%	4.17%	4.38%
Somewhat involved	28.57%	10.42%	18.13%
Routinely involved	67.14%	85.42%	77.50%
Management experience			
Years working for current employer	Mean = 18.78	Mean = 13.87	Mean = 16.12
Years of business experience	Mean = 23.34	Mean = 30.84	Mean = 27.39
Managerial position ⁸⁴	Lower: 17.14% Middle: 75.71% Upper: 7.14%	Employee: 5.15% Management: 17.53% Executive: 77.32%	--
Environmental commitment of respondent's firm			
Excessive	10.00%	9.28%	9.54%
About right	88.57%	88.66%	88.60%
Could use work	1.43%	2.06%	1.86%
Poor	0.00%	0.00%	0.00%
Compliance systems in respondent's company			
Code of ethics	100%	63%	80%
Mandatory ethics training	91%	20%	51%
Random audits	26%	4%	14%
Anonymous hotline	99%	10%	49%
Corporate environ. mgmt. system or company policy ⁸⁵	99%	38%	--
Top mgmt. treats ethics and violations seriously	91%	60%	65%

⁸⁴ The two samples received different response choices to the question, "What is your management level?"

⁸⁵ The two samples received different questions about company policy. The NIJ sample was asked, "Does your current employer have [a] Corporate Environmental Management System?" The TMone sample was asked whether their company had a "[c]ompany policy regarding environmental compliance management systems in relevant business sites."

As reported in Table 1, the average respondent is about fifty years of age. Most are married (85%) and male (84%), and a substantial majority attended college or graduate school (64%). They are experienced and loyal workers, with an average career length of twenty-seven years, sixteen of which have been with their current employer. About 78% report being routinely involved with environmental decisionmaking in their respective companies. Most respondents have a positive assessment of their firms' ethical commitments. Sixty-five percent of the respondents report that top management treats ethics and violations seriously, and 89% report that the environmental commitment of their firm is just right. There is more variation in the kinds of ethics training and compliance systems utilized by their firms. About 80% of respondents report the presence of a code of ethics in their workplace, 51% report mandatory ethics training, 14% report random audits, and 49% report an anonymous hotline.⁸⁶

D. MEASURES

1. *Dependent Variable*

After reading each scenario, respondents were asked to rate how likely they were to act like the manager in the scenario (0 = no chance at all to 10 = 100% chance), who in both scenarios always engages in noncompliant behavior. Therefore the dependent variable measures the respondent's willingness or intention to act illegally. Intentions are not distributed equally across vignette types; individuals were much less likely to offend when given the "significant noncompliance" scenario than when they were given the "technical noncompliance" scenario. Specifically, in the 113 EPA-order-defiance scenarios, 57.5% (N = 65) of the respondents reported no chance of offending. In comparison, 102 out of the 124 (82.3%) of the respondents to the toxic-release scenario reported no chance of offending.

⁸⁶ This seems fairly typical for major corporations. A recent LRN ethics study, for instance, found eight out of ten employees reporting that their organization has a written code of conduct or ethics. Moreover, a large percent (83%) also say that their management "genuinely" wants to promote integrity and ethics in the organization. LRN CORP., *THE IMPACT OF CODES OF CONDUCT ON CORPORATE CULTURE 3* (2006), available at <http://www.ethics.org/files/u5/LRNImpactofCodesofConduct.pdf>. The code of ethics or code of conduct is the most common part of the compliance infrastructure and hotlines are also fairly common. Highly regulated industries tend to have more detailed compliance structures. DONNA BOEHME, *FROM ENRON TO MADOFF: WHY MOST CORPORATE COMPLIANCE AND ETHICS PROGRAMS ARE POSITIONED FOR FAILURE 28* (2009), available at <http://compliancestrategists.net/sitebuildercontent/sitebuilderfiles/Rand1.pdf>. We expected and found the NIJ respondents (steel; pulp and paper) to report more extensive systems than the TMone sample.

Combined, 167 out of the 237 (70.5%) scenarios in the total survey had a “no chance of offending” outcome reported.⁸⁷ Given the obvious positive skew on offending overall as well as by scenario type, we recoded the dependent variable to a binary outcome (0 = unwilling to act like the manager in the scenario; 1 = 10% or more chance of acting like the manager in the scenario and engaging in illegal behavior).⁸⁸

2. Independent Variables

The independent variables can be sorted into three main categories: relevant control variables, individual/corporate risk factors for offending, and variables that capture some aspect of regulation (command-and-control, firm self-regulation). Variables are drawn from the vignettes themselves,⁸⁹ questions that follow each survey, and demographic information reported by respondents. Each class of variables is described briefly below.

i. Controls

Although there are a number of potential control variables to include in this analysis, we focused primarily on variables that had a significant bivariate relationship with the dependent variable⁹⁰ or affected offending intentions in preliminary analyses, once other variables were included in the models. Questions ask respondents to assess scenario realism (0 = not realistic, 1 = realistic) and to rate the desirability of the behavior (0 = not at all desirable to 10 = very desirable) and how likely the manager’s actions were to endanger human life and wildlife (0 = no chance at all to 10 = 100% chance). We also included measures that controlled for: (1) the respondent’s years of business experience; (2) whether the respondent had personally experienced or knew about any of the offense types presented;⁹¹

⁸⁷ Only people with no missing data are included in our analysis. Consequently, we do not lose any cases across models.

⁸⁸ Alternative coding strategies for the dependent variable (0–10) and analyses (OLS and Tobit) were conducted to assess whether the binary coding scheme is defensible. Results are substantively the same as those reported with only minor observed differences (results available on request). Because our primary interest in this study is to determine whether certain interventions minimize the likelihood of offending, it made sense for us to truncate all positive responses into a binary 0/1 coding scheme.

⁸⁹ Vignette characteristics entered into the models are dummy variables scored as 1 if the characteristic was present in the scenario and 0 if it was not included. The choice of the reference category is determined by theory and ease of interpretation.

⁹⁰ See *infra* Table 2.

⁹¹ The two samples received slightly different versions of this question—the NIJ sample was asked whether they had personal experience with *or knew about* any of the scenarios presented in the same question while the TMone sample was only asked about personal experience with each scenario. Further, we could not distinguish which of the specific

(3) scenario type (technical noncompliance versus release of toxins); and
 (4) whether the respondent was part of the NIJ sample (coded as 1) or the
 TMone sample (coded as 0).

ii. Risk Factors

Individual-level factors

The corporate crime literature has identified several individual-level characteristics that might confound the relationship between prevention-and-control strategies and offending intentions. Our respondents were asked several questions that tap into some of these attributes. Personal self-interest was measured by two questions about perceived career benefits from the crime (crude measures of Machiavellianism) and the level of excitement associated with illegal behavior (respondents rated both on 11-point scales where higher scores indicated greater perceived benefits).⁹² We expect that respondents who perceive more career benefits and greater thrills will report higher offending intentions. The risk of crime also should be greater when managers do not believe in the common value system represented by the law. Social control theory, for instance, asserts “there is *variation* in the extent to which people believe they should obey the rules of society [T]he less a person believes he should obey the rules, the more likely he is to violate them.”⁹³ To examine this, we asked respondents their degree of agreement with the following statement: “Individuals should comply with the law *so long as it does not go against what s/he thinks is right.*” Agreement with such a statement suggests that the respondent does not share conventional attitudes about the moral authority of law and is therefore at greater risk for offending.

