Are All Legal Probabilities Created Equal?

Doron Teichman
ARE ALL LEGAL PROBABILITIES CREATED EQUAL?

BY

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I. INTRODUCTION

Imagine you are offered to play a game at the casino for a cost of one dollar. According to the rules of the game you must first throw a die and then flip a coin. If you guessed both events correctly, you win ten dollars. Like a good rational player you turn to calculate the odds of winning the game, and multiply the probability of the die landing on your guess (1/6) by the probability of guessing the coin toss correctly (1/2). You then reach the conclusion that there is a one in twelve chance to win the game. Turning to cost benefit analysis you realize that the expected benefit from the game (1/12*$10) is smaller than its cost ($1), and therefore decline the offer to play.

The previous example demonstrates how legal economists treat the decisions of potential wrongdoers. Namely, within the economic framework the law sets prices for different activities in the form of legal payments (e.g., fines, damages, etc.). Potential wrongdoers weight the costs the legal system imposes on them and the benefits from the activity; and decide to engage in these activities if they create a net benefit for them. One of the central insights of traditional deterrence theory is that legal payments are, in many cases, probabilistic. The initial formalization of the theory was introduced by Becker in his seminal article on crime control. As Becker pointed out, what potential criminals face is the expected sanction, and not just the sanction that is actually imposed on a small subset of them, and therefore policymakers designing an optimal deterrence regime need to pay attention to the combination of actual sanctions and the probability of imposing them. Ever since Becker pointed out the importance of probabilities with respect to policy design, an abundance of legal literature explored the validity of his model’s positive assumptions, and the desirability of his policy implications. For example, many have criticized the Becker model for treating changes in the size of the sanction and in the probability of detection as identical, and argued that potential criminals are more sensitive to changes in the probability of detection than changes in the size of sanctions. Others, on the other hand, have endorsed the Becker model, and suggested to incorporate its insights into procedural and substantive aspects of private law.

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2 In the text we focus on the critic of the positive aspects of the Becker model, as those are of relevance to this empirical project. For a normative critic of the model see, e.g., Paul H. Robinson & John Darley, The Role of Deterrence in the Formulation of Criminal Law Rules: At Its Worst When Doing Its Best, 91 GEO. L. J. 949 (2003) (arguing that sanctions should be distributed along the lines of just desert rather than deterrence theory).


4 See David Rosenberg & Steven Shavell, A Simple Proposal to Halve Litigation Costs, 91 VA. L. REV. 1721 (2005) (procedural proposal based on the model); A. Mitchell Polinsky & Steven
One should note, however, that the probability of imposing sanctions is not determined by a single probabilistic event. Rather, it is determined by a series of sequential events such as being caught by the police, being charged by the prosecution and being convicted by a court in accordance to the different procedural rules of the legal system. From an economic perspective this detail is a minor complexity, and can be resolved by the tools of expected utility theory. Thus, potential wrongdoers are assumed to treat the different types of legal probabilities as equal, and simply multiply them in order to derive the probability of being sanctioned much like the player at the casino.

Exploring the way individuals treat probabilities in general, and legal probabilities specifically, however, has not been a monopoly of economists. Cognitive psychologists have studied in great detail different aspects of decision making under conditions of uncertainty. Building on these contributions, legal scholars from the behavioral law and economics movement have developed theories regarding decision making in uncertain legal situations. For instance, Rachlinski has examined civil litigation in light of prospect theory, and demonstrated that traditional economic models of litigation that assume litigants make rational decisions with respect to uncertain situations do not provide an accurate account of litigation.

Yet as a general matter the behavioral legal literature dealing with probabilities has ignored the constitutive role law can make with respect to peoples’ decisions. In other words, the focus of analysis was on whether different legal situations match the settings of documented behavioral biases. For instance, after cognitive psychologists taught us that individuals treat risks associated with gains and risks associated with losses differently, this insight can be applied to legal situations that involve both gains and losses in order to adjust the predictions of economic models in those situations. Thus, it is the match between the setting created by the law and the pre-existing behavioral bias, which triggered the divergence from the rational choice model, and not the content of law itself that affected peoples’ behavior.

In a recent study we explored the possibility that the way in which the law labels payments affects the way people perceive the situation, and the way in which they are
expected to behave. We demonstrated that payments of equal size that the law structures differently with respect to the timing of the payment (before or after the wrongful act) and the identity of the recipient (payment to the state or payment to the victim) have different effects on behavior. More specifically, our results showed that legal payments function as a continuum with respect to their affects on incentives. At one end of this continuum lie ex ante payments made to individuals. These payments are close in structure to a price, and are therefore perceived by people as legitimate. At the other end of the continuum lie ex post payments made to the state. These payments are close in structure to the paradigmatic punishment, and are therefore perceived as less legitimate by people.

In this study we turn to examine differences between different types of legal probabilities. More specifically, we wish to compare two sources of uncertainty that the law creates regularly. The first is legal uncertainty. Legal rules are inherently uncertain. This uncertainty can be a result of the limitations of the language, or as a result of ambiguous legal terms such as “reasonable” and “good-faith” that depend on a probabilistic ex post determination of an adjudicator. The second is enforcement uncertainty. Legal liability tends to be probabilistic as a result of difficulties associated with detecting wrongdoers, and assigning legal liability to them in accordance to the different procedural rules the law sets forth.

From the perspective of rational choice theory the difference between legal probabilities is much like the difference associated with throwing a die and flipping a coin in our initial example: there simply is no difference. The expected sanction if legality is certain and detection is 50% is identical to the expected sanction if detection is certain and the probability of illegality is 50%. We, on the other hand, conjecture that much like the case of legal payments, legal probabilities are not fungible from the perspective of decision makers. Forces such as social norms and the expressive power of the law coupled with internal aspects of human reasoning might cause people to perceive different legal probabilities as distinct. More specifically, we assume that uncertainty with respect to the content of the law leaves people the option of perceiving their acts as legal, and therefore worthy (or at least not blame worthy). On the other hand, in situations in which illegality is clear, and the sole source of uncertainty is enforcement, people will be forced to view the behavior itself as wrongful. Thus, we expect to find less willingness to engage in regulated activities when the source of uncertainty is the enforcement of a clear law.

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11 In the legal literature the accepted terminology describing uncertainty with respect to the content of law is ambiguity. We intentionally chose not use this terminology since in the cognitive psychology literature there is a distinction between uncertain situations in which decision makers are aware of the probabilities of the different contingencies, and ambiguous situations in which decision makers are not aware of the probabilities. From this perspective our study is a study of decision making under uncertainty and not ambiguity.

To test these predictions, we designed a series of between-subjects experimental surveys that measured and compared participants’ attitudes toward compliance in conditions of uncertainty. In the scenarios given to participants, their chances of being sanctioned were identical; the dimension that was manipulated was related to whether the source of uncertainty was in the legality of the behavior or in the likelihood of enforcement. Overall these studies confirmed our main hypothesis that people will comply less, when the source of uncertainty is in the law itself, in comparison to situations where the source of uncertainty is in enforcement but the illegality is clear. Given the argument that suggests that there are major differences in attitudes toward the law between Israelis and Americans, we conducted one of the studies in the United States and two of the studies in Israel. Our results in this regard did not detect a significant difference between the two groups of people.

This Article is organized as follows: In part II we describe the background for the study. We review the traditional literature dealing with legal probabilities and flesh out some of its drawbacks. We then present several bodies of literature that point out the potential differences between different types of legal probabilities. Building on these studies, we will suggest several hypotheses as to the differences between legal probabilities in different settings. Part II describes the design of the experiments and their results. In Part III we discuss our results, explore the potential policy implications, and deal with some of the limitations of this study. Finally, in Part IV we briefly conclude.

II. BACKGROUND

Legal economists, for the most part, view law as a social tool that creates a menu of prices for harmful behaviors that should be regulated. Thus, the “seminal insight” of the law and economics movement was that the tools of price theory can be employed in order to predict the way different legal rules will influence peoples’ behavior. Based on this insight, legal economists modeled the incentives created by an array of legal

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13 Further dimensions were added in the second and third studies, and explanations about them will appear in sections III D. and III E. infra.
payments. Expectation damages were viewed as the price of breach of contract,\textsuperscript{17} tort compensation as the price set for engaging in risky behavior,\textsuperscript{18} and criminal punishments as the price criminals must pay if they choose to commit crimes.\textsuperscript{19}

Yet from the outset, law and economics scholars realized that unlike prices for goods in the marketplace, legal prices are in many cases probabilistic. For example, when a driver speeds on the highway he will have to pay the legal price for speeding (e.g. the fine) only in those rare cases in which a police officer actually catches him and writes him a ticket. Recognizing this, economic models of deterrence starting from Becker’s seminal paper on crime and punishment did not focus on the sanctions applied to wrongdoers alone. Rather, they focused on the expected sanction wrongdoers face, which is calculated by multiplying the size of the sanction by the probability that it will actually be inflicted on the wrongdoer.

