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# Why Laws Work Pretty Well, but Not Great: Words and Rules in Legal Interpretation

Lawrence M. Solan

STEVEN PINKER. *Words and Rules: The Ingredients of Language*. New York: Basic Books, 1999. Pp. xi + 348.

## I. INTRODUCTION: TWO KINDS OF PROBLEMS IN LEGAL INTERPRETATION

*Words and Rules* is Steven Pinker's third "popular" book about linguistics and cognitive psychology.<sup>1</sup> It is not about the law. In fact, it barely even mentions the law. *Words and Rules* is a book about how we form plurals of nouns and past tenses of verbs.

According to Pinker, the words for *irregular* plurals and past tenses, like *children* and *went*, are learned from experience and stored in our minds as separate words. We remember them individually and relate them to their singular or present tense forms, *child* and *go*. In contrast, *regular* forms, like *books* and *rained*, are rule governed. Although we might remember them individually, we need not do so, because we routinely apply regular rules of pluralization (adding the sound *s* or *z* or *iz* depending on the final sound of the word being pluralized) and of past tense formation (adding the sound *t*

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1. The first two are *The Language Instinct* (1994) and *How the Mind Works* (1997). Steven Pinker is the director of the Center for Cognitive Neuroscience at MIT.

or *d* or *id* depending on the final sound of the verb stem). In fact, we are perfectly happy doing this with novel words or even nonsense words, such as *dooks*, *degs*, and *daches* (or *lecked*, *ligged*, and *lodded*).

Let us assume, as Pinker argues in the final chapter of *Words and Rules*, that the human language faculty works this way more generally. Some aspects of language are learned individually and reinforced from experience, whether by rote or by analogy with forms that have already been learned. Others are rule governed and apply generally within their domain. Word-like properties include such idiosyncratic aspects of a language as its list of words and some aspects of their meaning. Rule-like properties include syntactic and phonological regularities and regular aspects of meaning that follow from syntax.<sup>2</sup> In fact, much of contemporary linguistic theory can be seen as an effort to separate these two aspects of language and to explain what about the design of the human mind permits, and sometimes even requires, the various regularities that exist not only within a language but also across languages.

Why should the legal community care about any of this, apart from those who happen to enjoy reading books about cognition and language? If this perspective is by and large correct, it should not be much of a step for us to conclude that the law works this way as well. After all, laws are expressed in language, and we necessarily use words and rules whenever we use language, whether for legal or for other purposes. This cognitive dualism is simply part of our innate design. Yet, those who write about legal interpretation, especially the interpretation of statutes, do not organize their analyses around this very important aspect of our mental architecture. Rather, the literature on interpretation is largely polarized. Textualists focus on how rule-like our laws are (see, e.g., Scalia 1989, 1997). Critical scholars, including postmodernist scholars, draw our attention to the indeterminacies of legal rules and the need to introduce context and social norms (see, e.g., Schlag 1999; Campos 1995). Others take intermediate positions between text and context (see, e.g., Eskridge 1994; Schauer 1991; Dworkin 1986; Posner 1990). Pinker's book is most consistent with an intermediate approach to interpretation and should help shape it by showing just where the law is likely to be indeterminate in its meaning.

My point here, and my reason for reviewing *Words and Rules* for this journal, is this: Most battles over legal interpretation are battles about the meanings of words. Grammatical rules typically remain in the background unnoticed. Consider these classic examples of cases involving issues of statutory interpretation: Does a minister's work count as "labor" (*Church of the Holy Trinity v. United States* [1892])? In 1931, should an airplane have

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2. For example, Bill is the logical object of "adored" in the passive sentence, "Bill was adored by his constituents," even though Bill occupies the subject position in the sentence. This aspect of meaning, then, follows directly from the syntax.

counted as a “vehicle” for purposes of a federal statute outlawing the transportation of stolen vehicles across state lines (*McBoyle v. United States* [1931])? Has one “used a firearm” when one has traded a gun for cocaine (*Smith v. United States* [1993])? Even more broadly, most battles over the nature of legal interpretation are battles over how we should deal with indeterminacies in word meaning. Typical questions of legal interpretation include: Should the original intent of the framers govern the interpretation of such constitutional terms as *cruel and unusual punishment*? Should judges consider legislative history in deciding how broadly to interpret statutory language?

Because so many of the interpretive problems in the law are lexical, legal scholars have tended to think of meaning, and even language, as dealing almost exclusively with the meanings of words. Pinker’s book and many other works in contemporary linguistics<sup>3</sup> suggest that this perspective sells short the human capacity to communicate ideas, including legal ones. The fact that the automatic, rule-like properties of language typically go unnoticed does not mean that they are unimportant. To the contrary, as is often the case, those aspects of our nature that are so much part of us that we fail to notice them are the ones that reveal the most about us when studied systematically. Understanding how words and rules combine in language and lawmaking moves us, I believe, toward understanding why it is that the law seems to work pretty well, but always seems to leave a residue of uncertainty.

The federal bribery statute provides a good illustration. The core of the statute is contained in section 201(b) of the Criminal Code.<sup>4</sup> Subsection

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3. For some recent texts that discuss the relationship between form and meaning, see Freidin 1992, Heim and Kratzer 1998, Chomsky 2000. For an excellent introduction to the work of Noam Chomsky, who pioneered contemporary linguistics, see Smith 1999. I discuss the relevance of Chomsky’s work to legal interpretation in Solan 1993, 1997.

4. The statute reads in relevant part:

(b) Whoever—

(1) directly or indirectly, corruptly gives, offers or promises anything of value to any public official or person who has been selected to be a public official, or offers or promises any public official or any person who has been selected to be a public official to give anything of value to any other person or entity, with intent—

(A) to influence any official act; or

(B) to influence such public official or person who has been selected to be a public official to commit or aid in committing, or collude in, or allow, any fraud, or make opportunity for the commission of any fraud, on the United States; or

(C) to induce such public official or such person who has been selected to be a public official to do or omit to do any act in violation of the lawful duty of such official or person;

(2) being a public official or person selected to be a public official, directly or indirectly, corruptly demands, seeks, receives, accepts, or agrees to receive or accept anything of value personally or for any other person or entity, in return for:

(A) being influenced in his the performance of any official act;

(B) being influenced to commit or aid in committing, or to collude in, or allow, any fraud, or make opportunity for the commission of any fraud, on the United States; or

(1) makes it a crime to give or offer a bribe to a public official, and subsection (2) makes it a crime for a public official to accept a bribe. Consider this simplified version of subsection (1):

Whoever, directly or indirectly, corruptly gives, offers or promises anything of value to any public official, with intent to influence any official act, shall be punished.