Company-level factors

Risks associated with the company are captured in two types of measures: economic constraints on the firm and managerial position and authority. In the vignettes, respondents assessed scenario conditions

vignettes the NIJ sample had personal experience with or knew about. Thus, for both samples, this variable reflects personal experience or knowledge about any of the environmental situations presented, including overcompliance scenarios (not discussed in this paper). Although the NIJ sample is more likely to report having personal experience/hearing about these behaviors (mean = 0.896) than the TMone sample (mean = 0.577), this result may be due to the more inclusive nature of the NIJ question than a true difference in personal experience.

⁹² The distribution of the “perceived thrills” variable is skewed to the right, with 197 out of 237 responses at 0 (out of a possible 10). The mean of this variable is 0.43. We examined all six models using a dichotomous version of the variable, but results were substantively the same. We therefore report the results using the full 10-point scale.

⁹³ TRAVIS HIRSCHI, CAUSES OF DELINQUENCY 26 (1969).

wherein the firm was depicted as economically deteriorating, economically healthy, or losing ground to foreign competition. In addition, research has shown that a manager's location within the company affects offending risk as pressures are often placed on middle managers to meet performance goals regardless of whether these goals can be achieved within the constraints of the law. Similarly, offending risks are also tied to whether managers are in a position to compel others to act illegally. So manager level (middle and upper) and decisionmaking authority (asked by supervisor to act versus made an independent decision) are included as company risk factors; both variables are drawn from the hypothetical scenarios.

iii. Regulation

Firm Self-Regulation

Several vignette dimensions are important indicators of company self-regulation. For example, scenarios contained information about whether the depicted company participated (or not) in voluntary EPA pollution-reduction programs; the kind of internal compliance system at the firm (a range from mandatory training through mandatory self-reporting of releases); whether ethics typically guide decisionmaking in the firm; and the consequences for managers who were discovered by the company to be behaving in similar activities (graduated consequences from no consequence at all to the employee was fired).

Informal Sanction Risk

We also created a standardized scale that takes into account the perceived certainty and severity of three business-related informal sanctions directed at the individual. Variables include the perceived likelihood and cost of losing the respect of business associates, loss of job, and future harm to job prospects if the behavior was discovered informally. This scale also incorporates a measure of respondents' perceptions regarding the likelihood that their actions would be discovered by the firm but not by legal authorities.⁹⁴

Command and Control

After each scenario, respondents were asked to evaluate the adequacy

⁹⁴ Prior to standardization, scores can range from 0 to 3000. After centering, the range is from 1.889 to 1.699. Preliminary analysis revealed a significant difference between samples. TMone respondents perceive lower risks (mean = 1321.113) than do NIJ respondents (mean = 1812.02). However, the biserial correlations between the informal sanctions scale and the outcome are similar for the two samples. The biserial correlation between informal business sanctions and offending decisions are NIJ $r_{pb} = -0.38, p < .01$; TMone $r_{pb} = -0.36, p < 0.01$; merged sample $r_{pb} = -0.39, p < .01$. There is no evidence of outliers affecting this relationship.

(0 = too strict to 10 = too lenient) of the laws governing the behavior described in the scenario.⁹⁵ In addition, five questions focused on the respondents' perceptions of the formal costs of offending for the individual actor. The responses to these five questions were combined to form a formal sanction scale.⁹⁶ The scale takes into account both respondents' perceptions of the likelihood that a given negative outcome (e.g., being arrested, sued, or investigated by a regulatory agency) will result from the manager's actions (i.e., certainty) and how much of a problem the negative outcome would cause for the respondent (i.e., severity). Certainty (0 = no chance at all to 10 = 100% chance) and severity (0 = no problem at all to 10 = a very big problem) were measured on an 11-point scale.⁹⁷

IV. ANALYSIS AND RESULTS

Table 2 reports on bivariate relationships between reported offending intentions and the key independent regulatory variables of interest.

⁹⁵ Contradictory findings may emerge from this variable. Consistent with deterrence, the risk of offending should be low if law is perceived to be punitive. However, procedural justice and defiance theory would predict greater offending risk if law is perceived to be "overly strict," since this may tap into perceptions that law is unfair and illegitimate. See TOM R. TYLER, *WHY PEOPLE OBEY THE LAW* (1993); Lawrence W. Sherman, *Defiance, Deterrence, and Irrelevance: A Theory of the Criminal Sanction*, 30 J. RES. CRIME & DELINQ. 445 (1993).

⁹⁶ The construction of these scales is discussed in more detail (as are other variables) in Appendix IV.

⁹⁷ This excludes regulatory investigation, which only has direct implications for the firm. We calculated the scale in the following manner: Individual Formal Sanction Risk = (Certainty of criminal * Severity of criminal) + (Certainty of civil * Severity of civil). Certainty = the certainty of outcomes [arrest (criminal); being personally sued (civil)]; and Severity = the perceived severity of those outcomes.

Table 2
Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Act as manager	1												
2. Release toxins	-0.271 ***	1											
3. Danger to life	-0.158 *	0.239 ***	1										
4. Realistic scenario	0.079	-0.080	0.133 *	1									
5. Desirability of behavior	0.310 ***	-0.216 ***	-0.072	0.123 †	1								
6. Yrs. of business experience	-0.053	-0.009	-0.054	-0.026	0.084	1							
7. Personal experience	-0.027	-0.051	-0.005	-0.132 *	-0.011	-0.088	1						
8. Asked	0.142 *	0.011	-0.010	-0.033	-0.032	-0.009	0.042	1					
9. Foreign competition	-0.021	-0.149 *	-0.045	0.046	0.050	0.012	-0.030	0.016	1				
10. Economically deteriorating	-0.022	0.083	0.039	-0.051	-0.022	0.114 †	-0.017	-0.024	-0.474 ***	1			
11. Advance Career	0.352 ***	-0.131 *	0.069	0.326 ***	0.219 ***	0.072	-0.075	0.149 *	-0.016	0.058	1		
12. Thrill	0.290 ***	0.010	0.061	0.149 *	0.124	0.036	-0.009	0.127 †	-0.010	0.047	0.285 ***	1	
13. Conditional Compliance	0.163 *	-0.041	0.004	0.075	0.110	0.165 *	-0.044	0.034	-0.041	0.098	0.256 ***	0.168 **	1
14. Mid-level manager	-0.030	-0.066	-0.023	0.114 †	0.041	0.014	-0.070	-0.006	0.080	-0.011	-0.022	-0.059	0.067
15. Voluntary reduction	-0.043	-0.006	-0.209 **	-0.086	0.017	-0.011	0.061	0.087	-0.072	-0.061	-0.158 *	-0.069	-0.055
16. Ethics guide management	-0.001	-0.105	-0.026	-0.075	0.031	-0.039	0.015	-0.063	0.019	0.052	0.012	0.037	-0.042
17. Ethics are distinct	-0.010	0.028	-0.009	0.033	0.040	0.119 †	0.021	-0.055	-0.014	0.004	0.006	-0.091	0.047
18. Random audits	-0.043	0.116 †	0.025	-0.034	-0.037	-0.014	0.016	0.080	-0.029	0.011	0.048	0.104	-0.019
19. Self-reporting	-0.024	-0.044	-0.001	-0.005	-0.051	-0.116 †	-0.121	-0.083	0.050	-0.063	-0.015	-0.024	-0.038
20. Ethics training	0.134 *	-0.108 †	-0.025	0.027	0.044	0.104	0.052	0.044	0.061	-0.064	0.150 *	0.034	0.130 *
21. Hotline	-0.044	-0.030	-0.057	-0.016	-0.039	0.077	0.010	0.025	0.124 †	-0.038	-0.078	-0.063	-0.016
22. Fired	0.019	-0.106	-0.018	0.010	0.002	0.010	-0.135 *	-0.029	-0.010	0.092	0.041	0.092	0.071
23. Reprimanded	-0.137 *	0.060	0.022	0.048	-0.132 *	0.001	-0.027	-0.062	-0.010	-0.025	-0.145 *	-0.074	0.011
24. Informal sanctions	-0.386 ***	0.114 †	0.315 ***	-0.175 **	-0.214 ***	-0.115 †	0.093	-0.047	-0.002	0.002	-0.330 ***	-0.087	-0.203 **
25. Formal sanctions	-0.280 ***	0.227 ***	0.493 ***	0.002	-0.103	0.006	-0.017	0.031	0.016	0.082	-0.065	0.050	-0.124 †
26. Adequacy of law	-0.124 †	0.072	-0.284 ***	0.263 ***	-0.105	-0.065	0.052	-0.079	-0.072	0.028	-0.248 ***	-0.164 *	-0.218 ***
27. Original sample	-0.115 †	0.018	-0.170 **	-0.367 ***	-0.115 †	-0.361 ***	0.368 ***	0.010	0.014	-0.059	-0.301 ***	-0.179 **	-0.312 ***