The expected sanction is a complex term that is comprised of several factors. While, the probability detection draws in many cases most of the attention, a closer view at the term reveals that aside from detection there are many other probabilities that stand in the way of sanctioning wrongdoers. After the police detect a wrongdoer, the prosecution must decide to press charges against him. Different considerations such as the case load might cause the prosecution not to file charges.\textsuperscript{20} Similarly, once the prosecution decides to press charges, the wrongdoer must still be convicted in court before a sanction can be imposed. Court proceedings can create an array of reasons for the prosecution to fail to secure a conviction even for a guilty defendant. One group of such reasons can relate to difficulties to prove the wrongful act at the level of certainty required by law. Issues such as witness credibility, the ability to produce documents, and so forth inherently introduce uncertainty into the legal process, and bring about a probability of conviction for the guilty that is lower than one.

Our focus in this study is on uncertainty created by the law itself. Law is inherently uncertain. This uncertainty is a result of two main sources. First, uncertainty can be a result of the limitation of the language to capture every potential occurrence. For example, it might be unclear whether a law that forbids “vehicles” from entering into the

\textsuperscript{18} See, e.g., WILLIAM M. LANDES & RICHARD A. POSNER, \textit{The Economic Structure of Tort Law} (1987) (modeling the decisions of individuals as to the level of care they take as a function of the liability they incur through the tort system).
park applies to bicycles, roller skates or even toy automobiles.  

Thus, bicycle drivers that need to decide whether to drive through the park, face uncertainty as to the legal ramifications of their choice. Second, the law includes an array of standards that depend on an ex post evaluation of the actors acts in order to impose legal liability. Terms such as “negligence” in tort law, “good faith” in the contractual setting and “fair use” in the context of copyright law all create uncertainty with respect to the legal consequences of an act. Hence, for example, an artist deciding whether to incorporate copyrighted work into his own work can only reach an educated assumption as to the possibility of legal liability.

While legal economists recognize the different probabilistic aspects of legal prices, they treat the different probabilities as fungible from the perspective of potential wrongdoers. For example, in an influential article that explored the effects of uncertain legal standards on deterrence theory, Craswell and Calfee explicitly assume that all legal probabilities are fungible. Furthermore, to the extent they are willing at acknowledge that different probabilities might be treated differently by potential wrongdoers, their exclusive treatment of the issue focuses on the distinct monetary consequences of potential contingencies. In a more recent paper, Logue examined the design of an optimal deterrence policy given the ambiguity associated with tax law. As Logue points out, tax law is inherently probabilistic due to its uncertainty. This uncertainty can be described as a continuum: At one end of it lie positions that are clearly illegal (e.g. the probability of illegality is 100%), while at its other end lie positions that are clearly legal (e.g. the probability of illegality is 0%). Between these two extremes lies the vast body of tax law in which the probability of illegality is positive, yet not certain. In his model Logue assumes that tax payers are rational in accordance with traditional deterrence models. Thus, he assumes that they treat the probabilities associated with detection and with ambiguity as fungible.

The behavioral legal literature has dealt with different questions associated with legal probabilities and decision making in the deterrence model extensively. For the most part, these studies turn to existing studies in the area of cognitive psychology, and explore how different biases documented in these studies affect the evaluation of different legal regimes. For example, in a recent study Guttel and Harel examined the legal implications of the different way people perceive uncertainty relating to the past and uncertainty relating to the future. They first point out the robust psychological literature that demonstrates that people tend to prefer to take risks with respect to events that will take

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23 Id. at note 10.
25 Id. at 251-57.
26 Id. at 244-45.
place in the future and not in the past.\textsuperscript{28} That done, they turn to review the legal implications of these findings.\textsuperscript{29} For instance, they point out that deterrence can be enhanced by a simple move like determining the identity of the people the tax authority will audit at the beginning of the tax year rather than at its end.\textsuperscript{30} In another study closely related to our project Harel and Segal employ insights from cognitive psychology in order to compare the way potential criminals treat uncertainty with respect to the size of sanctions and uncertainty with respect to the probability of detection.\textsuperscript{31} These insights lead Harel and Segal to argue that increasing the certainty with respect to the size of sanctions while decreasing the certainty with respect to the probability of detection may enhance deterrence.\textsuperscript{32} This finding allows them to examine an array of legal questions ranging from the prohibition against retroactive punishment to the structure of the federal sentencing guidelines.\textsuperscript{33}

While existing studies took the behavioral characteristics of people as given, and applied them to different legal settings, our approach is different. We view law as an integral part of decision making, and as a device that in of its own can affect behavior. Thus, our analysis starts from law, and examines whether the legal characteristic of a probability affect the way individuals perceive it, and the way they are expected to behave. We hypothesize that it matters to people whether the source of uncertainty with respect to a legal payment is lack of enforcement by the police, a large case load on the local prosecutor, or uncertainty in the law itself. We now turn to review several bodies of literature that led us to reject the traditional “fungible probabilities” assumption, and present the competing “non-fungible probabilities” hypothesis.

A major body of both theoretical and empirical literature that challenges the view that legal payments simply reflect prices is the scholarship emphasizing the expressive value of law.\textsuperscript{34} Expressive theories of law consist of an array of distinct claims, including theories of lawmaking, claims about the connection between the law and social norms, and positive predictions as to the way different legal expressions affect behavior. In the context of regulation and sanctioning the basic claim of expressive theories is that a legal

\begin{itemize}
  \item \textsuperscript{28} Id. at \_\_ (to be completed after publication).
  \item \textsuperscript{29} Id. at \_\_ (to be completed after publication).
  \item \textsuperscript{30} Id. at \_\_ (to be completed after publication).
  \item \textsuperscript{31} See Alon Harel & Uzi Segal, Criminal Law and Behavioral Law and Economics: Observations on the Neglected Role of Uncertainty in Deterring Crime, 1-2 A\textsuperscript{M}. L. E\textsuperscript{CON}R\textsuperscript{EV}. 276 (1999).
  \item \textsuperscript{32} Id. at 294-306.
  \item \textsuperscript{33} Id. at 306-9.
\end{itemize}
prohibition of an act in itself gives people to act in accordance with the law. Thus, even a legal rule that is not backed by a sanction is expected to affect peoples’ behavior.\footnote{For an empirical demonstration of this point see McAdams & Nadler \textit{id}.}

In the context of our study, to the extent that legal prohibitions carry an expressive power that independently influences people, two theoretical mechanisms can explain different behavioral effects of uncertainty in law and uncertainty in enforcement. First, focusing on enforcement, the expressive power is less affected by the likelihood of enforcement, as it is less sensitive to sanctions in comparison to the deterring function of the law.\footnote{To be sure, this argument should be qualified, as no enforcement or harsh enforcement may in fact carry an expressive message. \textit{See Frank Zimring & Gordon Hawkins, \textit{The Legal Threat as an Instrument of Social Change}, 27 J. SOC. ISSUES 33, 89 (1971) (discussing the interrelations between formal deterrence). For a discussion of the effect of deterrence on the development of moral commitment see H.L.A HART, \textit{LAW, LIBERTY AND MORALITY} 58 (1963).}} Thus, even if the multiplication of probabilities is identical from an instrumental perspective, from an expressive perspective the question of legality carries greater meaning, and therefore uncertainty with respect to enforcement is expected to have a relatively lower effect on the regulated behavior. In other words, given that the expressive effect is not related solely to the likelihood of conviction but rather to the message conveyed by the law, uncertainty regarding the illegality of an act carries greater importance than uncertainty regarding detection. Second, focusing on legal clarity, the expressive power is more sensitive to the clarity of the law, since part of it stems from the clear message the law can convey. According to many of the studies that explore the mechanisms that underlie the expressive function of the law, its power comes from its ability to communicate a message about morality, social norm or scientific truth.\footnote{For a review of these theories see Yuval Feldman, \textit{The Expressive Function of the Trade Secret Law: Legality, Cost, Intrinsic Motivation and Consensus}, \textit{__} J. EMPIRICAL LEGAL STUD. __ (forthcoming 2008).} Hence, as the legal norm becomes vague it is reasonable to assume that its expressive effect will be diminished, and therefore uncertainty with respect to the law is expected to have a relatively higher effect on the regulated behavior.

research span to include shaming sanctions.\textsuperscript{42} Within, this literature, a similar distinction between external and internal motivation exists with respect to shame and guilt as a motivating factor of behavior.\textsuperscript{43} Shame relates to external sanctioning inflicted by fellow members of the community. Guilt, on the other hand, relates to an internal process through which the individual feels negative emotions as a result of disobeying the law.\textsuperscript{44} Since guilt feelings are built upon an internalization process, they are expected to be less sensitive to the probability of detection than feelings of shame. In other words, when people internalize the legal norm they suffer disutility from disobeying it, not withstanding whether or not they were caught. Thus, when motivation to comply stems from feelings of guilt we expect to find greater willingness to disobey the law when the uncertainty is created by the law rather than enforcement problems.\textsuperscript{45} However, when motivation to comply stems from feelings of shame, the source of legal uncertainty is less critical as the likelihood of getting caught defines the expected cost for the individual.