To understand this statute, one must at some level be aware of the following rule-like aspects of the statute, among others:

1. The statute is a sentence.
2. The subject of the sentence is “whoever, directly or indirectly, corruptly gives, offers or promises anything of value to any public official, with intent to influence any official act,” and the predicate is “shall be punished.”
3. The subject of the sentence is actually a clause. “Whoever” is the subject of that clause, and “directly or indirectly, corruptly gives, offers or promises anything of value to any public official, with intent to influence any official act” is the predicate of that clause.
4. The verbs “give” and “offer” involve three arguments: the subject of the sentence, a direct object, and an indirect object. The subject is “whoever,” the direct object is “anything of value,” and the indirect object is “any public official.”
5. “Corruptly” modifies the predicate, “gives, offers or promises anything of value.”
6. “With intent to influence any official act” modifies “whoever.”
7. The logic of the word “or,” which is used on two occasions, requires that modifiers apply to both disjuncts.

Again, one should not underestimate the complexity of these aspects of the statute’s meaning just because they come easily to us. Linguistic theory offers explanations for many of these phenomena, typically making sense of them at a level of abstraction somewhat remote from the facts. If we are willing to devote the time to it, we even do fine understanding the entire statute (see note 4), which contains all kinds of additional modifiers and parentheticals that make the statute harder to process. Although the bribery statute is heavily litigated, few cases raise any of these aspects of the statute’s meaning as a legal issue.

In contrast, the meaning of just about every phrase in the statute has been vigorously contested, sometimes even to the Supreme Court. For example, many cases ask who should count as a public official. Although the

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(C) being induced to do or omit to do any act in violation of the official duty of such official or person;[shall be punished]. (18 U.S.C. § 201(b))

statute defines that term,<sup>5</sup> courts have had to decide such issues as whether an independent contractor working on a federal project should count as a public official (*United States v. Ricketts* [1987]; *United States v. Dixon* [1984]); whether a state employee whose job includes supervising federal as well as state inmates should count as a public official (*United States v. Velazquez* [1988]); and whether a state official whose salary is funded with federal funds should count as a public official (*United States v. Loschiavo* [1976]; *United States v. Strissel* [1990]; *United States v. Hinton* [1982]). Similarly, there has been extensive litigation over what should count as an “official act” and what “corruptly” means.<sup>6</sup>

As for disputes over the meaning of the bribery statute that involve the application of linguistic rules, consider *United States v. Gjieli* (1983). The legal issue was whether the defendant had violated the statute by giving money to a federal agent who was to help a prisoner to escape from a state prison in Michigan. The agent had no official function with respect to Michigan’s state prison system. The linguistic issue was the scope of the expression “in any official function” in section 201(a),<sup>7</sup> which defines “public official” in part as “an officer or employee or person acting for or on behalf of the United States . . . in any official function.” Does “in any official function” modify “an officer or employee or person acting for or on behalf of the United States,” or does it merely modify “person acting for or on behalf of the United States”? Most people, I believe, would find this statute ambiguous.<sup>8</sup> The court held that “in any official function” applied

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5. “The term ‘public official’ means Member of Congress, Delegate, or Resident Commissioner, either before or after such official has qualified, or an officer or employee or person acting for or on behalf of the United States, or any department, agency or branch of Government thereof, including the District of Columbia, in any official function, under or by authority of any such department, agency, or branch of Government, or a juror” (18 U.S.C. § 201(a)(1)).

6. For “official act,” see *United States v. Sun-Diamond Growers* (1999) (Court held an “official act” for purposes of statute must involve a specific matter involving the corporation before the Agriculture Department in which it exercised regulatory authority); *United States v. Biaggi* (1988) (term “official act” involving the bribe of congressman was held not limited to acts in the legislative process, but included all acts generally thought to constitute legitimate use of congressman’s office); *United States v. Arroyo* (1978) (approval of a government loan was found to be an “official act,” because it was a decision brought by law before the public official in his official capacity and position of trust).

For “corruptly,” see *United States v. Chen* (1985) (defendant had requisite corrupt intent because he was repeatedly told that the law would have to be broken to obtain a green card from an INS official, and defendant was present when the money was given to the official); *Okabe v. INS* (1982) (corrupt mind element of the offense involves moral turpitude and was satisfied when the defendant offered the immigration officer \$325 with intent to induce him to behave in violation of his lawful duty); *United States v. Jennings* (1973) (defendant who seeks to corruptly influence a federal official need not know that the person is a federal official acting as such at the time the bribe is offered, suggesting that the sole requirement to satisfy intent is knowledge of the corrupt nature of the offer and an intent to influence an official act).

7. See note 5 above for the statute’s complete text.

8. Actually, this is an example of an ambiguity in the application of “the last antecedent rule,” a legal canon of interpretation that says that unless context dictates otherwise, modifi-

only to persons acting for or on behalf of the United States other than employees and officers and thus affirmed the bribery conviction. A dissenting judge disagreed.

While such cases are linguistically interesting, they are considerably less common than cases in which the dispute is the fit between the words in a statute and the events that have occurred in the world. The comparative abundance of bribery cases that deal with word meaning is, I believe, quite typical and quite telling. It illustrates how Pinker's book can contribute to legal discourse. The more rule-like language is, the more the rule of law really can be a law of rules, to use Justice Scalia's expression (Scalia 1989).<sup>9</sup> The more word-like language is, the more the rule of law must be contingent on individual experience and social convention. If language is both, as Pinker argues, then our laws are more complex. They consist of words whose applicability is not always clear. But the relationships among the words are typically uncontroversial. This approach seems to me to describe our law-making ability quite well. It also explains how legal theorists can disagree so vehemently, with each side able to adduce evidence to support its position. Textualists can point to rules—and there really are rules. Critical theorists, such as postmodernists, can point to indeterminacies in the applicability of legal concepts—and there really are indeterminacies.

Of course, things are not really so crisp. Linguistic expressions, as we have just seen, are sometimes subject to analysis under alternative rules, making them ambiguous. "Flying planes can be dangerous" is a classic example from the linguistic literature.<sup>10</sup> On the other hand, word meanings are often obvious, either because a word has only a single sense, or because our cognitive architecture makes certain interpretations automatic, or because people are so good at determining the intended sense of a word from context.<sup>11</sup> Not everything that is learned remains up for grabs. The stability of irregular past tense forms illustrates that point well. I return in section III to how these observations further impact on legal interpretation. First, though, let us look at Pinker's arguments for the words and rules approach to plurals and past tenses.

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ers are assumed to be linked to the last possible antecedent. The problem here is that the modifier follows a compound phrase, "an officer or employee or person acting for or on behalf of the United States." What counts as the last antecedent: the entire phrase, or only its last element? For discussion of this problem generally, including more detailed linguistic analysis, see Solan 1993.

9. See Winter (forthcoming) for recent criticism of Scalia's characterization of the way that legal rules operate. I return to Winter's work in section III.

10. This example comes from Chomsky 1965, 21. The sentence is ambiguous between meaning "it can be dangerous to fly planes" and "planes that are aloft can be dangerous."

11. For discussion of how skilled people are at determining the intended sense of a word from context, see Miller 1996.

## II. THE WORDS AND RULES PERSPECTIVE

### A. The Great Debate

Pinker presents his view as the middle ground between two extreme positions. On one side is Chomsky and Halle's seminal book, *The Sound Pattern of English* (1968), which accounts for English past tense forms, both regular and irregular, with a series of rules, many of which occur in the language anyway. The principal rule adds *t*, *d*, or *+d* to the end of a verb, depending on the verb's final sound (*walked*, *begged*, *created*). This rule is a productive one. As new verbs enter the language, every speaker knows how to express their past tense. Other rules handle irregular verbs. For example, a vowel change rule converts "sing" to "sang," and "ring" to "rang." Another one converts "buy" to "bought," and so on.