Note: †<0.10, *p<.05, **p<.01, ***p<.001

	14	15	16	17	18	19	20	21	22	23	24	25	26
14. Mid-level manager	1												
15. Voluntary reduction	0.011	1											
16. Ethics guide management	-0.069	-0.009	1										
17. Ethics are distinct	0.063	-0.019	-0.514 ***	1									
18. Random audits	-0.066	-0.021	0.048	-0.146 *	1								
19. Self-reporting	-0.087	-0.083	0.058	-0.055	-0.259 ***	1							
20. Ethics training	-0.023	-0.103	-0.063	0.048	-0.274 ***	-0.241 ***	1						
21. Hotline	0.099	0.025	-0.070	0.077	-0.203 **	-0.178 **	-0.188 **	1					
22. Fired	0.104	-0.029	0.019	-0.052	0.103	-0.142 *	-0.061	0.060	1				
23. Reprimanded	-0.013	-0.080	-0.065	0.021	-0.019	0.123	-0.090	-0.029	-0.518 ***	1			
24. Informal sanctions	-0.042	0.035	0.075	-0.076	0.103	0.017	-0.098	0.024	0.003	0.042	1		
25. Formal sanctions	-0.020	-0.078	0.085	-0.062	0.099	-0.087	-0.018	-0.047	0.031	-0.044	0.498 ***	1	
26. Adequacy of law	0.018	0.180 **	-0.037	0.118 †	0.042	-0.022	-0.059	0.089	-0.111	0.112	0.103	0.020	1
27. Original sample	-0.066	0.163 *	0.082	-0.055	0.046	-0.009	-0.011	0.041	-0.119	-0.043	0.314 ***	-0.031	0.348 ***

Note: †<0.10, *p<0.05, **p<0.01, ***p<0.001

Several of the relationships were significant and in the predicted direction. For instance, informal sanctions were negatively related to managerial intentions (offending propensity, $r_{pb} = -.386$, $p < .01$). Managers who perceived substantial discovery costs were less apt to violate the law. Similarly, intentions were inhibited when managers were depicted as being reprimanded within the company for engaging in similar acts ($\Phi = -.137$, $p < .05$) and when formal sanctions were perceived as likely ($r_{pb} = -.280$, $p < .001$). Conversely, reported offending was more likely when companies had mandatory ethics training as part of an internal compliance system ($\Phi = .134$, $p < .05$). As respondents' assessments of environmental law moved toward overly harsh or punitive, crime propensity increased slightly ($r_{pb} = -.124$, $p < .10$), suggesting a potential defiance effect.

Our bivariate correlations also revealed significant relationships between risk factors, especially those measured at the individual level, and offending propensity. Illegal intentions increased when the act was thought to be thrilling ($r_{pb} = .290$, $p < .001$) or likely to bring career benefits ($r_{pb} = .352$, $p < .001$). Consistent with our social-control argument, offending appears more likely when belief in the moral authority of the law is variable ($r_{pb} = .163$, $p < .01$). Most situational risk factors that capture firm-level processes (e.g., management level, economic constraints, and foreign competition) were not significantly correlated with offending with the exception of our measure of authority structure. Reported offending is more likely under the condition of a supervisor's request (i.e., asked by one's supervisor to act illegally, $\Phi = .142$, $p < .05$).

As previously noted, our dependent variable is a dichotomous outcome so logistic regression is used to assess variable relationships. To enhance statistical power, the two scenarios are combined and analyzed together.⁹⁸ Therefore, the majority of people contribute two responses to each set of analyses and the observations are not independent of one another, which is a key assumption of multivariate regression. When this assumption is violated, coefficient estimates will be consistent (i.e., unbiased), but standard errors are no longer valid.⁹⁹ For this reason, we estimate robust standard errors using the Huber/White/sandwich estimator to take into account the lack of independence among observations.¹⁰⁰

⁹⁸ We considered whether combining the outcomes made sense analytically as well as statistically. Logically, it seems reasonable to couple the illegal behaviors since both violate legal requirements or standards, albeit by different degrees. We statistically control for offense type in our models.

⁹⁹ SOPHIA RABE-HESKETH & ANDERS SKRONDAL, MULTILEVEL AND LONGITUDINAL MODELING USING STATA 34 (2005).

¹⁰⁰ An alternative method for handling lack of independence between observations is to estimate a random effects model, which allows the intercept to vary across individuals.

Our logistic regression analysis proceeds in stages.¹⁰¹ In the first stage, we examine the effect of firm and individual risk factors on offending intentions (including control variables). In the next model, we add the effects of informal sanctions. We know from the social control and deterrence literatures that informal sanctions may operate independently to inhibit offending, but informal sanctions may also be triggered as a consequence of internal compliance structures or by command-and-control interventions. Therefore, it is important first to examine informal sanctions separately from other regulatory elements. Our third model includes company self-regulation variables without informal sanctions. This enables us both to assess whether elements of this control strategy affect willingness to violate and to examine if the effects of the risk factors are mitigated by the addition of these variables. Our fourth model combines company self-regulation and informal sanctions. The fifth model substitutes the command-and-control measures for the self-regulation and informal sanctions variables. Finally, we estimate a full model including both firm self-regulation and command-and-control measures to assess how these strategies operate simultaneously.¹⁰² For the sake of brevity, we have

While estimating robust standard errors treats the correlation among time-varying variables as a nuisance, random effects models explicitly model the lack of dependence and decompose the total residual into between- and within-individual components. *Id.* at 74. Given that our research question does not require us to estimate the size of the between- and within-person error terms, we chose to use the simpler statistical method that requires the estimation of fewer parameters.

¹⁰¹ To assess whether we could combine data from the two samples, we selected variables that were significant in the regression models for the merged sample and conducted separate analyses by sample source. As shown in Appendix V, there are notable differences between samples. For instance, offending intentions are decreased for TMone respondents for the major pollution event (compared with defying an EPA order) and when informal sanction threats are high. Intentions increase when the act is perceived as thrilling. Among NIJ respondents, intentions are lessened when managers perceive the risk of formal sanctions to be high and consequential but increased when the depicted behavior is viewed as desirable and beneficial to the respondent's career. Although different variables are significant for the two samples, the signs for the coefficients are similar across samples and results are consistent with extant literature. Therefore, we have decided to merge the samples to enhance statistical power. Future research would benefit from exploring how risk and protective factors as well as the success of prevention-and-control strategies may vary by company or industry characteristics. That particular question is beyond the scope of this research.