An additional body of psychological and economic literature that we find relevant to our study is that dealing motivated reasoning.\textsuperscript{46} According to this literature, decision makers attempt to make choices that they perceive as such that can be later justified to a dispassionate observer.\textsuperscript{47} In other words, people want to avoid a dissonance between how they behave and how they think they ought to behave. Thus, they develop an array of internal reasoning tools that allow them justify their acts, and avoid categorizing them as immoral or dishonest.\textsuperscript{48} As Mazar, Amir and Ariely note in an example that comes close to our study: “people who pass by a gas station will not only be influenced by the expected amount of cash they stand to gain from robbing the place, the probability of being caught, and the magnitude of punishment if caught, but it would also matter how the act of robbing the store might make them perceive themselves.”\textsuperscript{49}


\textsuperscript{43}For an analytical discussion of the distinction among these different feelings see, e.g., June Price Tangney et. al, \textit{Are Shame, Guilt and Embarrassment Distinct Emotions?}, 70 J. PERSONALITY & SOC. PSYCH. 1256 (1996). For an analysis of the role of shame and guilt in the specific context of tax compliance see B. Erard & J.S. Feinstein, \textit{The Role of Moral Sentiments and Audit Perceptions in tax Compliance}, 49 PUB. FINANCE 70 (1994).

\textsuperscript{44}For one of the leading law and economic perspective on internalized values see Robert Cooter, \textit{Do Good Laws Make Good Citizens? An Economic Analysis of Internalized Norms}, 86 VA. L. Rev. 1577 (2000).

\textsuperscript{45}In the third study that we conduct in this paper, we compare the interaction between legal uncertainty and whether the motivation to comply is internal or external. See infra part III E.

\textsuperscript{46}For a review of this literature see Ziva Kunda, \textit{The Case for Motivated Reasoning}, 108 PSYCH. BULL. 480 (1990).

\textsuperscript{47}\textit{Id.} at 493.


Psychologists have not explored the connection between legal uncertainty and motivated reasoning. Nonetheless, they have studied different aspects associated with uncertainty and this behavioral phenomenon. Schweitzer and Hsee demonstrated that in a negotiations setting in which the costs and benefits of the parties were held constant, the parties decision to disclose private information to the opposing side was influenced by what they term as the “elasticity” of the private information. For example, in one study they examined the willingness of parties to disclose harmful private information when negotiating the sale of a car. In this study sellers were informed that the odometer of the car being sold had been disconnected, and that the buying party would believe them if they told him that the actual mileage was 60,000. Sellers were then divided into two groups: the first was told that the actual mileage was between 74,000 and 76,000, and the second was told that the mileage was between 60,000 and 90,000 (with equal probabilities within the range for each group). Note that according to traditional rational choice models sellers are expected (a) to tell the other party that the mileage is only 60,000; and (b) not to differ between the two control groups. Yet Schweitzer and Hsee report that the parties tended to disclose higher values than 60,000, and, more importantly for our purposes, that the average mileage claimed by the first group was significantly higher than the average claimed by the second group. These results demonstrate the importance of motivated reasoning and self serving justifications in a probabilistic setting. Members of the first group could not represent to the opposing party a mileage figure bellow 74,000 without knowing for certain that they are deceiving him. Members of the second group, on the other hand, could claim that the mileage was only 60,000 while convincing themselves that stating this figure was not a misrepresentation. In a legal context, Feldman and Harel showed that when faced with uncertain legal standards, participants’ tendency to choose an interpretation that fit their self interest grew as the expected benefits from non-compliance rose. The authors viewed this result as an indication for interpretation driven by motivated reasoning, where participants used uncertainty to a greater extent when temptation to shirk was stronger.

The existence of a self serving bias towards interpreting behavior as moral could cause a distinction between enforcement uncertainty and legal uncertainty. Enforcement draws on external motivations, and therefore is not susceptible to a self serving bias. The law, on the other hand, is tied to the internal desire of people to perceive their behavior as worthy. The existence of uncertainty with respect to the content of the law can allow people to discount their internal fear of behaving in an inappropriate fashion, since behaving in such a way can be internally justified as an honest mistake with respect to the nature of the act, and not seen as part of an inappropriate cost benefit analysis. Thus, we are again drawn to assume that people will tend to demonstrate a higher propensity to

51 Id. at 189-92.
52 Id.
53 Id. at 190. More specifically, the average of the first group was 70,764 and the average of the second group was only 68,354.
54 Feldman & Harel, supra note 12.
participate in the regulated activity when uncertainty originates from the content of the law itself.

III. THE EXPERIMENTS

A. Participants and Design

To test our propositions, we conducted an experimental survey study, using situational vignettes in a between-subject design on a student population in both the United States and Israel. A total of 422 students at Bar-Ilan University, the Hebrew University of Jerusalem, and Tulane University were sampled.

The questionnaires depicted a legal dilemma that participants were asked to evaluate. More specifically, respondents were instructed to imagine that they were factory managers who need to decide whether to produce a chemical that might pollute a nearby lake. The experimental manipulation was conducted by randomly dividing the sample to equal sub-groups and making controlled changes to the descriptions of the dilemma. After reading the description of the dilemma, participants were asked about their individual evaluation of the dilemma, perceived norm and intention to behave. In addition, we measured participants’ perceived social norms regarding the polluting behavior and their willingness to pay for abstaining from polluting.

B. Factors

1. The Manipulated Factors

The first study had two experimental groups, while the second and third studies employed a 2X2 design. The first manipulated factor – source of uncertainty had two levels (uncertainty in law vs. uncertainty in enforcement), and was used in all three studies. Enforcement uncertainty was described to participants as a situation where it is clear that the law prohibits pouring the chemical into the lake, however there is a low chance (10%) that the authorities will be able to detect the identity of the polluting factory. Thus, participants were told that the overall likelihood of prosecution is 10%. Legal uncertainty was described to participants as a situation where it is clear that if the chemical will be poured into the lake, it will be detected by the authorities. However, it is not clear that the pouring of the chemical is illegal since the chemical is relatively new and its legal status has not been determined yet. In this situation, too, the participants were told that the overall likelihood of prosecution is 10%.

In the second study, an additional manipulated factor - the type of the sanction - was used. This factor had two levels, criminal sanction and civil sanction. In the criminal sanction group, participants read about a situation where the enforcement was done by the state and was criminal. In the civil sanction group, the scenario described a situation,

55 Study II was conducted in Bar-Ilan University and included 159 students.
56 Study III was conducted in the Hebrew University of Jerusalem and included 194 students.
57 Study I was conducted in Tulane University and included 69 students.
where the enforcement was done by a private party and the payment was paid as damages rather than as a fine.

In the third and final study, the second manipulated factor was replaced with a different two level factor - the existence of a rational for the law. In one level, the law that prohibited pollution was given an explanation – the potential death to fishes in the lake. In the second group, participants were told that there was no extra-legal rational for the law, as in this specific lake, there were no fish from the kind sensitive to the chemical.

2. Dependent Variables

The dependent variables in the study were self reported and were measured on a Likert scale of (1-10). Dependent variable refers to the variables that are explained by the model. The first two items were related to social and moral desirability of incompliance. Perceived morality was examined by asking participants whether producing the fertilizer in the described legal situation is morally unacceptable (1 acceptable, 10 unacceptable). Perceived social desirability was examined by asking participants and whether producing the fertilizer in the described legal situation is socially desirable (1 desirable, 10 undesirable).

The next two items were related to the perceived prevalence of compliance. Industry wide incompliance was measured by asking participants what percentage of factories in the country would choose to produce the fertilizer in the described setting (1, 10%, 10 – 100%). Managerial incompliance was measured by asking participants whether they agree with a statement that “most managers would decide to produce the fertilizer in the given legal situation?” (1, agree, 10 disagree).

The last three items were related to participants’ hypothetical future behavior. Likelihood of compliance was measured by asking participants whether they agree with the statement that “If possible I will try not to produce the fertilizer in the given legal situation.” Willingness to pay for compliance was measured by asking participants whether they would agree with the statement “Even if I receive a high amount of money, I will not produce the fertilizer in the given legal situation” (1-disagree, 10 agree). Finally, participants were asked a yes/ no question to measure their intention to violate the law – “At the end of the day, would you produce the fertilizer?”