Pinker's disagreement with Chomsky and Halle's position is the baroque manner in which it handles the irregular verbs (p. 100). While I will not go into detail here, the basic problem is that the rules work at maximum generality if they are applied to abstract forms that resemble the English spoken hundreds of years ago. Thus, the alternation between "run" and "ran" becomes more regular if we assume that the underlying form for the two is "rin," the form from which modern "run" actually evolved (see Chomsky and Halle 1968, 209). It then resembles the alternation between "sing" and "sang." English irregular verb forms are a function of historical contingency, and unless one finds a way to capture that history in the grammar, English irregular past tense forms really are just that: irregular. As elegant as Chomsky and Halle's theory is, Pinker argues, there is no evidence that children learning English today have any access to the history of English, making it very unlikely that this aspect of their theory bears any significant relationship to what is psychologically real.

Pinker's criticism of the Chomsky and Halle position is fair. Nonetheless, it is important to recognize that neither Chomsky nor Halle claims that all knowledge about words is rule governed. Their claim is far more limited: The sound pattern of English is rule governed. To the contrary, Chomsky takes the position that certain aspects of word meaning may be innate in that they are universal and appear to follow automatically from learning the concept that the word expresses,<sup>12</sup> but that other aspects of word meaning are learned from experience.<sup>13</sup> No one claims that the meaning of words is

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12. For example, Chomsky notes that we can understand the word *book* either abstractly or as a concrete object, as in "the book that he is planning will weigh at least five pounds if he ever writes it." About such facts, Chomsky comments: "What we discover is surprisingly intricate; and, not surprisingly, known in advance of any evidence, hence shared among languages" (2000, 16). See Bloom (2000, 9) for further discussion of these examples.

13. Chomsky writes: "Investigating language use, we find that words are interpreted in terms of such factors as material constitution, design, intended and characteristic use, institutional role, and so on" (2000, 15).



rule governed in the same way as is the sounding out of the past tense in regular verbs. Rather, linguists traditionally describe the mental lexicon as a repository for idiosyncratic information.<sup>14</sup> Pinker is best described as a Chomskyan who disagrees with Chomsky on a rather narrow issue (and is most likely right about it). Outside the debate about the status of irregular past tense verbs and plural nouns, linguists generally subscribe to a words and rules approach, more or less as a given.

Not so a group of connectionists, who occupy the other extreme position in the debate that Pinker describes. In their 1986 book, David Rumelhart and James McClelland first claimed that they were able to computer-generate all English past tense forms—both regular and irregular—without resort to rules at all. They characterized this approach as a new alternative to the Chomskyan, rule-oriented approach to studying language. How did they do this? They trained a neural network with the sounds of numerous verbs and then taught the network the past tenses of those verbs: “walk-walked,” “is-was,” “run-ran,” “go-went,” “bring-brought,” and so forth. The irregular verbs in English are typically among the most common. Based solely on experience, and without the benefit of rules, the neural network operates by analogizing the features of new input to the most salient features of what it has learned.<sup>15</sup>

In their simplest form, neural networks are learning machines, much along the lines of the behaviorist tradition of Thorndike, B. F. Skinner, and others.<sup>16</sup> With the right kind of training, the neural network, it was claimed, could not only generate regular and irregular past tense forms, but it could also, by analogy, handle novel words as they occurred. The networks are pattern associators that draw conclusions based on how well new

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14. “In general, all properties of a formative that are essentially idiosyncratic will be specified in the lexicon” (Chomsky 1965, 87). In fact, this view predates Chomsky. For example, Bloomfield wrote: “The lexicon is really an appendix of the grammar, a list of basic irregularities” (1933, 274).

15. For an accessible description of the connectionist approach to the past tense from authors sympathetic to that position, see Elman et al. 1996, 130–47.

16. For instance, in his book, *Verbal Behavior*, Skinner noted: “Every verbal operant may be conceived of as having under specified circumstances an assignable probability of emission—conveniently called its ‘strength.’ . . . A second sort of evidence suggests that strength lies along a continuum from zero to a very high value” (1957, 22–23). For discussion of connectionism as behaviorism, see Smith (1999, 131–35). As Smith points out, there are many serious problems for connectionism as a theory of linguistic knowledge. Among them is the fact that connectionist models are in some sense too good: they can recognize patterns that do not occur in human language. For example, Smith refers to experiments in which subjects were confronted with a fragment of a “new” language. They simply could not learn a rule that provides emphasis by adding the sound “nog” to the end of the third word of a sentence. Natural language has no counting rules of that sort. Yet such a rule would be a simple matter for a connectionist model that relies solely on associations of patterns. Of course, one can instruct a connectionist model to ignore any patterns that require counting. But such a model would have programmed into it an innate rule, which is just what the connectionist theory says is superfluous. For a discussion of differences between connectionism and behaviorism, see Elman et al. 1996, 103–4.

information fits into various patterns they have already experienced. For example, once we know that *rang* is the past tense of *ring*, we are likely to conclude that *sang* is the past tense of *sing*.

Pinker devotes a great deal of *Words and Rules* to showing the weaknesses in the connectionist approach. The problem is that it just doesn't work very well unless one rigs the training (order and amount of input). Even then it overgenerates some forms and undergenerates others. Moreover, summarizing research that he had conducted with psychologist Gary Marcus and others (Marcus et al. 1995), Pinker extends the words and rules approach to languages like German, in which the regular, default forms occupy a much smaller percentage of total verbs (45% in German vs. 86% in English) (p. 217). This is a problem for the connectionist approach. Any system that uses experience to generate past tense forms by analogy will surely overgenerate irregular forms, and the connectionist models do just that.

Similarly, German has eight different plural forms. The default form, that applies to such forms as names, is *s*. However, as Marcus et al. 1995 point out, only about 1 to 3% of German plural nouns actually take the *s* ending. Pattern associators have difficulty handling such facts without building them into the network in advance. But to do so is to endow the neural network with innate rules, such as, "mark names specially and give them the *s* plural ending," exactly what the connectionist approach claims it is able to avoid (see Marcus et al. 1995, 243-44). Also difficult for the connectionist approach is Hebrew, where nouns with irregular plurals are very similar in sound to those with regular plurals (pp. 235-36). Any effort to generalize irregular forms based on similarity of sound will fail. In contrast, it is easy to account for the Hebrew data by assuming that speakers learn the irregular nouns and regard the rest of the language as subject to the default plural rules.

On the other hand, Pinker argues that connectionism works fine when limited to the irregular forms only. Recall that these forms are learned individually even under his theory. In English, irregulars tend to exist in clusters, such as "ring-rang," "sing-sang." Similarities among the sounds of irregular verbs and the amount of exposure to them indeed matter in their acquisition. Nonetheless, if you never hear an irregular form, you will just assume that the verb is regular ("ping-pinged").