¹⁰² We conduct a total of 145 hypothesis tests (including controls). Given this large number of tests, we would expect seven significant results to occur by chance alone. Our results, however, reveal forty-nine significant relationships (including controls)—substantially more than would be expected by chance. Moreover, these findings are consistent with extant empirical and theoretical expectations.

removed the control variables from the Tables and report those results in Appendix VI.¹⁰³

Table 3
Regression of Behavioral Intentions on Risk Factors, Regulatory Components, and Relevant Control Variables⁺ (N = 237)

	<u>Model 1:</u> <u>Risk Factors</u>	<u>Model 2:</u> <u>Informal Sanctions</u>	<u>Model 3:</u> <u>Self-Regulation</u>
	B (Robust SE)	B (Robust SE)	B (Robust SE)
	Odds ratio	Odds ratio	Odds ratio
Constant	1.21 (.92)	0.23 (1.00)	2.67 (1.34)**
Situational Risk			
Asked	.51 (.33) 1.66	.53 (.38) 1.70	.46 (.34) 1.58
Midlevel manager	-.12 (.35) 0.89	-.05 (.37) 0.95	-.11 (.35) 0.90
Economically deteriorating	-.40 (.47) 0.67	-.41 (.50) 0.67	-.37 (.47) 0.69
Foreign competition	-.51 (.39) 0.60	-.48 (.41) 0.62	-.57 (.43) 0.57
Individual Risk			
Advance career ^a	.23 (.07)*** 1.26	.18 (.08)** 1.20	.24 (.08)*** 1.27
Thrill	.43 (.15)*** 1.53	.49 (.14)*** 1.64	.46 (.14)*** 1.58
Conditional compliance	.05 (.06) 1.05	.04 (.07) 1.04	.05 (.06) 1.05
Self-regulation			
Voluntary reduction			-.23 (.39) 0.79
Ethics guide management			-.51 (.49) 0.60
Ethics are distinct			-.13 (.47) 0.88

¹⁰³ Several of our control variables are significantly associated with willingness to violate environmental regulations. Individuals are less willing to violate regulations when the noncompliance is of a more significant nature (i.e., releasing toxins vs. ignoring a compliance order) and when they perceive that there is a greater likelihood that the behavior will endanger human life or wildlife. They are more willing to violate when they view the behavior as more desirable. In addition, individuals who report more business experience are marginally less willing to violate environmental law. It is important to note, however, that several control variables have no effect in the model. Scenario realism does not affect offending intentions, nor does sample origin (NIJ) or personal experience/knowledge of acts depicted in scenarios. This latter null finding, which is consistent across all of our models, is surprising considering the argument that “decisions from experience and decisions from description can lead to dramatically different choice behavior.” Ralph Hertwig et al., *Decisions from Experience and the Effect of Rare Events in Risky Choice*, 15 PSYCHOL. SCI. 534, 534 (2004).

Random audits			-.47 (.62) 0.63
Self-reporting			-.33 (.61) 0.72
Ethics training			.15 (.53) 1.16
Hotline			-.05 (.65) 0.95
Fired			-.54 (.45) 0.58
Reprimand			-.70 (.51) 0.50
Informal sanctions ^a		-.96 (.25)*** 0.38	
Command and Control			
Formal sanctions			
Adequacy of laws			
Interactions			
Career* informal sanctions ^a			
Pseudo r ²	.27	.33	.29

Continued

	<u>Model 4:</u> <u>Self-</u> <u>Regulation and</u> <u>Informal</u> B (Robust SE) Odds ratio	<u>Model 5:</u> <u>Command</u> <u>and Control</u> B (Robust SE) Odds ratio	<u>Model 6:</u> <u>Full Model</u> B (Robust SE) Odds ratio	<u>Model 7:</u> <u>Interactions</u> B (Robust SE) Odds ratio
Constant	1.19 (1.41)	.37 (1.10)	1.33 (1.54)	1.50 (1.58)
Situational Risk				
Asked	.47 (.39) 1.61	.67 (.35)* 1.95	.61 (.41) 1.83	.62 (.41) 1.86
Midlevel manager	-.03 (.38) 0.97	-.06 (.38) 0.94	-.04 (.40) 0.96	-.06 (.39) 0.94
Economically deteriorating	-.37 (.52) 0.69	-.25 (.49) 0.78	-.22 (.52) 0.81	-.16 (.52) 0.85
Foreign competition	-.48 (.45) 0.62	-.43 (.40) 0.65	-.43 (.45) 0.65	-.36 (.45) 0.70
Individual Risk				
Advance career ^a	.19 (.08)** 1.21	.24 (.07)*** 1.27	.20 (.08)** 1.22	.26 (.08)*** 1.30
Thrill	.51 (.13)*** 1.67	.53 (.17)*** 1.70	.57 (.15)*** 1.76	.54 (.15)*** 1.72
Conditional compliance	.04 (.06) 1.04	.04 (.06) 1.04	.03 (.07) 1.03	.03 (.07) 1.03
Self-regulation				
Voluntary reduction	-.03 (.42) 0.97		-.11 (.45) 0.90	0.01 (.45) 1.01
Ethics guide management	-.43 (.49) 0.65		-.39 (.51) 0.68	-.37 (.52) 0.69

Ethics are distinct	-.22 (.49) 0.80		-.16 (.53) 0.85	-.20 (.54) 0.82
Random audits	-.24 (.64) 0.78		-.34 (.65) 0.71	-.42 (.64) 0.66
Self-reporting	-.02 (.62) 0.98		-.32 (.63) 0.73	-.35 (.63) 0.71
Ethics training	.21 (.56) 1.23		.13 (.60) 1.13	-.35 (.63) 1.09
Hotline	.00 (.71) 1.00		-.11 (.72) 0.89	-.03 (.72) 0.97
Fired	-.41 (.48) 0.66		-.50 (.51) 0.61	-.40 (.50) 0.67
Reprimand	-.60 (.52) 0.55		-.66 (.54) 0.52	-.59 (.54) 0.55
Informal sanctions ^a	-.91 (.26)*** 0.40		-.72 (.27)*** 0.49	-.98 (.32)*** 0.37
Command and Control				
Formal sanctions		-.77 (.23)*** 0.46	-.56 (.27)** 0.57	-.63 (.28)** 0.53
Adequacy of laws		-.04 (.11) 0.96	-.07 (.11) 0.94	-.05 (.12) 0.95
Interactions				
Career* informal sanctions ^a				-.12 (.06)* 1.13
Pseudo r ²	.35	.31	.36	.37

Note: * $p < .10$, ** $p < .05$, *** $p < .01$

Note: † Control variables are removed from the tables and reported in Appendix VI.

^a In model 7, “career” and “informal sanctions” were mean centered to ease interpretability of coefficients.

Our main findings are reported in Table 3. As shown in model 1, the decision to violate is related to instrumental considerations. Specifically, individuals are more willing to violate when they believe this behavior will advance their careers and when they perceive such behavior to be more thrilling. For each unit increase in the respondent’s estimate that the behavior will advance the manager’s career, the odds that the respondent would be willing to violate environmental regulations increase by almost 26%. For every unit increase in perceived thrills, the odds of being willing to offend increased by about 53%. None of the firm-level risk factors examined are significantly related to willingness to violate.

