

Do lawyers know uncertainty when they see it?

Lawyers are supposed to be experts at assessing legal risk. We analyze how well they can predict the decision of a court on a legal issue. In our model, legal uncertainty arises from random errors of judges and actors (or their advisers) in determining the applicable legal standard. This implies that lawyers will often produce widely dispersed probability estimates regarding the outcome of a case. Our theoretical model yields a number of testable implications. One of them is that probability estimates are strongly related to a lawyer's own judgment of the case. In contrast to much of the previous literature, this "consensus effect" does not result from a cognitive bias but reflects limited knowledge regarding the applicable legal standard. An experiment with four different cases and 215 law students largely confirms the predictions of the model.

Keywords: legal uncertainty, legal predictability, consensus effect, settlement bargaining, case selection, uncertain liability

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“I shall not today attempt further to define the kinds of material I understand to be embraced within that shorthand description [i.e., hard-core pornography]; and perhaps I could never succeed in intelligibly doing so. But I know it when I see it, and the motion picture involved in this case is not that.”

Justice Potter Stewart, *Jacobellis v. State of Ohio*, 378 U.S. 184, 197 (1964)

1 Introduction

This paper asks a simple question: Can lawyers predict how a court will decide a legal issue? For instance, can they assess the probability that a certain behavior violates a duty and exposes the actor to liability? In approaching this question, we consider a situation where judges and lawyers have the same information regarding the facts of the case. Any variation therefore stems from random errors in applying the law to the case or from indeterminacy of the law that produces diverging evaluation. We argue that, under these conditions, probability estimates (PEs) of individual lawyers tend to spread widely. For instance, if the true probability to prevail in litigation is 25%, our model predicts that lawyers' PEs will range from 3% to 72%. The model provides us with a number of testable implications on lawyers' assessments of legal cases: We hypothesize individual estimates to be highly related to a lawyer's own judgment of the case; lawyers should ascribe a probability greater than 50% to a decision that conforms to their own view. The model also predicts lawyers to underestimate on average the probability of the outcome that is in fact more likely. Considering only lawyers holding the majority view, we expect them on average to overestimate the success probability of their own judgment in uncertain cases and to underestimate it in more certain cases. These varied predictions are

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largely confirmed in an experiment with four hypothetical cases conducted with 215 law students at the University of Mannheim.

How well lawyers can predict court decisions bears on the private and social value of legal advice. For example, one main task in structuring a business transaction is to minimize legal risk or trade off such risk against other objectives. This requires an ability to assess the risk from different design options. Legal advice on litigation and pre-trial settlement likewise depend on PEs regarding case outcomes. This figures prominently in the literature starting with Priest and Klein (1984) on the selection of cases for litigation, trial, or appeal. Priest and Klein assume that parties only engage in litigation if their PEs diverge and if the difference in expectation values exceeds litigation costs. In their framework, erroneous and inconsistent PEs regarding the court's judgment cause legal conflict and a net loss to the parties. This highlights the social value of accurate information on legal duties and entitlements.

Legal certainty is also crucial to the law's role in allocating resources and guiding behavior. An example in point is the standard of care in negligence liability. If the injurer knows the optimal standard of care and if the court applies it without error, negligence liability for damages perfectly aligns incentives. Yet when the standard is uncertain, deterrence will be too strong or too weak, depending on the way damages are calculated (Grady, 1983; Craswell and Calfee, 1986). As a consequence, the injurer will deviate from the socially optimal behavior by applying excessive care or too little care. To achieve the optimal amount of deterrence, the law could in principle adjust the liability amount to the injurer's estimated probability of a finding of fault (Craswell and Calfee, 1986). This would require the court to know the injurer's probability assessment. Our theoretical and empirical results suggest that this is asking far too much. There is no commonly known probability that a certain behavior will be found at fault. Depending on her particular estimate, an injurer may have consciously taken significant legal risk, or she may as well have believed that there was little probability of violating a duty. Our analysis thus bears on the design and limitations of liability rules.

The theoretical model in this paper is based on heterogenous assessments of the true state of the law as in Priest and Klein (1984) and Friedman and Wittman (2007). An example are different views on the appropriate standard of care in negligence

liability. Judges and lawyers receive a noisy signal of the true state of the law and apply it to the case at hand. This leads to different judgments and PEs over case outcomes. Because the court's judgment turns on what it believes to be more likely correct, judges' and lawyers' own judgment will generally coincide with a PE of more than 50% for their own view. In addition, we predict that lawyers on average presume too much uncertainty and underestimate the actual probability of legal outcomes. This result is best explained by considering a marginally certain case: Although all lawyers share the same evaluation, some are close to disagreeing and therefore less confident in their judgment. This keeps the mean PE away from one. A similar argument applies to the average PE of lawyers holding the majority view in cases with disagreement. If the issue is fairly close to universal consensus and hence relatively certain, the majority will underestimate its own size. Yet as the case becomes more uncertain and approaches an evenly split opinion distribution, the majority grows excessively confident. This is due to a selection effect: the majority includes only lawyers who estimate the success probability of their own view at more than 50%.

To test the predictions of the model, we assume that the probability of a particular outcome depends on the probability with which the case is decided by a judge holding the respective view. In our experiment, we use the observed frequency of judgments in four vignette cases as estimates of the true probability and compare them to participants' own reported estimates of the judgment distribution. Importantly, participants receive the exact same information on the case. All of our results have the expected signs and most of them are statistically significant.

In the subsequent section 2, we relate our work to previous contributions that have contemplated the nature and import of legal uncertainty. Section 3 presents our theoretical model. It seeks to determine what lawyers can and cannot know about the probability of a legal outcome under conditions of symmetric information about the facts of the case but uncertain legal evaluation. We also briefly consider how the model relates to the underlying questions of legal theory, such as whether a right answer exists in hard cases. Section 4 tests the predictions obtained from the analysis in an experiment with law students. Section 5 concludes.

2 Related literature

Various lines of research in law and economics are concerned with the predictability of legal outcomes and the implications of legal uncertainty. A major area of inquiry has been the effect of uncertain judicial decisions on incentives, notably in fault-based liability. While we do not directly consider these consequences, we argue that legal uncertainty may be a more serious impediment to optimal liability than has been acknowledged so far: Uncertainty has been attributed to mistakes of courts in applying the legal standard of due care to the facts of the case. Under this account, actors face uncertainty over the court's decision both when they have acted carefully (type I errors) and when they have not (type II errors). How this affects deterrence has been widely studied (see, e.g., Polinsky and Shavell, 1989; Kaplow and Shavell, 1994; Lando, 2006; Lando, Nikitin, and Baker, 2007; Kaplow, 2011; Lang, 2014). A second source of uncertainty is that actors can misunderstand the legal requirements or misperceive the riskiness of their behavior, leading them to inadvertently violate the standard of care (Kaplow, 1990; 1994). A third group of studies examines the effect of uncertainty on liability without concentrating on a particular root cause (Grady, 1984; Craswell and Calfee, 1986; Beckner and Katz, 1995). Whatever the source of uncertainty, all of these contributions assume that actors and courts know the probability of error and hence the probability of a finding of fault for a given behavior. In contrast to this literature, we contend that there is a less benign and pervasive type of legal uncertainty. Rather than sharing a common probability distribution, courts and actors may have radically different estimates whether a particular conduct is at fault. This variation arises in spite of identical information on the facts of the case due to random differences in applying the law.