One cannot praise Pinker enough for emphasizing this fact. While prominent psychologists in other areas of cognition share Pinker's dualistic approach,<sup>17</sup> this area of cognitive psychology is sharply divided. In the

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17. For example, in his text on human memory, Alan Baddeley assesses connectionist models as follows: "They appear to offer a plausible way of theorizing about pattern recognition and retrieval, but may be less effective than more traditional serial or rule-based approaches to describing certain types of problem-solving and reasoning behavior. It is suggested that in the final analysis, it will probably be necessary to blend connectionist approaches with

middle of this battle, Pinker asks just the right questions: When is each theory at its best, and can we gather evidence from experiments and natural speech samples that will shed light on these issues? The bulk of *Words and Rules* presents that evidence, which impressively supports Pinker's dualistic approach to the structure of the language faculty.

## B. The Evidence

Much of the book is devoted to demonstrating that the words and rules approach accounts for all kinds of data in adult and child language. Included are preferences for one form over another in experimental studies, analysis of frequency effects in large corpora, child language facts, and studies of the consequences of particular kinds of brain injury. I will not summarize all of this evidence. Rather, I will illustrate it with a few examples from each type of data.

### 1. *Adult Intuitions about English*

The most obvious empirical argument for the words and rules approach is that regular forms are productive—irregular ones are not. In fact, other than “snuck,” there are no irregular past tenses creeping into the vocabulary right now. In contrast, words like “shone” seem to be on their way out. Novel verbs (“he wugged the fish”), words from foreign sources (“cappucinos,” not “cappucini”); verbs from names (“he Richard Nixoned the tapes”), names themselves (Julia and Paul Child are “the Childs,” not “the Children”), verbs from quotations (“I can't believe that he ‘hello deared’ me again”), and all kinds of other new words are regular. In fact, some of them *must* be regular. Pinker argues that irregular verbs are all *roots*, that is, canonical word forms. Verbs from names, foreign sources, and phrases, in contrast, are rootless. There is thus no way for them to become irregular, and they never do.

As Pinker gets more involved in arguing for his position, the data become more subtle and more interesting. Consider the following examples:

- (1) \*I wouldn't move into that rats-infested apartment.<sup>18</sup>
- (2) I wouldn't move into that mice-infested apartment.
- (3) I wouldn't move into that mouse-infested apartment.

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more rule-based models using the empirical methods of experimental psychology to evaluate and shape such developments” (1990, 378). Pinker's position is consistent with Baddeley's approach. But compare, for example, Fodor and Pylyshyn 1988 and Elman et al. 1996.

18. “\*” is used in the linguistic literature to indicate an ungrammatical sentence.

Even if you don't find (2) very good, it is much better than (1). Why? Pinker explains that we form compounds from roots—not from whole words. "Mice" is itself a root in addition to being a whole word. "Rats" on the other hand, is made up of the root, *rat*, and the plural marker, *s*. Thus, while we may prefer (3) to (2), many examples like (2) appear in everyday speech, and no examples like (1) do.

Similarly, Pinker predicts that verbs formed from nouns should be regular, even if they have the same sound as irregular verbs. This is why we say that the baseball player "fled" out to left field (not "flew" out) or that the soldiers "ringed" the city (not "rang"). While there are exceptions to this phenomenon that Pinker explains on a more or less *ad hoc* basis, the overall story is a compelling one. Connectionist models, which rely exclusively on similarity of sound, have no way to approach these facts at all. What word could possibly sound more like *ring* than *ring*?

The book is also full of experimental data, some of which relates to this very point. For example, Pinker and his colleagues (Kim et al. 1991) presented adult subjects with stories such as (4).

- (4) When guests come, I hide the dirty dishes by putting them in boxes or in the empty sink. Bob and Margaret were early so I quickly boxed the plates and *sinked/sank* the glasses.

Half the subjects heard one version, and half heard the other. When asked to rate how good the past tense was, subjects that heard the regular form gave higher rankings.

These examples are significant not only because they show that aspects of past tense and plural formation are rule governed but also because they show that aspects of the rules refer to the abstract structure of words. The past tense becomes very predictable once we introduce concepts such as verb, noun, and root into the analysis. To the best of my knowledge, no one has been able to account for this range of subtle data without such theoretical apparatus. It is very strong evidence that the "rules" part of the words and rules approach has substance.

## 2. *Child Language*

Among the most interesting parts of the book is Pinker's discussion of child language. Everyone has stories about children's overgeneralizing regular forms, such as, "he hitted me," or "I bringed my book." There is a substantial literature on such phenomena. Pinker's version,<sup>19</sup> again based

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19. Pinker and his colleagues have worked on the problem of acquisition of past tense forms in English for many years. See Marcus et al. 1992 for a more technical exposition of some of this work.

largely on research conducted in collaboration with other psychologists, makes crucial use of what he calls “the blocking principle.” According to Pinker, regular forms are defaults that occur unless they are “blocked” by an irregular form that one has specifically learned. The blocking principle accounts for how languages like German can exist, in which the majority of verbs are irregular. Psychologically, a form is regular not because it is in the statistical majority, but rather because the language defaults to that form if no other form has been learned.

All observers of child language note that acquisition seems to proceed in a “U-shaped” curve. Children initially make very few errors. At some point during the acquisition process, errors, especially overgeneralization of regular forms, become far more common. Subsequently, they subside, and the adult form of the language is acquired. Pinker explains this phenomenon elegantly. Children begin by learning whatever forms they acquire—regular or irregular. At some point, they learn the past tense rule. The blocking principle should inhibit errors, and it does. As cute as children’s overgeneralizations sound, they continue to use irregular forms appropriately most of the time (pp. 86-87). What errors they do make result from the irregular forms not being deeply enough entrenched at such a young age to inhibit the regular form every single time. With more experience, the errors subside. The same holds for children’s efforts to analogize irregular forms to new situations. A child may use “brang” for a while, but will stop when “brought” becomes sufficiently salient.

What is especially compelling about this approach to language development (see Marcus et al. 1992 for details), is that it requires no special assumptions about cognitive reorganization during childhood or about the order or quality of the input. There is no overgeneralization until children learn the rule, and there is little overgeneralization after children become more familiar with the full set of irregular forms. Connectionist models also purport to mimic the U-shaped pattern of the language acquisition process. But they do so, Pinker argues, only by flooding the device with disproportionate numbers of regular verbs at the time that they are overgeneralized. Empirical analysis of child language corpora reveals that parents do not use disproportionately many regular verbs when speaking to children during this period (pp. 204–6). Pinker makes much of these facts in arguing for his position.