In the second model, we add the informal sanctions scale. Informal sanctions exert a strong inhibiting effect on offending; individuals who perceive the informal costs associated with violating environmental law to be more certain and severe are significantly less willing to violate. For every unit increase in perceived business-related informal costs, the odds of being willing to offend decrease by 62%. It is also noteworthy that the effect of perceived danger to life becomes nonsignificant when informal

sanctions are included in the model.¹⁰⁴ The two variables are modestly correlated ($r = .315$); thus, it appears our respondents believe informal costs are higher for acts they perceive as more dangerous.

Model 3 includes our variables capturing elements of company self-regulation. None of the self-regulation variables significantly affect offending intentions, nor do they mitigate the effect of the individual- and firm-level risk factors. Directionally, however, most of the variables operate in a predictable manner (except for mandatory ethics training and an anonymous hotline). Notice that the inhibitory effect of danger to life on offending intentions becomes significant once again in this model.¹⁰⁵

Next, we examine the effect of including firm self-regulation variables and perceived informal sanctions (model 4). The results are substantively the same as the previous two models, with the firm self-regulation variables remaining nonsignificant while informal sanctions exert a strongly significant influence (odds of being willing to offend decrease 60% for every unit increase in perceived informal costs). The previously significant risk and control variables remain so in model 4 with the exception of perceived danger, which again is rendered nonsignificant by the inclusion of informal sanctions.¹⁰⁶

In model 5, we examine variables capturing command-and-control regulatory techniques, controlling for individual- and firm-level risk factors. Individuals who believe that they will face more certain and severe formal sanctions are significantly less willing to violate environmental regulations.¹⁰⁷ A one-unit increase in the formal sanctions costs scale decreases the probability that the respondent is willing to violate environmental regulations by about 54%. In contrast, the perceived adequacy of the law governing the violating behavior is unrelated to willingness to violate the law. Several of the individual- and firm-level risk factors remain significant in this model. For instance, neither career advancement nor thrill of the act is mitigated by formal sanction risk in this model. However, this is the first model in which being asked to offend by

¹⁰⁴ See *infra* Appendix VI.

¹⁰⁵ See *infra* Appendix VI.

¹⁰⁶ See *infra* Appendix VI.

¹⁰⁷ We also examined the effects of formal sanctions directed at the firm (criminal, civil, and regulatory sanction certainty and severity), but found that they were highly collinear with the individual-level formal sanctions variable. When both scales were included in the model, neither achieved statistical significance. When entering the variables separately, individual-level sanctions exhibited a stronger and more consistent effect on offending (reflecting the notion that managers may be more concerned with formal sanctions directed at themselves) than did firm-level formal sanctions. Therefore, the decision was made to drop firm-level sanctions from the analysis.

one's supervisor increases the propensity likelihood. Although the odds of offending are 95% higher for those who have been asked to offend by a superior versus those who have not, the effect is only marginally significant ($p < .10$). Regarding the control variables (Appendix VI), the crime-reduction effect associated with the perceived danger of the act (whether the respondent believes that the behavior will endanger human life or wildlife) is not significant here, a result we saw in the informal sanctions models as well. The measure of formal sanctions is correlated with perceived danger ($r = 0.493$), implying that formal sanctions (like informal sanctions) may be redundant with perceptions of danger. The effects of other controls in the model remain consistent.

In the full model depicted in Table 3 (model 6),¹⁰⁸ company self-regulation and command-and-control variables are included along with the risk and control variables. The influence of formal sanction costs and informal costs are both somewhat reduced, but remain significant at $p < .05$. Thus, for every unit increase in sanction risk, the odds of being willing to offend decrease by 43% for formal sanctions and 51% for informal sanctions. This outcome may be the consequence of the high correlation between formal and informal costs ($r = .498$, see Table 2), but it is informative that both types of sanctions continue to have an effect when modeled together. Other measures of company self-regulation that capture the structure or component parts of an internal compliance system (e.g., audits, ethics codes, hotlines) and its operation (e.g., formal reprimand, fired) remain nonsignificant in model 6. Several control variables (i.e., desirability of the behavior, type of noncompliance, and business experience, see Appendix VI) and a couple of risk factors (i.e., advancing one's career and perceived thrills) retain their significant effects. Compared with model 5, however, being asked to offend by one's supervisor is no longer significant.

At this point, our results suggest that both formal legal and informal (but business-salient) sanction threats can inhibit environmental noncompliance. However, intra-organizational control mechanisms (such as self-reporting, audits, or hotlines) do not directly affect noncompliance when modeled alone or in conjunction with other regulatory levers for this group of respondents. Importantly, none of the interventions appears to substantially lessen the powerful influence of career benefits on offending intentions.

¹⁰⁸ A reviewer raised concerns about the large number of independent variables in the model. Although we did not experience any difficulty fitting the models (e.g., perfect prediction), we examined the variance inflation factor score for each variable in the analysis. None exceeded 2.24 and most were below 2. See *infra* Appendix III, Table 3.

One possible explanation for the continued importance of perceived career benefits on offending is that the true relationship between regulatory levers, benefits, and noncompliance is multiplicative instead of additive. So we explored some likely interactions between variables drawing from the extant literature. We expected, for instance, that people who strongly believed the illegal act would benefit their careers would be less likely to be deterred by potential formal legal proceedings¹⁰⁹ and informal sanction threats. Further analysis (not reported here) failed to reveal a significant interaction between formal sanctions and perceived benefits to one's career, but we did discover a modest interaction ($p < .07$) between career benefit and informal sanctions (*see* Table 3, model 7).¹¹⁰ For people who perceive greater career advancement associated with the illegal act (compared with those who perceive less benefit), informal sanctions matter less in predicting offending likelihood. Using predicted probabilities to demonstrate, when the person perceives no career benefit, the probability of offending decreases by 0.25 (from 0.31 to 0.06) as the perceived informal sanctions increase from 1 SD below the mean to 1 SD above. When the person ranks the likelihood that offending would advance his career as a 5 (out of a possible 10),¹¹¹ the probability of offending only decreases by 0.171 (from 0.47 to 0.30) when perceived informal sanctions are increased from 1 SD below the mean to 1 SD above. This implies that when a person perceives a large career benefit, she is less likely to consider informal sanctions before deciding to offend. The perceived benefit of illegal behavior for this group appears to trump any anticipated loss of respect and future harm to job prospects associated with the informal discovery that promotes crime inhibition for others in the sample. Although this finding is modest,¹¹² it points out that some regulatory elements may be less salient for managers who are more instrumentally oriented.

The empirical literature also suggests that regulatory interventions might operate differently for "experienced" respondents. We ran models 1–6 on a subset of scenarios in which the respondent reported personal experience with the environmental conditions described in any of the

¹⁰⁹ Both types of formal sanctions (threats directed at the firm and individual managers) were analyzed for multiplicative effects.

¹¹⁰ To ease interpretation, the variables were mean-centered prior to creating the interaction. Mean-centered values are reported in model 7. None of the firm self-regulatory variables (e.g., elements and operation of an internal compliance system) interacted with career benefit.

¹¹¹ Only 13% of the sample ranked career benefits above a 5.