C. Study I: Legal Uncertainty vs. Uncertain Enforcement

We begin with a simple benchmark case in which we compare uncertainty created by probabilistic enforcement and uncertainty created by legal ambiguity. To examine the effect of the type of legal situation on participants’ attitudes toward the misconduct, a one-way multivariate analyses of variance (MANOVA) was conducted, and the subgroups were compared with respect to the dependent variables of the study (attitudes toward the misconduct, perceived prevalence of the misconduct and personal inclination
Following a significant effect, a series of univariate one-way ANOVAs were conducted in order to examine the source of the variance. A chi square test ($\chi^2$) was then performed to examine the independence between the yes/no question about the engagement in the misconduct and the legal situation. In Table 1 we report the mean scores and standard deviations for perceived attitudes and reactions toward the misconduct as a function of the legal situation.

Table 1: Mean Scores and Standard Deviations (in parentheses) for Perceived Attitudes and Reactions towards the Misconduct as a Function of the Legal Situation

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Legal Situation</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Legal uncertainty</td>
<td>Enforcement uncertainty</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n=28)</td>
<td>(n=41)</td>
<td></td>
</tr>
<tr>
<td><strong>Attitudes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Morality</td>
<td>5.96 (2.97)</td>
<td>7.90 (2.54)</td>
<td></td>
</tr>
<tr>
<td>Perceived Social Desirability</td>
<td>6.46 (2.55)</td>
<td>6.56 (2.67)</td>
<td></td>
</tr>
<tr>
<td><strong>Perceived Prevalence</strong></td>
<td>4.11 (2.45)</td>
<td>4.63 (2.45)</td>
<td></td>
</tr>
<tr>
<td>Industry wide Incompliance</td>
<td>3.39 (1.57)</td>
<td>4.88 (2.37)</td>
<td></td>
</tr>
<tr>
<td>Managerial Incompliance</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Personal Behavior</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Likelihood of Compliance</td>
<td>6.93 (2.85)</td>
<td>8.12 (2.27)</td>
<td></td>
</tr>
<tr>
<td>Willingness to Pay</td>
<td>5.89 (3.09)</td>
<td>6.98 (2.76)</td>
<td></td>
</tr>
<tr>
<td>Intention to Violate the Law</td>
<td>1.57 (.50)</td>
<td>1.83 (.38)</td>
<td></td>
</tr>
</tbody>
</table>

59 MANOVA is a procedure that examines the explained variance in a series of dependent variables, by a series of independent variables. The advantage of this procedure is that it enables to identify both an interaction between the independent variables as well as other associations between the dependent variables.

60 Significance in statistics refers to the odds that a certain result was created by chance. In the context of this paper, every time a difference or a result is presented as Significant, it means that there is less than 5% likelihood that this difference was coincidental. The 5% level of significance is a common threshold used in statistical analysis. In some cases where the result was stronger we added $p < .01$ to imply that the likelihood of a chance driven result was lower than 1%.

61 ANOVA is a very common statistical technique, which aims to identify the sources of variance among participants. In contrast to MANOVA, in ANOVA, there is only one dependent variable. In our design, the purpose of the statistical analysis is to examine whether the experimental groups are different from each other. The procedure allows us to tell how much of the difference between participants could be attributed to the assignment to the different sub-groups. In plain words, the statistical analyses will tell us how much of the differences in the responses of participants could be explained by the framing of the legal probability.

62 A chi Square procedure is used to examine whether a certain distribution of events is random or could be explained by a certain model. It is used in this study to test the dependence between the distribution of the dichotomous dependent variable of 'intention to violate' (Yes/No) and the source of uncertainty in all three studies.

63 Standard Deviation (SD) is a common concept used to measure the distribution of a variable around the average.

64 All first six items were rated on a 10-point Likert-type scale. The Intention to violate the law was rated by two categories: 1 (yes), 2 (no). In the order of variables in the table, higher mean values indicate more negative attitudes toward the misconduct, lower perceived prevalence of the misconduct and lower inclination to perform the misconduct.
Multivariate analysis of variance for the attitudes and reactions toward the misconduct indicated that overall, the subgroups significantly differed. A univariate analyses of variance indicated that a significant difference was detected for four of the seven variables: Perceived Morality, Managerial Incompliance, Likelihood of Compliance, and the Intention to Violate the Law. These tests reveal that for all of these measures, means were higher in the uncertainty in enforcement subgroup than in the uncertainty in law subgroup. Therefore, in accordance with the hypothesis, the inclination to violate the law was found to be higher for the group faced with uncertainty in law than in the group faced with uncertainty in enforcement. The subgroups did not differ significantly on the other variables presented in the table (all p's > .05).

Finally, in Table 2 we report the frequency distribution of the participants as a function of the engagement in the misconduct and the legal situation.

Table 2: The Distribution of Participants as a Function of the Engagement in the Misconduct and the Legal Situation

<table>
<thead>
<tr>
<th>Legal Situation</th>
<th>Uncertainty in Law</th>
<th>Uncertainty in Enforcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention to violate the law</td>
<td>YES</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td>16</td>
</tr>
</tbody>
</table>

The chi square ($\chi^2$) test indicated a significant dependence between the variables $\chi^2 (1, N=69) = 4.33, p<.05$. In accordance with the hypothesis, in the legal uncertainty subgroup, the proportion of participants showing an inclination to violate the law (42.9%) was significantly higher than in the uncertain enforcement sub-group (17.1%).

D. Study II: Legal Probabilities in Civil and Criminal Settings

In our first experiment we confirmed our basic hypothesis that legal probabilities are not fungible, and demonstrated the difference between uncertainty associated with enforcement and uncertainty associated with the content of law. This led us to examine the boundaries of this effect and the extent to which it would be repeated in other legal settings. Identifying the areas where people prefer legal uncertainty over uncertain enforcement could help us both understand the theoretical mechanisms that underlie it, and give policymakers tools to use this gap more effectively.

A basic distinction between legal regimes is the distinction between civil and criminal regulation. While civil regulation generally involves litigation between a private party harmed by the acts of another private party, criminal regimes are based on the act of the state that brings a legal action against one of its subject. A large body of theoretical

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$^{65}$ Multivariate $F(7,61)=3.18, p<.01, \eta^2 = .27$

$^{66}$ $F(1,67)=8.43, p<.01, \eta^2 = .11$

$^{67}$ $F(1,67)=8.45, p<.01, \eta^2 = .11$

$^{68}$ $F(1,67)=3.72, p<.05, \eta^2 = .05$

$^{69}$ $F(1,67)=5.85, p<.01, \eta^2 = .08$
literature has dealt with the unique social meaning of criminal sanctions, and their distinct power to internalize norms and regulate behavior. In a series of influential articles Robinson and Darley explored these issues, and argued that criminal law reflects a set of internalized norms. In addition, past empirical studies examined the different incentives created by tagging a legal payment as either civil or criminal. These studies showed that individuals are less willing to engage in simple cost benefit analysis once a legal sanction is labeled as criminal. Given these characteristics of criminal sanctions, one can expect that the content of the law plays a larger role in that context. Thus, we hypothesized that the effect of legal uncertainty will be greater in a criminal setting, when compared with a similar civil setting.

To examine the effects of the type of the sanction and the type of legal uncertainty on the dependant variables, a two-way multivariate analyses of covariance (MANCOVA), sanction’s type (Criminal/ Civil) X legal probability (Uncertainty in Enforcement / Uncertainty in Law) was conducted. Separate one-way ANCOVA’s for each of the sanction’s types comparing the means of the legal situation subgroups were also conducted. Because of continuity considerations, a chi square test ($\chi^2$) was then performed to examine the independence between the Intention to Violate the Law (Yes/No) and whether the sanction was civil or criminal.

The two-way MANCOVA for the general measures of the study indicated that overall, the Uncertainty in Law subgroup significantly differed from the Uncertainty in Enforcement subgroup. It also indicated that the sanction’s type effect was not statistically significant (p's >.05). Finally the MANCOVA showed a significant interaction effect between the sanction’s type and the legal situation. The univariate tests indicated that a significant difference between the legal situation subgroups was detected for four of the seven variables: Perceived Morality, Perceived Social Desirability, Willingness to Pay for Compliance, and the Intention to Violate the Law (Yes/No). These tests reveal that for all of these variables, means were higher in the uncertainty in enforcement subgroup than in the uncertainty in law subgroup. Therefore, as expected, the inclination to violate the law was found to be higher for the group faced

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71 See, e.g., Feldman & Teichman, supra note 10.
72 Id.
73 Gender and the level of religiosity, were included as covariates in the analyses, and they were employed to reduce their value as competing explanations for the participants' outcomes. MANCOVA and ANCOVA are similar procedures to MANOVA and ANOVA respectively. The major difference is that in MANCOVA and ANCOVA the influence of a supplementary independent variable - covariate – can be controlled and accounted for. In this context the demographic factors were treated as covariates to control for their influence.
74 Multivariate $F(3,143)=4.81$, p<.01, $\eta^2=.09$
75 Multivariate $F(3,143)=3.08$, p<.05, $\eta^2=.06$
76 $F(1,144)=9.78$, p<.01, $\eta^2=.06$
77 $F(1,144)=15.39$, p<.001, $\eta^2=.10$
78 $F(1,144)=8.55$, p<.01, $\eta^2=.06$
79 $F(1,144)=4.53$, p<.05, $\eta^2=.03$
with uncertainty in law than in the group faced with uncertainty in enforcement. No significant differences were detected between the Civil Sanction and the Criminal Sanction subgroups for all of the variables tested in the study (all p's >.05).