This debate over how children acquire the past tense is part of a larger debate about the acquisition of linguistic structures generally. A recent book by Paul Bloom (Bloom 2000) adds further support for Pinker’s general approach. According to Bloom, associative theories of word learning do not account for the meanings of words either. Rather, to acquire new words in

abundance, children use a theory of mind that attributes certain intentions to the speaker (often their parents). Bloom concludes:

If this is right, then a *direct* connectionist implementation of word learning, in which sounds are associated with percepts, is unfeasible. (And this does preclude all connectionist implementation of word learning that I am aware of.) But it leaves open the possibility that the mechanisms underlying word learning, while themselves not associationist, are somehow the product of associationist learning mechanisms. In particular, if a connectionist theory can account for the origin and nature of the relevant theory of mind capacities, then connectionism is consistent with the facts of early word learning. If it can't, it isn't. (Bloom 2000, 60)

Bloom also recognizes that “[l]earning a word is a social act” (2000, 55). If Bloom is right on both counts, it means that learning the meanings of words is an endeavor that engages various aspects of our cognitive capacity, just as the acquisition of past tense and plural forms does, if Pinker is right.

### 3. *Brain Research*

Probably the most speculative part of the book is Pinker's discussion of the relationship between specific neurological injury and the words and rules theory. The weakness comes not from the structure of the argument, but from the fact that brain injuries are rarely limited to particular areas of the brain. Nonetheless, Pinker presents some suggestive data.

For example, as a result of stroke or head trauma, some people suffer from agrammatic aphasia, the result of which is that they have trouble applying linguistic rules generally. They speak in strings of words without appropriate grammatical connectives, like “Son . . . university . . . smart . . . boy . . . good . . . good” (p. 248). Other people suffer from anomia, a different kind of aphasia, in which people become unable to retrieve words. Agrammatic aphasia and anomia are associated with injuries to different parts of the brain, which is itself suggestive of the presence of different systems for words and rules.

Pinker and a group of colleagues (Ullman et al. 1997) compared the performance of an agrammatic aphasic patient with that of an anomic aphasic patient on a test that asked them to complete sentences such as “today I dig a hole, yesterday I \_\_\_\_ one.” Some verbs were irregular (like “dig”), others regular, and still others novel. The agrammatic patient “had far more trouble inflecting regular verbs than irregular verbs, was almost incapable of inflecting novel words like *plam*, and never overgeneralized the rule to irreg-

ular verbs, which would have resulted in errors like *digged*” (1997, 249). The anomic patient, in contrast, did just the opposite.<sup>20</sup>

Because brain lesions typically span more than one area, and because they often have a variety of effects on their victims, these studies are hard to conduct and do not always suggest only a single interpretation. Pinker is straightforward about these limitations. Moreover, Pinker does not devote much effort to discussing the opposing view—that the brain’s plasticity, now well documented, provides support for the connectionist model. For example, Elman et al. (1996) argue that certain brain injuries ultimately result in the re-establishment of lost cognitive function in other parts of the brain using other brain cells. This is especially true during the developmental period. This phenomenon argues against the type of specialization that Pinker espouses. Of course, the experiments on aphasic patients that Pinker describes provide counterexamples to Elman et al.’s position. These debates are underrepresented in *Words and Rules*. Nonetheless, the studies that Pinker describes give at least some added support to his position.

### III. LEGAL RULES AND LINGUISTIC DETERMINISM

Ultimately, the question that engages the legal community is the extent to which language determines meaning independent of social context. The last chapter of *Words and Rules*, titled “A Digital Mind in an Analog World,” speculates on such matters and even recognizes its implications for a system of law in the book’s final paragraph (p. 287). I would like here to discuss Pinker’s position and to go a little further in showing how the duality of the words and rules approach to grammatical phenomena generalizes to issues of conceptualization that are more obviously relevant in legal thinking. I will then discuss some of the limits of this approach. As it turns out, words sometimes give us certainty, and rules uncertainty in meaning. Finally, I will show how a more sophisticated model of linguistic rules potentially provides additional insights into the nature of thought and its ramifications for legal reasoning.

#### A. Two Approaches to Conceptualization

Throughout this essay I have contrasted various word-like linguistic phenomena with rule-like linguistic phenomena, showing how each con-

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20. Research on Japanese nominal forms published after the publication of Pinker’s book adds further neurolinguistic support to the words and rules approach. Japanese has two suffixes for changing adjectives into nouns: *sa* is the productive, default suffix, and *mi* is used with a particular set of adjectives. Moreover, the two suffixes have somewhat different meanings. Hagiwara et al. (1999) found that people with a particular type of aphasia (corresponding to the agrammatic aphasia described above) had trouble with *sa* adjectives and that other groups had more trouble with *mi* adjectives.

tributes to interpretation. In the final chapter of *Words and Rules*, Pinker shows how word meaning itself is really subject to both kinds of analysis. Since so much of legal debate is over the meanings of words, it is useful to see how the psychology of word meaning plays out. Here, I will only briefly summarize the argument.<sup>21</sup> Traditionally, word meaning was thought to be captured in definitions, that is, the set of conditions both necessary and sufficient for the word to obtain. A sister is a female sibling, a bachelor is an unmarried adult male, and so on. This approach to word meaning is often called the classical approach, since it follows from Aristotle. In the 1970s, psychologist Eleanor Rosch conducted groundbreaking experiments in which she showed that for most people, concepts have fuzzy boundaries, that some examples of words are better than others, and that many features of words are neither necessary nor sufficient (see Rosch 1975). For example, subjects regarded an ostrich as a bad example of a bird and a robin as a good example of a bird. Beds are good examples of furniture, clocks are fuzzy ones. Rosch explained these phenomena by arguing that our concepts are based, at least in part, on prototypes, rather than on definitions. Most important is the presence of certain salient features and combinations of enough features to help us to draw conclusions about categorization. The closer an object comes to the prototype of the category, the better an example of the category it is.<sup>22</sup>

Prototype analysis is exactly what the connection models do best. As noted above, they are pattern associators. What Rosch showed is that in categorizing objects, we associate them with the most salient patterns based on past experience. If this is correct, then we should expect pattern associators to do a good job when it comes to issues of categorizing artifacts—and they do. This has important ramifications for legal theory, as Steven Winter has noted (Winter 1989; forthcoming).<sup>23</sup> It means that definitions of legal concepts will often be elusive, and that legal categories should generally be socially contingent, based on salient experiences.

It is now generally accepted that prototypes play a role in our psychology. Yet in recent years, many psychologists have concluded that our minds work both with defining features and with prototypes. For example, Medin et al. (1987) demonstrate that, given a choice, people prefer to categorize

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21. Elsewhere, I have taken the position that cognition involves both kinds of system, and have argued that awareness of them contributes explanatory power to issues in statutory interpretation. See Solan 1998.

22. Rosch was intentionally vague about the mechanisms through which her observations are actually realized in the mind, leaving that for future research. For disagreement with Rosch's approach, see Wierzbicka 1996. Wierzbicka proposes that words have classical definitions, but that those definitions include information about the mental states that they trigger. To the extent that she is successful, she reconciles the two approaches. For an excellent discussion of current thinking on the psychology of concepts and categories, see Smith 1995.