¹¹² Model comparisons (with and without the interaction term) fail to show an improved fit for the model with the interaction. However, the pseudo r^2 for the model increases from .36 to .37.

scenarios (N = 177). While some coefficients dropped to nonsignificance in these models (possibly due to the reduction in sample size), the overall results were similar. There were not enough cases to run all six models on the subsample of scenarios in which respondents reported no personal experience (N = 60), but a likelihood-ratio test indicated that models 1–3 were not significantly different for respondents with personal experience and those without.

V. IMPLICATIONS FOR REGULATORY STRATEGY

This research was conducted to learn more about corporate environmental crime prevention-and-control strategies in the context of the kinds of pushes and pulls toward crime that company managers may experience. Specifically, we examined whether offending intentions would be lessened in the presence of particular regulatory elements drawn from cooperative and punitive intervention strategies. Although our sample of respondents is nonrandom, a nontrivial number of managers in this study reported a chance of offending under experimentally generated conditions (N = 61, or 37.9% of the respondents). For this select group of managers, certain crime prevention-and-control strategies are more successful than others. For instance, the perceived certainty and severity of legal sanctions that target responsible managers deter environmental wrongdoing. Thus, as others have discovered,¹¹³ credible enforcement by the state inhibits offending propensity for our respondents as well. Counter to expectations, however, perceptions of the laws themselves (e.g., are they too strict or too lenient?) are unrelated to intentions. Our managers appear neither defiant (more apt to offend because the law is seen as unfair) nor willing to take advantage of weak laws.

Our results also highlight the symbiosis between formal and informal controls. Formal sanctions do not work in isolation. As Ayers and Braithwaite suggest, salient legal consequences can buttress extralegal controls.¹¹⁴ In effect, the threat of external enforcement adds an additional layer of crime-control capacity for managers who are uninhibited by a moral sense of right and wrong, by their understanding of how others (including their colleagues) are likely to view their behavior, and by the extent to which they think the discovery of these acts would bring shame on themselves (i.e., informal sanction threats). Internal compliance systems per se had no significant impact on behavioral intentions, nor did specific outcomes associated with such systems, such as being internally

¹¹³ See Gunningham et al., *supra* note 30.

¹¹⁴ See BRAITHWAITE, *supra* note 8, at 150. These effects are additive and not multiplicative. We did not find an interaction between formal and informal sanction threats.

reprimanded or fired (relative to the firm doing nothing when transgressions were discovered). However, most of these variables showed the expected negative relationship with offending intentions and perhaps, given the difficulties with small sample sizes and statistical power, would have shown stronger effects had there been more respondents.

In general, the risk of environmental crime appears least likely when there is a credible legal threat for noncompliance and/or when one perceives informal consequences associated with offending, such as losing the respect of one's significant others, to be certain and costly. The presence of these control mechanisms, however, does not negate some of the more pernicious risk factors (i.e., career benefits or perceived thrills), which remain significantly associated with noncompliance, especially in the command-and-control models. Company self-regulation that draws on informal social controls may be somewhat more effective at alleviating the attractions of crime than deterrence-based interventions (as indicated by the slightly diminished coefficient for career benefits in models 2, 4, and 6). However, even with a full complement of control mechanisms, respondents who perceive career benefits and thrills associated with offending are significantly more likely to report offending proclivity. This is especially true for those on the "high end" of perceived benefits—those for whom intra-organizational discovery or stigma from family, friends, or business associates appears to matter less (model 7). To affect these kinds of offending risks, changes in company incentives for managers might be needed. For instance, structuring internal rewards to prioritize a broader measure of excellence (e.g., profits *and* compliance) over a simple focus on the bottom line may persuade self-interested individuals to comply with the law while pursuing career advancement.

Finally, across all seven models, respondents are significantly less likely to violate environmental law when the act: (1) is perceived as likely dangerous to humans and wildlife and (2) is viewed as undesirable. These findings reinforce what sociologists have emphasized since Durkheim—social norms influence how we behave.¹¹⁵ In this particular case, our results highlight the importance of a human health and environmental norm¹¹⁶ that—if replicated in a larger random sample—has policy implications on its own merits. Knowing that individuals respond to information about human health and environmental harms, announcements about new environmental regulations and enforcement actions can be framed around this message. If we know that certain types of violations are viewed as more undesirable than others, it will be easier to justify targeting

¹¹⁵ Or, how we predict we will behave.

¹¹⁶ See Vandenberg, *supra* note 51, at 59.

these behaviors for more stringent enforcement while other, less serious (and probably more common) acts, are better left to self-regulatory measures. It would be a mistake, however, to assume that normative sanctions alone will prevent minor violations. Braithwaite's family model and enforcement pyramid emphasize that norms must be reinforced by moral authority.¹¹⁷ When norms fail, the government must be ready and willing to intervene.

Although our results should be substantiated by further study, the findings have implications for regulatory policy more broadly. First, both informal sanctions and command-and-control strategies lower the likelihood of corporate crime. The risk of corporate offending increases when there is not a credible legal threat *or* when one's duty to behave ethically is not reinforced by colleagues or through fear of informal sanctions. Second, the deterrent capacity of these control mechanisms does not negate certain corporate or individual risk factors, which remain significantly associated with noncompliance. This suggests that current policy levers do not fully mitigate offending risks and may indicate that a one-size-fits-all policy is shortsighted. Last, our research has several implications for how regulators can frame environmental messages, utilize scarce resources, and align regulatory levers with specific types of offenses. Future research should untangle whether the processes and control mechanisms we discovered in this study are similar for other types of corporate crime.

¹¹⁷ See AYRES & BRAITHWAITE, *supra* note 14.

Appendix I*Vignette Dimensions and Levels*

Variable Name	Description
<u>Vignette Type</u>	
RELEASE TOXINS	Significant Noncompliance: vignette depicts scenario about discharging toxins into a local waterway
COMPLIANCE	Technical Noncompliance: vignette depicts scenario about ignoring an EPA compliance order [reference category]
<u>Locus of Control</u>	
ASKED	Is asked by a higher level manager
ASKS	Mgr. asks an employee [reference category]
<u>Firm EPA Volunteer Status</u>	
VOLUNTARY REDUCT	Volunteered to participate in an EPA-sponsored pollution-reduction program
DECLINE	Was contacted by the EPA to participate in a voluntary pollution-reduction program but declined to do so [reference category]
<u>Environmental Constraints</u>	
FOREIGN COMPETE	Losing ground to foreign competitors
ECONOMIC HEALTHY	Economically healthy [reference category]
ECON DETERIORATING	Economically deteriorating
<u>Managerial Ethics</u>	
ETHICS GUIDE	Ethical considerations guide top management hiring decisions, performance evaluations, and promotions
ETHICS DISTINCT	Ethical considerations are considered important, but distinct, from business decisions
ETHICS IRRELEVANT	Ethical considerations are considered mostly irrelevant to business decisions [reference category]

Management Location

MID-LEVEL MGR A midlevel manager

UPPER-LEVEL MGR An upper-level manager

Internal Compliance Structure

HOTLINE A hotline in which violation of compliance can be anonymously reported

ETHICS Mandatory ethics training

AUDITS Internal random environmental audits in which violations of compliance can be uncovered

SELF REPORT Mandatory self-reporting to the EPA of monthly release data

ETHICS CODE An ethics code [reference category]

Internal Compliance Operation

NO ACTION The firm took no action against an employee who was discovered violating environmental regulations [reference category]

REPRIMANDED The firm severely reprimanded an employee who violated environmental regulations

FIRED The firm fired an employee who violated environmental regulations

Note: All vignette dimensions take the value of 1 when they are present and 0 when they are absent.

