
Note

Shining a Light on the Shadow-of-Trial Model: A Bridge Between Discounting and Plea Bargaining

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We don't see very far in the future. We are very focused on one idea at a time, one problem at a time and all these are incompatible with full rationality as economic theory assumes it. —Daniel Kahneman¹

Phillip Bivens, accused of raping and killing a woman in Mississippi in 1979, was confronted with this choice: take the bargain of life in prison, or go to trial and face the death penalty.² After three decades in prison, Bivens was exonerated in 2010 by DNA tests conducted by the Innocence Project in New Orleans.³ Why would Bivens, who was factually innocent, plead guilty to a crime he did not commit and forgo his constitutional right to a trial? How can this be explained? Bivens's choice may be deemed rational because his choice was between life, albeit life in prison, and death. But what about defendants confronted with life in prison or twenty years in prison—why would an innocent defendant plead guilty then?

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1. *Fast and Slow: Pondering the Speed of Thought*, NPR (Oct. 19, 2011), <https://www.npr.org/templates/transcript/transcript.php?storyId=141508854>.

2. *Phillip Bivens*, INNOCENCE PROJECT, <http://www.innocenceproject.org/cases/phillip-bivens> (last visited Dec. 3, 2017).

3. *Id.*

The Innocence Project has exonerated 351 individuals by DNA evidence, and thirty-eight of the exonerees accepted a plea bargain.⁴ There is no well-documented and unifying explanation for innocents that plead guilty, but intuitive hypotheses include coercion, attorney malpractice, and/or defendant incompetence. Despite this “innocence problem,”⁵ plea bargaining is extremely prevalent.

As Brown and Bunnell note, “[p]lea bargaining is a defining, if not *the* defining, feature of the present federal criminal justice system.”⁶ In 2003, the Bureau of Justice Statistics reported 75,573 federal criminal cases, of which approximately ninety-five percent were disposed of by a guilty plea, or plea bargain.⁷ These high plea-bargain rates in federal cases are not qualitatively different from those in state cases.⁸ Criminal sanctions, which by definition often involve the loss of liberty, are the harshest sanctions society uses to deter and punish behavior.

4. *DNA Exonerations in the United States*, INNOCENCE PROJECT, <http://www.innocenceproject.org/dna-exonerations-in-the-united-states> (last visited Dec. 3, 2017); see also *As United States Exonerations Rise, Role of Guilty Pleas in Generating Wrongful Convictions Scrutinized*, INNOCENCE PROJECT (Feb. 17, 2016), <http://www.innocenceproject.org/as-united-states-exonerations-rise-role-of-guilty-pleas-in-generating-wrongful-convictions-scrutinized> (discussing the case of an Ohio man who pleaded guilty to a crime for which he was later exonerated). There are likely more than thirty-eight innocent defendants who accepted a plea bargain because the Innocence Project cannot feasibly take on all cases, or exonerate all innocent clients using DNA evidence. In short, these statistics are likely gross underestimates of the actual innocence problem in plea bargaining.

5. See Oren Bar-Gill & Oren Gazal Ayal, *Plea Bargains Only for the Guilty*, 49 J.L. & ECON. 353, 353–54 (2006) (discussing the problem of innocent defendants accepting plea bargains and referring to it as the “innocence problem”); Lucian E. Dervan & Vanessa A. Edkins, *The Innocent Defendant’s Dilemma: An Innovative Empirical Study of Plea Bargaining’s Innocence Problem*, 103 J. CRIM. L. & CRIMINOLOGY 1, 2–5 (2013) (discussing the prevalent problem of innocent defendants admitting guilt in order to avoid a harsher punishment).

6. Mary P. Brown & Stevan E. Bunnell, *Negotiating Justice: Prosecutorial Perspectives on Federal Plea Bargaining in the District of Columbia*, 43 AM. CRIM. L. REV. 1063, 1064 (2006) (emphasis added).

7. LINDSEY DEVERS, U.S. BUREAU OF JUSTICE ASSISTANCE, U.S. DEPT OF JUSTICE, PLEA AND CHARGE BARGAINING RESEARCH SUMMARY 1 (Jan. 24, 2011), <http://www.bja.gov/Publications/PleaBargainingResearchSummary.pdf>.

8. See SEAN ROSENMERKEL ET AL., U.S. BUREAU OF JUSTICE STATISTICS, U.S. DEPT OF JUSTICE, FELONY SENTENCES IN STATE COURTS, 2006 – STATISTICAL TABLES 1 (rev. ed. Nov. 22, 2010) (stating that ninety-four percent of felony offenders sentenced in state court pleaded guilty); Bill Mears, *Justices Say Defendants Who Get Bad Advice on Plea Bargains Deserve Relief*, CNN (Mar. 21, 2012), <http://www.cnn.com/2012/03/21/justice/scotus-plea-bargains/index.html> (“97% of federal convictions and 94% of state convictions . . . stem from guilty pleas.”).

Noting this reality, William Blackstone coined the well-known maxim: “[I]t is better that ten guilty persons escape, than one innocent suffer.”⁹ The prevalence and centrality of plea bargaining in the criminal justice system and the documented innocence problem provokes a broader question: what factors other than innocence or guilt affect criminal defendants’ decisions to accept a plea or go to trial? Presumably, defendants’ innocence (or guilt) is one of the factors that influences their decisions, but the fact that there is an innocence problem suggests that innocence is being outweighed by other factors.

The traditional explanation of plea bargain decision-making is that all criminal defendants make their decisions by comparing the consequences associated with accepting the plea to the consequences associated with going to trial and losing.¹⁰ The plea bargain offers the reception of a reduced criminal charge (for example, felony to gross misdemeanor) and/or reduced sentence (for example, one year in prison to one month in prison).¹¹ This charge-sentence discount is bargained for between the defense attorney and prosecutor.¹² In the case of a guilty defendant, the reasoning is relatively straightforward: Why risk a more serious charge and/or a harsher sentence? However, it is not clear why an innocent defendant would nonetheless plead guilty. For them, the charge-sentence discount is almost moot, because if the world were perfectly just the charges would be dropped or the defendant could go to trial and be acquitted. So why forgo the only chance to be rightfully freed at trial unless the perceived chances of freedom after trial are low? Ironically for innocent defendants, a plea *bargain* is a perverse deal. If accepted, an innocent is convicted of their own volition. Contemplating an innocent defendant’s choice makes it clear that the perceived probability of conviction at trial features strongly in criminal defendants’ decision-making process, so the traditional model of plea bargain decision-making that focuses mostly on the charge-sentence discount is too simplistic.

These thought experiments about criminal defendants’ rationality and preferences are common in legal scholarship on

9. 4 WILLIAM BLACKSTONE, COMMENTARIES *358.

10. *Supra* note 5 and accompanying text.

11. *See Plea Bargain*, BLACK’S LAW DICTIONARY (10th ed. 2014).

12. The term charge-sentence discount is used to allow for the possibility that sentence, charge, or charge and sentence reductions are negotiated in different instances.

plea bargaining.¹³ Even though they produce testable hypotheses, experimental and empirical tests of these ideas have been slow to proliferate.¹⁴ Beginning in the 1980s, researchers have completed a few studies that test legal scholars' hypotheses about plea bargaining.¹⁵ Until there is experimental evidence identifying which factors affect criminal defendants' plea bargain decisions, the field is left with legal scholars' educated guesses.

This Note describes two separate literatures: plea bargaining in legal scholarship and discounting in behavioral economics. Developments in the literature suggest the beginnings of a conceptual bridge between the two fields; legal scholars have called for empirical and experimental demonstrations of plea bargain decision-making models to challenge the traditional law and economics model of plea bargaining,¹⁶ and behavioral economics researchers have moved past financial decision-making to contexts

13. See *infra* Part I.B.3.

14. An experimental research study means that an experiment was conducted and the aim of experimental research is to identify cause-and-effect relationships by direct manipulation of an independent, or predictor, variable. See DAVID R. BONIFACE, EXPERIMENT DESIGN AND STATISTICAL METHODS FOR BEHAVIOURAL AND SOCIAL RESEARCH 4–5 (1995) (discussing experimental research). Empirical research studies, on the other hand, do not necessarily manipulate anything, but rather only observe a phenomenon and make use of numbers to describe the results. See *id.* at 128 (discussing empirical research methods).

15. See, e.g., Henry H. Rossman et al., *Some Patterns and Determinants of Plea-Bargaining Decisions: A Simulation and Quasi-Experiment*, in PLEA BARGAINING 77 (William F. McDonald & James A. Cramer eds., 1980) (considering factors that may predict outcomes in plea bargaining decision-making); Shawn D. Bushway et al., *An Explicit Test of Plea Bargaining in the “Shadow of the Trial,”* 52 CRIMINOLOGY 723 (2014) (modeling the shadow-of-trial model using survey responses from defense attorneys, prosecutors, and judges); Shawn D. Bushway & Allison D. Redlich, *Is Plea Bargaining in the “Shadow of the Trial” a Mirage?*, 28 J. QUANTITATIVE CRIMINOLOGY 437 (2012) (finding zero or a negative impact of evidentiary factors on probability of conviction); Hunter A. McAllister & Norman J. Bregman, *Plea Bargaining by Prosecutors and Defense Attorneys: A Decision Theory Approach*, 71 J. APPLIED PSYCHOL. 686 (1986) [hereinafter McAllister & Bregman (Plea Bargaining)] (evaluating the impact of sentence severity and conviction probability on plea bargaining).

16. Stephanos Bibas, *Plea Bargaining Outside the Shadow of Trial*, 117 HARV. L. REV. 2464, 2530 (2004) (“The size of each variable may be uncertain, but that is not a good reason to set each variable at zero. Rather, this difficulty should spur empirical research to measure these [demographic] factors. Though there are many empirical studies on negotiating civil settlements, very few exist on the criminal side.”).

with less tangible commodities.¹⁷ However, interdisciplinary experimental research on plea bargain decision-making is still lacking. Moreover, the nature of the plea bargain decision options—plead guilty, which is certain and immediate, or go to trial, which is uncertain and delayed—lends itself to be studied using the discounting paradigms, which ask participants to choose between two options with similar differences (that is, extent of delay and certainty). Furthermore, the strong influence of law and economics on plea bargaining scholarship makes behavioral economics paradigms like discounting particularly promising because the fields are conceptually connected.

In order to address these gaps in the scholarship, this Note proposes the use of experimental discounting paradigms to test the influence of two features that are underemphasized by the traditional law and economics model: delay to trial and probability of conviction. But first, Part I summarizes the two disparate literatures: the behavioral economics literature and the legal scholarship on plea bargaining. Part II takes a critical look at interdisciplinary scholarship, concluding that the lack of experimental and empirical frameworks that center on criminal defendant decision-making has prevented an integrative understanding of plea bargaining. Part III connects discounting to plea bargaining and suggest that delay and probability discounting paradigms provide a good first step to understanding and experimentally testing scholars' hypotheses about how criminal defendants make plea bargain decisions. This Note argues that legal scholars and legislatures will be in a better position to develop an integrated and coherent evaluation of the fairness of plea bargaining once there is experimental evidence demonstrating what factors affect defendants' plea bargain decisions. If discounting is at work in plea bargaining, a plea bargain decision may be presenting defendants, including innocent ones like Philip Bivens, with an unjust choice; admit guilt and accept a satisfyingly immediate and certain sentence or pursue the right to trial and face uncertainty and risk. Experimental data is the key to understanding the effect of these psychological forces on individual defendants as well as the criminal justice system as a whole.

17. See *infra* notes 44–46 and accompanying text.

I. TWO SEPARATE LITERATURES: PLEA BARGAINING AND DISCOUNTING

Despite the volume of scholarship on plea bargaining,¹⁸ there remain unanswered questions. Specifically, no scholar has satisfactorily described, explained, and proven which factors influence criminal defendants' plea bargain decisions. There are at least two reasons for this: (1) legal theory has not been satisfactorily supported by experimental evidence; and (2) experimental work has not satisfactorily addressed the question of criminal defendant decision-making, using instead judges and attorneys as participants. This disconnect may be rectified by an experimental paradigm driven by legal scholars' hypotheses but focusing on criminal defendant decision-making, rather than other legal actors like attorneys.

To demonstrate the utility of an experimental paradigm, it is necessary to first canvas the landscape of the current scholarship. This Part describes two disparate literatures that, if connected, may answer the unanswered questions. Section A describes discounting, its place between the disciplines of cognitive psychology and traditional economics, and the utility of discounting studies in describing human decision-making. Section B summarizes the legal scholarship on plea bargaining. Section C suggests that, conceptually and theoretically, the two separate scholarships, discounting and plea bargaining, have edged closer in the last decade due to seminal work by Stephanos Bibas.¹⁹

A. THE HISTORY AND APPLICATION OF DISCOUNTING

This Section provides a concise history of the development of behavioral economics, a description of the behavioral economics concept of discounting, and an explanation of the detailed procedure used to measure discounting. The following Subsections place discounting in the context of its home discipline and describe what questions discounting answers.