23. Simon 1998 also uses connectionist modeling to account for certain aspects of the judicial decision-making process.



objects according to defining features rather than according to the number of features that they have in common. Other psychologists who have addressed the issue have come to similar conclusions (see Johnson-Laird 1983; Sloman 1996). And in an important study, Armstrong, Gleitman and Gleitman (1983) showed that people exhibit prototype effects for categories such as *bird*, while clearly recognizing that “bad” examples of birds are no less real birds than are “good” examples of birds. Pinker relates this duality in our formation of concepts to the words and rules approach of his book. Some of our thinking is from the top down, other aspects of it are from the bottom up.

If Pinker and the other psychologists are right about this, the ramifications for the legal system are both serious and far reaching. For example, referring to social psychologists who have drawn similar conclusions about this psychological duality, Sanders (2001) argues in a recent article that decisions about the admissibility of expert testimony should take into account whether the expert is being called to reason from the bottom up, as a person with greater experience than others, or from the top down, as a theorist. How the system deals with such problems is a legal issue, but recognition of the psychology of these two different kinds of expertise is a prerequisite for an informed approach.

Perhaps most significant are the implications of this psychological duality for questions of legal interpretation. Some Supreme Court cases concerning statutory interpretation can be seen as battles among the justices over definitions versus prototypes. For example, in *Smith v. United States* (1993), the Court had to decide whether the defendant’s attempt to trade a machine gun for cocaine constituted “using a firearm during and in relation to a drug trafficking crime.”<sup>24</sup> In a 6–3 decision, the majority said it did. Justice O’Connor’s opinion recites many dictionary definitions of “use” and concludes that bartering is a kind of using. Justice Scalia’s dissent relies on prototype analysis: no one would ever think of “using a firearm” as meaning trading a firearm. Rather, people think of “using a firearm” as meaning using it as a weapon.<sup>25</sup> Pinker’s approach does not tell us who is right. That is a legal question. But it does explain what such vehement debates are about conceptually. If recognized by judges, it has the potential to elevate debate over statutory interpretation to a far more informed level of discourse.

A look at the Court’s most recent examination of the same statute clearly shows a need for improvement in judicial reasoning about statutory concepts. In *Muscarello v. United States* (1998), the Court dealt with the ordinary meaning of the word “carry.” Consider (5):

(5) John carried a gun when he bought the cocaine.

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24. The statute at issue is 18 U.S.C. § 924(c)(1). It also refers to carrying a firearm.

25. I discuss this and related cases in more detail in Solan 1997, 1998.

Everyone would agree that John was carrying a gun if he had one in his hand or in his pocket, which are the usual ways to carry a gun. But was he carrying a gun if he had one in the trunk of his car while trading in drugs in the front seat? Those were the facts in *Muscarello*. And even if he was, is that sense of “carry” so unusual that a legal system should not deem John guilty of violating a law that imposes a lengthy sentence for those who carry a firearm during and in relation to a drug trafficking crime? These are the kinds of questions that the legal system is accustomed to addressing. They are typically not questions of rules, but questions of norms. A basic canon of statutory interpretation says that words are to be given their “ordinary” meaning, and meaning is ordinary when it is typical.

In *Muscarello*, the Court held that a defendant with a gun in the back of his truck was carrying it. In determining the “ordinary” use of “carry,” the Court referred to dictionaries, to examples of similar usage in literature, to database searches, and to intuitions about ordinary word use. The dissenting opinion used the same kinds of sources, but focused on different examples and data. The opinions jump from quoting *Robinson Crusoe* to arguing over which dictionary is the most authoritative. Some of these sources, like the dictionary, reflect a rule-like approach to word meaning. Others, like analysis of frequency of use in literature, seem to focus on prototypical usage. Nowhere in either opinion was there evidence that the justices were aware that they were taking advantage of competing cognitive styles to make legal argument. The case is an advertisement for the need of more serious judicial approaches to the meanings of statutory words. Pinker’s book provides the intellectual underpinnings of one such approach.

## B. Ambiguity in the Application of Rules and Clarity in the Use of Words

Earlier in this essay, I suggested that the “words” aspects of our linguistic capacity accounts for much of the uncertainty in language, while the “rules” aspects account for its regularity. Though that generalization loosely holds, it is too simple. In this section, I will explain why.

Some uncertainty about meaning comes from the ambiguous application of rules. Legal cases involving the ambiguity in the application of linguistic rules do occur from time to time, as we saw earlier in the discussion of the federal bribery statute.<sup>26</sup> In the past 15 years, for example, there have been several Supreme Court decisions about the scope of adverbs in laws whose syntax is like (6):

(6) John intentionally hit Bill near the china closet.<sup>27</sup>

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26. See text accompanying note 4 above.

27. I discuss this structure and some of the older cases in Solan 1993, 67–75.

The ambiguity here is whether “intentionally” modifies “hit Bill,” or whether it modifies the entire phrase, “hit Bill near the china closet.” In the first reading, the sentence says nothing about John’s intentions with respect to the location of his violence—only with respect to the violence itself. The second reading says that both the violence and its location were intentional.

Now consider the following statutory excerpts:

- (7) Whoever knowingly . . . transfers . . . [food stamps] in any manner not authorized by this chapter or the regulations issued pursuant to this chapter shall . . . [be punished]. (7 U.S.C. § 2024(b); see *Liparota v. United States* [1985])
- (8) A person willfully violating this subchapter or a regulation prescribed under this subchapter [dealing with the structuring of currency transactions] . . . shall be fined not more than \$ 250,000, or imprisoned for not more than five years, or both. (31 U.S.C. § 5322(a); see *Ratzlaf v. United States* [1994])
- (9) Whoever . . . (D) willfully violates any other provision of this chapter [relating to the licensing of people who sell firearms], shall be fined under this title, imprisoned not more than five years, or both. (18 U.S.C. § 924(a)(1); see *Bryan v. United States* [1998])

In each instance, the Supreme Court had to decide whether to apply the rule of lenity, which requires courts to resolve statutory ambiguity in favor of the defendant. It did so in (7) and (8) but not in (9).

Let us examine this array of results more closely. The ambiguity in (7) is reflected in the different bracketing of (10) and (11):

- (10) Whoever [knowingly [transfers food stamps in any manner not authorized by this chapter or the regulations issued pursuant to this chapter]] shall be punished.
- (11) Whoever [knowingly transfers food stamps] [in any manner not authorized by this chapter or the regulations issued pursuant to this chapter] shall be punished.

In *Liparota v. United States* (1985), the Supreme Court held that this ambiguity was sufficient to trigger the rule of lenity, and reversed the defendant’s conviction for dealing in food stamps without proof that he knew that what he was doing was illegal.

In (8) and (9), the syntax is subtly different. Those statutes make no reference to the particular conduct that is proscribed—only to wilful violation of the statutes and regulations themselves. Thus, the syntactic ambiguity present in (7) has disappeared. One can still debate the scope of “wilfully” in these statutes, as the Supreme Court did in deciding how the statutes should be interpreted. But the interpretation of these statutes does

not depend on our having more than one choice in our assignment of syntactic structures.