Most importantly, the univariate tests also indicated a significant interaction effect for three of the seven variables: Likelihood of Compliance, Willingness to Pay for Compliance and the Intention to Violate the Law. A marginal significant interaction effect was detected for Perceived Social Desirability.

To understand the source of the variance a separate ANCOVA's for each of the sanction's subgroup was conducted. The analysis indicated that for the Criminal sanction condition, significant differences were detected between the Legal situation subgroups for five of the seven variables: Perceived Morality, Perceived Social Desirability, Likelihood of Compliance, Willingness to Pay for Compliance, and the Intention to Violate the Law (Yes/No). In the Civil sanction condition, a significant difference was detected between the Legal situation subgroups only for one of the seven variables: Perceived Morality.

In Table 3 we report the mean scores for perceived attitudes and reactions toward the misconduct as a function of the sanction's type and the legal situation. In addition the table presents the results of the sub-group analysis conducted separately for the criminal and civil conditions.

Table 3: Mean Scores and Standard Deviations (in parentheses) for Perceived Attitudes and Reactions toward the Misconduct as a Function of the Sanction's Type and the Legal Situation

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Legal Situation</th>
<th>Sanction's Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Attitudes</td>
<td>Civil (N=77)</td>
</tr>
<tr>
<td>Perceived Morality</td>
<td>Uncertainty in Law</td>
<td>7.68 (2.11)</td>
</tr>
<tr>
<td></td>
<td>Uncertainty in Enforcement</td>
<td>8.57 (1.87)</td>
</tr>
<tr>
<td>Difference test</td>
<td></td>
<td><strong>F(1,73)=4.25, p&lt;.05, η²=.05</strong></td>
</tr>
<tr>
<td>Perceived Social Desirability</td>
<td>Uncertainty in Law</td>
<td>7.27 (2.22)</td>
</tr>
<tr>
<td></td>
<td>Uncertainty in Enforcement</td>
<td>7.97 (2.29)</td>
</tr>
</tbody>
</table>

80 The meaning of an interaction between the type of sanction and the source of uncertainty is that the differences that were found between the averages in the variables of Likelihood of Compliance, Willingness to Pay for Compliance and the Intention to Violate the Law, in the two uncertainty conditions were moderated by the type of uncertainty.
81 F(1,144)=5.58, p<.05, η²=.04
82 F(1,144)=7.33, p<.05, η²=.05
83 F(1,144)=6.15, p<.05, η²=.04
84 F(1,144)=3.02, p=.08, η²=.02
85 All first six items were rated on a 10-point Likert-type scale. The Intention to violate the law (Yes/No) was rated by two categories: 1 (yes), 2 (no). In the order of variables in the table, higher mean values indicate more negative attitudes toward the incompliance, lower perceived prevalence of incompliance and lower inclination to violate the law.
Table 4 reports the frequency distribution of the participants as a function of the engagement in the misconduct and the legal situation for civil sanction vs. criminal sanction.

<table>
<thead>
<tr>
<th></th>
<th>Prevalence</th>
<th>Personal reactions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Industry wide Incompliance</strong></td>
<td><strong>Uncertainty in Law</strong></td>
<td><strong>Uncertainty in Enforcement</strong></td>
</tr>
<tr>
<td></td>
<td>3.27 (1.59)</td>
<td>3.41 (1.92)</td>
</tr>
<tr>
<td></td>
<td>3.05 (1.53)</td>
<td>3.53 (1.54)</td>
</tr>
<tr>
<td><strong>Managerial Incompliance</strong></td>
<td><strong>Uncertainty in Law</strong></td>
<td><strong>Uncertainty in Enforcement</strong></td>
</tr>
<tr>
<td></td>
<td>3.86 (2.71)</td>
<td>3.59 (2.31)</td>
</tr>
<tr>
<td></td>
<td>4.57 (2.98)</td>
<td>3.88 (2.64)</td>
</tr>
</tbody>
</table>

Table 4: The Distribution of Participants as a Function of the Engagement in the Misconduct and the Legal Situation for Civil Sanction vs. Criminal Sanction

<table>
<thead>
<tr>
<th></th>
<th>Legal Situation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sanction’s Type</strong></td>
<td><strong>Intention to violate the Law</strong></td>
</tr>
<tr>
<td>Civil Sanction</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>NO</td>
</tr>
<tr>
<td>Criminal Sanction</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>NO</td>
</tr>
</tbody>
</table>

The chi square (\( \chi^2 \)) test indicated that for the Civil Sanction, there was no dependency between the variables \( \chi^2 (1, N=82) = .02, p>.05 \). On the other hand, for the Criminal
Sanction, a significant dependency between the variables emerged $\chi^2 (1, N=77) = 6.41$, p<.01. In accordance with the hypothesis, only for the Criminal Sanction, a significant difference was found between the legal situation sub-groups in their intention to violate the law. In the Uncertainty in Law sub-group, the proportion of participants showing an inclination to violate the law (35.7%) was significantly higher than in the Uncertainty in Enforcement sub-group (8.6%).

E. Study III: Legal Probabilities and the Causation of Harm

In our third and final study we turned to explore how altering the factual aspects of the situation can affect the way in which people perceive legal probabilities. More specifically, we explored whether the causation of harm to others affects the way in which people perceive legal probabilities. Exploring this question is a more complex and challenging task, since one can present two competing hypothesis as to the role of legal uncertainty in this regard.

One hypothesis stems from the process of motivated reasoning. As we have seen, one of the psychological forces driving the differences between enforcement uncertainty and legal uncertainty is the ability of people to employ self serving motivated reasoning that justifies their choices of action. Yet, this way of reasoning is limited by the factual setting in which it is conducted. For example, while one might be able to justify to himself stealing a pencil worth 10¢ form a friend (e.g., everyone does it, etc.), he will find it difficult to justify stealing 10¢ from the friend’s wallet. Similarly, the effect of the legal prohibition may depend on the degree to which the law itself affects people’s judgment of the morality of the act. If people have a clear judgment of the wrongfulness of the act notwithstanding the law, then the effect of legal uncertainty is expected to be diminished. For example, even if (hypothetically) there is some legal uncertainty whether intentionally killing another man is covered by the criminal code, one would expect this uncertainty to have little effect on people’s behavior since they view the act as wrongful irrespective of the law’s content. If, on the other hand, people do not view the regulated act as inherently wrong, then they will find it easier to engage in motivated reasoning once legal uncertainty is introduced. For instance, legal uncertainty with respect to a technical aspect of the tax code might draw people to utilize it in order to minimize their tax liability, if they see nothing inherently illegitimate with minimizing their tax payments.

The competing hypothesis, which stems from the vast literature on instrumental motivations for legal compliance, suggests that the role of legal uncertainty may be less significant in situations that carry limited moral meaning. As the compliance literature points out, people do not obey the law merely because of the fear of sanctions. Rather, it is the view of law as a moral authority that causes people to willfully obey it. Thus, if the law deals with a morally charged situation (e.g., stealing money from a friend), then the existence of uncertainty with respect to its content is expected to affect the decisions of individuals significantly, since people may infer moral vagueness from the abstinence of

86 See Mazar, Amir & Ariely, supra note 49.
87 See supra notes 39-41 for some of the classical studies on instrumental motivation to comply.
legal uncertainty. If, on the other hand, the law deals with technical prohibitions that do not seem to hold specific moral value, then the role of legal uncertainty is expected to be diminished, since people do not view the content of law in such situations as a guide to their behavior.

The same analysis conducted for study II was conducted in study III. A two-way MANCOVA for the general measures of the study indicated that overall, the Uncertainty in Law subgroup significantly differed from the Uncertainty in Enforcement subgroup.\(^{88}\) It also indicated that the No Environmental Damage subgroup significantly differed from the Environmental Damage subgroup,\(^{89}\) however there was no significant interaction effect between the variables (\(p>.05\)). The univariate tests indicated that a significant difference between the legal situation subgroups was detected for two of the variables: Perceived Social Desirability\(^{90}\) and Managerial Incompliance.\(^{91}\) A marginal significant effect was detected for the Industry wide Incompliance.\(^{92}\) These tests reveal that for these three variables, means were higher in the Uncertainty in Enforcement subgroup than in the Uncertainty in Law subgroup. As expected, incompliance was found to be higher for the group faced with legal uncertainty than in the group faced with enforcement uncertainty.