1. Behavioral Economics: At the Intersection of Economics, Cognitive Psychology, and Mathematics

The concept of discounting has its home in the field of behavioral economics, which is a discipline influenced by tradi-

18. See *supra* note 15 (listing scholarship on plea bargaining).

19. See generally Bibas, *supra* note 16 (arguing that a "structural-psychological perspective" must be added to the shadow-of-trial model).

tional economic theories, cognitive psychology, and mathematics. Traditional economic models, often called models of utility maximization,²⁰ regard humans as rational, and accordingly require the decision-maker to consider every possible action.²¹ Not every scholar has agreed with the description of humans as utility-maximizing, rational beings. For example, Herbert Simon, a Nobel Prize winner in economics, was fiercely critical of the rational man, and suggested that traditional economic theories were computationally unrealistic because they required more calculation ability than human minds actually have.²² Relying on Simon's criticisms of economics,²³ the core belief of behavioral economics is that "increasing the realism of the psychological underpinnings of economic analysis will improve the field of economics *on its own terms*—generating theoretical insights, making better predictions of field phenomena, and suggesting better policy."²⁴ Thus behavioral economics is a discipline situated be-

20. See Daniel Kahneman, *Maps of Bounded Rationality: Psychology for Behavioral Economics*, 93 AM. ECON. REV. 1449, 1449 (2003) (discussing utility maximization as a traditional economic model).

21. See Thomas D. Gilovich & Dale W. Griffin, *Judgment and Decision Making*, in 1 HANDBOOK OF SOCIAL PSYCHOLOGY 542, 543 (Susan T. Fiske et al. eds., 5th ed. 2010) (discussing a critique of the traditional economic model based on the premise that "full economic rationality" is unrealistic).

22. *Id.*; see also Herbert A. Simon, *A Behavioral Model of Rational Choice*, 69 Q.J. ECON. 99, 101 (1955) (stating there are limits on the "computational capacity" of the human mind); Herbert A. Simon, *Invariants of Human Behavior*, 41 ANN. REV. PSYCHOL. 1, 7 (1990) (stating humans' short-term memory is limited). Later, Daniel Kahneman and Amos Tversky revolutionized cognitive psychology, arguing that cognitive processes involved in decision-making should mirror the processes and principles of visual attention and perception. See Gilovich & Griffin, *supra* note 21, at 544–46 (discussing Kahneman and Tversky's work and stating it has come to define the field). Following the cognitive illusion paradigm, their approach was to test judgment in environments that resulted in clear errors. *Id.* at 545. Their work established the concept of judgmental heuristics, and they identified three general purpose heuristics: (1) availability; (2) representativeness; and (3) anchoring. *Id.* at 548–54. Herbert Simon is also regarded as a cognitive psychologist that helped move psychology from an emphasis on behaviorism to an emphasis on the mental processes that go on inside individuals' minds. See ROBERT J. STERNBERG ET AL., SCIENTISTS MAKING A DIFFERENCE 4 (2016) (stating psychologists such as Simon revolutionized the field by suggesting psychology "had to start over" and by emphasizing a focus on the mental "processes that go on inside the head").

23. Although Simon was not alone in criticizing traditional economic assumptions of rationality, he is a notable example. See NICK WILKINSON & MATTHIAS KLAES, AN INTRODUCTION TO BEHAVIORAL ECONOMICS 14 (2d ed. 2012) (noting the influence of Simon, Kahneman, and Tversky).

24. Colin F. Camerer & George Loewenstein, *Behavioral Economics: Past, Present, Future*, in ADVANCES IN BEHAVIOR ECONOMICS 3, 3 (Colin F. Camerer

tween the psychology of economic decision-making and the economics of human decision-making²⁵—meaning that researchers utilize psychological insight to inform mathematical models of human decision-making about economically relevant behaviors.

2. What is Discounting?

The term discounting describes an individual's subjective devaluation of a specific option, evidenced by the acceptance of one option over the devalued option. For example, if someone is offered an apple or an orange, if s/he chooses the apple, one might infer a preference for the apple, or conversely a devaluation of the orange. In most discounting studies, however, the choice is not between fruit options, but rather between two values of money.²⁶

Discounting researchers have focused on two types of discounting, named after the respective source of, or reason for, an individual's discounting: delay and probability.²⁷ For example, in delay discounting of fruit, a choice may be between a bruised

et al. eds., 2004). Notably, work in behavioral economics has earned scholars the Nobel Prize in Economic Sciences. Both Daniel Kahneman and Richard H. Thaler, the most recent Prize winner, contributed to economics through their use of behavioral economics. Interview by Adam Smith with Richard H. Thaler, 2017 Laureate in Economic Sciences, https://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2017/thaler-interview.html (last visited Dec. 3, 2017) ("Richard H. Thaler describes some of the impacts of his work on behavioural economics in this telephone interview recorded immediately after the public announcement of the award of his Prize in Economic Sciences. He also explains the concept of the 'nudge', and looks forward to being in Stockholm again with his old friend Daniel Kahneman, Laureate in Economic Sciences from 2002.").

25. The question of what broader discipline in which behavioral economics sits is complicated and varies based on the research question of particular studies. Knowing what disciplines are implicated in the behavioral economics paradigms is important to understand how this Note begins to connect the two disparate literatures.

26. See, e.g., Wanjiang Du et al., *Cross-Cultural Comparisons of Discounting Delayed and Probabilistic Rewards*, 52 PSYCHOL. REC. 479, 483–84 (2002) (discussing a study which forced participants to choose between different values of money); Leonard Green & Joel Myerson, *A Discounting Framework for Choice with Delayed and Probabilistic Rewards*, 130 PSYCHOL. BULL. 769, 775 (2004) (listing a number of studies dealing with money).

27. See, e.g., Matthew W. Johnson & Warren K. Bickel, *Within-Subject Comparison of Real and Hypothetical Money Rewards in Delay Discounting*, 77 J. EXPERIMENTAL ANALYSIS BEHAV. 129, 129 (2002) ("Delay discounting implies that the value of a reward declines with increasing delay."); Jerry B. Richards et al., *Delay or Probability Discounting in a Model of Impulsive Behavior: Effect of Alcohol*, 71 J. EXPERIMENTAL ANALYSIS BEHAV. 121, 121 (1999) ("[T]he value of a probabilistic reward decreases as its probability decreases.").

apple now or an undamaged apple in one week. In probability discounting of fruit, a choice may be between a 100% chance of receiving a bruised apple or a sixty percent chance of receiving an undamaged apple (with a forty percent chance of receiving nothing at all). In the former example, the differences between the options are a difference in the apple offered and the time until receipt (immediate versus delayed); and in the latter example, the differences are a difference in the apple offered and probability of receiving the apple (100% certainty versus less than 100% probability of receipt). Thus the names delay and probability discounting describe the patterns of choices individuals make under those conditions—most individuals choose the damaged apple option, demonstrating that they devalue the undamaged apple because of its association with delay or uncertainty.²⁸

Delay discounting is the human cognitive preference for immediate, as opposed to delayed, options.²⁹ This is because, in general, research has shown that individuals choose the immediate receipt of the bruised apple over the delayed option of the objectively more appealing, undamaged apple. Probability discounting is the human cognitive preference for certain, as opposed to uncertain, outcomes, because, in general, individuals choose the certain (100%) receipt of the slightly less desirable apple over the uncertain option of the better apple. Accordingly, in both situations, individuals seem to discount, or set aside as less important, the actual condition of the apple, focusing instead on the difference in delay or probability between the two options. Because there are two differences between the two options (condition of the apple and extent of delay/probability) with the less desirable fruit condition combined with the more desirable extent of delay/probability, the trends in individuals' responses suggest that the feature of delay/probability is of special importance in their decisions.³⁰

28. See *supra* note 27 and accompanying text.

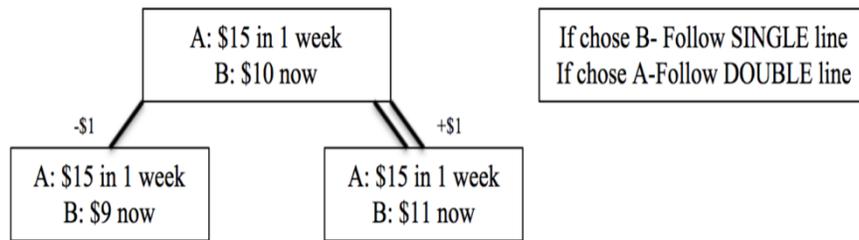
29. See, e.g., Joel Myerson et al., *Area Under the Curve As a Measure of Discounting*, 76 J. EXPERIMENTAL ANALYSIS BEHAV. 235, 236 (2001) [hereinafter Myerson et al. (2001)] (discussing ways to “conceptualiz[e] the choice between immediate and delayed rewards”).

30. *Id.* at 235 (“[T]he value of a reward . . . decreases as a function of delay.”).

3. What Procedure Is Used to Assess Discounting? A Series of Binary Choices

In a traditional behavioral economics or cognitive psychology paradigm, researchers test people's degree of delay discounting by giving participants a series of two choices.³¹ Figure 1 shows the two paths participants may take.

Figure 1



Participants are given a first choice (for example, receiving \$10 now or \$15 in one week³²), and depending on what they pick,

31. See, e.g., Leonard Green et al., *Temporal Discounting in Choice Between Delayed Rewards: The Role of Age and Income*, 11 PSYCHOL. & AGING 79, 80 (1996) (“Participants made a series of choices between hypothetical amounts of money, a smaller amount available immediately and a larger amount available after a delay.”).

32. There is an ongoing and robust debate about gains versus losses in the discounting literature, but for convenience and clarity only gains, or receipt of a commodity, are used in the examples. For a sampling of the robust debate about gains versus losses, see Sara J. Estle et al., *Differential Effects of Amount on Temporal and Probability Discounting of Gains and Losses*, 34 MEMORY & COGNITION 914, 918, 920 (2006) (finding that losses were associated with less reliable effects of discounting than gains, but the same “hyperbola-like” function described both gains and losses); Joel Myerson et al., *Individual Differences in Delay Discounting: Differences are Quantitative with Gains, but Qualitative with Losses*, 30 J. BEHAV. DECISION MAKING 359, 367 (2016) [hereinafter Myerson et al. (2016)] (finding that for losses participants’ responses differed based on impulsivity with a considerable portion of participants choosing to pay money later rather than immediately). Moreover, some researchers have not found correlations between losses and gains. See, e.g., Christine R. Harris, *Feelings of Dread and Intertemporal Choice*, 25 J. BEHAV. DECISION MAKING 13, 24 (2012) (discussing “the absence of any detectable correlation across participants” who were choosing between a preferred time to experience “shock”). David J. Hardisty and Elke U. Weber found mixed evidence of correlational relationships between gains and losses that depended on the commodity being compared (e.g., money versus air quality). See David J. Hardisty & Elke U. Weber, *Discounting Future Green: Money Versus the Environment*, 138 J. EXPERIMENTAL PSYCHOL. 329, 336 (2009) (discussing the correlation between the different studies examined). Given the mixed findings, future work should be sensitive to impulsivity

the immediate outcome either decreases or increases. So, if the participant picks \$10 now, the next set of options may be \$9 now or \$15 in one week, and if the participant picks \$15 in one week, the next set of options may be \$11 now or \$15 in one week. Thus, the immediate option's monetary value fluctuates (option B in Figure 1) to be more or less appealing with the goal that eventually the participant switches his/her choice. For example, if a participant picked the \$10 now option, the immediate option would decrease (first to \$9 as seen in Figure 1) until the participant decides it is worth waiting a week for the \$15. On the other hand, if a participant picked the \$15, the \$10 would increase until the participant decides a slight decrease in monetary value is worth getting the money immediately.

This switch from the penultimate option to the last option suggests the presence of an indifference point. An indifference point is the point at which a participant does not have a preference for either of the two choices.³³ This indifference point is presumed in discounting studies to be the average of the last two immediate options.³⁴ For example, using the values above, if a participant were to choose \$15 in one week rather than \$10 now (choosing the delayed choice), but then when confronted with the choice between \$11 now or \$15 in one week, the participant

as an individual difference as well as the type of commodity being used. Even if there is a true difference between the way people process—and discount—gains versus losses, the discounting paradigms are still useful to describe losses. However, it is not a foregone conclusion that criminal charges and sentences as commodities *are* losses—it may depend largely on a defendant's perception of his/her own innocence or guilt. If discounting paradigms are applied to plea bargaining, the findings may not match the simple hypothesis that individuals desire immediate and certain outcomes. In that case, there would be many variables that researchers would need to assess to understand those disparate findings, and the characterization of criminal charge-sentences as either gains or losses would be one of those variables. Other important variables would include the consequentiality or salience of the commodity, the defendant's perception of his/her own innocence/guilt, whether the defendant was out on bail or in jail while the plea was bargained for, and the defendant's perception of the criminal justice system.

33. Another name for indifference points is subjective values. See Leonard Green et al., *Amount of Reward Has Opposite Effects on Discounting of Delayed and Probabilistic Outcomes*, 25 J. EXPERIMENTAL PSYCHOL. 418, 419 (1999) (“The subjective value was calculated as the average of the value at which the participant switched preference from the immediate . . . reward to the delayed . . . reward . . .”).

34. *Id.* However, there are other defensible methods for creating indifference points. See, e.g., Richards et al., *supra* note 27, at 126 (“The amount of immediate certain money the participant judged to be equivalent to the \$10 reward was taken to indicate the subjective value of the delayed or uncertain rewards.”).

switches and selects \$11 now (the immediate choice), the indifference point is presumed (for ease) to be 10.5 (the average of ten and eleven).³⁵

Mean or median indifference points are then graphed to demonstrate that as the delay increases, the immediate value a participant is willing to accept decreases.³⁶ For example, if offered \$155 now or \$500 in thirty months, participants have been shown to prefer \$155 now, but when everything is the same except the delay is increased to sixty months,³⁷ participants are willing to accept as low as \$90 now.³⁸ This is evidence that participants discount (deem less weighty or important) the value of the \$500 when delay increases. Importantly, the graphical representations of discounting are not linear functions, but rather are hyperbolic curves.³⁹

In a traditional behavioral economics or cognitive psychology paradigm, testing people's degree of probability discounting entails—once again—giving study participants a series of two choices, except probability is substituted for delay. Figure 2 shows the two paths participants may take.