Appendix II
Sample Scenarios

Environmental Violations

1. Lee, a middle-level manager at AmCorp, **asks an employee to ignore an environmental agency's demand to act on a compliance order**. This practice is common in the firm. Lee believes that ignoring the environmental agency's demand may weaken the firm's competitive position.

AmCorp is a subsidiary of USA Corp, a publicly held U.S.-based firm that promotes itself as a green company. USA Corp owns and operates one fully integrated manufacturing facility in a large urban center. The facility, which has been refurbished, is designated as a minor discharger according to the EPA ranking system, with an environmental compliance record that has exceeded regulatory compliance standards. Last year, USA Corp was contracted by the EPA to participate in a voluntary pollution-reduction program but declined to do so.

USA Corp is currently experiencing declining sales and revenues in an industry that is economically healthy.

At USA Corp, ethical considerations are considered mostly irrelevant to business decisions. The firm has mandatory ethics training but the firm took no action against an employee who was discovered violating environmental regulations.

2. Lee, a low-level manager at AmCorp, is asked by a supervisor **to discharge toxins into a local waterway that exceeded permitted levels by 200%**. This practice is common in the firm. Lee believes that discharging toxins into a local waterway may strengthen the firm's competitive position.

AmCorp is a publicly held U.S.-based firm that promotes itself as a green company. AmCorp owns and operates one fully integrated manufacturing facility in a large urban center. The facility, which is over 20 years old, is designated as a minor discharger according to the EPA ranking system with an environmental compliance record that has exceeded regulatory compliance standards. Last year, AmCorp volunteered to participate in an EPA-sponsored pollution-reduction program.

AmCorp is currently experiencing declining sales and revenues in an industry that is losing ground to foreign competitors.

At AmCorp, ethical considerations guide top management hiring decisions, performance evaluations, and promotions. The firm has an ethics code and the firm severely reprimanded an employee who recently violated environmental regulations.

Appendix III

Table 1
NIJ Participating and Nonparticipating Firms, 1995–2000

	Nonparticipants N = 71 ^a	Participant 1	Participant 2
Mean # of facilities	3.27 (2.29)	16.83	6.00
Mean # of employees	14,296.87 (16015.81)	102,816	22,388
Mean total stockholders' equity	36,018.39 (100,943.06)	9,515,200,000	17,933
# of informal sanctions per year	0.94 (1.56)	2	0
# of formal sanctions per year	0.84 (1.64)	0.83	0.50
# of violations per year	12.04 (13.21)	17.33	30.83
# of inspections per year	4.55 (3.47)	19.67	13.67
Yearly violation rate per average # of facilities	5.26 (9.74)	1.03	5.14
Yearly inspection rate per average # of facilities	1.57 (1.15)	1.17	2.28

^a Due to missing data, the sample sizes used to compute descriptive statistics for the variables number of employees and total stockholder equity were N = 69 and N = 65, respectively.

Table 2
Comparing TMone Respondents to Nonrespondents, Excluding Undelivered Surveys (N = 411)^a

	# of Respondents (%)	# of Nonrespondents (%)
Type of Profession^b		
Environmentally Related Profession	37 (80.4)	278 (77.2)
Not Environmental	9 (19.6)	82 (22.8)
Total	46 (100)	360 (100)
Type of Business^b		
Profit-Oriented Business (Not Including Consulting)	3 (6.5)	73 (20.4)
Government Agency	1 (2.1)	11 (3.1)
NGO or Civic Association	14 (30.4)	104 (29.1)
Law Firm	1 (2.1)	12 (3.4)
Private Consulting Firm	27 (58.7)	155 (43.4)
Other	0 (0.0)	2 (0.6)
Total	46	357
Gender^b		
Male	26 (60.5)	226 (69.3)
Female	17 (39.5)	100 (30.7)
Total	43 (100)	326 (100)
Average Number of Employees Per Company ^c	14.04	9.59

Note: Totals may not add up to N = 411 as some individuals' information was not given in enough detail to categorize. Also, percentages may not up to 100% due to rounding.

^a One respondent responded to the survey, but also was listed as having his or her survey notification letter returned. We assumed the latter coding was in error so this individual was included as a respondent in the above analyses.

^b Pearson Chi-square tests indicated that there were no significant differences between respondents and nonrespondents by Type of Profession, Type of Business, or Gender.

^c An independent-samples *t*-test showed a significant difference in company size by response status, $p < .01$

Table 3
Variance Inflation Scores, Full Model

Variable	VIF	1/VIF
Zinformal sanctions	2.24	0.447264
Original sample	2.1	0.47633
Informal sanctions	1.86	0.539082
CareerXinformal sanctions	1.84	0.543545
Danger to life	1.76	0.569553
Advance career	1.68	0.596472
Ethics training	1.67	0.599498
Fired	1.65	0.604242
Audits	1.64	0.611286
Reprimand	1.62	0.616837
Self-report	1.6	0.626457
Ethics distinct	1.49	0.671535
Adequacy of law	1.47	0.682192
Ethics guide mgt.	1.46	0.68455
Hotline	1.42	0.705503
Foreign competition	1.41	0.709856
Economic deteriorate	1.4	0.714221
Situation real	1.37	0.73174
Years of business experience	1.31	0.763621
Release toxins	1.26	0.794501
Personal experience	1.26	0.794955
Conditional compliance	1.26	0.796812
Voluntary reduction	1.23	0.813388
Desirability of behavior	1.22	0.821074
Thrill	1.19	0.84052
Asked	1.11	0.900475
Mid-level Manager	1.08	0.923981
Mean VIF	1.5	

Appendix IV
Description of Variables

Variable	Variable Definition	Scoring and Descriptive Characteristics
Dependent Variable		
Act as manager	What is the chance that you would act as the manager did under these circumstances?	1 = 10% or more chance of noncompliance (29.67%) 0 = 0% chance of noncompliance (70.33%)
Control Variables		
Toxins vignette	Scenario depicts significant noncompliance (i.e., discharging toxins) as opposed to technical noncompliance (i.e., ignore EPA order).	1 = Significant Noncompliance (52.85%) 0 = Technical Noncompliance (47.15%)
Danger to life	11 point mean score scale composed of two items: 1) What is the chance the behavior described in the scenario will endanger human life? 2) What is the chance the behavior described in the scenario will endanger aquatic/wildlife?	0 (no chance at all) to 10 (100% chance) (M = 6.76, SD = 2.57)
Realistic scenario	Regardless of what you would do, is the situation described in this scenario believable or realistic?	1 = Yes (65.04%) 0 = No (34.96%)
Desirability of behavior	Please rate this behavior according to its desirability.	0 (not at all desirable) to 10 (very desirable) (M = .80, SD = 1.85)
Years business experience	Years of business experience.	(M = 27.05, SD = 9.75)
Personal experience*	<u>NIJ sample:</u> Have you personally experienced or known about situations similar to those described in the scenarios? <u>TMone sample:</u> If you have ever worked in publicly or privately owned business, have you personally experienced situations similar to those described in the scenarios?	1 = Yes (74.68%) 0 = No (25.32%)
Original sample	Was the respondent part of the original NIJ study?	1 = Yes (51.22%) 0 = No (48.78%)
Situational Risk		
Asked	Manager in the scenario is asked by a higher level manager to engage in violating behavior.	1 = Manager is asked by higher level employee (52.44%) 0 = Manager asks an employee (47.56%)