The univariate tests also indicated that a significant difference between the environmental context subgroups was detected for five of the variables: Perceived Morality\(^{93}\), Perceived Social Desirability\(^{94}\), Likelihood of Compliance \(^{95}\), Willingness to Pay\(^{96}\) and the Intention to Violate the Law.\(^{97}\) These tests reveal that for all of these variables, means were higher in the Environmental Damage subgroup than in the No Environmental Damage subgroup.

Following the same approach used in study II, and given that our prediction was that the source of uncertainty will have the same effect in both conditions, we conducted a separate ANCOVA for each of the environmental contexts. The split file analysis indicated that for the Environmental Damage context significant differences were detected between the Legal Situation subgroups for two of the variables: Perceived Social Desirability and Managerial Incompliance. A marginal significant effect for the Legal situation was found for the Industry Wide Incompliance rate. In the no damage condition, no significant differences were detected between the Legal Situation subgroups for all of the variables tested in the study (all \(p\)'s >.05)

\(^{88}\) Multivariate \(F(3,181)=4.28, p<.01, \eta^2=.07\)
\(^{89}\) Multivariate \(F(3,181)=10.79, p<.001, \eta^2=.15\)
\(^{90}\) \(F(1,177)=8.4, p<.01, \eta^2=.04\)
\(^{91}\) \(F(1,177)=9.85, p<.001, \eta^2=.05\)
\(^{92}\) \(F(1,177)=3.43, p=.066, \eta^2=.02\)
\(^{93}\) \(F(1,177)=30.00, p<.001, \eta^2=.14\)
\(^{94}\) \(F(1,177)=18.70, p<.001, \eta^2=.10\)
\(^{95}\) \(F(1,177)=20.06, p<.001, \eta^2=.10\)
\(^{96}\) \(F(1,177)=11.06, p<.001, \eta^2=.06\)
\(^{97}\) \(F(1,177)=13.13, p<.001, \eta^2=.07\)
In Table 5 we report the mean scores for perceived attitudes and reactions toward the misconduct as a function of the environmental context and the legal situation. In addition, the table presents the results of the sub-group analysis conducted separately for the environmental context conditions.

Table 5: Mean Scores and Standard Deviations (in parentheses) for Perceived Attitudes and Reactions toward the Misconduct as a Function of the Environmental context and the Legal Situation

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Environmental context</th>
<th>Legal Situation</th>
<th>No Damage (N=90)</th>
<th>Damage (N=93)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attitudes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Morality</td>
<td>Uncertainty in Law</td>
<td>6.28 (2.60)</td>
<td>8.33 (1.76)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uncertainty in Enforcement</td>
<td>6.61 (2.81)</td>
<td>8.55 (1.63)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Difference test</td>
<td>$F(1,89)=.28, p&gt;.05, \eta^2=.00$</td>
<td>$F(1,89)=.28, p&gt;.05, \eta^2=.00$</td>
<td></td>
</tr>
<tr>
<td>Perceived Social Desirability</td>
<td>Uncertainty in Law</td>
<td>5.98 (2.38)</td>
<td>7.62 (1.80)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uncertainty in Enforcement</td>
<td>7.04 (2.72)</td>
<td>8.48 (1.44)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Difference test</td>
<td>$F(1,89)=3.16, p&gt;.05, \eta^2=.03$</td>
<td>$F(1,89)=5.84, p&lt;.05, \eta^2=.06$</td>
<td></td>
</tr>
<tr>
<td><strong>Prevalence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry wide Incompliance</td>
<td>Uncertainty in Law</td>
<td>3.11 (1.95)</td>
<td>3.40 (1.83)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uncertainty in Enforcement</td>
<td>3.41 (2.17)</td>
<td>4.06 (1.85)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Difference test</td>
<td>$F(1,89)=.61, p&gt;.05, \eta^2=.03$</td>
<td>$F(1,89)=3.55, p=.06, \eta^2=.04$</td>
<td></td>
</tr>
<tr>
<td>Managerial Incompliance</td>
<td>Uncertainty in Law</td>
<td>3.43 (2.66)</td>
<td>3.27 (2.40)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uncertainty in Enforcement</td>
<td>4.43 (3.19)</td>
<td>4.56 (2.68)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Difference test</td>
<td>$F(1,89)=2.87, p&gt;.05, \eta^2=.03$</td>
<td>$F(1,89)=7.58, p&lt;.01, \eta^2=.08$</td>
<td></td>
</tr>
<tr>
<td><strong>Personal reactions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood of Compliance</td>
<td>Uncertainty in Law</td>
<td>5.96 (2.58)</td>
<td>7.93 (2.26)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uncertainty in Enforcement</td>
<td>6.68 (2.85)</td>
<td>8.12 (2.05)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Difference test</td>
<td>$F(1,89)=.72, p&gt;.05, \eta^2=.01$</td>
<td>$F(1,89)=.08, p&gt;.05, \eta^2=.00$</td>
<td></td>
</tr>
<tr>
<td>Willingness to Pay</td>
<td>Uncertainty in Law</td>
<td>4.87 (2.57)</td>
<td>6.64 (2.96)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uncertainty in Enforcement</td>
<td>5.29 (3.12)</td>
<td>6.77 (2.71)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Difference test</td>
<td>$F(1,89)=1.2, p&gt;.05, \eta^2=.00$</td>
<td>$F(1,89)=.00, p&gt;.05, \eta^2=.00$</td>
<td></td>
</tr>
<tr>
<td>Intention to Violate the</td>
<td>Uncertainty in Law</td>
<td>1.50 (.50)</td>
<td>1.73 (.48)</td>
<td></td>
</tr>
</tbody>
</table>

98 All first six items were rated on a 10-point Likert-type scale. The Intention to violate the law (Yes/No) was rated by two categories: 1 (yes), 2 (no). In the order of variables in the table, higher mean values indicate more negative attitudes toward the misconduct, lower perceived prevalence of the misconduct and lower inclination to perform the misconduct.
1.85 (.36) 1.57 (.50) Uncertainty in Enforcement

<table>
<thead>
<tr>
<th>Law</th>
<th>Difference test</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncertainty in Enforcement</td>
<td>$F(1,86)=.10$, $p&gt;.05$, $\eta^2=.00$</td>
<td></td>
<td>$F(1,89)=1.89$, $p&gt;.05$, $\eta^2=.02$</td>
</tr>
</tbody>
</table>

The chi square ($\chi^2$) test indicated that for the No Environmental Damage context, there was lack for dependency between the variables $\chi^2(1, N=95) = .27$, $p>.05$. On the other hand, for the Environmental Damage context, a significant dependence between the variables emerged $\chi^2(1, N=99) = 2.68$, $p<.05$. In accordance with the hypothesis, only for the Environmental Damage context, a significant difference was found between the legal situation sub-groups in their intention to violate the law. In the Uncertainty in Law sub-group, the proportion of participants intending to violate the law (30.0%) was significantly higher than in the Uncertainty in Enforcement sub-group (14.3%).

IV. DISCUSSION AND POLICY IMPLICATIONS

A. General Discussion

Our goal in this Article was to explore the ways in which distinct legal probabilities affect human behavior. In a series of three experiments we showed that the source of legal uncertainty affects the way people perceive situations and the way they are expected to behave. While our three experiments clearly cannot offer a full account of the meaning of all types of legal probabilities in every conceivable situation, they do allow for two general conclusions to be drawn from them. First, our main finding is that people treat uncertain enforcement and uncertain law differently. Unlike uncertain enforcement that simply reflects a reduction in the expected sanction; uncertain law carries a deeper meaning in the eyes of people, and offers them a justification for behaving in a way that fits their self interest. Thus, uncertainty with respect to law is expected to raise incompliance to a larger degree than uncertain enforcement will. Second, the behavioral effects of legal probabilities depend to a large degree on both the legal and factual settings in which they are situated in. Issues such as the type of legal regime and the nature of the activity being regulated may all generate different affects with respect to probabilistic legal regimes.

There are several ways in which the behavioral patterns we documented can be interpreted. One interpretation is that we have managed to present empirical evidence of the expressive power of the law. Subjects in the different experiments did not view legal sanctions as a mere price they must pay in order to engage in harmful activities. Rather, the preference for legal uncertainty suggests that the act of legally prohibiting a certain conduct holds independent expressive value that does not depend on the price tag that the law attaches to the prohibition.