35. See Green et al., *supra* note 33.

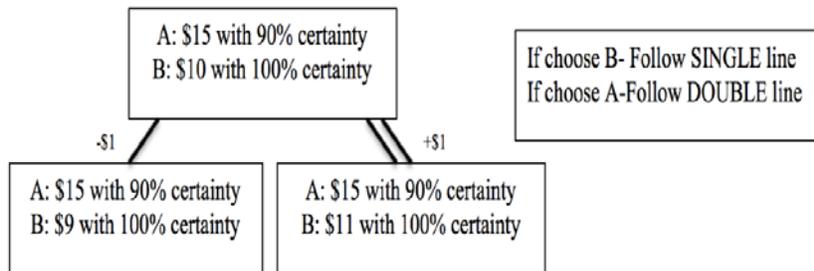
36. See Myerson et al. (2001), *supra* note 29, at 242 fig.5.

37. Note that in this example, there would be two indifference points being graphed—one for the decision tree with a thirty-month delay and one for the decision tree with a sixty-month delay. A common execution of the titration procedure changes only the immediate dollar value and nothing else within each decision tree. See Du et al., *supra* note 26, at 484 (discussing an experiment in which the immediate dollar value decreased while the length of delay and the delayed dollar value remained the same).

38. See *id.* at 486–90 (discussing the results of the experiment).

39. Leonard Green et al., *Rate of Temporal Discounting Decreases with Amount of Reward*, 25 *MEMORY & COGNITION* 715, 717–18 (1997). See the figures on page 718, showing that the hyperbolic curve displayed with a solid line fits the data better than the exponential curve displayed by a dotted line. A straight line would fit the data even worse than the exponential curve—that is, the sum of the squared vertical distances from the data points to the exponential curve would be less than the sum of the squared vertical distances from the data points to a straight line. This differentiation between linear and curvilinear functions to describe discounting is important because the law and economics functions proposed thus far for plea bargaining have also been curvilinear. See, e.g., Frank H. Easterbrook, *Criminal Procedure as a Market System*, 12 *J. LEGAL STUD.* 289, 331–32 (1983) [hereinafter Easterbrook (1983)] (discussing a mathematical representation of settlement in the Appendix).

Figure 2



For example, participants are given a first choice (for example, \$15 with ninety percent certainty or \$10 with 100% certainty), and depending on what they pick, the certain or uncertain option, the certain outcome either decreases or increases. So, if the participant picks \$10 with 100% certainty, the next set of options may be \$9 with 100% certainty or \$15 with ninety percent certainty (making the chosen certain option *less* appealing). If the participant picks \$15 with ninety percent certainty, the next set of options may be \$11 with 100% certainty or \$15 with ninety percent certainty (making the certain option *more* appealing). Thus, the certain option's monetary value (option B in Figure 2) fluctuates to be more or less appealing with the goal that, after enough of these choices, the participant will converge on an indifference point.

The methods for computing indifference points and graphically representing the probability data are the same as in delay discounting. The graphed probability indifference points demonstrate that as the probability of the uncertain option decreases, the certain value a participant is willing to accept decreases. For example, if offered \$155 with 100% certainty or \$500 with thirty-three percent certainty, participants have been shown to prefer \$155 with 100% certainty,⁴⁰ but when everything is the same except the probability is decreased to ten percent,⁴¹ participants

40. Note that the uncertain option actually leads to a mathematically more attractive option, using basic probability: \$500 multiplied by thirty-three percent is \$165, whereas \$155 multiplied by 100% is \$155. Thus, the human preference for the certain option is arguably mathematically *irrational*.

41. Once again, this example compares two indifference points from two different decision trees—one from a thirty-three percent decision tree and another from a ten percent decision tree. A common execution of the titration procedure changes only the certain dollar value and nothing else within each decision tree. See Du et al., *supra* note 26, at 484 (discussing an experiment in which

are willing to accept as low as \$50 with 100% certainty.⁴² This is evidence that participants discount (deem less weighty or important) the value of the uncertain \$500 when probability of receiving that \$500 decreases.

4. What Questions Does Discounting Answer?

Discounting tells researchers that when making decisions between two choices (1) time between decision and receipt of the outcome; and (2) the probability of receipt of the outcome are important—meaning they influence decisions. To date, the concept of discounting has been used to explain decision-making patterns in hypothetical financial gain and loss situations,⁴³ as well as real clinical outcomes such as smoking cessation,⁴⁴ inpatient detoxification program retention,⁴⁵ and various other health behaviors.⁴⁶ However, discounting has not been applied to criminal defendant decision-making.

These studies provide valuable information about human behavior. For example, researchers found that current smokers devalue rewards delayed further in the future than ex-smokers and nonsmokers.⁴⁷ In other words, the delay until receiving a reward is an important feature in predicting people's smoking behavior; a person's tendency to strongly discount—a pattern of strongly devaluing future rewards—predicts poor responses to smoking cessation treatments.⁴⁸ The promise of discounting in predicting resistance to smoking cessation treatments suggests

the immediate dollar value decreased while the length of delay and the delayed dollar value remained the same).

42. See *id.* at 486–90 (discussing the results of the experiment).

43. See Estle et al., *supra* note 32, at 916 (stating that “different hypothetical amounts of money” were used to test subjects).

44. See James MacKillop & Christopher W. Kahler, *Delayed Reward Discounting Predicts Treatment Response for Heavy Drinkers Receiving Smoking Cessation Treatment*, 104 DRUG ALCOHOL DEPENDENCE 197 (2009) (using delayed reward discounting to study success of smoking cessation).

45. *Id.* at 198 (discussing the relationship between delayed reward discounting (DRD) and substance abuse treatment and stating that studies have shown “high levels of DRD are associated with poorer outcomes”).

46. James R. Daugherty & Gary L. Brase, *Taking Time To Be Healthy: Predicting Health Behaviors with Delay Discounting and Time Perspective*, 48 PERSONALITY & INDIVIDUAL DIFFERENCES 202, 204 (2010) (measuring self-reported health behaviors such as tobacco, alcohol, and drug use, exercise frequency, eating breakfast, and wearing a safety belt).

47. MacKillop & Kahler, *supra* note 44, at 197. This study used a behavioral economics index of impulsivity to quantify individuals' tendency to devalue rewards in the future.

48. *Id.* at 202.

that discounting may be useful in explaining more than hypothetical, and relatively simple, financial decisions.

In sum, discounting paradigms help answer two important questions: (1) what aspects of a decision between two choices influence or predict an individual's final choice; and (2) how do those features influence an individual's final choice? Regarding the first question, discounting paradigms suggest that features of delay and probability may affect criminal defendants' choices between plea or trial. Importantly, the second question can be divided into at least two parts. First, is the relationship positive or negative? That is, as a particular feature (for example, probability of conviction) increases, does the likelihood of plea acceptance increase or decrease? Second, what is the mathematical form of the relationship between the particular feature and the likelihood of plea acceptance? For example, is the relationship linear or curvilinear?⁴⁹

B. PLEA BARGAINING IN LEGAL SCHOLARSHIP

Legal scholars have relied on substantive law, such as the concept of bargaining power in contract law and due process in constitutional criminal law, as well as the subfield of law and economics, to explain the utility, (un)fairness, and efficiency of plea bargaining. This Section provides background information on the current state of the legal scholarship on plea bargaining. Subsection 1 describes a commonly referenced pair of conflicting values: fairness versus efficiency. These values also permeate Subsection 2, which explores the substantive legal argument that plea bargains are contracts. Subsection 3 summarizes the traditional shadow-of-trial model of plea bargaining, and then argues that plea-bargaining-as-contract and traditional economic conceptions, actor rationality and decision-making, undergird that model.

49. As discussed in Part I, the traditional law and economics model proposes a simple linear relationship between probability of conviction and plea acceptance, whereas discounting literature experimentally demonstrates a hyperbolic relationship. See, e.g., Leonard Green & Joel Myerson, *Exponential Versus Hyperbolic Discounting of Delayed Outcomes: Risk and Waiting Time*, 36 AM. ZOOLOGIST 496, 496 (1996) ("Our research demonstrates that, of the two [relationships], a hyperbola-like discounting model consistently explains more of the variance in temporal discounting data at the group level, and importantly, at the individual level as well.").

1. Fairness Versus Efficiency

Plea bargaining is considered one of “the most controversial practices in the criminal justice system,”⁵⁰ and much of the controversy centers on competing interests and values. In particular, efficiency is often pitted against fairness.⁵¹ Evincing the breadth of scholarly opinion, the solutions proposed by scholars range between an outright ban on plea bargaining,⁵² to “prosecutorial caution”⁵³ or regulation,⁵⁴ to alternative dispute resolutions,⁵⁵ to maintenance of the status quo.⁵⁶

Scholars supporting plea bargaining warn of the cost to the criminal justice system to adjudicate all—or at least more—criminal cases, and laud both the usefulness of compromise before trial and the utility of predictability.⁵⁷ For example, one scholar noted that when prosecutors offer plea bargains “they

50. Montré D. Carodine, *Keeping It Real: Reforming the “Untried Conviction” Impeachment Rule*, 69 MD. L. REV. 501, 502 (2010).

51. Compare Albert W. Alschuler, *The Changing Plea Bargaining Debate*, 69 CALIF. L. REV. 652, 660–61 (1981) (characterizing plea bargaining as inherently unfair and an irrational process), Stephen J. Schulhofer, *Plea Bargaining As Disaster*, 101 YALE L.J. 1979, 1980 (1992) (concluding that plea bargaining should be banned), and Bibas, *supra* note 16, at 2467–68 (arguing for substantial reforms to plea bargaining), with Frank H. Easterbrook, *Plea Bargaining As Compromise*, 101 YALE L.J. 1969, 1972 (1992) [hereinafter Easterbrook (1992)] (arguing that plea bargaining and trial processes are equally effective at separating the guilty and the innocent), and Ronald F. Wright, *Sentencing Commissions As Provocateurs of Prosecutorial Self-Regulation*, 105 COLUM. L. REV. 1010, 1013 (2005) (contending that sentencing commissions can be successful in regulating prosecutors’ authority and discretion).

52. Bibas, *supra* note 16, at 2545 (“Short of abolishing plea bargaining entirely, there is no obvious remedy.”).

53. *Id.* at 2536 (discussing limiting prosecutors’ plea discounts as a way to “deter prosecutions of the possibly innocent.”); see also Stephen J. Schulhofer, *A Wake-Up Call from the Plea-Bargaining Trenches*, 19 LAW & SOC. INQUIRY 135, 143 (1994) (suggesting the feasibility of a short adversarial bench trial for defendants that choose to have one).

54. Susan R. Klein et al., *Waiving the Criminal Justice System: An Empirical and Constitutional Analysis*, 52 AM. CRIM. L. REV. 73, 77 (2015) (“[W]e must be willing to regulate plea bargaining, or the executive branches of the government will fill the vacuum with rules favorable to itself.”).

55. Ronald Wright & Marc Miller, *The Screening/Bargaining Tradeoff*, 55 STAN. L. REV. 29, 31–32 (2002) (advocating for “prosecutorial ‘screening’ as the principal alternative to plea bargains”).

56. Easterbrook (1992), *supra* note 51.

57. Jacqueline Cohen & Michael H. Tonry, *Sentencing Reforms and Their Impacts*, in 2 RESEARCH ON SENTENCING: THE SEARCH FOR REFORM 305, 308–09 (Alfred Blumstein et al. eds., 1983) (explaining that criminal attorneys like the certainty of the plea).

achieve a reliable compromise between maximum punishment and no punishment at all.”⁵⁸

On the other hand, scholars arguing for the need to ensure fairness of process focus primarily on the need for public visibility,⁵⁹ as well as defendants’ forfeiture of a number of constitutional rights, including but not limited to the right to a criminal trial.⁶⁰ The so-called waiver bug started in the 1980s and 1990s when prosecutors began adding additional terms into plea agreements,⁶¹ with the first change of defendants being asked to waive their appellate rights.⁶² Next, waivers of defendants’ right to habeas corpus review were added to plea agreements, which have been upheld by courts even in the face of ineffective assistance of counsel claims.⁶³ In the last decade, prosecutors began asking defendants to waive their rights to discovery materials, which can include evidence of prosecutorial misconduct and even exculpatory evidence of the defendant’s actual innocence.⁶⁴ The prevalence rates of these waivers are staggering. Using data from robbery and arson cases from the U.S. Sentencing Commission, over half of plea agreements contained habeas waivers and nearly a third of robbery plea agreements permitted the destruction of DNA evidence, the right to test DNA evidence, or both.⁶⁵

58. Wright & Miller, *supra* note 55, at 38; *see also id.* at 87 (“A negotiated plea is less publicly visible than a trial.”).

59. Bibas, *supra* note 16, at 2545 (“There is precious little oversight of what these lawyers do.”); *id.* at 2547 (“[P]lea bargaining hides within a low-visibility process.”).

60. Klein et al., *supra* note 54, at 76 (“[M]any prosecutors began demanding waiver of all constitutional criminal procedure rights, not just the trial and investigative related ones inherent in replacing the trial with the plea.”).

61. *Id.*

62. *Id.* at 76.