Another important research field dealing with legal uncertainty is settlement bargaining (see Daughety and Reinganum, 2012, for a survey). Because litigation is costly, the parties collectively benefit from settling the case. They only have to agree on the price at which the plaintiff agrees to "sell" his case to the defendant. This poses comparatively little difficulty if the parties agree on the probability of the litigation outcome. Therefore, the literature mostly concerns asymmetric information leading to divergent probability estimates and a potential bargaining failure. We vary this approach by assuming heterogeneous beliefs among lawyers who receive random signals on the true state of law. As Daughety and Reinganum (2012) point out, such

symmetric uncertainty can be seen as two-sided asymmetric information. Therefore, we are closest to the analyses of settlement bargaining that consider two-sided asymmetric information (Schweizer, 1989; Daughety and Reinganum, 1994; Friedman and Wittman, 2007). Likewise, the literature on the selection of cases for litigation, trial or appeal initiated by Priest and Klein (1984) also assumes divergent expectations on the outcome of potential litigation (see Hylton and Lin, 2012; Lee and Klerman, 2014). Again, our results contribute to these lines of research by demonstrating that two-sided asymmetric information can arise from mere differences in individual lawyers' evaluation of an identical fact pattern.

On the empirical side, our analysis closely resembles three studies on a "false consensus effect" among lawyers (Solan, Rosenblatt, and Osherson, 2008; Klöhn and Stephan, 2009; Falk and Alles, 2014). All three of them report a finding that is also central to our analysis, namely that lawyers typically believe that their own legal judgment of a case is shared by a majority of other lawyers. These studies are particularly important to our endeavor because they document that the effect is not confined to law students (on which we rely for our experiment) but also occurs with professional judges and practicing lawyers in the United States and in Germany. We nevertheless believe our study to make significant progress by offering and testing a richer theory. The previous contributions explain their result based on a "false consensus effect". In fact, an extensive literature in psychology shows that people in general tend to strongly overrate the degree of consensus with their own views or preferences in a relevant population or community. This error has been attributed to a cognitive egocentric bias (Ross, Greene, and House, 1977; Mullen et al., 1985). However, what this early research overlooks is that an individual's own evaluation is in fact a piece of information that should rationally influence her estimate of the corresponding distribution in the population (Dawes, 1989; see Engelmann and Strobel, 2000, 2012 for experimental evidence). Accordingly, our model predicts a "consensus effect" based solely on rational probability estimates. In addition to this, it generates further testable predictions that receive solid support in our experimental data.

Other related studies examine the impact of lawyers' own involvement in a case on reported confidence regarding the merits. Based on a survey of trial attorneys, Loftus et al. (2010) find some degree of overconfidence regarding a self-defined minimum

goal in ongoing cases litigated by the respondents. In controlled settings, Loewenstein et al. (1993) and more recently Eigen and Listokin (2012) have shown that student subjects assess the merits of cases significantly different depending on a randomly assigned role as attorneys for either the plaintiff or the defendant (petitioner or respondent). We view these findings as complementary to ours. While they indicate that lawyers' evaluation of success chances reflects their own interest and advocacy role, our results show that probability estimates vary even without such self-serving reasons merely because of random differences in opinion.

3 A model of legal knowledge

In theoretical terms, our goal is to determine what lawyers can know about the outcome of an uncertain case. Subsection 3.1 contains our informational assumptions. The following two subsections 3.2 and 3.3 derive implications, including the hypotheses for our experiment. Subsection 3.4 discusses theoretical objections.

3.1 Information structure

For ease of exposition, we use a case of potential negligence as an example that has been widely used in the literature. Let us assume that we can collapse all the relevant facts of a case into a single variable x . The possible behaviors of an injurer are ordered in such a way that a higher x is more suggestive of a finding of negligence. One can think of x as higher intensities of a risky activity or lower levels of precautions and hence a greater expected harm.²

To judge whether a particular behavior x is negligent requires a standard of care. If the standard is \bar{x} , then any behavior $x > \bar{x}$ violates the standard and is at fault,

² The same approach can be used for other legal issues, such as (in case 1 of our experiment) when notice of termination has been served to a tenant. x would then represent the possible fact patterns, for instance: "Landlord has written but not sent the notice", "Landlord has mailed the notice", "The notice letter has been received by the postal service provider", "The notice letter has been delivered to the tenant's mailbox at 7 a.m.", etc.

whereas $x \leq \bar{x}$ is compliant. We adopt the framework of Craswell and Calfee (1986) where the actor faces uncertainty over the standard of care \bar{x} that a court will apply to her behavior.³ Legal uncertainty thus arises from incomplete knowledge of the pertinent legal command. To fix ideas and facilitate the discussion, we make an assumption that some readers will find problematic: We suppose that there is a unique optimal standard that the law requires. This is at odds with the widespread view that courts enjoy judicial discretion in deciding on the negligence of defendants at least in the more intricate cases. Whether this assumption is critical for our model will be discussed below in subsection 3.4.1. For the moment, note only that a “true state of the law” need not be known to the court. In fact, as will become clear shortly, the model focuses precisely on the case that both the actor and the court are uncertain about the legal standard.

Craswell and Calfee (1986) further assume that the actor knows the probability distribution of being held liable. To capture this idea, let $F(x)$ be the cumulative distribution function for the probability that a court will apply x as the standard. We assume $F(x)$ to be a uniform distribution over $[x^* - \Delta, x^* + \Delta]$ with some $\Delta > 0$.⁴ Also, for simplicity let $x^* > 3\Delta$:

$$F(x) = \begin{cases} 0 & \text{for } x < x^* - \Delta \\ \frac{x - x^* + \Delta}{2\Delta} & \text{for } x^* - \Delta \leq x \leq x^* + \Delta \\ 1 & \text{for } x > x^* + \Delta \end{cases} \quad (1)$$

The symmetry of $F(x)$ means that actors are equally likely to over- or underestimate the value of the true standard. Because $F(x)$ is the *cumulative* distribution function, it describes the probability that a court will apply a standard of x or less than x . The negligence rule implies that behavior x is at fault if the standard of care is x or less

³ In Priest and Klein (1984), the legal standard is commonly known but the assessment of the actor’s behavior is subject to error. We make the opposite assumption to emphasize that uncertainty arises from different evaluations of an identical fact pattern. The conclusions should nonetheless carry over because the two setups are symmetric.

⁴ Similarly, Friedman and Wittman (2007) use a uniform distribution for parties’ signals in their model of settlement bargaining.

than x . Therefore, $F(x)$ gives the actor the probability that behavior x will be judged as negligent.

As said before, the uncertainty expressed in $F(x)$ can have different explanations: If courts commit random errors in discerning the true standard, $F(x)$ could result from the distribution of these errors. Also, $F(x)$ may describe the probability distribution regarding the location of the optimal standard, reflecting the actor's own limited knowledge. We are interested in a radical form of legal uncertainty under which neither the court nor the actor knows the precise standard x^* . Such two-sided uncertainty seems plausible because judges and actors (including their legal advisors) in principle have the same access to legal information. There is no reason why only one of them should be subject to error in identifying x^* . On the contrary, if there were a legal technique to precisely localize x^* , it is hard to see why it should remain confined to either judges or actors. We therefore assume symmetry between the court and the actor in the sense that they either possess the same knowledge or that they are subject to the same error-generating process.

Under this notion of symmetric uncertainty, it becomes immediately clear that there cannot be a single commonly known probability distribution for the court and the actor. Suppose that the court has the same distribution $F(x)$ as the actor, describing the subjective probability of the true location of x^* . The court would then have to invoke a decision rule, such as holding the actor liable when it is more likely than not that she has violated the standard, that is, whenever $F(x) > .5$. By virtue of symmetry, the actor knows this rule, which would eliminate her uncertainty because she can now rely on the fact that the court will dismiss a liability claim for $x \leq x^*$ and grant it for $x > x^*$. More generally, if the court and the actor share the same set of legal information, including a determinate decision rule, then they can never disagree on the outcome.