In this regard, studies two and three offer more subtle insights as to the expressive power of the law. The second study suggested that the non-instrumental function of law is greater when the legal payment is defined as a criminal sanction rather than as civil
payment. This difference between the criminal and civil contexts, demonstrated an additional refinement in the expressive function of criminal law, and the greater importance of legal certainty in the criminal context. The findings of our third study shed new light on the limits of the expressive power of the law. As was evident in that study, not every legal prohibition carries with it the expressive power of the law. Rather, the expressive value is created to a larger degree with respect to those situations in which the law functions within morally charged situations. On the other hand, when a legal prohibition is technical in nature, the ability of the law to generate an expressive value is more limited.

A second interpretation of our findings is that the law lends itself to a process of motivated reasoning by the people subject to it. In this regard, the emphasis is not on the prohibitive nature of law, but rather on the legitimizing effect of behaving in accordance with it. Ex ante legal uncertainty creates a path through which people can justify their choices in their own eyes by focusing their attention on the possibility that their acts will eventually be determined to be legal. Such effect might be exacerbated by the optimism bias since individuals might systematically overestimate their ability to convince the legal authorities that their interpretation of the law will be proved to be right.99 Uncertainty with respect to enforcement, on the other hand, does not carry with it the potential for self justification as people view it as a simple reduction to the price they must pay for behaving in an undesirable way.

B. Policy Implications

Thus far we have focused on the theoretical and abstract implications of our findings. We now turn to explore the implications of our results with respect to more concrete policy issues. The first, and perhaps most obvious, is the discussion over the tradeoff between uncertain law and uncertain enforcement as policy tools aimed at enhancing compliance. While this question is general in nature, it has drawn the most attention in the tax compliance literature.100 For example, in an influential article Scotchmer and Slemrod designed a stylized model in order to derive the optimal level of legal uncertainty in the tax system.101 Consistent with traditional economic models, they implicitly assumed that the behavioral effects created by uncertain enforcement and uncertain law are identical. This assumption coupled with the assumption of risk aversion allowed them to argue that increasing legal uncertainty will increase reported income and raise tax revenues.102 Furthermore, since reducing legal uncertainty creates many costs

101 Scotchmer & Slemrod, id.
102 Id. at 19-24.
(e.g., specifying the code, training auditors, etc.). Scotchmer and Slemrod argued that the optimal tax regime might be designed such that it will include relatively high legal uncertainty coupled with low audit rates.  

Our findings, however, suggest that these claims need to be re-examined and refined. A large body of literature has dealt with the question why do people pay taxes. While the traditional deterrence model for compliance certainly holds ground in the tax context, much of the observed tax compliance cannot be explained by deterrence given the extraordinarily low audit rates. Rather, it is explained by the willingness of people to contribute to the society in which they live once required by law to do so. Yet as we have seen, legal uncertainty might erode some of these nonlegal incentives to pay taxes. As a result the use of legal uncertainty as a revenue enhancing policy tool might turn out to be counterproductive, and drive people to report lower incomes since they will be able to justify this act to themselves. Thus, the importance of a clear tax code might be much greater than currently perceived by economists.

More generally, our findings can function as a behavioral explanation for the centrality of the principle of legality in criminal jurisprudence. The principle is perhaps the most basic tenant of criminal law, and stands for the proposition that subjects of the criminal justice system must be warned in a precise and clear way of all criminal prohibitions. In the United States the principle may be applied through the vagueness doctrine, which requires that a “crime definition be meaningfully precise--or at least that it not be meaninglessly indefinite.” There are several justifications for the principle of legality. One group of justifications take an institutional approach to the issue, and argue that criminal prohibitions should only be created by the branch of government that is politically accountable to the people. A second group of justifications focuses on potential criminals, and argues that is unfair to punish people who were not given fair warning prior to committing the wrongful act.

While we do not aim to quarrel with any of these justifications, our findings suggest an additional behavioral explanation for the doctrine, and for its focus on criminal prohibitions. As we have seen, uncertainty creates an ideal setting for people who value themselves to be law-abiding people to justify in their own eyes not complying with the law. Furthermore, our findings showed that legal uncertainty is especially counter productive in the criminal setting, in which people look to the law for guidance.

103 Id. at 25-26.
105 Id. at 21-22.
106 Tax scholars have long since been aware to the rich motivations to pay taxes and have attempted to design tax regimes that will utilize these motivations efficiently. For a recent example see Alex Raskolnikov, Beyond Deterrence: Targeting Tax Enforcement with a Penalty Default (Working Paper Presented at the 2008 meeting of the American Law and Economics Association, on file with authors).
109 Id. at 196.
Thus, vague criminal prohibitions may undermine the self-enforcing aspects of criminal law and diminish compliance. Yet specifying criminal laws might be costly for politicians, either because of the time and effort required in order to achieve specificity, or because of the political costs associated with creating a prohibition. Hence, it is especially important to motivate legislatures to create clear criminal prohibitions that limit the amount of legal uncertainty by employing judicial review over the level of this uncertainty, and striking down prohibitions that are not sufficiently specified. Moreover, the focus of the doctrine on criminal prohibitions is expected to motivate legislatures to focus their marginal effort to specifying criminal legislation rather than civil legislation, which is desirable given the larger expressive power of the law in that area.

A second policy debate that our study is closely tied to is the one regarding the desirable balance between rules and standards in the legal system. Legal norms can be placed on a continuum of specificity. At one end of this continuum lie standards, which include open ended terms such as “reasonable care” and “good faith.” The application of these terms is conducted by an adjudicator who applies them to the specific fact pattern of each case. Rules, on the other hand, are much more specific in nature. They include detailed provisions that attempt to anticipate in advance different fact patterns, and leave little room for discretion of the adjudicator.110

Rules and standards differ with respect to the level of uncertainty they generate for potential wrongdoers. Standards are inherently vague, since they rely on ex post adjudication that is difficult to predict ex ante. Rules, on the other hand, create more certainty, since a potential wrongdoer can evaluate his acts in light of the detailed provisions of the rule, and know with relative predictability whether his act fits the fact pattern covered by it. For example, think of the decision an employer needs to make with respect to installing a new safety measure at the workplace. If safety issues are governed by a negligence standard, the employer can only estimate ex ante what is the probability that not installing the measure will be deemed as negligence by a court. If, however, the regime is based on rules specified in a safety code, the employer faces less uncertainty as to his obligations under the law.

Legal economists view the choice between rules and standards as one that is governed by cost benefit considerations.111 In this regard they take account of costs such as the costs of legislating a rule ex ante, the costs of acquiring information on the law, and the costs of enforcing the law ex post.112 Generally, the conclusion of this analysis is that as the frequency of an activity increases, it becomes more desirable to adopt rules since the relatively higher cost associated with creating them ex ante, is justified by their

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110 For further discussion of the behavioral mechanisms that underlie how individuals interpret standards see Feldman & Harel, supra note 12 at section 3.1.
112 Kaplow, id. at 568-70.
frequent use ex post. In rare cases, on the other hand, one can rely on ex post adjudication and save the costs of extensive legislation.

Our analysis sheds new light on this issue, and suggests an additional difference between rules and standards that should be incorporated into the analysis. As we have seen, the introduction of legal uncertainty may give rise to an internal process through which individuals convince themselves that they are acting in accordance with the uncertain standard. Thus, setting bright line rules may be more desirable than previously perceived, as such rules can eliminate motivated reasoning on behalf of decision makers, and draw them to conduct a more objective analysis of the situation.

As a related matter, our findings in this regard offer an additional explanation for the puzzle: why do we observe systematic violations of legal standards? From an economic perspective, the expected level of violations of standards that were designed optimally is zero, since from the standpoint of potential wrongdoers it is irrational to violate the legal standard. For example, a well functioning negligence regime is expected to give people incentives to always take optimal care. Nonetheless, there is ample evidence that people behave negligently quite often.

Traditional explanations for the existence of violations of standards focus on two main dimensions. The first are problems associated with the legal system. To the extent that the legal system is not designed in an optimal fashion (e.g., the legal standard is set at a wrong level, enforcement is uncertain, damages are too low, etc.) then one would expect to observe rational parties choosing to deviate from the legal standard. The second are deviations from the rational choice model. If people are subject to an array of cognitive biases that affect their decisions, then these biases might cause them to violate the legal standard even though that is not the best course of action from their perspective.

While all of these explanations remain valid, a complimenting explanation suggested by our findings is that the uncertainty created by standards such as negligence draws people to violate them. Rules cause people to face a clear dilemma between obeying and disobeying the law. Standards, on the other hand, allow parties to view their choices ex ante as such that will be determined by an adjudicator ex post to be non-negligent, and therefore legal. This “window of legality” draws people to behave in a way that is not in accordance with the standard.

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113 Id. at 577.
114 Id.
117 Id.
119 Id. at 1724 n. 70.
A third body of literature that our study lends itself to is that dealing with legal advice. Legal advice is information that individuals buy from lawyers as to content of the law. In our framework this implies that once purchasing legal advice is possible, individuals can choose to reduce legal uncertainty with respect to their potential liability by investing resources in buying advice. For example, a lawyer might be able to provide his clients with advice as to the meaning of the negligence standard in a certain setting, the application of a statute to a contemplated behavior, or the tax liability generated by a certain transaction.