63. *See, e.g.,* United States v. Mabry, 536 F.3d 231, 236–37 (3d Cir. 2008) (finding a habeas waiver enforceable despite a claim of ineffective counsel). This is striking given the fact that the defense attorney is the person the defendant is relying on to make the plea deal. *Cf.* Gabriella Khorasane, *Habeas Waiver in Plea Doesn’t Bar Ineffective Counsel Claim*, FINDLAW (Aug. 12, 2013), http://blogs.findlaw.com/seventh_circuit/2013/08/habeas-waiver-in-plea-doesnt-bar-ineffective-counsel-claim.html.

64. Klein et al., *supra* note 54, at 77.

65. *See id.* at 85 (“27% of robbery plea agreements contained a FOIA waiver, 32% contained some combination of *Brady* waiver (actual innocence or *Giglio*), 29.8% permitted the destruction of DNA evidence, the right to test such evidence, or both, and 64% contained habeas waivers. Of the arson plea agreements, 59.2% contained habeas waivers, 23% included FOIA waivers, and 71% appeared to contain some combination of *Brady* waiver (actual innocence or *Giglio*).”). Note that over half of both samples contained habeas waivers.

Despite the seeming dichotomy between efficiency interests and fairness values, efficiency and fairness are not mutually exclusive,⁶⁶ nor are these two characteristics either wholly present or absent—making the plea bargaining process either efficient or inefficient, fair or unfair.⁶⁷ Rather, it is a matter of degree. Despite the clashing of scholarly opinion and some voices calling for reform for more than thirty years,⁶⁸ plea bargaining has continued without any substantive modification.⁶⁹

2. Plea-Bargain-as-Contract

In plea bargaining scholarship, plea-bargain-as-contract is a foundational term of art that equates, or at least analogizes, plea bargains to contracts, and many scholars examine plea bargains through the lens of traditional contract law.⁷⁰ Efficiency and fairness interests undergird many contract law explanations of plea bargaining.⁷¹ For example, an efficient system of contracting can “reduce the harm to innocent defendants and meanwhile reduce transaction costs and inefficiency for everyone

66. WILKINSON & KLAES, *supra* note 23, at 396 (“[T]his book . . . takes the view that ‘fairness is in the eye of the beholder.’”).

67. *See, e.g., id.* at 428 (“[I]n an ultimatum game, offering 80%/20% may be regarded as unfair in some situations, but fair in others, depending on what alternatives were open to the decision-maker.”). Situational dependency of fairness and efficiency is not the only source of nuance. Efficiency and fairness are often treated as continuous variables, rather than binary ones. *See, for example, CINZIA DARAIO & LÉOPOLD SIMAR, ADVANCED ROBUST AND NONPARAMETRIC METHODS IN EFFICIENCY ANALYSIS: METHODOLOGY AND APPLICATIONS* 13–15 (2007) (describing the calculation of efficiency as a ratio).

68. *See, e.g.,* Schulhofer, *supra* note 51 (arguing to abolish plea bargaining).

69. *See* Klein et al., *supra* note 54, at 74–75 (discussing what the current plea bargaining process looks like, which began to shift to its current form in the 1970s).

70. *See* Robert E. Scott & William J. Stuntz, *Plea Bargaining As Contract*, 101 YALE L.J. 1909, 1912 (1992); *cf.* Daniel D. Barnhizer, *Bargaining Power in the Shadow of the Law: Commentary to Professors Wright & Engen, Professor Birke, and Josh Bowers*, 91 MARQ. L. REV. 123, 123–24 (2007) (“[F]rom a contract law standpoint, it is difficult to think of plea bargains as ‘contracts’ in any sense . . . Such agreements are, in fact, merely one more point on a continuum of bargaining, promissory, and contractual relationships based upon the relative bargaining power of the parties.”).

71. *See, e.g.,* Barnhizer, *supra* note 70, at 128 (“Producers in such situations likewise may have incentives to impose inefficient standard form terms upon consumers, knowing that consumers are unlikely to have sufficient information or bargaining power to identify or negotiate away from such terms.”).

else,”⁷² which maximizes the system’s overall utility.⁷³ This example also demonstrates how fairness interests, vis-à-vis reduced harm to innocents,⁷⁴ can overlap with efficiency interests. Contract law also grapples with issues of coercion, fraud, and distributive justice, which affect both system fairness and efficiency.⁷⁵ It is important to recognize that the substance of contract law addresses both efficiency and fairness arguments, because contract law may be fertile ground for scholars with different philosophical beliefs to achieve a meeting of the minds about plea bargaining. However, for this to be possible, the field needs to first grapple with whether a plea agreement can accurately be characterized as a contract.

The concept of plea-bargaining-as-contract relies on the premise that parties have the relatively unconditioned right to strike a bargain,⁷⁶ and on its face, a plea agreement *is* bargained for between the prosecutor and defense attorney. However, one must at least wonder, given the widespread and systematic disenfranchisement evinced by the growing waiver of rights through plea bargains, whether a plea bargain agreement can accurately be called a contract made *freely* between two parties. It may be that the freedom to contract, even with constitutional entitlements, is cognizable under traditional contract law because the freedom to contract is the overriding presumption.⁷⁷ Arguably, the very nature of an entitlement means that individuals can exploit and bargain them away for value.⁷⁸ Additionally, Robert E. Scott and William J. Stuntz argue that without the freedom for criminal defendants to bargain with their entitlement to trial, it would instead become a burden on defendants—a burden of lost money, lost time, and lost opportunity for

72. Scott & Stuntz, *supra* note 70, at 1967.

73. *See id.* (“By following appropriate contract models, one can devise different rules that reduce the harm to innocent defendants and meanwhile reduce transaction costs and inefficiency for everyone else.”).

74. *Id.*

75. *Id.* at 1913 (“Force, fraud, and even distributional unfairness are all grounds for restricting contract. If they are pervasive in the plea bargaining process, then plea bargaining should be abolished—not as a matter of constitutional law, but as a matter of contract law and contract principles.”).

76. Easterbrook (1992), *supra* note 51, at 1978.

77. *See* Scott & Stuntz, *supra* note 70, at 1912, 1931 (“The potential unfairness in the typical plea bargain is not that the defendant gives up some legal entitlements, but that he may not get enough from the government in return.”).

78. *Id.* at 1915.

a reduced sentence.⁷⁹ In sum, there are strong arguments for allowing criminal defendants to bargain away their constitutional rights.

On the other hand, do plea bargains preserve the key features of a contractual choice: “free, informed, and rational?”⁸⁰ Without those key features, a system of bargaining with constitutional entitlements may be condoning disenfranchisement.⁸¹ The freedom of choice is closely linked to the presence or absence of disparate bargaining power.⁸² For example, in traditional contract law, if a seller has a monopoly on the market, then individual buyers do not have a free choice to bargain for all features of the contract;⁸³ simplistically a buyer’s choice starts with the possibility of negotiating with multiple sellers regarding their respective requests and becomes restricted to a binary choice to either obtain the product on the monopolist’s terms, or forgo the benefit that the product or service confers. Thus a monopoly constrains the buyer’s freedom in an important way. Accordingly, courts have protected parties from particular classes of contracts where standard forms and market power combine to systematically disadvantage one party⁸⁴—and plea bargains may fit this bill.

Analogizing from seller/buyer in traditional contracting to government/defendant in plea bargaining, the characterization

79. *Id.* at 1913.

80. *Id.* at 1918.

81. *Id.*

82. Barnhizer, *supra* note 70, at 124 (“The problem with criminal plea negotiations isn’t really that the resulting agreements aren’t contracts. It is that the power relationship between the parties appears so one-sided that even innocent parties may have strong incentives to accept a guilty plea rather than face trial—their best, worst, and only alternative to a negotiated agreement.”).

83. *See Henningson v. Bloomfield Motors, Inc.*, 161 A.2d 69, 86 (N.J. 1990) (applying traditional contract law to a monopoly situation).

84. *See id.* at 87 (reasoning that the standardized form of a warranty, which now protects the car maker more than the ordinary customer, combined with a monopoly on the car market and unequal bargaining powers is enough to deem the contract unfairly procured). In *Richards v. Richards*, the court concluded that a contract was void for policy reasons, including that the standardized agreement leaves no room for negotiation—which was particularly problematic given the breadth of the release. 513 N.W.2d 118, 119 (Wis. 1994).

of plea bargain documents as having boilerplate waivers of various sorts⁸⁵ suggests the presence of a standard form. Additionally, “standard-form plea agreements,”⁸⁶ in which a guilty plea is “accompanied by standardized charge reduction[] . . . [,] renders negotiation more of a theoretical possibility than the norm.”⁸⁷ Moreover, in large numbers of misdemeanors or low-level felonies, plea bargains often are the product of “an assembly line model of case processing,”⁸⁸ with prosecutors relying largely on police reports and assigning a preliminary offer—which is often the final offer.⁸⁹ This prosecutorial power and lack of true back-and-forth bargaining has caused scholars to comment on the “coercive aspects of the *structure* of the negotiation itself.”⁹⁰ Furthermore, in criminal law, the government’s prosecutors have a monopoly on plea bargains.⁹¹ Defense attorneys and criminal defendants cannot shop around for a sympathetic

85. See Klein et al., *supra* note 54, at 85; see also John G. Douglass, *Fatal Attraction? The Uneasy Courtship of Brady and Plea Bargaining*, 50 EMORY L.J. 437, 510 (2001) (noting that prosecutors in both the Northern and Southern Districts of California put “Brady waiver[s]” in their standard form plea bargains after *Sanchez v. United States*, a Ninth Circuit decision that adopted the post-plea standard of materiality to determine whether a defendant may withdraw a guilty plea); Benjamin A. Naftalis, “Queen for A Day” Agreements and the Proper Scope of Permissible Waiver of the Federal Plea-Statement Rules, 37 COLUM. J.L. & SOC. PROBS. 1, 3 n.6 (2003) (citing *United States v. Mezzanatto*, 513 U.S. 196, 216 (1995) (Souter, J., dissenting)) (“Already, standard forms indicate that many federal prosecutors routinely require waiver of Rules 410 and 11(e)(6) rights before a prosecutor is willing to enter into plea discussions.”).

86. See, e.g., Stephanos Bibas, Essay, *Regulating the Plea-Bargaining Market: From Caveat Emptor to Consumer Protection*, 99 CALIF. L. REV. 1117, 1160 (2011) (suggesting that supervision attorneys could oversee fairness of process).

87. Priyanka Prakash, Comment, *To Plea or Not To Plea: The Benefits of Establishing an Institutionalized Plea Bargaining System in Japan*, 20 PAC. RIM L. & POL’Y J. 607, 633 n.22 (2011).

88. Margareth Etienne & Jennifer K. Robbennolt, *Apologies and Plea Bargaining*, 91 MARQ. L. REV. 295, 311 (2007).

89. Prakash, *supra* note 87, at 311–12; see also Richard B. Zabel & James J. Benjamin, Jr., “Queen for A Day” or “Courtesan for A Day”: *The Sixth Amendment Limits to Proffer Agreements*, 15 No. 9 WHITE COLLAR CRIME REP. 1, 5 (Oct. 2001), <https://www.akingump.com/images/content/9/6/v4/961/306.pdf> (“Prosecutors generally refuse to forego or tinker with the language of proffer agreements. Thus, a defendant who chooses not to sign the proffer agreement in effect chooses not to proffer.”).

90. *Federal Jurisdiction and Procedure, Federal Rules of Evidence: Waiver -Plea Negotiation Statements*, 109 HARV. L. REV. 249, 253–54 (1995) (“The crucial issue is . . . the actions of the government in presenting certain choices to a criminal defendant in the first place.”).

91. Easterbrook (1983), *supra* note 39, at 311 (“The prosecutor may impose the penalty because of the bilateral monopoly that accompanies plea bargaining: the defendant cannot insist on dealing with another prosecutor.”).

prosecutor or jurisdiction.⁹² Thus, the proliferation of waivers that substantially expand the breadth of rights signed over by the defendant, the use of standard form plea bargains, and prosecutors' monopoly power undermine both the integrity of a free contractual choice and the fairness of the plea bargain contract.

In sum, balancing efficiency and fairness is a recurring theme in foundational legal scholarship on plea bargaining that overlaps with traditional contract policy arguments. Efficiency arguments are built into plea-bargaining-as-contract via defendants' freedom to contract and maximize their constitutional entitlements in order to receive a charge-sentence discount.⁹³ Fairness arguments appear in the form of various concerns about the effects of disparate bargaining power.⁹⁴ Furthermore, the fairness arguments only become more potent when analogizing from buyer-seller situations to the criminal justice system, where physical freedom and other fundamental rights are at stake.⁹⁵

3. The Shadow-of-Trial Model

The shadow-of-trial model describes plea bargaining as contracting in the shadow of expected trial outcomes, including the

92. Naftalis, *supra* note 85, at 41 (“[P]arties to this bilateral monopoly possess significantly disparate bargaining power positions.”).

93. *See, e.g.*, Easterbrook (1983), *supra* note 39, at 297 (“Settlement is a form of contract. A deal is possible if the defendant’s maximum offer equals or exceeds the prosecutor’s minimum demand. The defendant saves the anxiety and cost of litigation, and the prosecutor frees up resources to pursue other criminals.”).

94. *See* Barnhizer, *supra* note 70, at 124 (“[T]he question of whether a promise or agreement should be enforceable under contract law depends entirely upon whether both parties to the transaction possessed bargaining power of a type that courts can consistently and credibly identify.”).