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Therefore, if the information structure is to allow legal uncertainty, it must provide for different probability distributions for the actor and the court. Because the court and the actor have the same legal technology, the distributions stem from the same underlying process: While neither of them knows the precise value of the true

standard of care, each of them forms a private opinion. Formally, we assume that the court and the actor receive a signal \hat{x}_A and \hat{x}_C , respectively; we drop the subscript whenever an expression refers to both the court and the actor. We now interpret the original probability distribution $F(x)$ as the distribution from which these signals are drawn. Importantly, though, the court and the actor do not know $F(x)$. They only know that their private signal stems from a uniform distribution over $[x^* - \Delta, x^* + \Delta]$. To them, the true standard of care is a random variable \tilde{x}^* with the following probability distribution conditional on their signal \hat{x} :

$$F_i(x) = \begin{cases} 0 & \text{for } x < \hat{x}_i - \Delta \\ \frac{x - \hat{x}_i + \Delta}{2\Delta} & \text{for } \hat{x}_i - \Delta \leq x \leq \hat{x}_i + \Delta \\ 1 & \text{for } x > \hat{x}_i + \Delta \end{cases} \quad (2)$$

with $i \in \{C, A\}$. Intuitively, the court and the actor know that x^* can be anywhere in a range of $\pm\Delta$ around their signal \hat{x} . They neither know the exact position of x^* nor the signal drawn by the other side. As before, the court finds fault if, in its view, it is more likely than not that the actor's behavior x exceeds the standard, that is, whenever $F_C(x) > .5$.⁵ Again, we assume the actor to know this decision rule.

3.2 Implications for legal knowledge

We are interested in how an actor will assess the liability risk of her behavior. This boils down to a probability estimate (PE) for a finding of fault regarding some behavior x . We denote the PE for behavior x based on the actor's signal \hat{x}_A as $p(x; \hat{x}_A)$. We derive the functional form of $p(x; \hat{x}_A)$ in appendix 7.1; it reflects the probability distribution of the court's signal conditional on the actor's probability distribution $F_A(x)$. Figure 1 depicts the resulting graph of $p(x; \hat{x}_A)$ together with $F_A(x)$ (dashed line).

⁵ The substance of the analysis would not change with any other threshold than .5.

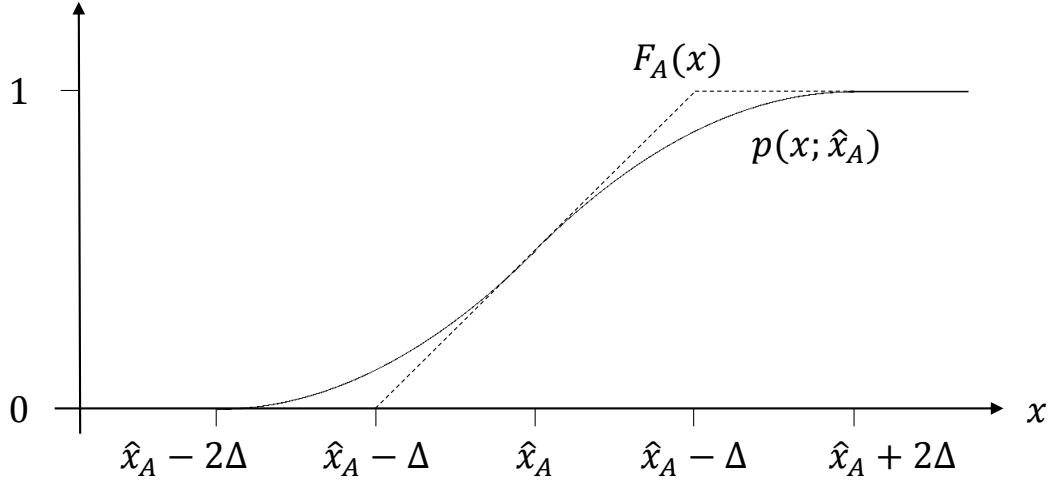


Figure 1: Probability of liability as a function of behavior x conditional on the agent's signal \hat{x}_A .

Figure 1 reveals that the actor ascribes a strictly positive probability to being held liable even when she knows with certainty that she does not violate x^* , namely for behavior between $\hat{x}_A - 2\Delta$ and $\hat{x}_A - \Delta$. For her, a particular conduct $x = \hat{x}_A - \Delta$ has a zero probability of violating the standard ($F_A(\hat{x}_A - \Delta) = 0$). Nonetheless, she accounts for the possibility that the true standard x^* could be at the lower end of her subjective probability distribution $F_A(x)$ and, given this true standard, the court could have received a signal \hat{x}_C that is even lower (and excessively strict). Therefore, she assigns a probability of $\frac{1}{8}$ to being held liable for a behavior $x = \hat{x}_A - \Delta$. Conversely, at $x = \hat{x}_A + \Delta$ the actor knows with certainty that she violates the legal standard while her probability of liability is only $\frac{7}{8}$.

So far, we have considered the probability of a finding of fault as a function of behavior x . We can also think of the PE as a function of an actor's signal, which we write as $p(\hat{x}_A; x)$. Viewed in this way, the function provides us with the distribution of PEs across different actors. Figure 2 depicts the graphs of $p(\hat{x}_A; x)$ for four possible behaviors x . Due to the signal-generating distribution $F(x)$, the actors' opinions range only from $x^* - \Delta$ to $x^* + \Delta$. Therefore, the distribution of PEs among actors is represented by those parts of $p(\hat{x}_A; x)$ that lie between $x^* - \Delta$ and $x^* + \Delta$.

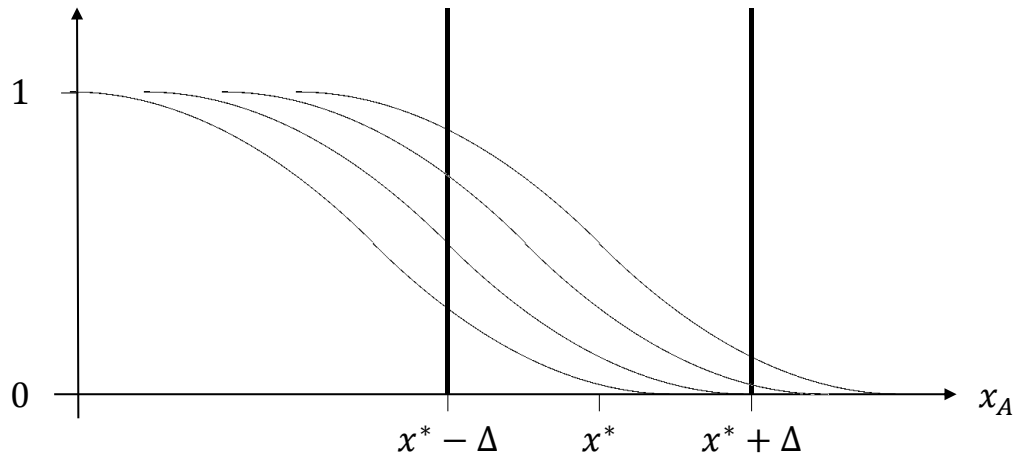


Figure 2: Probability of liability as a function of the agent's signal \hat{x}_A , conditional on behavior $x = x^* - 1\frac{1}{2}\Delta$, $x = x^* - \Delta$, $x = x^* - \frac{1}{2}\Delta$ and $x = x^*$ (from left to right).

The question of this paper is how accurately individual lawyers can estimate the probability of a case outcome. Equating actors with lawyers, Figure 2 indicates the sobering main conclusion from the analysis: The individual PEs of lawyers can vary wildly and depart far from the true probability of how a court will rule on a given issue. In the model, the true probability is given by $F(x)$. Consider the case with the greatest possible uncertainty, namely behavior $x = x^*$ with $F(x^*) = .5$. The distribution of PEs is represented by the rightmost graph in Figure 2. Individual PEs vary between 12.5% and 87.5%. In a high-uncertainty setting like this, a lawyer's assessment of the case can and often will be very far off the mark. Such professional guidance is of rather limited value and could well be dangerous to a client. Table 1 contains the corresponding results for all four cases depicted in Figure 2.