Legal economists have long since modeled the incentives of individuals to acquire legal advice, and the social value of this advice. Generally, these models are an extension of economic models of the value of information to decision makers. According to this framework, individuals acquire legal advice only if its expected value exceeds its costs. The expected value of legal advice is calculated by multiplying the probability that the advice will lead the party to alter her behavior by the benefit gained from the altered behavior. For example, if a factory owner can save $3,000 by pouring a chemical into a lake, and the fine for this act is $5,000; then she will choose to pour the chemical as long as she believes that the probability of illegality is below 60% since the expected sanction (0.6*5,000=3,000) is smaller than the gain from the act. Now assume that the subjective valuation of illegality of the factory owner is 40%. Under these conditions it will be beneficial for her to invest up to $800 in legal advice that might inform her about the illegality of pouring the chemical into the lake, since there is a 40% chance that the advice will inform her that the act is in fact illegal and save her a net cost of $2,000 ($5,000 fine minus of the $3,000 saved costs), and a 60% chance that the advice will be worthless since it will inform her about the legality of the act and not alter her behavior.

While economic models of legal advice capture many of the incentives individuals have in acquiring legal information, our findings suggest that they do not tell the full story of this market. Economic models explicitly assume that the probability of detection and the probability of illegality have identical affects on the incentives of decision makers. Our analysis, on the other hand, suggests that there is something different about legal advice. As we have seen, decision makers clinch to legal uncertainty in a process of motivated reasoning. Thus, the incentive to acquire legal advice might be lower than that predicted by current models, since decision makers know that a clear

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120 To be sure, legal advice can relate to other aspects of people’s decisions to engage in regulated activities such as the magnitude of liability. In this study we focused solely on uncertainty relating to liability and therefore we limit the analysis to this point alone.
122 See, e.g., HOWARD RAIFFA, DECISION ANALYSIS (1968).
123 Shavell, Contemplated Acts supra note 121 at 127.
124 Id. at 127-28.
125 Id. at 128 (uncertainty with respect to tax law and audit rates are assumed to be fungible).
answer from a legal expert as to the illegality of their act will prevent them from rationalizing their acts in their own eyes. In other words, people might chose to remain strategically uniformed with respect to the law. Moreover, our results suggest that even if the expected legal sanction is identical, the value of legal advice might be different in a criminal and a civil context since people are especially susceptible to utilize legal uncertainty in the criminal context.

Note that our result also suggest that in some cases the incentive to seek legal advice might be to enhance uncertainty rather than reduce it. According to this view, legal advice can create uncertainty where no such uncertainty existed before hand. For example, a lawyer might be able to employ a creative interpretation yet completely unrealistic of the law according to which a certain transaction is not taxable. In such situations, our findings imply that beyond the potential instrumental value of such uncertainty associated with the possibility to launch a reliance defense, it also has a non-instrumental value by diminishing the expressive power of the law and allowing individuals to feel as if they are complying with the norm.

Finally, the results of our third experiment can be used to guide policymakers in which settings they should focus their efforts to specify and clarify the law. As we have seen, the role of clarity is of relatively greater importance in settings that are morally charged. Thus, while one might speculate that there is no need for legal specificity in such situations since the moral intuitions of people will guide them notwithstanding the content of the law, our findings suggest that it is precisely in these areas that introducing uncertainty to the law might reduce compliance by either eroding the expressive power of the law or allowing people to engage in motivated reasoning. On the other hand, in areas that are less morally charged people view the law in a more instrumental way, and the role of specifying the law is diminished since its expressive function is more limited. As a result, in those areas there is less of a difference between the effects of uncertainty in law and uncertainty in enforcement. Hence, in these areas policymakers might choose to focus attention on designing efficient enforcement regimes.

C. Limitations and Future Research

In this final sub-section, we evaluate the potential criticisms to this project. We outline the limitations of our results, and sketch out additional research that could help deal with these limitations.

First, one should recognize the general limitations of the methodology we used in this study. Measured items are attitude scales. Given the extensive literature on the complexity of the attitude-behavior relationship, one ought to be careful not to over-state these findings, especially in the context of the expressive aspects of participants’

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126 Relying in legal advice might create a legal defense depending on the circumstances of the situation. For an updated review see Zathrina Perez, Eric Cochran and Christopher Sousa, Twenty-Third Survey of White Collar Crime, 45 AM. CRIM. L. REV. 923, 969-70 (2008).
behavior. After all, it is relatively easy to express different values when there is no price tag attached to the expression. Thus, since participants in our study did not face real monetary incentives, their answers might be biased towards overstating the expressive power of the law. Future research should attempt overcome this problem by combing monetary incentives, which might balance the fact that instrumental perspective of the law is more prone to be affected by the method of attitude questionnaire. That said, it should also be recognized that numerous studies have documented the validity of using intention as a proxy for behavior. Thus, we expect that the current pattern of findings should be replicated using other methodologies.

Second, the transformation of uncertainties in both law and enforcement into the specific numbers that we used, limit our ability to argue for a general difference between legal uncertainty and enforcement uncertainty. It might be the case that in different probabilities these two uncertainties will behave differently. One explanation for this hypothesis stems from the process of motivated reasoning. As we saw, motivated reasoning is constrained by the situation in which it is conducted. One can speculate that as the probability of illegality rises, the ability of people to justify to themselves behavior that does no accord with the expected legal norm to diminish. If that is the case, controlling for the size of the uncertainty is expected to interact with the willingness to engage in harm-generating behavior. Thus, future research should replicate the same study, but with different levels of uncertainty.

Third, while in the second experiment, which examined the interaction between the type of sanction and the source of uncertainty, a significant interaction emerged, this was not the case with respect to the third experiment in which we examined the effect of the factual setting. This might be explained by the fact there are two competing theoretical mechanisms in this setting that drive towards opposing directions. Thus, while the relatively weaker effect might have been expected, the weakness of the current pattern should be recognized. Clearly, without an interaction, the differences that emerged in the sub-group analysis between the two conditions should not be overstated. Here too, future research should replicate this study with minor modification of existence of social motivation and likely guilt from violating the law.

Fourth, the sample that we used in this study consists exclusively of law students whose reactions to legal uncertainty might not represent those of the general population. For example, law students might be more risk seeking with respect to legal uncertainty than the general population since they view it as a natural phenomenon they are familiar with. From this perspective we expect to see a larger willingness to exploit legal uncertainty among law students. On the other hand, the law might hold greater expressive power in the eyes of law students, since they tend to care more about their own image as law abiding people. From this perspective we expect to see a smaller willingness to act not in accordance with an uncertain legal norm among law students. Thus, it will be both interesting and useful to rerun our experiments on subjects without a legal education, and

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examine whether they perceive different sources of legal uncertainty differently from our sample.

A separate set of questions that we leave for future research is the source of legal uncertainty. In our study the sole source of uncertainty was the language of the law. Nonetheless, as we noted there are additional sources of legal uncertainty, such as that created by legal standards.\textsuperscript{129} Similarly, there might be a distinct social meaning to different players in the legal system making probabilistic decisions. For example, the effect of a 10\% chance that a prosecutor will choose not to bring charges due to a large case load might be different from the effect of a 10\% that a jury will decide to acquit a defendant.\textsuperscript{130}

V. CONCLUSION

We began this paper with by describing the traditional economic theory regarding probabilistic sanctioning regimes. According to this theory potential wrongdoers treat different types of legal probabilities much like a gambler treats a series of bets at the casino – they simply multiply them as if they were fungible in order to derive the expected sanction. Using a series of experiments we demonstrated that legal probabilities should not be treated as fungible. Rather, an array of factors relating to the source of uncertainty and the setting in which it is located, cause people to treat different legal probabilities distinctly. These distinctions, in turn, generate behavioral predictions that differ from traditional deterrence models, and shed new light on an array of policy debates.

The general picture rising from our results is a complex network of relationships between law, social norms and internal motivations. These nuances and complexities are currently not a part of deterrence models employed by legal economists. Nonetheless, it should be noted that our goal in this study, and others related to it, is not simply to criticize or undermine these models. Rather, it is to create a richer and ultimately more accurate model of law and human behavior. Incorporating our empirical findings into existing models could eventually assist policymakers utilize the different legal tools at their disposal in an optimal fashion.

\textsuperscript{129} See Feldman & Harel, \textit{supra} note 12.
\textsuperscript{130} Note that while the question we pose in the text could be of analytical interest, it will be extremely difficult to measure empirically. A decision of a prosecutor not to press charges eliminates the need for a trial. Since the ordeal of a trial might deter people independently of the sanction imposed (if imposed) at its end, comparing the two probabilities could prove to be a thorny task.