95. This is partly because freedom to buy a particular product is qualitatively different from loss of physical freedom. Additionally, however, unlike civil contracts, contracting with constitutional entitlements during the criminal justice process is different and, per the Supreme Court, is a protected area of criminal process. *See* Stephanie Stern, Note, *Regulating the New Gold Standard of Criminal Justice: Confronting the Lack of Record-Keeping in the American Criminal Justice System*, 52 HARV. J. LEGIS. 245, 245–46 (2015) (citing *Lafler v. Cooper*, 132 S. Ct. 1376, 1384 (2012)); *Missouri v. Frye*, 132 S. Ct. 1399, 1404 (2012)); *see also* *Brown v. Cty. of Los Angeles*, 229 Cal. App. 4th 320, 323 (Cal. Ct. App. 2014) (“Since plea bargains are enforced by courts on due process grounds, principles of contract law should not be imported wholesale into the plea bargaining process.”). A last important difference is that contract law is governed by state law, whereas plea bargaining seems to be governed by state contract law—for example, *see Buckley v. Terhune*, 441 F.3d 688, 695 (9th Cir. 2006) (“California courts are required to construe and interpret plea agreements in accordance with state contract law.”)—as well as the Due Process Clause.

specific potential conviction and its respective sentence.⁹⁶ First described in a seminal article on divorce settlement,⁹⁷ scholars have since used this model⁹⁸ to defend plea bargaining, arguing that these contracts reflect the sentence outcomes that would have occurred at trial minus a fixed discount.⁹⁹ The shadow-of-trial model has been used to argue for maintaining the plea bargaining system as is, because sentences are assumed to mirror culpability, incentivize prosecutors from convicting innocents, and deter police misconduct.¹⁰⁰

Overall, proponents of the model use it to justify the plea bargaining system by emphasizing the intuitive contracts-and-efficiency-based bargain: exchanging a charge-sentence discount for reduced demands on the criminal justice system's resources.¹⁰¹ However, the shadow-of-trial model assumes that fairness concerns function at the margins and accordingly are not sufficient to undermine the benefit of the system's efficiency.¹⁰² Although envisioning negotiations in the dark shadow of a looming trial is a salient metaphor, the shadow-of-trial model reduces the complex constellation of contractual efficiency and fairness arguments discussed above to a "rational choice among independent economic actors."¹⁰³ The rationality of the choice is used to justify individual plea bargain outcomes as well as the very plea bargaining system itself. But what does rationality mean when defendants are bargaining against a monopoly with a standard form as a baseline contract? The shadow-of-trial model not only fails to provide an answer, but conclusively dismisses the disparate bargaining power considerations to the

96. Bibas, *supra* note 16, at 2465; Frank H. Easterbrook, *Plea Bargaining is a Shadow Market*, 51 DUQUESNE L. REV. 551, 551 (2013) [hereinafter Easterbrook (2013)] ("Plea bargaining is a form of contract, and its regulation through the common-law process is fundamentally no different from the way courts treat other contracts. People bargain to advance their view of their interests.").

97. Robert H. Mnookin & Lewis Kornhauser, *Bargaining in the Shadow of the Law: The Case of Divorce*, 88 YALE L.J. 950, 968 (1979).

98. For scholarship on the shadow-of-trial model, see Easterbrook (1983), *supra* note 39; Easterbrook (1992), *supra* note 51; Scott & Stuntz, *supra* note 70.

99. Bibas, *supra* note 16, at 2465; Easterbrook (1983), *supra* note 39, at 308–09.

100. Bibas, *supra* note 16, at 2466.

101. Easterbrook (2013), *supra* note 96, at 552.

102. Bibas, *supra* note 16, at 2465–66.

103. Jennifer Rae Taylor, *Restoring the Bargain: Examining Post-Plea Sentence Enhancement As an Unconscionable Violation of Contract Law*, 48 CAL. W. L. REV. 129, 142 (2011).

margins because, the theory goes, criminal defendants will make a rational choice.¹⁰⁴

The shadow-of-trial model is a specific application of efficiency-based contract arguments that treat actor rationality as a panacea to any and all fairness concerns, but in the last decade the model has been questioned.¹⁰⁵ The next Section outlines the initial efforts of scholars to evaluate the shadow-of-trial model. Most of the model's critics invoke nontraditional economic models of human rationality by borrowing from disciplines like cognitive psychology.¹⁰⁶

C. THE BEGINNINGS OF A BRIDGE BETWEEN DISCOUNTING AND PLEA BARGAINING

Despite the lack of experimental discounting studies that explain plea bargain decision-making, scholars have taken foundational first steps toward the mutually beneficial unification of discounting and plea bargaining. Scholars from different disciplines have begun to question the traditional law and economics model by pointing to cognitive principles.¹⁰⁷ This Section describes and connects the theoretical and experimental beginnings of disciplinary cross-talk regarding plea bargaining decision-making, most recently initiated by Stephanos Bibas. Subsection 1 delineates Bibas's influential critique of the shadow-of-trial model and the scholarly work he evoked in the academic legal community. Subsection 2 details the experimental and empirical studies that test legal experts' theories about what drives plea bargain decisions. Both Subsections also point out what theoretical and experimental advancement still

104. Bibas, *supra* note 16, at 2464.

105. *Id.* at 2467.

106. *Id.*

107. *Id.*; Richard Birke, *Reconciling Loss Aversion and Guilty Pleas*, 1999 UTAH L. REV. 205, 208; Alafair S. Burke, *Prosecutorial Passion, Cognitive Bias, and Plea Bargaining*, 91 MARQ. L. REV. 183, 185 (2007) [hereinafter Burke (2007)]; Rebecca Hollander-Blumoff, *Social Psychology, Information Processing, and Plea Bargaining*, 91 MARQ. L. REV. 163, 165 (2007). The reasons for the emergence of this discourse is outside the scope of this Note, but may be due to the cross-disciplinary impact of psychologists like Kahneman and Tversky, who had a strong influence on behavioral economics, as well as the public via accessible books. DANIEL KAHNEMAN, THINKING, FAST AND SLOW (Farrar et al. eds., 2011); MICHAEL LEWIS, THE UNDOING PROJECT: A FRIENDSHIP THAT CHANGED OUR MINDS (2017); *see also* Camerer & Loewenstein, *supra* note 24 (explaining the impact of cognitive psychology on behavioral economics); Kahneman, *supra* note 20 (using psychology to inform behavioral economics).

needs to be done to prepare for the more developed critique in Part II and the proposed solution in Part III.

1. Bibas Questions the Simplicity of the Shadow-of-Trial Model

In 2004, Stephanos Bibas argued that the shadow-of-trial model needs to more strongly weigh variables like transaction costs, time, financial access, and risk preferences,¹⁰⁸ as opposed to the traditional overemphasis on trial charge-sentence discounts.¹⁰⁹ As mentioned above,¹¹⁰ many of the shadow-of-trial supporters are also supporters of traditional economic models, which assume that variables like transaction costs and individual decision-making differences are negligible.¹¹¹ For example, noted jurist and law-and-economics scholar Judge Frank Easterbrook has espoused exactly this view, writing, “First, like all economic analysis, [my argument] proceeds on the assumption that large groups of people act as if each person is a rational maximizer.”¹¹² Additionally, in a journal article he authored, Judge Easterbrook once provided a formula that he suggested might describe and predict trends in plea acceptance: the defendant’s best offer, “ V^d , is given by $V^d = p^d J + C^d$, where J is the punishment expected if there is a trial and conviction, p^d is the defendant’s subjective estimate of the probability of conviction, and C^d is the amount by which the defendant’s costs of going to trial exceed his costs of settling.”¹¹³ Although he acknowledges the complexity of both delay until trial and how cost of trial may influence a person’s perception of probability of conviction, he “disregard[s]” them by not including these factors in his models.¹¹⁴ Theoretical formulas, unsupported by experimental or empirical data, are common in the law and economics field, but it stands

108. Bibas, *supra* note 16, at 2465 n.3 (noting that these variables are relegated by Robert H. Mnookin and Lewis Kornhauser to a single sentence in their conclusion).

109. *Id.* at 2465.

110. *Supra* Part I.B.3.

111. See, e.g., Edward A. Ruttenburg, *Plea Bargaining Analytically: The Nash Solution to the Landes Model*, 7 AM. J. CRIM. L. 323, 353 (1979).

112. Easterbrook (1983), *supra* note 39, at 291.

113. *Id.* at 331.

114. *Id.* (“Because the present value of J is influenced substantially by delay in the commencement of sentence, a complete model would reflect the time value of the punishment. That is not necessary for present purposes, however. Similarly, I disregard the effect C^d may have on p^d .”).

to benefit from using more realistic, and empirically-defensible, methods of analysis.¹¹⁵

Behavioral economics may offer the solution. Bibas's encouragement to not rely on hypothetical models is theoretically and conceptually consistent with the goals of behavioral economics.¹¹⁶ In fact, Bibas explicitly connects his argument to behavioral law and economics literature by challenging the shadow-of-trial model's "assumption that actors are perfectly rational,"¹¹⁷ which is one of behavioral economics' central criticisms of traditional economics: "behavioral models . . . can even be more *precise* than traditional ones which assume more [actor] rationality."¹¹⁸ Thus, a bridge between behavioral economics and plea bargaining has a theoretical foundation, which Bibas brought to the fore.

Moreover, legal scholars have even identified the concepts of delay to trial and probability of conviction, which suggests a connection to delay and probability discounting research.¹¹⁹ For example, Judge Easterbrook has noted the importance of probability of conviction to the bargaining model,¹²⁰ and Bibas and other scholars have taken note of what they call "time discounting."¹²¹ However, to date, there are important features missing from the

115. See, e.g., Louis Kaplow & Steven Shavell, *Why the Legal System Is Less Efficient than the Income Tax in Redistributing Income*, 23 J. LEGAL STUD. 667, 677 (1994) (using formulas as "formal proof," rather than experimental data).

116. See discussion *supra* note 22; Camerer & Loewenstein, *supra* note 24, at 1–2 (describing the aims of behavioral economics).

117. Bibas, *supra* note 16, at 2496 ("A more basic problem with the reigning model is its assumption that actors are perfectly rational. The behavioral law and economics literature has undermined this assumption, exposing consistent irrationalities and imperfect heuristics in human decisionmaking. Until now, however, the literature has largely ignored how these deficiencies skew plea bargaining.").

118. Camerer & Loewenstein, *supra* note 24, at 3.

119. See *supra* Part I.A.

120. Easterbrook (1983), *supra* note 39, at 331–32 (including probability of conviction in his hypothetical model); Easterbrook (2013), *supra* note 96, at 552 ("Defendants are risk averse and prefer the certainty of a year in prison to a 50/50 or 90/10 chance of a longer term.").

121. Bibas, *supra* note 16, at 2465; Russell Covey, *Reconsidering the Relationship Between Cognitive Psychology and Plea Bargaining*, 91 MARQ. L. REV. 213, 221 (2007) [hereinafter Covey (2007)] ("[I]t is always marginally better to consume a good now (or defer a bad until later) than to defer gratification until tomorrow (or suffer the bad consequence now), for the simple reason that tomorrow may never come. However, while some discounting is rational, significant discounting may not be."); see also Easterbrook (1983), *supra* note 39, at 294–95.

scholarship: (1) no scholar has explicitly used the behavioral economics concept of discounting; and (2) no scholar has connected the two concepts to explain a systematic cognitive psychological trend.¹²² The scholars that come so close to substantively connecting probability and delay discounting to plea bargaining focus instead on hypothetical models of human behavior.¹²³ They also assume that “criminals as a class” are probably different from the rest of the population because they are more impulsive or likely to take risks.¹²⁴

The key benefit of applying discounting to plea bargaining is not merely to enable scholars to discuss risk aversion and risk-taking propensities of subclasses of the population, but rather to bring to light a robust human cognitive preference for immediate and certain outcomes. Importantly, this preference might explain why the vast majority of criminal defendants accept plea bargains—because the majority of *all* people would take a deal under the same circumstances.

2. Experimental Tests of the Shadow-of-Trial Model

Although plea bargaining studies in social science are emerging,¹²⁵ this Note (and Subsection particularly) focuses on studies that evaluate a general model of decision-making by pointing to particular features that theoretically affect final decisions to plead guilty or go to trial. To date, there are only a handful of studies that fit this bill. In walking through the details of the studies, this Subsection proceeds in chronological order based on publication date and notes the limitations of each study.

122. Chad M. Oldfather, *Heuristics, Biases, and Criminal Defendants*, 91 MARQ. L. REV. 249, 249 (2007) (“As most of the commentators who have applied behavioral law and economics to the plea bargaining process have pointed out, what results appears to present something of a puzzle. A straightforward application of the heuristics and biases literature leads to the conclusion that plea bargaining should occur only rarely.”).

123. See *supra* note 113 and accompanying text.

124. Covey (2007), *supra* note 121, at 220.

125. See generally Besiki L. Kutateladze et al., *Does Evidence Really Matter? An Exploratory Analysis of the Role of Evidence in Plea Bargaining in Felony Drug Cases*, 39 LAW & HUM. BEHAV. 431 (2015) (evaluating the influence of evidence on plea bargaining in felony drug cases); Jodi L. Viljoen et al., *Legal Decisions of Preadolescent and Adolescent Defendants: Predictors of Confessions, Pleas, Communication with Attorneys, and Appeals*, 29 LAW & HUM. BEHAV. 253 (2005) (examining plea bargaining in the juvenile context).