Behavior x	True probability of liability $F(x)$	Upper bound of PE $p(\hat{x}_A; x^* - \Delta)$	Lower bound of PE $p_x(\hat{x}_A; x^* + \Delta)$
x^*	.5	.875	.125
$x^* - \frac{1}{2}\Delta$.25	.719	.031
$x^* - \Delta$	0	.5	0
$x^* - 1\frac{1}{2}\Delta$	0	.281	0

Table 1: True probability and upper/lower bound of lawyers' individual PEs for four different types of behavior.

3.3 Testable implications

Empirically, we cannot observe the signals of individual actors. What we can test is whether the reported PEs of actors conform to more general predictions of our model. To this end, we calculate the *expected* PE of an actor as a function of behavior, $\mu(x) \equiv E(p(x; \hat{x}_A))$, see appendix 7.2. This function tells us the mean (average) PE that the model predicts for a sample of actors. Figure 3 depicts $\mu(x)$. Note that $\mu(x)$ differs from $p(x; \hat{x}_A)$. Specifically, it is strictly increasing over the interval $[x^* - 3\Delta; x^* + 3\Delta]$.

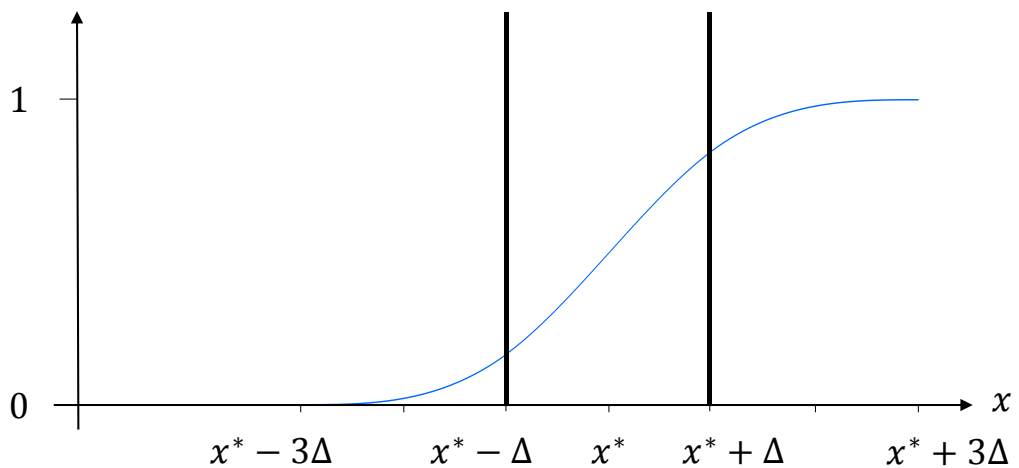


Figure 3: Expected probability estimate for a finding of liability as a function of behavior x .

In addition, we can calculate expected PEs for subsets of actors, specifically for those actors who judge a particular behavior as negligent. To this end, let us assume that actors judge the case based on the same decision rule as the court: they consider liability to be justified if $F_A > .5$, which in effect leads them to apply their own signal \hat{x}_A as the standard. Based on this rule, actors' individual judgments diverge only if x is between $x^* - \Delta$ and $x^* + \Delta$; all actors agree on liability for behavior above $x^* + \Delta$ and on no liability for conduct below $x^* - \Delta$. Within the range of disagreement, we calculate separate expected PEs for those actors who believe that behavior x violates the standard and those who do not; see again appendix 7.2.

Figure 4 brings the various expected PEs together. It encapsulates all our empirical predictions. Figure 4 is confined to those behaviors x which a majority of the actors, based on their signals, considers negligent. The opposite case (with a majority finding no fault) is symmetric. Therefore, Figure 4 is best interpreted generally in terms of the majority versus the minority view. The benchmark for the PEs is the actual probability of a finding of fault, which is $F(x)$. It is shown as a bold dashed line from .5 for $x = x^*$ to 1 for $x = x^* + \Delta$.

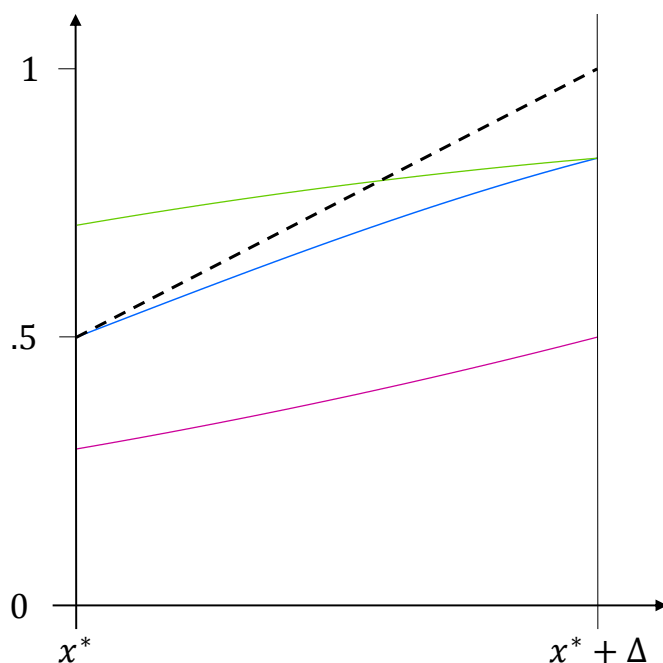


Figure 4: Mean probability estimates of a finding of liability as a function of behavior x of all actors together $\mu(x)$ (blue line), of the majority of actors who affirm liability (green line) and of the minority who rejects liability (red line). The dashed line graphs the objective probability $F(x)$ of a finding of liability.

Since most of our hypotheses compare PEs to the actual probability $F(x)$, we should state beforehand how we intend to measure $F(x)$ empirically. Because of the court's decision rule, judges effectively apply their own individual signal \hat{x}_c as the standard. The probability of being found liable for behavior x is simply the probability of confronting a judge whose signal \hat{x}_c is below x .⁶ We estimate this probability using the relative frequency of judges who consider x negligent: our measure of $F(x)$ is the observed judgment distribution (JD) among judges. Our symmetry assumption even allows us to disregard the different roles and to include actors in determining the relevant JD (as well as judges in measuring the mean PE): judges and actors do not differ systematically in terms of their own judgment and their PE. We can therefore speak of “lawyers” when we collectively refer to judges and actors.

⁶ Note that we implicitly assume courts with a single judge. The effect of aggregating the views (signals) of several lawyers on the part of the actor or court is beyond the present study.

One straightforward implication of Figure 4 is that lawyers' expected PEs reflect their own judgment of the case: The mean PE of the majority far exceeds .5 even for "hard" cases (with the JD close or equal to parity). Conversely, the mean PE of the minority is below .5 throughout, implying that the minority believes herself to be the majority. Our first hypothesis thus is:

H1 ("individual confidence in own judgment"): If judgments over a legal issue are split, both the minority and the majority have a mean PE of more than .5 that their own judgment will prevail in court.

Hypothesis H1 essentially states that the mean JD estimate of the majority and the minority will be such that each group considers itself to be the majority. H1 thus describes the "consensus effect" that previous studies have observed for lawyers and for human subjects in general. Yet at variance with much of the psychology literature, H1 only reflects random errors in detecting the true legal standard rather than an egocentric bias of lawyers. The reason is the following: The court decides the issue depending on which result it considers more likely correct given its signal x_C . Because the median judge receives a signal that corresponds to the true standard ($F(x^*) = .5$), we expect a majority of judges to decide in accordance with the true standard. Knowing this, a judge should believe her own judgment to be shared by a majority of judges. By virtue of symmetry, the same argument then applies to lawyers generally.