Variable	Variable Definition	Scoring and Descriptive Characteristics
Midlevel manager	Scenario depicts a midlevel manager.	1 = Midlevel manager (52.03%) 0 = Upper-level manager (47.97%)
Economically deteriorating	Industry described in scenario is economically deteriorating (versus economically healthy).	1 = Yes (28.86%) 0 = No (71.14%)
Foreign competition	Industry described in scenario is losing ground to foreign competitors (versus economically healthy).	1 = Yes (36.18%) 0 = No (63.82%)
Individual Risk		
Advance career	How much would it advance your career if you did what the manager did under these circumstances?	0 (no chance at all) to 10 (100% chance) (M = 1.79, SD = 2.58)
Thrill	How exciting or thrilling would it be for you if you did what the manager did under the circumstances?	0 (not exciting) to 10 (very exciting) (M = 0.43, SD = 1.34)
Conditional compliance*	Extent to which respondent agrees with the statement: "An individual should comply with the law so long as it does not go against what s/he thinks is right."	0 (do not agree) to 10 (strongly agree) (M = 2.95, SD = 3.75)
Company Self-Regulation		
Voluntary reduction	Scenario depicts a firm that volunteered to participate in an EPA-sponsored pollution-reduction program.	1 = Firm volunteered to participate in an EPA-sponsored reduction program (51.63%) 0 = Firm was contacted by the EPA to participate in a voluntary reduction program but declined to do so (48.37%)
Ethics guide management	The scenario depicts a firm in which ethical considerations guide top management hiring decisions, performance evaluations, and promotions.	1 = Yes (32.93%) 0 = No (67.07%)
Ethics are distinct	The scenario depicts a firm in which ethical considerations are considered important, but distinct, from business decisions.	1 = Yes (35.37%) 0 = No (64.63%)
Random audits	The scenario depicts a firm which uses internal random environmental audits to uncover violations of compliance.	1 = Yes (23.17%) 0 = No (76.83%)
Self-reporting	The firm described in the scenario has been mandated to report monthly release data to the EPA.	1 = Yes (18.29%) 0 = No (81.71%)

Variable	Variable Definition	Scoring and Descriptive Characteristics
Ethics training	The scenario depicts a firm that mandates ethics training for employees.	1 = Yes (20.33%) 0 = No (79.67%)
Hotline	The scenario depicts a firm that uses a hotline in which violations of compliance can be anonymously reported.	1 = Yes (12.20%) 0 = No (87.80%)
Fired	The firm depicted in the scenario fired an employee who violated environmental regulations (versus the firm took no action).	1 = Yes (36.18%) 0 = No (63.82%)
Reprimand	The firm depicted in the scenario severely reprimanded an employee who violated environmental regulations (versus the firm took no action).	1 = Yes (32.52%) 0 = No (67.48%)
Informal sanctions	Informal sanction cost scale: 3 items on the certainty/severity of losing respect of business associates, loss of job, and loss of future job prospects. We multiplied the certainty and severity of each item by each other as well as by the chance that the behavior would become known within the firm, then summed those three scores. This scale was also normalized.	(M = 0, SD = 1)
Command and Control		
Formal sanctions	Formal sanction cost scale: 5 items about the certainty/severity of civil/criminal prosecution of the individual as well as the certainty of a regulatory investigation.	(M = .05, SD = .99)
Adequacy of laws	How adequate is the law governing this behavior?	0 (too strict) to 10 (too lenient) (M = 3.88, SD = 2.21)

*Demographic or attitudinal information collected from each respondent.

Appendix V
*Comparison of Significant Variables Between TMone
and NIJ Samples*

	TMone Sample (N = 111) B (Robust SE) Odds Ratio	NIJ Sample (N = 126) B (Robust SE) Odds Ratio
<u>Control variables</u>		
Release toxins	-1.92 (0.52)*** 0.15	-0.00 (.53) 1.00
Desirability of behavior	0.18 (0.11) 1.20	0.31 (.12)** 1.36
Years business experience	-0.03 (0.03) 0.97	-0.01 (.03) 0.99
Career	0.10 (0.08) 1.10	0.40 (.13)*** 1.48
Thrill	0.48 (0.13)*** 1.61	0.90 (.57) 2.45
Informal sanctions	-0.99 (0.36)*** 0.37	-.44 (.40) 0.65
Formal sanctions	-0.10 (0.35) 0.90	-.67 (.30)** 0.51
Pseudo r ²	0.34	0.37

Note: * $p < .10$, ** $p < .05$, *** $p < .01$

Appendix VI
Regression Coefficients of Control Variables

Control variables	Only Controls	Model 1: Risk Factors	Model 2: Informal Sanctions	Model 3: Self-Regulation
	B (Robust SE) Odds Ratio	B (Robust SE) Odds Ratio	B (Robust SE) Odds Ratio	B (Robust SE) Odds Ratio
Release Toxins	-0.91 (0.31)*** 0.40	-1.04 (.36)*** 0.35	-1.21 (.36)*** 0.30	-1.18 (.38)*** 0.31
Danger to Life	-0.13 (0.06)** 0.88	-.16 (.07)** 0.85	-.04 (.08) 0.96	-.18 (.07)*** 0.83
Desirability of Behavior	0.30 (0.13)** 1.36	.29 (.09)*** 1.34	.28 (.08)*** 1.33	.28 (.10)*** 1.32
Years Business Experience	-0.04 (0.01)** 0.96	-.04 (.02)* 0.96	-.04 (.02)* 0.96	-.05 (.02)** 0.95
Realistic Scenario	-0.04 (0.41) 0.95	-.44 (.43) 0.64	-.62 (.44) 0.54	-.52 (.45) 0.60
Personal Experience	0.05 (0.41) 1.05	-.06 (.48) 0.94	-.18 (.49) 0.84	-.18 (.49) 0.83
Original Sample (NIJ Sample)	-0.84 (0.43) 0.43	-.41 (.51) 0.66	.36 (.56) 1.30	-.51 (.52) 0.60
Pseudo r²	0.15	0.27	0.33	0.29

Continued

Control variables	Model 4: Self-Regulation and Informal	Model 5: Command and Control	Model 6: Full Model	Model 7: Interactions
	B (Robust SE) Odds Ratio	B (Robust SE) Odds Ratio	B (Robust SE) Odds Ratio	B (Robust SE) Odds Ratio
Release Toxins	-1.28 (.39)*** 0.28	-.88 (.38)** 0.41	-1.14 (.41)*** 0.32	-1.14 (.41)*** 0.32
Danger to Life	-.06 (.08) 0.95	-.05 (.08) 0.95	-.01 (.08) 0.99	-.01 (.09) 1.01
Desirability of Behavior	.28 (.09)*** 1.32	.32 (.10)*** 1.38	.30 (.09)*** 1.35	.32 (.09)*** 1.38
Years Business Experience	-.04 (.02)** 0.96	-.04 (.02)* 0.96	-.05 (.02)** 0.95	-.05 (.02)** 0.95
Realistic Scenario	-.69 (.45) 0.50	-.57 (.44) 0.56	-.76 (.46) 0.47	-.77 (.45)* 0.46
Personal experience	-.26 (.50) 0.77	-.21 (.48) 0.81	-.36 (.49) 0.70	-.23 (.49) 0.80
Original Sample (NIJ Sample)	.15 (.57) 1.16	-.27 (.55) 0.76	.14 (.56) 1.15	.13 (.53) 1.14
Pseudo r²	0.35	0.31	0.36	0.37

Note: * $p < .10$, ** $p < .05$, *** $p < .01$