In 1986, Hunter A. McAllister and Norman J. Bregman conducted an experimental study of defendants' and defense attorneys' plea bargain decisions based on post-conviction sentence severity and the probability of conviction.¹²⁶ Using a sample of twenty-four individuals, the researchers gave each participant a packet containing six hypothetical cases in which the participant was instructed to imagine themselves as the criminal defendant and decide between a plea bargained sentence of one year in prison versus trial with probability of conviction (for example, eighty percent, fifty percent, or twenty percent) and sentence (for example, two or five years).¹²⁷ McAllister and Bregman found that (1) as the severity of the post-conviction sentence increased (two years to five years), the proportion of individuals that accepted the plea increased; and (2) as the probability of conviction increased (from twenty percent to fifty percent probability of conviction at trial), the proportion of individuals that accepted the plea increased.¹²⁸ Accordingly, this study points to sentence discounting and probability of conviction as important factors affecting people placed in criminal defendants' shoes by reading a hypothetical scenario.

McAllister and Bregman's study is the only study that specifically asks participants to make plea bargain decisions, acting as a criminal defendant. Notably, the sample size is small and the sentences tested are not particularly realistic, because they do not vary in charge (misdemeanor versus felony) and only entail jail time of a relatively restricted length of time, a differential of three years. Moreover, jail sentences are usually accompanied by other sentence elements such as probation.¹²⁹ Additionally, delay to trial is notably missing as a variable of interest. In sum, McAllister and Bregman found evidence consistent with the shadow-of-trial model, which emphasizes the importance of sentence discounting, and they found evidence

126. Hunter A. McAllister & Norman J. Bregman, *Plea Bargaining by Defendants: A Decision Theory Approach*, 126 J. SOC. PSYCHOL. 105, 106–08 (1986) [hereinafter McAllister & Bregman (Defendants)].

127. *Id.* at 106–07.

128. *Id.* at 108.

129. See, e.g., John D. Burrow & Patrick G. Lowery, *A Preliminary Assessment of the Impact of Plea Bargaining Among a Sample of Waiver-Eligible Offenders*, 13 YOUTH VIOLENCE & JUV. JUST. 211, 222–23 (2015) (explaining that sentences may include sex offender registration or placement in a treatment program); Rebecca K. Helm & Valerie F. Reyna, *Logical but Incompetent Plea Decisions: A New Approach to Plea Bargaining Grounded in Cognitive Theory*, 23 PSYCHOL., PUB. POL'Y & L. 367, 376 (2017) (using length of probation time to alter severity of sentences).

consistent with probability of conviction, which is less emphasized but still included in the shadow-of-trial model.¹³⁰

These researchers, though, did not explicitly set out to (dis)prove the shadow-of-trial model. Their stated purpose “was to examine the extent to which defendants are rational decision makers,”¹³¹ which they define as decision-making that “attempt[s] to minimize his sentence,”¹³² which is conceptually tied to the shadow-of-trial model.¹³³

More recently, in 2012, Shawn D. Bushway and Allison D. Redlich, responding to Bibas, introduced the concept of shadow-of-trial model to “a criminological audience”¹³⁴ and used archival trial and plea bargain data¹³⁵ from the 1970s to “test whether the presence or absence of certain kinds of evidence drives plea discounts.”¹³⁶ They reasoned that certain kinds of evidence such as confessions should theoretically increase the probability of conviction and thus increase plea acceptance.¹³⁷ Their sample consisted of 1593 plea cases and 305 tried cases of robbery and burglary cases with male defendants; they coded the type of evidence in the case (eyewitness, confession, physical evidence, et cetera) as well as other demographic information (age, race, number of prior felony arrests, and drug history).¹³⁸ In general, their model, which predicted that evidence increased the probability of conviction at trial and in turn increased likelihood of plea acceptance, did not hold up; “[o]ur prediction was that evidence would be positively correlated with the probability of conviction. However, . . . the evidence is either not significant or it is negative and significant.”¹³⁹

130. See, e.g., Russell D. Covey, *Signaling and Plea Bargaining's Innocence Problem*, 66 WASH. & LEE L. REV. 73, 82 (2009) (explaining the shadow-of-trial model) [hereinafter Covey (2009)].

131. McAllister & Bregman (Defendants), *supra* note 126, at 106.

132. *Id.* at 105.

133. See *supra* Part I.B.3.

134. Bushway & Redlich, *supra* note 15, at 438.

135. *Id.* at 440 (“We will test this simple model with a well-known plea-bargaining dataset, Plea Bargaining in the United States, 1978 by Miller et al. (1980).”).

136. *Id.* at 443 (“[I]f prosecuting and defense attorneys are basing their plea offers/acceptances on what jurors would do at trial, rather than structural or extra-legal factors (such as race of the defendant), we would expect to see the presence of confession, for example, to influence the plea discount.”).

137. *Id.*

138. *Id.* at 445.

139. *Id.* at 449 (“Our prediction was that evidence would be positively correlated with the probability of conviction. However, in Column 1, of Table 5, the

A basic premise of the shadow-of-trial model is that strength of a case incentivizes rational decisions to accept a guilty plea.¹⁴⁰ An intuitive way to measure strength of a criminal case is strength of the evidence against the criminal defendant, and yet, using real criminal cases, the researchers did not find a link. In explaining their results, Bushway and Redlich cursorily point to Bibas's suggestion that there may be significant individual differences in perceptions of the pleas associated sentence discounting, which in turn problematizes the simple rationality analysis suggesting that increased amounts of evidence would increase the probability of conviction at trial.¹⁴¹ Thus, the 2012 study by Bushway and Redlich, relying on archival data from the 1970s, did not find evidence supporting the shadow-of-trial model's assumption that evidence strength determines the probability of conviction.

After the disappointment with archival data, Bushway, Redlich, and Robert J. Norris performed original data collection¹⁴² so that they could control what questions were asked rather than rely on data collected decades previously.¹⁴³ Specifically, the researchers assessed 1585 judges' and attorneys' perceptions of probability of conviction based on type of evidence present (DNA, eyewitness, and confession) and a long or short defendant criminal history.¹⁴⁴ They found "that the basic shadow of the trial theory seems to hold across the experimental manipulations."¹⁴⁵

evidence is either not significant or it is negative and significant. The effects are large, with a confession leading to a nearly 12 percentage point reduction in the probability of conviction at trial for those who pled guilty. The R^2 are also quite low (.045). In general, the model performs poorly.").

140. Covey (2009), *supra* note 130, at 81 ("To the extent that evidence tends to be strongest against defendants who are 'actually guilty,' and weakest against defendants who are innocent, the pricing model seems consistent with conventional conceptions of justice.").

141. Bushway & Redlich, *supra* note 15, at 450–51. ("Bibas (2004) argues convincingly that the evaluation of the shadow-of-trial model must take place at the individual level. He posited that the plea discount would be both too high and too low for some people relative to what one would expect if bargaining occurred in the shadow of the trial. He also argued that this variation would not be explained by factors such as evidence. His claims appear to be true in these data.").

142. Bushway et al., *supra* note 15, at 725.

143. Constance Jones, *Archival Data: Advantages and Disadvantages for Research in Psychology*, 4 SOC. & PERSONALITY PSYCHOL. COMPASS 1008, 1013 (2010) ("[A]n identified data set genuinely [may] not contain information needed to address the researcher's research question, despite whatever efforts have been put into understanding the data set.").

144. Bushway et al., *supra* note 15, at 734.

145. *Id.* at 741.

Notably, however, this experimental work left out the delay until trial as well as criminal defendant decision-making.

In a 2011 study using archival data from Cook County, Illinois, David Abrams found that, on average, the plea sentence accepted by criminal defendants was higher than the sentences that criminal defendants received at trial.¹⁴⁶ Specifically, after controlling for case and defendant characteristics,¹⁴⁷ sentence lengths were longer for defendants that accepted a plea bargain than those that went to trial—suggesting exactly the opposite of the shadow-of-trial model: defendants may not be getting sentence discounts when compared to defendants that went to trial.¹⁴⁸

Responding to Abrams's results, Bushway, Redlich, and Norris summarized three possible explanations: “[D]efendants 1) are acting irrationally (they should be going to trial), 2) are risk adverse, or 3) are facing significant nonsentencing costs for going to trial.”¹⁴⁹ Arguably, based on the traditional focus on charge-sentence discounting, defendants in this sample *are* acting irrationally. This suggests either that the criminal defendants in the sample are different from the rest of the population in their ability to reason *or* the variables being used to define human rationality are limited and overly simplistic.

In sum, as a general body of work, only one experiment assessed criminal defendant decision-making;¹⁵⁰ the archival work using real criminal defendants found no support for the shadow-of-trial model;¹⁵¹ and experimental work using attorneys and judges found evidence for the shadow-of-trial model.¹⁵² Thus although there has been some empirical and experimental work exploring models of plea bargain decision-making, the results regarding real-world validity of the shadow-of-trial model are

146. David S. Abrams, *Is Pleading Really a Bargain?*, 8 J. EMPIRICAL LEGAL STUD. 200, 201 (2011).

147. *Id.* at 208 (including number of charges, defendant race, defendant sex, defendant age, finding of guilt, offense type, and presence of a weapon).

148. *Id.* at 213–14. As seen in Table 3, crime severity as measured by number of charges explained less than one percent of the variance in sentence length, and crime severity as measured by the “violent” category explained less than or equal to 0.5% of the variance of sentence length, as evidenced by three crime type categories being entered into the model simultaneously and producing an adjusted R^2 of .047 compared to the just plea model in column 1 which produced an adjusted R^2 of .024.

149. Bushway et al., *supra* note 15, at 730.

150. *See supra* note 126 and accompanying text.

151. Abrams, *supra* note 146; Bushway & Redlich, *supra* note 15, at 449.

152. Bushway et al., *supra* note 15, at 740.

mixed and possibly depend on the type of sample used. The next Part addresses the obstacles that legal scholars and researchers may be facing in their attempts to test the shadow-of-trial model.

II. OBSTACLES TO BRIDGE-BUILDING

Although there have been important initial steps toward understanding factors influencing criminal defendant plea bargain decisions, there are also obstacles to the conceptual unification of legal and experimental scholarship. First, legal (and law and economics) scholars' comfort with, and use of, argument by analogy perpetuates the continued use of—and reliance on—untested hypotheses. Second, there is valid concern regarding the descriptive utility of social science data; even if scholars do the work of assessing the impact of cognitive biases, how useful will they be in describing real world rates and patterns of plea bargain decisions? Third, empirical and experimental work has arguably lost sight of the central decision-maker, the criminal defendant, and overlooked the promise of behavioral economics.

A. LEGAL SCHOLARS' UNTESTED HYPOTHESES AND REASONING BY ANALOGY

Bibas criticizes the shadow-of-trial model for oversimplifying plea bargain decision-making and treating psychological biases as if they influence decisions only “at the margins.”¹⁵³ To rectify this, he expressly applies cognitive psychology concepts to the plea bargaining context and argues that psychological findings could be pervasive.¹⁵⁴ He argues this by using evidence from psychology studies to analogize to the plea bargaining context. For example, he writes:

Hundreds of psychological studies, however, show that people are consistently too optimistic and therefore overconfident in their chances of achieving favorable outcomes Overconfidence leads each side to more extreme aspirations and reservation prices in negotiations, reducing the incentive to compromise Because [overconfidence] makes the trial out-come seem more promising, defendants will lean toward rejecting these sentence bargains.¹⁵⁵

153. Bibas, *supra* note 16, at 2465–67.

154. *Id.* at 2527. Bibas describes a number of cognitive psychology findings that have different effects on behavior: (1) psychological processes that “lead parties to resist or even reject beneficial bargains”; (2) processes that “prevent the parties from seeing the weaknesses in their own cases”; and (3) processes that “lead defendants to reject lighter plea bargains in the present and to accept worse sentences in the future.” *Id.* at 2496.

155. *Id.* at 2498–2500.

Others have been inspired by Bibas and they, also by analogy, have applied cognitive psychology concepts to actors in plea bargaining contexts.¹⁵⁶ They too do not collect original data, but rather argue for an expansion of shadow-of-trial model through powerful anecdotes and untested hypotheses.¹⁵⁷ For example, Alafair Burke describes four types of cognitive bias (confirmation bias, selective information processing, belief perseverance, and avoidance of cognitive dissonance) and then explains how they could be at work in prosecutorial decision-making in plea bargain situations¹⁵⁸ like decisions to investigate and charge: “[t]he phenomenon of confirmation bias suggests a natural tendency to review the reports not for exculpatory evidence that might disconfirm the tested hypothesis, but instead for inculpatory, confirming evidence.”¹⁵⁹

Because Bibas does not provide an empirical or experimental test of this argument, he rightly characterizes his work as observation, and he calls for research to assess plea bargaining from a psychological lens.¹⁶⁰ To jumpstart research, Bibas

156. See Russell Covey, *Behavioral Economics and Plea Bargaining*, in THE OXFORD HANDBOOK OF BEHAVIORAL ECONOMICS AND THE LAW 643 (Eyal Zamir & Doran Teichman eds., 2014) [hereinafter Covey (2014)]; Alafair S. Burke, *Improving Prosecutorial Decision Making: Some Lessons of Cognitive Science*, 47 WM. & MARY L. REV. 1587 (2006) [hereinafter Burke (2006)]; William J. Stuntz, *Plea Bargaining and Criminal Law's Disappearing Shadow*, 117 HARV. L. REV. 2548 (2004); Ronald F. Wright, *Trial Distortion and the End of Innocence in Federal Criminal Justice*, 154 U. PA. L. REV. 79 (2005); Birke, *supra* note 107; Burke (2007), *supra* note 107; Holander-Blumoff, *supra* note 107.