Returning to Figure 4, we also see that the mean PEs of the majority and the minority covary in different ways with the actual probability. The majority's mean PE rises as the certainty of the case outcome increases. By contrast, the minority tends to confuse hard cases with simple ones. As the minority shrinks, its adherents on average lose confidence in their judgment. Note that Figure 4 depicts the mean PE for a judgment in favor of the majority view. Therefore, the rise of the red line implies that the minority becomes less confident in their own judgment.

H2 ("mean confidence across cases"): Moving from uncertain to certain legal issues (from hard to simple cases), the majority grows more confident in its own judgment in terms of its mean PE, while the minority becomes less confident.

The blue line graphs the mean probability estimate $\mu(x)$ of all actors combined. Comparing it with the JD as a measure of the true probability of case outcomes (the dashed line) leads to the following prediction:

H3 (“lawyers overall underestimate certainty”): The mean PE across all lawyers is accurate only for highly uncertain cases (JD close to .5). As certainty rises, the mean PE increasingly underestimates the probability of the majority’s judgment.

Hypothesis H1 implies that the majority rightly believes its own view to have a greater chance of prevailing in court. Thus, one might hope that at least the majority accurately gauges the probability of case outcomes. Figure 4 makes a different prediction, namely:

H4 (“majority has excessive (too little) confidence in uncertain (certain) cases”): For highly uncertain cases (JD close to .5), the majority’s mean PE is too high, while it is too low for very certain cases (JD close to 1).

More specifically, for the most uncertain case $x = x^*$ with $F(x) = .5$, the majority’s expected PE is .708, while it is .833 at the marginally certain case $x = x^* + \Delta$ with $F(x) = 1$. At the intersection of the dashed and green lines in Figure 4, the expected JD and the expected PE are $F(x) = \mu_L(x) \approx .791$.⁷ Of course, these values result from our particular assumptions, such as that \hat{x} is drawn from a uniform distribution.

3.4 Discussion

Before putting our predictions to an experimental test, two theoretical aspects of the model deserve closer attention. One is the assumption highlighted above that a uniquely true standard of care exists. A second controversial feature of the model is its implication that the right answer is always that of the majority.

3.4.1 Judicial discretion: is there a right answer even in hard cases?

Our model assumes that there is a true standard x^* or, more generally, that the law always provides a clear-cut decision rule even if it can be very hard to determine.

⁷ $\mu_L(x)$ is the expected probability estimate of those actors who consider the behavior negligent, see appendix 7.2.

Many lawyers and legal theorists will disagree with this statement. While Dworkin has famously championed a “single right answer” thesis (Dworkin, 1978; 1977), the prevailing opinion is that the law can and often will be indeterminate (see Leiter 1995; Leiter 2007, pp. 9–11; Raz, 1979, pp. 70–74). According to this view, the law provides a range of possible standards but not a uniquely correct one that a court could discern. Instead, within the area of indeterminacy, judges enjoy the power to “make” new law, rather than just attempting to “find” existing law (Hart, 1994, pp. 131–132, 272–276).

Judicial discretion offers an alternative explanation of legal uncertainty instead of legal error. Do the implications of our model still hold under this account? Under one reading of legal indeterminacy, there is only a conceptual difference. Suppose that the law sometimes failed to prescribe a unique case outcome but that the courts, for lack of a determinate legal rule, were held to consider other factors to determine the standard, such as moral reasons or policy considerations. As long as these additional concerns are understood to be the same for all judges, the analysis would not change. Legal indeterminacy would only imply that the true standard x^* depends on legal and extra-legal reasons. The distinction of legal and extra-legal reasons, no matter how important in other respects, would not affect our predictions.

But judicial discretion could also allow judges to introduce their own individual convictions, even when they realize that these idiosyncratic views are not shared by others. As a shorthand description, one can say that judges may have leeway to follow their individual normative “preferences” or “tastes”. Without a unique standard x^* , it no longer makes sense to assume that the court receives a noisy signal \hat{x}_C of x^* . Instead, we would interpret \hat{x}_C as the normative preference of the court and $F(x)$ as the corresponding distribution of judicial preferences. As a consequence, we no longer need the assumption that judges are ignorant of $F(x)$: In the original setup, if a judge had learned that her own opinion \hat{x}_C reflected a minority position,⁸ she would have changed her mind. By contrast, knowing the preferences of others need not affect one’s own preferences. It follows that legal uncertainty would be

⁸ More precisely: that a majority of judges favored a lower or higher standard, which is the case whenever $F(\hat{x}_C) \neq .5$.

consistent with judges knowing the probability distribution $F(x)$. By virtue of symmetry, the same would be true for actors. Judicial discretion thus allows for a simple model of legal uncertainty with a single probability distribution $F(x)$ that is common knowledge to all lawyers. Such a theory would predict that lawyers share the same probability estimate for the outcome of a given case, in stark contrast to the predictions of our model. Yet the experimental evidence reported below quite clearly refutes such a simple theory.⁹

Crucially, the empirical findings only reject the joint hypothesis that (1) judges decide according to their normative preferences *and* that (2) the probability distribution $F(x)$ is common knowledge. It remains a possibility that judges follow their individual normative views but lawyers do not know the preference distribution. Regrettably, this latter version of a preference-based theory does not necessarily yield different predictions from our information-based model. At first blush, one may be tempted to assume that when judges decide the case based on their personal leanings, their PE should not correlate with their own judgment, which would contradict our hypothesis H1. But H1 is very well compatible with the preference-based account. If judges do not know the distribution $F(x)$, their best attempt at an accurate PE may well be to consider themselves as being representative of all judges and to conclude that their own judgment reflects that of a majority. In fact, this precisely corresponds to the rational explanation of the “consensus effect” in other fields outside the law (Dawes, 1989). Thus, even in light of our experiment, lawyers may well continue to believe that divergent judgments reflect individual normative preferences rather than random errors in discerning a single true standard.

3.4.2 Is the majority always right?

In our analysis with a true standard, hypothesis H1 states that both the majority and the minority believe their respective judgment to represent the majority view. The underlying reason is that the majority is more likely to decide in accordance with the true standard than the minority. Therefore, if one endorses a particular judgment one

⁹ The same is true of the experimental evidence in Solan, Rosenblatt, and Osherson (2008), Klöhn and Stephan (2009) and Falk and Alles (2014).

necessarily has to assume that it conforms to a majority. Nonetheless, it appears to us that this argument often meets resistance from legal scholars and practitioners. They claim that lawyers sometimes take a position on a legal issue even when they know that it is not shared by a majority. Although in our experiment few respondents considered themselves to be in the minority, we still believe that this intuition is valid. We can think of three ways to make sense of it.

One is that judges enjoy discretion and use it to decide according to their individual preferences. If one adopts this view, then judges have nothing to learn from the majority and can easily take a minority stance, as discussed in the preceding subsection 3.4.1. Lawyers may still believe their own judgment to be the majority's but only because they consider themselves similar to most other lawyers, not because the majority has a higher probability of being right.

A second approach is that although a single true standard exists, lawyers may commit errors with a systematic bias. A biased signal distribution could be such that the median lawyer no longer applies the true standard ($F(x^*) \neq .5$). Under certain conditions, the expected majority decision could then be wrong against the yardstick of the true standard. However, to show that some or all lawyers consider themselves in the minority would require additional assumptions: Specifically, some but not all lawyers would have to know or believe that the signal distribution is biased. A plausible scenario is that a certain legal error is widespread and at the same time known to be widespread, such as an exotic legal rule that is notorious for being overlooked.¹⁰ If one group is informed of the error while the other is ignorant, it would be consistent for the first group to believe in their own judgment while seeing itself in the minority.