Similar interpretive problems involve complicated laws whose logic is difficult to disentangle. Lawmakers sometimes trip over their own feet when they try to create laws that are both analytically crisp and logically complicated.<sup>28</sup> Brewer (2000) discusses section 2-207(1) of the Uniform Commercial Code in this light. That section reads in part:

A definite and seasonable expression of acceptance or a written confirmation which is sent within a reasonable time operates as an acceptance even though it states terms additional to or different from those offered or agreed upon, unless acceptance is expressly made conditional on assent to the additional or different terms.

The problem here is that, as a logical matter, once terms “have been agreed upon,” it’s too late for there to be an acceptance, either on modified terms or otherwise.<sup>29</sup> The syntax of the sentence is so convoluted and complicated, that the drafters seem to have lost their way.

Or consider (12), the statute at issue in *United States v. X-Citement Video* (1994):

(12) Any person who knowingly . . . distributes, any visual depiction that has been mailed, or has been shipped or transported in interstate or foreign commerce. . . if—(A) the producing of such visual depiction involves the use of a minor engaging in sexually explicit conduct; and (B) such visual depiction is of such conduct; shall be punished as provided in subsection (b) of this section. (18 U.S.C. § 2252)

The problem facing the Supreme Court was whether “knowingly” modifies not only the distribution of the material but also “the producing of such visual depiction involves the use of a minor engaging in sexually explicit conduct.” If not, then the statute would appear to impose criminal liability on individuals who distribute child pornography not knowing that they are doing so. Such a statute would be unconstitutional.

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28. I discuss other examples of this phenomenon in Solan 1993, such as problems in the interpretation of “and” and “or” (45–55) and problems in determining the antecedent for a modifying clause at the end of a sentence (29–37).

29. See *American Parts Co. v. American Arbitration Association* (1967). The parties had originally reached an oral understanding of the sale of goods, but the seller’s confirmation form added an arbitration clause which said the entire form would become controlling if the buyer accepts delivery of all or any of the parts, in addition to the agreed upon terms. When the buyer refused to accept some of the goods, the seller sought arbitration. The court held that under 2-207 (1) a confirming form can constitute acceptance even where there has already been an oral agreement, and thus the arbitration clause was valid.

Most readers (including me) find it very difficult to interpret the statute as including the child pornography provision as within the scope of knowingly.<sup>30</sup> To see why, consider (13), a simplified version of the statute:

- (13) Any person who knowingly distributes a depiction—if the depiction contains child pornography—shall be punished.

The “if” clause is really only a parenthetical inserted into the middle of the sentence. Consequently, it is not easily interpreted as being within the scope of “knowingly.” Yet it is not easy to draft the statute so that the scope of “knowingly” is clear. Compare (13) to (14):

- (14) Any person who knowingly distributes a depiction that contains child pornography shall be punished.

Statement (14) runs up against exactly same problem as (7). It is ambiguous with respect to whether “knowingly” modifies “distributes a depiction” or whether it modifies “distributes a depiction that contains child pornography.” In order to ensure that “knowingly” modifies all of the elements of the statute, something like (15) is necessary:

- (15) Any person who knowingly distributes a depiction, knowing the depiction to contain child pornography, shall be punished.

In *X-Citement Video*, the Court acknowledged the problem, and rewrote the statute to require the government to prove that the defendant acted with the requisite knowledge that the material being distributed contained child pornography. Justice Scalia dissented, arguing that the statute should be declared invalid.

Interpretive problems do arise, then, when a law is syntactically ambiguous and context does not resolve the ambiguity or was mistakenly drafted because legislators missed the logical problems that would face interpreters. But these examples, while by no means rare, are not nearly as prevalent as problems in the interpretation of words. For the most part, problems of syntax and logic stay far in the background. My point here, and what we learn from Pinker, is that the ease with which we typically apply linguistic rules uncontroversially in legal interpretation does not make those rules unimportant. In fact, just the opposite is true. Our ability to apply these rules so easily is what gives us even the semblance of a rule of law.

Moreover, just as semantic indeterminacy can result from uncertainty in the application of rules, the interpretation of words often enough leads to

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30. For a discussion of what in the syntax of the statute causes the problem, see Kaplan and Green 1995.

confidence in meaning. In some instances, this confidence comes not from the words being clear in some abstract sense, but rather from the fact that in context, there is no controversy about their applicability. If a defendant argues that a statute that outlaws bank robbery is really about picking flowers on the river bank we would find the defendant's position laughable. To the extent that there is consensus about the applicability of statutory words to a situation in the world, words do just fine.

For example, such concepts as "student" are largely social constructs. There is no rule from which it must follow that the English word for *student* must be "student" and that the French word for *student* must be "élève." Moreover, what things come to mind when a person hears the word "student" must depend, at least in part, upon our experience with students. In a culture with no formal schools, the concept, if it exists at all, would no doubt be very different from the concept in our society. Our culture is sufficiently homogeneous that in most cases the use of a word like "student" will be so uncontroversial as to make its social contingency go unnoticed. But this homogeneity of experience is not enough to assure that we will end up with the same concept of student. In addition to shared experience, we must have a cognitive architecture that causes us to "lock" on to the same kind of concept "from experience with good examples" of students (Fodor 1998, 137). To the extent that we do this, words used in socially salient contexts appear to be unambiguous. In this way, culture and cognition combine.

Consensus can also come from other universal aspects of our cognition. For example, all languages seem to have words for concepts such as *when*, *where*, *before*, *after*, *under*, *above*, *think*, *say*, and others (Wierzbicka 1996, 35–111). There is little variation across languages and cultures. Most likely, the concepts expressed by different words in different languages are innate. No doubt both social consensus and the structures of our minds are both at work in many instances.<sup>31</sup>

All of this brings us a long way toward answering questions that have always been important to the legal system: What makes plain language plain, and when language isn't plain, what has gone wrong? Language can be plain to the extent that:

1. Its rule-like aspects either apply unambiguously, or ambiguities are resolved noncontroversially. We don't care that "visiting relatives can be annoying" has two readings if it is clear that we are unhappy with family members who have overstayed their welcome; and

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31. In some instances, these two systems are intertwined. Some syntactic structures occur only with verbs that have certain meanings. For example, alternations such as "John broke the vase" and "the vase broke" occur only for causative verbs that we conceptualize as taking an external cause. In contrast, while we can say, "the plants blossomed," we cannot say, "the gardener blossomed the plants." For discussion, see Levin and Rappaport Hovav 1995.

2. Its word-like aspects are noncontroversial, either because the situation is a prototypical instance of the words in the statute, or because it is clear from context which sense of a word with multiple meanings was intended, or because the meaning in question follows automatically from knowing the word at all as a result of our cognitive architecture. No one would argue that shooting someone with a handgun during a drug deal is not using a firearm during a drug trafficking crime, and no one would argue that bank robbery refers to river banks.