157. The following articles simply describe past social science empirical findings and argue that they have implications for plea bargaining: Covey (2014), *supra* note 156; Burke (2006), *supra* note 156; Burke (2007), *supra* note 107; Covey (2007), *supra* note 121; Holander-Blumoff, *supra* note 107.

158. Burke (2006), *supra* note 156, at 1602–06 (“No reason exists to believe that lawyers are immune from the documented bounds of rationality, and yet the literature on prosecutorial decision making continues to describe prosecutors as rational, wealth-maximizing actors Through the lens of the cognitive phenomena summarized in Part I, a more complicated story is evident This Part explores some of the potential ways that cognitive bias may taint the decision making of even ethical prosecutors when executing this broad discretion.”).

159. *Id.* at 1603.

160. Bibas, *supra* note 16, at 2530 (“The size of each variable may be uncertain, but that is not a good reason to set each variable at zero. Rather, this difficulty should spur empirical research to measure these [demographic] factors. Though there are many empirical studies on negotiating civil settlements, very few exist on the criminal side.”); *id.* at 2547 (“[Researchers] can use databases to compare charges and sentences, can interview lawyers and defendants, and can test hypothetical scenarios on these parties.”). Interestingly, Bibas does not

hypothesizes that psychological factors push defendants to choose the trial option even when it may be harmful to them.¹⁶¹ If Bibas is right, in that respect, the next question is: are there any other psychological factors that can explain why most defendants accept pleas? Otherwise, the descriptive utility of the psychological factors is low because the vast majority of defendants accept plea deals.¹⁶² This is exactly the criticism that Russell Covey levied on Bibas's argument.

B. THE MARGINAL UTILITY OF USING COGNITIVE PRINCIPLES TO DESCRIBE PLEA BARGAIN DECISION-MAKING

Covey argues, rightly, that if all of the psychological factors discussed by Bibas describe a trial tendency, the sheer fact that over ninety percent of defendants accept guilty pleas¹⁶³ calls the utility of those factors into question.¹⁶⁴ In other words, the psychological factors that Bibas suggests affect plea bargain decision-making cannot be that weighty or important because otherwise more defendants would go to trial and reject the plea bargain. Covey writes:

Most of the cognitive quirks and biases identified by researchers, such as loss aversion, overconfidence, overdiscounting, and self-serving bias, suggest that defendants should be consistently disinclined to plead guilty Were one to form predictions about plea bargaining based only on cognitive research, it would be logical to expect plea bargaining to be a rare occurrence. Of course, it is not.¹⁶⁵

Covey is right to be critical. If a theory or argument does not accurately describe reality, then it should be questioned and challenged, so that researchers can determine whether it is wholly incorrect or only has such a weak influence on decisions that there may be more important factors to consider. However,

cite, or seem to know of McAllister and Bregman's 1986 study on plea bargaining decision-making, which is one of very few studies on the topic, and is especially unique because it assesses plea bargaining decision-making by hypothetical criminal defendants. See McAllister & Bregman (Defendants), *supra* note 126.

161. Bibas, *supra* note 16, at 2497 (explaining that "characteristics irrelevant to guilt" have significant influence on defendants' sentences).

162. See *supra* notes 7–8 and accompanying text.

163. *Supra* note 7 and accompanying text.

164. Covey (2007), *supra* note 121, at 215. Others have echoed this concern. See Oldfather, *supra* note 122, at 249–50 ("A straightforward application of the heuristics and biases literature leads to the conclusion that plea bargaining should occur only rarely. That, of course, does not accord with reality, in which plea bargaining accounts for the resolution of the vast majority of all criminal cases.").

165. Covey (2007), *supra* note 121, at 214–15.

Covey implicitly argues, or at least assumes, that there are no *other* psychological concepts¹⁶⁶ that may explain why the vast majority of defendants take plea deals.¹⁶⁷ He goes on to assume that the criminal justice system's design must thus be a stronger influence than any cognitive bias, and he misses the opportunity to uncover the potential utility of discounting to explain the high rates of plea acceptance. Instead, he reverts back to focusing on the actors that legal scholars know best: attorneys and judges.

C. EXPERIMENTAL ASSUMPTIONS THAT THE ANSWER TO PLEA BARGAINING PATTERNS IS BUILT INTO THE SYSTEM: FOCUS ON ATTORNEYS AND JUDGES

Testing models of plea bargain decision-making without focusing on the central decision-maker, the defendant, oversimplifies the decision-making process and implicitly treats the criminal defendant as a passive receiver of attorney recommendation. That *may* be true in aggregate, but it is yet another testable hypothesis. As demonstrated in Part I,¹⁶⁸ most experimental work on plea bargaining decision-making focuses on attorneys' and judges' perceptions rather than focusing on criminal defendants' perceptions, which could be accomplished by surveying actual criminal defendants or by placing study participants in a criminal defendant's shoes.¹⁶⁹ Having participants imagine being in realistic and consequential scenarios has limitations, but there is some evidence that discounting of real and hypothetical rewards are not significantly different.¹⁷⁰ Anchoring on the experiences and perceptions of attorneys and judges, on the other

166. By detailing only the psychological concepts provided by Bibas and then concluding that "cognitive research" as a whole does not offer any insights to plea bargain decision-making, Covey relies on the assumption that Bibas has provided an exhaustive recounting of all cognitive research that may apply to plea bargaining. *Id.* at 214 n.5.

167. Notably, discounting may explain why most defendants accept the plea—because discounting patterns demonstrate a cognitive human preference for the immediate and certain option. *See supra* Part I.A; *infra* Part III.

168. *See generally supra* Part I.A.2 (explaining discounting and how it is measured).

169. *See* Bushway et al., *supra* note 15, at 732 (using survey responses from defense attorneys, prosecutors, and judges); McAllister & Bregman (Defendants), *supra* note 126, at 106–08 (using psychology students as participants by asking them to imagine themselves as defendants in experiment one and as defense attorneys in experiment two).

170. Gregory J. Madden et al., *Delay Discounting of Real and Hypothetical Rewards*, 11 EXPERIMENTAL & CLINICAL PSYCHOPHARMACOLOGY 139, 143 (2003) ("The strong positive correlation ($r = .92$) shown in Figure 3 demonstrates, beyond the statistical tests provided above, that individual participants'

hand, may be contributing to the overemphasis on charge-sentence discounting and probability of conviction.¹⁷¹ Although trial is relatively undesirable to judges and attorneys because it utilizes limited and valuable time and resources, it may also be undesirable for criminal defendants, because the delay and uncertainty of trial provoke apprehension and a general inability to plan life decisions, for example, about family and employment. Importantly, experimentally testing attorneys' and judges' perceptions of plea bargains addresses the pros and cons of trial for those actors in their professional capacity;¹⁷² however, individual criminal defendants likely do not, and arguably should not, care about judicial resources in and of themselves. Experimentally assessing criminal defendants' perceptions of the pros and cons of trial and the plea bargain may reveal more considerations than just charge-sentence discounts and the probability of conviction. The focus on non-criminal defendant samples, or at least hypothetical criminal defendant samples, may be contributing to the focus on relatively few variables.

The next Section provides an experimental paradigm that can be used to evaluate the shadow-of-trial model by assessing the influence of sentence discounting¹⁷³ as well as explain how variables like delay until trial and probability of conviction at trial influence plea bargain decisions over and above a sentence discount.

discounting rates were similar across the real- and hypothetical- reward conditions.”).

171. Importantly, research has demonstrated significant differences between criminal defendant and attorney samples. *See* McAllister & Bregman (Defendants), *supra* note 126, at 109 (“Although severity of sentence was important in the decision making of defendants it had little impact on defense lawyers.”); *see also supra* Part I.C.2 (explaining experimental tests of the shadow-of-trial model). *Compare* Bushway et al., *supra* note 15 (suggesting the shadow-of-trial model predicts attorneys' and judges' responses), *with* Abrams, *supra* note 146 (explaining that the result of the criminal defendant sample suggests that they are not really getting deals).

172. For example, an important empirical question is how long attorneys take to evaluate a case's evidence before communicating to the client his/her chances of conviction at trial.

173. *See* Easterbrook (2013), *supra* note 96, at 555 (discussing the use of sentence discounts “in exchange for a speedy plea” in *United States v. Ruiz*, 536 U.S. 622 (2002)).

III. PRESENTING THE BRIDGE'S KEYSTONE: CONNECTING DISCOUNTING TO PLEA BARGAINING

Delay and probability discounting paradigms, like many other cognitive psychology and behavioral economics paradigms, place individual decision-makers at the center of focus. By measuring under what conditions individuals take one option over another, researchers can test legal scholars' expert intuitions and hypotheses about plea bargaining. This Section directly applies the concepts of delay and probability discounting to the plea bargaining context in order to outline a promising experimental paradigm, which evaluates the shadow-of-trial model (the influence of charge-sentence discounting) as well as recent arguments for the model's expansion to include and more strongly weigh other variables. Section A applies delay and probability discounting to plea bargaining decisions, using paradigms that mirror the procedures used by traditional behavioral economics decisions regarding money. Section B explains how this application of delay and probability discounting provides scholars with the possibility to test (1) the influence of charge-sentence discount, which is the central variable in the shadow-of-trial model; and (2) whether the features of delay and probability that are inherent in comparing plea deals and trial affect decision-making of criminal defendants. Section C outlines the limitations of using discounting paradigms and potential future directions for experimental and empirical explorations of plea bargain decision-making.

A. APPLYING DISCOUNTING TO CRIMINAL DEFENDANTS' PLEA BARGAINING DECISIONS: PROCEDURE AND HYPOTHESES

As set forth in Part I.A, the classic delay and probability discounting paradigms ask participants to make a choice between two options (for example, \$10 now or \$20 in a month, in delay discounting, and \$10 with 100% certainty or \$20 with sixty percent certainty in probability discounting).¹⁷⁴ Overall, delay discounting studies find that individuals prefer immediate outcomes to delayed outcomes,¹⁷⁵ and, probability discounting

174. See, e.g., Estle et al., *supra* note 32, at 914.

175. See, e.g., *id.*; Sara J. Estle et al., *Discounting of Monetary and Directly Consumable Rewards*, 18 PSYCHOL. SCI. 58, 58 (2007); Joel Myerson et al., *Discounting Delayed and Probabilistic Rewards: Processes and Traits*, 24 J. ECON. PSYCHOL. 619, 620 (2003) [hereinafter Myerson et al. (2003)].

studies find that individuals prefer certain outcomes to uncertain outcomes.¹⁷⁶ In plea bargaining, the criminal defendant is choosing between a plea deal, which is both immediate and certain, and trial, which is delayed and uncertain.¹⁷⁷ Thus, generally, researchers may hypothesize that participants in the proposed study would accept pleas more as the probability of conviction and delay to trial increase.

Mirroring traditional paradigms, the procedure for measuring the impact of delay and probability discounting could be as follows: (1) randomly assign participants to a condition (for example, fifty percent certainty of winning at trial, with that trial being six months away); (2) have participants read a vignette about committing a crime; and (3) ask participants to choose between a realistic plea deal and trial change/sentence for the crime in the vignette. Based on what participants choose, the certain and immediate option (that is, the plea deal) will fluctuate to be more or less appealing with the goal that after enough of these choices, the participant will converge on an indifference point.¹⁷⁸ For example, the participant could be first offered the following two options:

176. See, e.g., Du et al., *supra* note 26, at 479–80.

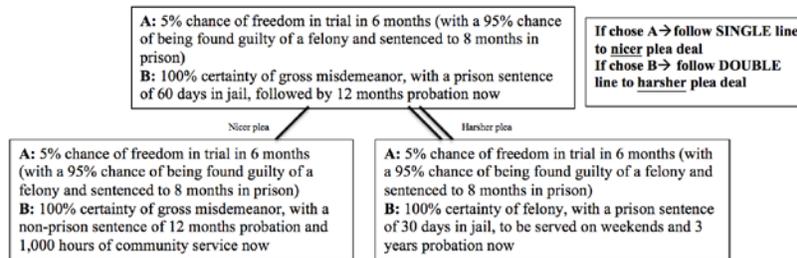
177. Recently, researchers have combined delay and probability discounting paradigms into a single task, making the choice: \$400 right now for certain, or an eighty percent chance of \$800 in six months. Ariana Vanderveldt et al., *Discounting of Monetary Rewards That Are Both Delayed and Probabilistic: Delay and Probability Combine Multiplicatively, Not Additively*, 41 J. EXPERIMENTAL PSYCHOL. 148, 150 (2015). Their findings are consistent with studies assessing delay and probability discounting separately, with some added suggestion that probability discounting is more weighty or important in participants' decisions. Furthermore, a critical reader may note that receiving money is different than receiving a criminal punishment, and they would be correct. However, the differences are not insurmountable. First, although there seem to be some differences between gains and losses, see *supra* note 32, the general preferences for immediate and certain outcomes holds because the proportion of participants who chose immediate loss ranged between forty percent and eighty-five percent, *supra* Figure 1, and mean proportion of participants who chose immediate loss was over sixty percent, *supra* Figure 2. Myerson et al. (2016), *supra* note 32, at 363–64. It is important to note that this study only evaluated delay discounting, and not probability discounting, but the field will likely be taking a closer look at probability discounting in the near future. Second, even if *loss* of money is different than *loss* of freedom (i.e., criminal punishment), performing the experiment provides a direct test of this. After a few replicated studies, scholars could be relatively certain that there is, or is not a difference between the commodities of money and freedom in the context of losses. The key here is that the proposal is an experimental test that the discounting theory applies in a new context. The application of theory to a new context is thus acutely falsifiable.