The third attempt at reconciling hypothesis H1 with lawyers' intuition plays on the fact that the likelihood of the majority being right depends on the sample size. When lawyers claim that they (occasionally) take a minority position, they refer to their professional behavior in legal discourse. Translated into our model assumptions,

¹⁰ In fact, two previous studies document instances where the majority's decision arguably was mistaken because it overlooked a statutory provision or a firmly established precedent (Klöhn and Stephan, 2009; Falk and Alles, 2014). Even there, the minority on average believed itself to be the majority.

legal discourse consists of communicating one's own judgment of the case or one's perception of the true standard. Collecting and aggregating signals from different lawyers enhances the accuracy of judgments and PEs. Given our assumptions on the information structure, a new signal regarding the true standard is more valuable the more distant it is from the signals reported so far.¹¹ This suggests that the professional norms of lawyers should encourage even strongly divergent views. At the same time, legal issues are rarely voted upon by representative samples of judges or lawyers. Therefore, the legal discourse produces only a very noisy estimate of the true JD among lawyers. When lawyers see themselves in the minority, they refer to this noisy estimate rather than to the JD in a large sample. In sum, lawyers' willingness to oppose a majority view may be inspired by their professional experience with the legal discourse, where the logic of hypothesis H1 has only limited force.

4 Experiment

Our theoretical model paints a rather bleak picture of lawyers' ability to assess legal risk. To investigate the matter empirically, we subjected the implications of the model to an experiment with law students.

4.1 Design and summary statistics

The experiment was conducted using paper questionnaires during courses at the Department of Law of the University of Mannheim. Students were instructed that participation was voluntary and anonymous. We did not provide monetary incentives but offered students the opportunity to obtain a performance evaluation through an individual code printed on the questionnaire.

The experiment involved legal issues in four different fact patterns. In case 1, we asked respondents to evaluate whether a notice regarding the termination of a lease had been given in time. In case 2, they had to establish whether a principal or his

¹¹ Suppose that two signals \hat{x}_1 and \hat{x}_2 have been reported and that $\hat{x}_1 < \hat{x}_2$. A third signal \hat{x}_3 does not add any information on the true value of x^* if $\hat{x}_1 < \hat{x}_3 < \hat{x}_2$. It would fully reveal x^* if it had the maximum possible distance to either \hat{x}_1 or \hat{x}_2 (i.e., $\hat{x}_3 = \hat{x}_1 + 2\Delta$ or $\hat{x}_3 = \hat{x}_2 - 2\Delta$).

agent had become a party to a sales contract concluded by the agent. Cases 3 and 4 consisted of a negligence determination in a particular setting. The case description consisted of only one paragraph, followed by the pertinent question (see Appendix 7.2). We randomized the order of cases to neutralize potential expectations of the participants regarding intended differences between the cases. In each of the four cases, we asked students for their own judgment on the issue (*own judgment*). In addition, they had to rate their confidence on a five-value Likert scale from “very uncertain” to “very certain” (*subjective confidence*). As one of our treatments, participants were asked to imagine themselves in the role of either a judge deciding the case or an attorney advising a client (*role*).

Besides their own judgment and subjective confidence, participants had to estimate how many out of one hundred other law students would judge the legal issue one way or another (*estimated JD*). The question was phrased without reference to the participant’s own judgment. That is, we explicitly asked for numerical values for each of the two possible legal findings, reminding participants that the numbers had to add up to one hundred.

In light of previous evidence, we expected participants to assume more consensus with their own view, once they had formed their own judgment. We therefore varied the order of questions: In one condition, respondents first had to make their own judgment in all four cases before being asked for their estimates of the judgment distribution (*own judgment first*). The question regarding the estimated JD was not disclosed in advance.¹² In the second condition, the order of the questions was reversed so that participants provided their estimate of the judgment distribution before stating their own judgment.

In the last part of the questionnaire we obtained individual characteristics: 54% of our student respondents are female. The median respondent is in her fourth semester of legal education; Table 2 shows the distribution. Finally, we asked for the grade in the student’s most recent written exam in private law. The mean reported grade is

¹² We required students to answer the questions in the order they appeared in the questionnaire and not to turn pages before they had provided their judgment and confidence ratings on all four cases. The case descriptions were repeated for the second question. We were able to convince ourselves in the classroom that students complied with these instructions.

7.43 on the 0–18 scale used in German legal education, which is at the higher end of what we expected. Table 3 contains the variables and their descriptions. Table 4 shows the correlation matrix for the individual characteristics and the treatment variables.

Semester	Number of respondents	Percentage
2	102	48%
4	53	25%
5	2	1%
6	20	9%
8	28	13%
9	2	1%
10	5	2%
12	2	1%
	214	100%

Table 2: Respondents' semester of law study.

Variable name	Description
<i>own judgment</i>	Own judgment of a case, expressed in relation to the majority view (0 = own judgment contradicts majority view; 1 = own judgment conforms to majority view).
<i>estimated JD for own judgment</i>	Estimate of judgment distribution between 0 and 1, expressed in relation to respondent's own judgment (approval rate for own judgment).
<i>estimated JD</i>	Estimate of judgment distribution between 0 and 1, expressed in relation to the majority view (a value of 1 would indicate unanimous approval of the majority view).
<i>observed JD</i>	Mean of <i>own judgment</i> .
<i>subjective confidence</i>	Self-rated degree of certainty on a scale from 1 ("very uncertain") to 5 ("very certain").
<i>own judgment first</i>	Treatment dummy variable (takes the value 1 if participant had to report her own judgment and subjective confidence before estimating the JD, and 0 otherwise).
<i>role</i>	Treatment dummy variable (takes the value 1 if participant were asked to decide the case as judge, and 0 if they were asked as legal adviser of a client).
<i>gender</i>	Participant's reported gender (takes the value 1 if male and 0 if female).
<i>grade</i>	Participant's grade in the most recent written exam in private law on a scale from 0 to 18 points.
<i>semester</i>	Participant's reported semester of law studies.
<i>legal intuition</i>	Counts the number of cases, other than that of the present observation, in which the participant has taken the same position as the majority.

Table 3: Variables and variable descriptions.

	gender	semester	grade	role	own judgment first
gender	1.0000				
semester	-0.0112 (0.8710)	1.0000			
grade	0.0421 (0.5454)	0.0343 (0.6214)	1.0000		
role	0.0206 (0.7646)	-0.1060 (0.1222)	-0.1268 * (0.0667)	1.0000	
own judgment first	0.1200 * (0.0806)	0.0833 (0.2251)	-0.0410 (0.5548)	0.1078 (0.1149)	1.0000

Table 4: Correlation coefficients of respondent characteristics and treatments. *p*-values in parantheses.

Table 5 summarizes the main observations for the four cases. The observed JD is the number of respondents opting for “yes” divided by 215, the total number of responses we received for all four cases. The mean estimated JD is the mean of the answers to the question how many of 100 law students would opt for “yes”, divided by 100. We normalize each of these values by referencing them to the majority judgment in the given case. Hence, all the normalized observed or estimated JD are greater than .5. The last column contains the mean of the respondent’s subjective confidence in her own judgment on a 1 to 5 Likert scale.

	Number of observations	Observed JD (not normalized)	Mean estimated JD (not normalized)	Observed JD	Mean estimated JD	Mean subjective confidence (1–5 scale)
Case 1	213	.623	.573	.623	.573	3.77
Case 2	212	.312	.401	.688	.599	3.86
Case 3	213	.833	.708	.833	.708	3.77
Case 4	213	.363	.437	.637	.563	3.47

Table 5: Observed JD, mean estimated JD and mean reported confidence across cases. We normalize the observed and estimated JD by making the majority judgment the reference (so that normalized values are greater than .5). The number of observations refers to the estimated JD. For respondents’ own judgment (observed JD), the number of observations is 215 throughout all cases.

One aim in designing the experiment was to create both certain and uncertain cases with a JD close to 1 and close to .5, respectively. We need such variance to test the across-cases hypothesis H2. At the same time, our own theory predicts that lawyers find it difficult to distinguish hard and simple cases. We received unwanted confirmation of this difficulty from the differences in observed JD across cases in

Table 6: The margins of the majority in cases 1, 2, and 4 do not differ at any level of statistical significance. Only case 3 stands out as a comparatively clear-cut case with a majority of 83.3%.