Thus, while it is true that language has no single, “correct” interpretation, we should expect to do pretty well most of the time. Given that it was the prototypical situation that usually prompted a law’s enactment in the first place, word meaning should give us problems only occasionally. Steven Winter makes this point forcefully using such examples as H. L. A. Hart’s hypothetical, “no vehicles in the park” (Winter 1989; see also Schlag 1999). Relying heavily on George Lakoff’s version of prototype theory (see Lakoff 1987), Winter shows that our interpretation of this rule depends not only on our understanding of the word *vehicle*, but on our social understanding of what activities are legitimate in the park. Bicycles may be appropriate for some kinds of parks, but not others. To the extent that there is consensus about these matters, as there is with automobiles in this example, the interpretation of rules should be straightforward. But it will not always be straightforward, as the many years of debate over this hypothetical demonstrates. (See Schauer 1991, 55–62, for an interesting perspective on this history.)

Ambiguity in the application of grammatical rules should create problems for legal interpreters even less frequently. These ambiguities typically allow for fewer interpretive possibilities and are often resolved unself-consciously from context. From this perspective, one should expect the law to work pretty well, but not great.

### C. Rules and Constraints in Linguistic Theory and Law

Thus far, my argument has been direct—not metaphorical. I have not argued that problems of linguistics and problems of law are merely structured similarly. Rather, I have taken the stronger position that certain legal problems are structured as they are precisely because they *are* linguistic problems. This section, in contrast, is somewhat more speculative. Here, I will point out some other legal problems that share their structure with linguistic problems, about which we now know enough only to observe suggestive parallels between the two domains.

The law has embedded in it many values, which show up as presumptions, or at least as the justification for legal decisions. It is commonplace for judges and legal scholars to recognize that the law sometimes must choose among meritorious competing values: Should we prefer freedom of speech to fairness in commercial competition? Should we place efficient allocation of resources over the creation of a more racially harmonious society? And so on. In his book, *After the Rights Revolution*, Cass Sunstein (1990) argues that we should be self-conscious about these values and about the fact that we have to make decisions about how to weight them. Robert Nozick suggests that weighting of this kind is more generally a significant part of moral decision making (1981, 294).

Some of what Pinker calls “rules” can be looked at similarly. Recall that English regular past tense and plural forms are pronounced in three different ways, depending on the final sound of the word:

pull-pulled (d)	tub-tubs (z)
rent-rented (+d)	bus-busses (+z)
link-linked (t)	mitt-mitts (s)

Pinker describes the relationships among past tense forms in terms of a basic rule: “add *d* to form the past tense of a regular verb”; and a set of ancillary spelling rules: “insert a vowel before the *d* if the verb ends in *t* or *d*”; “devoice the *d* (i.e., change it to *t*) if the verb ends in an unvoiced consonant.” The plural works similarly.

But, as contemporary linguistic theory recognizes, it is not necessary to account for these facts in terms of a set of rules. Rather, it is possible to account for them in terms of a set of weighted preferences. Let’s say that languages typically have certain preferred realizations, which are defaults, much the way the law has certain default presumptions. One of these preferences is to avoid consonant clusters at the end of a syllable. Another is to stay faithful to the rules and not add extra sounds. A third is to avoid consonant clusters of similar sounding consonants (e.g., English would not have a word *witchth*). Another is that consonant sequences must be identical in voicing (i.e., both voiced or both unvoiced). Let’s further say that languages differ from one another in how they weight these preferences.

Assume that English weights these constraints as follows:

1. harmony in voicing of consonant sequences;
2. avoid clusters of similar sounding consonants;
3. faithfulness;
4. avoid complex consonant clusters.



Now let us look at the word *kisses*. The constraints and their order rule out the following forms:

*kiss	[kiss]	(violates 2)
*kissz	[kisz]	(violates 1)
kisses	[kis̩t̩z̩]	(violates 3).

Since English values (1) and (2) more than (3), we use the form *kisses*. *Locks*, on the other hand, violates only constraint (4), which is not highly valued in English. The alternatives would violate more highly valued constraints (*lockes* or *lockz*). The same set of constraints also account for the past tense forms, *t*, *d*, and *ed*. Compare these facts to Spanish, which values the avoidance of consonant clusters above faithfulness. The result is that the plurals of nouns ending in a consonant is *es* as in *cárceles* (jails).

This account uses no rules, except for the rule that the regular past tense form in English is *d*. All of the other facts follow directly from how English implements various constraints from a list that is universally available, but defeasible. Languages differ from each other in their implementation, and the history of a language reflects changes over time in how the constraints are implemented.

The particular version that I have described is a somewhat simplified version of optimality theory,<sup>32</sup> which has been influential in linguistic theory during the past decade. Although it is not universally accepted by linguists, it illustrates an important trend in linguistic theory over the past 20 years that has produced significant results: Much of what in language appears to be rule governed is better seen in terms of constraints, some of which are defeasible.<sup>33</sup> To take an example that concerns meaning, there is no rule that tells us who *he* must refer to in "he thought John should be more courteous," but there is a constraint, articulable in terms of linguistic structures, that prevents *he* and John from being grammatically linked. Sometimes the constraints are defeasible. In other instances they provide languages with a limited range of choices. Which possibility a language selects sometimes has what appear to be significant consequences for all kinds of phenomena within the language. Chomsky's minimalist program is among the most recent instantiations of this research strategy in linguistics.<sup>34</sup>

32. For an introduction to this approach, see Archangeli and Langendoen 1997. Some of the facts discussed in the text are from Hammond 1997 in that volume. Optimality theory is generally attributed to Prince and Smolensky 1993.

33. For example, in his text on phonology, which is not written in the framework of optimality theory, Michael Kenstowicz 1994 refers to such things as default rules and soft universals, concepts which by and large capture the same generalizations about which I write here.

34. See Chomsky 1995. For an accessible summary of some of this work, see Smith 1999.

If this approach to language is correct, and even if it is only partially correct, it suggests some exciting, unexplored parallels between language and law. Law is replete with problems that require us to decide which among competing values to prefer. Sometimes, these decisions remain in the background, but often enough they are too central to ignore. It is interesting to learn that our language faculty engages in just this kind of activity, unselfconsciously and automatically. Perhaps these observations can form the beginning of a cognitively based explanation as to why so many seemingly important legal preferences remain hidden in the background as well.

#### IV. CONCLUSION

Laws are expressed in language. Relying on advances in linguistic theory generally, and on exciting work that he and his colleagues have conducted, Pinker envisions language as a complex mixture of rule-governed and idiosyncratic phenomena, the structure of which we are now beginning to understand. Once we recognize this, certain legal debate that has occupied a great deal of attention in the literature seems almost beside the point. For example, it makes little sense to think that one can construe statutes simply by looking at their texts to the extent that statutory interpretation involves the determination of whether unforeseen events in the world fit within the purview of the words in the statute. Culture and context do matter. On the other hand, it makes no more sense to focus on a few examples of problems concerning goodness of fit and to conclude that language plays little or no role in the interpretation of statutes. Language plays a huge role, albeit a largely unnoticed one, through the uncontroversial application of syntactic principles and morphological rules to strings of words to determine their relationship with each other. No one ever argues that *looked* is not the past tense of *look* or that subject relative clauses should be interpreted as object relative clauses.

Where does all this leave us? It leaves us with a system of laws that is in part determinate and in part requires interpretation in social context. Pinker's book begins to explain why this should be so.

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