178. This requires scaling criminal charge-sentence combinations by asking participants to rank a series of criminal charge-sentence combinations so that

Trial option with 5% chance of freedom at trial in 6 months (95% chance of being found guilty of a felony and sentenced to 8 months in prison) or a plea deal of 100% certainty of receiving a gross misdemeanor, with a prison sentence of 60 days in jail, followed by 12 months probation.¹⁷⁹

If the participant takes the trial option, the plea option should be made more appealing (for example, gross misdemeanor with prison sentence of thirty days with twelve months probation) in order to get the participant to switch to choosing the plea option.¹⁸⁰ On the other hand, if the participant takes the plea option, the plea option should be made less appealing (for example, gross misdemeanor with a prison sentence of six months with two years probation) in order to get the participant to switch to choosing the trial option. Just like in the traditional delay and probability paradigms, the certain and immediate option should be the one that either gets more or less appealing. Figure 3 depicts these options.

Figure 3



If criminal defendants’ plea bargain decisions are consistent with the traditional discounting findings, one would expect that as the probability of conviction at trial increases and/or the delay to trial increases the likelihood of a criminal defendant accepting the plea increases. Lastly, to test the impact of charge-sentence discounting, a post-conviction sentence (felony with eight-month prison sentence in Figure 3) could be manipulated. For example, participants could be randomly assigned to conditions with one

you know which pleas are nicer/harsher than others.

179. As suggested in Part I.A, the probability of conviction can be changed in each decision tree, or this could be manipulated between subjects such that each participant only imagines a single scenario in which his/her chance of conviction is set and unchanging.

180. See Vanderveldt et al., *supra* note 177, at 150–51 (explaining that the participant’s subsequent choice included an adjusted amount of the smaller reward, “based on the participant’s previous choice”).

year, five years, ten years, or twenty years as their post-conviction sentences, and the difference in discounting between those conditions would quantify the extent of influence of a sentence discount (trial sentence minus plea bargain sentence offered).

In sum, it is possible to apply the traditional delay and probability discounting paradigms to plea bargaining decision-making in order to (1) test whether delay until trial and probability of conviction are important in plea bargaining decision-making; and (2) provide a consolidated experimental paradigm through which to test scholars' accumulating hypotheses about what influences criminal defendants' plea bargain decisions.

B. IMPLICATIONS FOR THE SHADOW-OF-TRIAL MODEL

The shadow-of-trial model suggests that the looming charge and sentence motivates defendants to plead and the time investment incentivizes prosecutors to negotiate a mutually agreeable plea bargain with a lower charge or sentence than the one threatened at trial.¹⁸¹ The charge-sentence discount may be part of the equation in plea bargain decision-making, but delay until trial and probability of conviction have been relegated to the margins. This Section explains the theoretical importance of the experimental paradigm described in the previous Section.

1. Traditional Charge-Sentence Discount

The manipulation of post-conviction sentence would serve as an explicit test of the impact of charge-sentence discount. However, in order to execute the paradigm, researchers would have to conduct preliminary studies on people's rankings and ratings of different realistic criminal charge and sentence combinations. For example, researchers would need to know whether a gross misdemeanor with twelve months of probation and 1000 hours of community service is more (or less) harsh than a gross misdemeanor with thirty days in jail, served on weekends. Different realistic sentences may be viewed by different defendants as more (or less) harsh. Additionally, researchers need to know whether a gross misdemeanor with a moderately harsh sentence (for example, sixty days in jail, followed by twelve months of probation) is perceived as more (or less) harsh than a felony with an objectively less harsh sentence (for example, thirty days in jail, followed by twelve months of probation). Knowing which charge-sentence combinations are ranked (or rated) as more (or less)

181. See *supra* Part I.B.3 and accompanying footnotes.

harsh would be integral for the titration procedure to work as designed, because the option that changes must be more (or less) appealing than the last option in order to converge on an indifference point.¹⁸²

2. Measuring Two Marginalized Variables: Delay to Trial and Probability of Conviction

Because the discounting paradigms outlined above present participants with two options with three differences (severity of charge-sentence, delay to conclusion, and probability), this model goes above and beyond the shadow-of-trial model by including more variables and testing scholars' accumulating intuitions about the factors that affect plea bargain decisions.¹⁸³

As mentioned in Part I.B, the shadow-of-trial model characterizes the plea bargaining process as a contractual negotiation in which attorneys subtract from the trial charge-sentence outcome (for example, gross misdemeanor with six months in jail) a fixed discount so that the plea deal results in a more appealing option for the criminal defendant in exchange for an acceptance of guilt, waiver of trial, and various other waivers.¹⁸⁴ The model underemphasizes factors other than this simple sentence discount, or at least assumes those factors are not sufficiently influential in criminal defendants' plea bargain decisions.¹⁸⁵ The behavioral economics literature suggests that delay and probability are influential features in decision-making in other contexts; and, the discounting paradigms outlined above provide the means of testing whether delay to trial and perceived probability of conviction at trial have systematic effects on the criminal defendant's choice separate from, and intersecting with, the criminal sentence or charge itself. Accordingly, the application of discounting paradigms to plea bargain decisions is a means of quantifying the effects of time and probability of conviction and giving it the proper weight in scholars' evaluation of plea bargaining utility and fairness, rather than letting the variables be relegated to the margins based on anecdotal evidence.

182. See *supra* Part I.A.3 (using monetary values, which allows for options that are obviously more or less appealing than others, to explain the titration procedure).

183. See, e.g., Bibas, *supra* note 16, at 2465 (noting time discounting); see also *supra* note 113 and accompanying text (noting probability of conviction).

184. Klein et al., *supra* note 54, at 76.

185. Bibas, *supra* note 16, at 2465.

Furthermore, the potentially central role of delay to trial and probability of conviction in the plea bargain decision-making process may explain why plea acceptance rates are so high¹⁸⁶—because of the preferences for immediate and certain outcomes.¹⁸⁷ As such, discounting paradigms are the answer to Covey's desire for cognitive principles that shed light on the majority of cases.¹⁸⁸ Although behavioral economics research on discounting suggests that the preferences for certain and immediate outcomes are relatively universal and robust, successfully applying the paradigms to a plea bargaining scenario would be a convincing demonstration of its generalizability. Additionally, the general preference for certain and immediate outcomes may even explain why people who are innocent, when confronted with this dichotomous decision, take the plea deal. This general preference for certain and immediate outcomes may combine with an innocent's worries about serving the full trial sentence or, in extreme cases like Phillip Bivens's, being sentenced to death.

Lastly, this model provides conceptual grounding to explain *how* specific aspects of the plea bargaining decision affect either delay to trial, probability of conviction, or both. For example, bail and pretrial detention rules may systematically influence the importance of delay to trial in the decision: if a defendant has to wait six months in detention for trial, those six months are much less appealing than six months on bail, living life relatively normally. In the latter case, delay to trial may not be that important to defendants aside from apprehension they may feel. Variables like strength of evidence, attorney time and resources, and attorney method of communication regarding odds of conviction may all influence a defendant's perception of the probability of his/her conviction at trial. Thus the discounting paradigm provides a theoretical explanation of how variables outside the traditional shadow-of-trial model, mentioned by Bibas and others, may influence the plea bargaining decision-making process by making delay to trial or probability of conviction more salient.

186. Plea acceptance rates are ninety-seven percent and ninety-four percent in federal and state cases respectively. Erica Goode, *Stronger Hand for Judges in the 'Bazaar' of Plea Deals*, N.Y. TIMES (Mar. 22, 2012), <http://www.nytimes.com/2012/03/23/us/stronger-hand-for-judges-after-rulings-on-plea-deals.html>; Mears *supra* note 8 and accompanying text.

187. Myerson et al. (2003), *supra* note 175, at 620.

188. Interestingly, the discounting paradigms, if supported, would counter the effects of the psychological processes that Bibas explores because he proposed that they were trial tendencies. *See supra* Part II.A.

In sum, discounting paradigms provide a step toward producing original data to test (1) whether the shadow-of-trial model's emphasis on charge-sentence discount is too narrow; and (2) whether the criminal justice system's design (two options with differences in delay and probability) systematically influences rates of plea bargain acceptance via the general human preference for certain and immediate outcomes.

C. DISCOUNTING'S LIMITATIONS AND FUTURE DIRECTIONS

Like any other experimental paradigm, discounting as applied to plea bargaining has limitations. First, in the outlined study, participants would be imagining themselves confronted with a choice between accepting a plea bargain or going to trial, and there is mixed evidence about whether the consequentiality of the commodity differentially affects real and hypothetical decisions.¹⁸⁹ Second, asking participants a series of questions does not perfectly mirror a real criminal defendant's plea bargain decision because the latter group makes a single decision. However, in applied experimental work, there is often a delicate balance between internal and external validity¹⁹⁰—the discounting paradigms are useful because of the robust results. If and when they are applied to plea bargaining, the results will likely inform more realistic studies in the future. Third, when experimental paradigms assign participant guilt or innocence, it is difficult to generalize to real cases because true guilt/innocence is relatively uncertain and unascertainable, except in the rare case of DNA exonerations. Fourth, participants may not respond to a simple vignette in a way that is realistic because they are not actually concerned that they will be criminally punished. While this limitation is a legitimate concern, realistic hypothetical scenarios are the best option to allow for experimentation because ethically and constitutionally, researchers cannot manipulate which

189. Anton Kühberger et al., *Framing Decisions: Hypothetical and Real*, 89 ORGANIZATIONAL BEHAV. & HUM. DECISION PROCESSES 1162, 1171 (2002) (“While our results are encouraging for the piecemeal validity of hypothetical decisions, we still lack a comprehensive theory of why in some cases hypothetical decisions match real decisions and in other cases they do not Without such a theory the whole advantage of hypothetical decision research is nullified because for each question to be answered by a hypothetical decision experiment the results have to be validated by an accompanying real decision experiment.”).

190. Leonard Bickman & Debra J. Rog, *Applied Research Design: A Practical Approach*, in THE SAGE HANDBOOK OF APPLIED SOCIAL RESEARCH METHODS 3, 12 (Leonard Bickman & Debra J. Rog eds., 2d ed. 2009).

criminal defendant gets what plea deal. Fifth, if researchers manipulate multiple levels of delay (one, two, four, six, ten month(s) to trial) *and* probability of conviction (twenty-five percent, thirty-three percent, fifty percent, seventy-five percent, and ninety-five percent) the sample size required will be large, which requires time and resources to complete.

After the experimental study suggested by this Note is completed, and assuming the hypotheses are supported, future research can explore many follow-up questions: (1) how does case evidence strength affect attorneys' evaluations of the probability of conviction, attorneys' recommendations communicated to their clients, and the final defendant decisions;¹⁹¹ (2) how do pre-trial detention and bail affect the results; (3) how do demographic and other psychological factors like impulsivity, delay of gratification, race, gender, and education interact with attorney communication style and degree of time and resources to affect these decisions; (4) how do steep mandatory minimums affect plea bargaining acceptance rates;¹⁹² (5) how does the difference between trial and plea bargain charge-sentence combinations affect decisions—maybe it is the distance between the two options that matters more than the other features; and (6) is there a threshold difference that makes it virtually impossible to refuse the plea deal? This research has the potential to add experimental and empirical rigor to the analysis of plea bargaining. Most importantly, if the features of trial (its delay and uncertainty) are found to be systematically aversive such that they influence criminal defendants to accept plea bargains, then this cognitive preference for immediate and certain options may be a finger on the scales of justice for all criminal defendants, including innocent defendants.

CONCLUSION

This Note starts by describing two currently separated literatures: plea bargaining in legal scholarship and discounting in behavioral economics. Developments in the literature suggest the beginnings of a conceptual bridge between the two literatures. However, interdisciplinary experimental research is still

191. This would add the more realistic complexity to Bushway and Redlich's 2012 paradigm. *See* Bushway & Redlich, *supra* note 15 and accompanying text.

192. Discounting studies utilizing monetary outcomes suggest discounting rates are different for different amounts of money. *See, e.g.*, Estle et al., *supra* note 32, at 918.

lacking. Moreover, the nature of the plea bargain decision options—a guilty plea, which is certain and immediate, or trial, which is uncertain and delayed—lends itself to be studied using the discounting paradigms. Furthermore, the traditional law and economics conception of plea bargaining makes behavioral economics paradigms like discounting particularly promising because the two fields are conceptually connected, and these paradigms explicitly test legal scholars' assumptions.

This Note makes the case for the use of discounting paradigms to experimentally test the influence of two features that are underemphasized by the shadow-of-trial model: delay to trial and probability of conviction. Once scholars have a better understanding of plea bargain decision-making (and the factors influencing those decisions), they will be better prepared to evaluate its fairness and implement change if appropriate. Focusing on experimental evidence may reveal that the very structure of the plea bargain choice unwittingly takes advantage of the underlying human preferences for certain and immediate outcomes. This results in a very efficient criminal justice system—if efficiency is defined as concluding cases with minimal time, money, and effort. This very design may violate contract law's requirement of a “free, informed, and rational” choice, especially for certain subpopulations, if not for all criminal defendants.¹⁹³ Experimental and empirical evidence should serve as the guiding light in assessments of plea bargaining—constitutional rights should not be relegated to the shadows.

193. See Scott & Stuntz, *supra* note 70, at 1918.