	Case 2	Case 3	Case 4
Case 1	-.065 (.155)	-.209 *** (.000)	-.014 (.764)
Case 2		-.144 *** (.000)	.051 (.262)
Case 3			.195 *** (.000)

Table 6: Differences in observed JD across cases (row case minus column case). p -values of a χ^2 -test of association are reported in parentheses. Asterisks indicate the 1%, 5%, and 10% significance level, respectively.

Figure 5 shows the distribution of the JD estimates as quintile plots for the four cases. This already provides a visual impression of the most important prediction of our model: The JD estimates are never the same or within a close range across participants. Rather, they are widely dispersed just as one would expect from our predicted distribution in Figure 2 above.

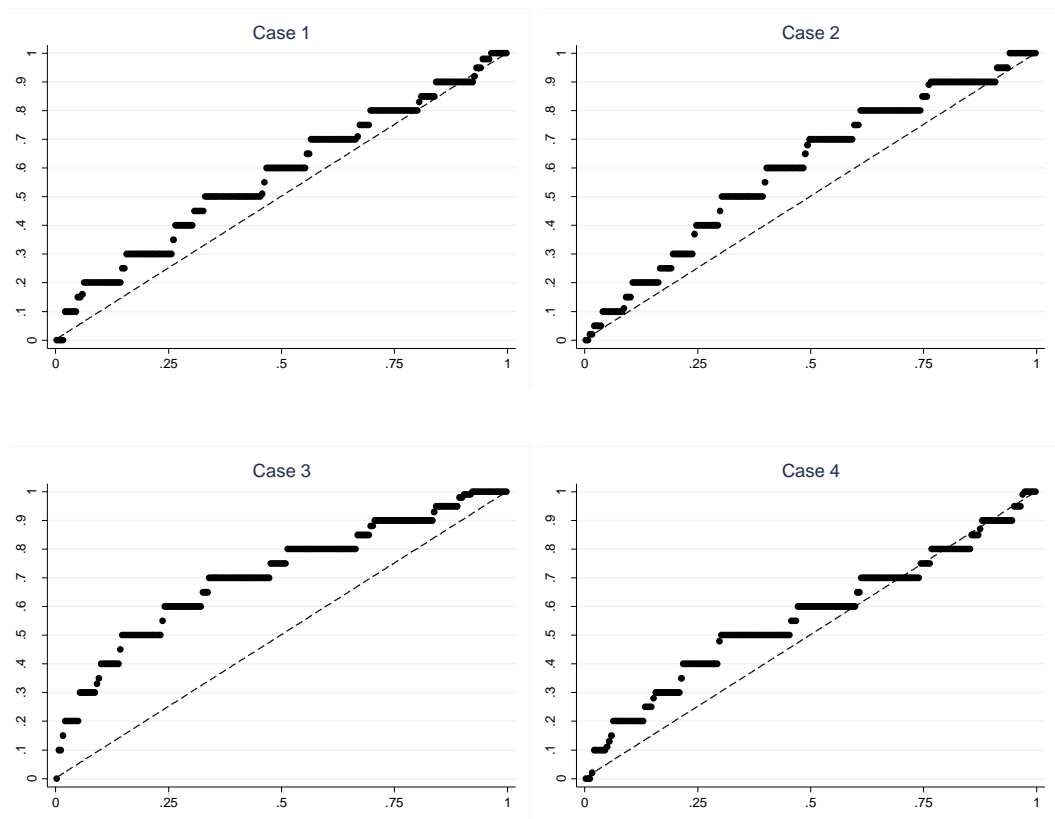


Figure 5: Quintile plots of estimated JD for the four cases.

4.2 Results

In this section, we formally test our hypotheses (subsections 4.2.1 to 4.2.2). In addition, we attempt to shed more light on the determinants of better estimates of the JD (subsection 4.2.4).

4.2.1 Individual confidence in own judgment (H1)

The experiment clearly confirms our first hypothesis. As witnessed by Table 7, the mean estimated JDs differ strongly depending on respondents' own judgment. Across all four cases, respondents believe in only 10.9% of observations their own judgment to be shared by less than half of their peers. In an additional 11.6% of observations, respondents estimate the JD to be split equally (i.e., a JD of 50%). The remaining 77.4% assume their own judgment to command a majority.

	Number of observations	Observed JD	Mean estimated JD of majority	Mean estimated JD of minority	Difference majority – minority
Case 1	213	.623	.713	.341	.372 *** (.000)
Case 2	212	.688	.732	.298	.435 *** (.000)
Case 3	213	.833	.770	.401	.369 *** (.000)
Case 4	213	.637	.660	.395	.264 *** (.000)
Total	851	.695	.723	.355	.368 *** (.000)

Table 7: Differences in mean JD estimates between majority and minority. *p*-values of a Mann-Whitney *U* test are reported in parentheses. Asterisks indicate the 1%, 5%, and 10% significance level, respectively.

The regression in Table 8 uses other independent variables to predict JD estimates. Clearly, respondents' own judgment is the only relevant predictor. When we leave out *own judgment*, the model loses most of its predictive power and *gender* becomes the only significant but rather weak predictor. We will explore the role of individual characteristics further below (section 4.2.4). For now, it suffices to establish that *own judgment* is clearly the strongest driver of JD estimates in our data, which underscores hypothesis (H1).

	(1) estimated JD	(2) estimated JD	(3) estimated JD
own judgment	0.367*** (0.002)	0.358*** (0.002)	
gender	-0.021 (0.143)	-0.021 (0.138)	-0.054** (0.011)
semester	-0.003 (0.266)	-0.003 (0.281)	-0.006 (0.266)
grade	-0.003 (0.288)	-0.003 (0.294)	-0.001 (0.785)
role	-0.011 (0.303)	-0.011 (0.312)	-0.003 (0.850)
own judgment first	-0.014 (0.654)	-0.014 (0.655)	0.020 (0.639)
legal intuition	-0.019 (0.230)	-0.016 (0.353)	-0.018 (0.343)
Constant	0.453*** (0.002)	0.428*** (0.002)	0.650*** (0.001)
Observations	827	827	827
R-squared	0.420	0.429	0.058
Case controls	no	yes	yes

Table 8: The dependent variable in the OLS regressions are the respondents' JD estimates. Regressions (2) and (3) contain dummies for cases as controls. p-values in parentheses are based on standard errors clustered for cases. Asterisks indicate the 1%, 5%, and 10% significance level, respectively.

4.2.2 Mean confidence across cases (H2)

The second hypothesis posits that majority respondents are more confident in their own judgment – in terms of their JD estimates – in cases with a more certain outcome as compared to less certain cases. For the minority, we expect the opposite relationship to hold. Unfortunately, within our four cases only the observed JD of .833 in case 3 differs significantly from the observed JD in the three other cases (with .623, .688, and .637). Therefore, Table 9 compares the mean JD estimates of cases 1, 2, and 4 with that of case 3. Remember that as we normalize the JD estimates, they have the opposite meaning for the majority and the minority: For the majority, a large JD estimate implies greater confidence while the reverse holds for the minority. Hence, the hypothesis predicts the JD estimate of the uncertain minus the more certain case to be negative for both the majority and the minority. Table 9 confirms this prediction for the three cases 1, 2, and 4 as compared to case 3. The difference is significant in three out of six relations.

	Majority mean estimated JD	Minority mean estimated JD
Case 1 minus case 3	-.057 ** (.016)	-.060 (.132)
Case 2 minus case 3	-.038 (.193)	-.103 *** (.004)
Case 4 minus case 3	-.111 *** (.000)	-.005 (.663)

Table 9: Difference in mean JD estimates for majority and minority respondents between case 3 and cases 1, 2, 4, respectively. *p*-values of a mean comparison Mann-Whitney *U* test are reported in parantheses. Asterisks indicate the 1%, 5%, and 10% significance level, respectively.

4.2.3 Over- and underestimating the judgment distribution (H3, H4)

Our third and fourth hypotheses concern the difference between mean JD estimates and the observed JD. They make three predictions:

(H3): The mean JD estimate across all lawyers is below the true JD.

(H4a): The mean JD estimate of lawyers holding the majority view exceeds the true JD in *uncertain* cases (with a JD close to .5).

(H4b): The mean JD estimate of lawyers holding the majority view remains below the true JD in *certain* cases (with a JD close to 1).

To evaluate whether respondents over- or underestimate the certainty of the case, we are ultimately interested in how their estimates compare with the true probability of the case outcome. The latter depends on the JD in the population of all lawyers (or law students in our experiment). However, the JD we observe is in fact only an estimate of the true JD based on our sample. To account for the estimation error, we use a two-sample t-test.¹³

Table 10 presents the results. All differences between mean JD estimates and observed JD have the expected signs. The mean estimates of all respondents taken

¹³ The t-test seems appropriate for the following reasons: The distribution of *estimated JD* is reasonably close to normal. By contrast, *observed JD* is the mean of *own judgment* for all observations in a given cases. Therefore, it takes the same value for all observations and a given case. Because it is estimated from our sample, we assume that *observed JD* is a single observation of a random variable with standard deviation equal to the standard error of the mean estimate. For our sample size and estimates, the binomial distribution from which *observed JD* is drawn approximates a normal distribution. A simulation based on 10,000 resamplings of *estimated JD* from the original data and of a mean observed JD from binomial distributions confirms the significance levels in Table 10 except that the difference for the majority in case 3 is only significant at the 10% level.

together underrate the size of the majority for each single case and across all cases. By contrast, the majority overestimates the approval rate for its own judgment in cases 1, 2, and 4. This conforms to prediction (H4a) because these cases are comparatively uncertain with a majority of .623, .688, and .637. Remember that our model with a uniform error distribution led to a threshold value of .791 for a certain vs. an uncertain case. Against this benchmark, only case 4 qualifies as a relatively certain case with an observed majority of .833. Here, the majority shows too little confidence in its own judgment, which is in line with prediction (H4b). The results for all lawyers are statistically significant but for one case. In the smaller sample of respondents holding the majority view, two out of four cases are significant at the 5% level.

	Number of observ.	Observed JD	Mean estimated JD	Difference mean est. JD – observed JD	Mean estimated JD of majority	Difference mean est. JD of majority – observed JD
Case 1	213	.623	.573	-.050 (.189)	.713	.090 ** (.017)
Case 2	212	.688	.599	-.089 ** (.017)	.732	.044 (.226)
Case 3	213	.833	.708	-.125 *** (.000)	.770	-.062 ** (.031)
Case 4	213	.637	.563	-.074 ** (.045)	.660	.022 (.553)
Total	851	.695	.611	-.085 *** (.000)		

Table 10: Differences between mean JD estimates and observed JD for all lawyers and for lawyers holding the majority view. Paratheses contain p-values based on a two-sample t-test (see footnote 13). Asterisks indicate the 1%, 5%, and 10% significance level, respectively.

4.2.4 Individual determinants of estimation error and own judgment

Beyond testing the hypotheses, it is an interesting question how individual characteristics of participants relate to their ability to predict the JD. We create a new variable to measure the deviation of respondents JD estimates from the observed JD: *estimation error* is the absolute value of the difference between the individual estimate and the observed JD, scaled by 100.

Table 11 contains the results of OLS regressions (specifications (1) to (3)). Because *estimation error* is right skewed and contains many small values, we also report results from an ordered probit regression where we sorted *estimation error* in nine

groups with roughly equally many observations (*estimation error class*).¹⁴ In line with the evidence presented so far, respondents' own judgments have the strongest effect on *estimation error*. Participants holding the majority view suffer from significantly less estimation error than the minority. In addition, considering errors rather than the levels of JD estimates in Table 8 yields a rather surprising result: When respondents were first asked for their own judgment (*own judgment first*), their estimates were significantly better throughout. The effect is large: The OLS coefficient indicates that participants who formed their judgment before estimating the JD benefitted from an error reduction by around 7 percentage points. This compares favorably to the expected error reduction by 11 percentage point from picking the right (majority) answer. Specification (7) reports a probit regression of the sign of the error, where 1 implies a positive error. The negative coefficient for *own judgment first* implies that these respondents were more conservative on average. If estimation error resulted from a psychological bias to find support for one's own decision in the approval of others (e.g., Sherman, Presson, and Chassin, 1984), one would expect the opposite finding.¹⁵

The only other covariate that persistently shows a significant effect is *legal intuition*. This variable is designed to capture an otherwise unobserved ability to identify the majority position. It is calculated by counting the number of cases (outside the present observation) in which the participant's own judgment reflected that of the majority. Contrary to expectations, *legal intuition* is positively related to the participant's estimation error. This could reflect a regression-to-the-mean effect.

¹⁴ For values from 0 to 40, we divide *estimation error* in five-percent steps. The ninth group contains values greater than 40. The maximum value is around 63.7.

¹⁵ In the context of a moot court competition, Eigen and Listokin (2012, pp. 257–258) also express amazement at their finding that students are less confident in the merits of their case when they have spent more time working on it.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	estimation	estimation	estimation	estimation	estimation	estimation	estimation
	error	error	error	error class	error class	error class	error sign
own judgment	-11.262*** (0.003)			-0.762*** (0.000)			1.824*** (0.000)
gender	1.382 (0.374)	0.931 (0.631)	2.510 (0.116)	0.104 (0.320)	0.096 (0.565)	0.145*** (0.006)	-0.031 (0.641)
semester	0.202 (0.517)	0.012 (0.949)	0.675 (0.312)	0.014 (0.455)	0.001 (0.900)	0.044 (0.211)	-0.005 (0.756)
grade	0.112 (0.218)	0.275** (0.028)	-0.272 (0.325)	0.011 (0.123)	0.023*** (0.001)	-0.014 (0.409)	-0.021 (0.237)
role	-0.049 (0.976)	-0.598 (0.617)	1.823 (0.600)	0.016 (0.913)	-0.026 (0.839)	0.121 (0.593)	-0.006 (0.965)
own judgm. first	-7.078*** (0.003)	-6.095*** (0.003)	-9.846** (0.026)	-0.564*** (0.000)	-0.583*** (0.000)	-0.617*** (0.001)	-0.297*** (0.001)
legal intuition	1.600** (0.011)	1.373*** (0.008)	2.443** (0.039)	0.103*** (0.000)	0.107*** (0.000)	0.138** (0.030)	-0.110* (0.075)
Constant	25.609*** (0.003)	14.939*** (0.009)	23.336** (0.023)				-0.970*** (0.000)
Observations	827	576	251	827	576	251	827
R-squared	0.212	0.085	0.118				
Regression	OLS	OLS	OLS	ord. probit	ord. probit	ord. probit	probit
Sample	all	majority	minority	all	majority	minority	majority
Case controls	yes	yes	yes	yes	yes	yes	yes

Table 11: Specifications (1) to (3) report OLS regressions of absolute errors in the estimated JD, specifications (4) to (6) ordered probit regressions of estimation error classes, and specification (7) a probit regression of the sign of the estimation error (1 corresponds to a positive error). Regressions refer to the full sample, the majority and the minority, respectively. Case dummies are included as controls. p-values in parentheses are based on standard errors clustered for cases. Asterisks indicate the 1%, 5%, and 10% significance level, respectively.

Table 11 again underscores that the most important determinant of accurate JD estimates is whether a respondent adopts the “right” judgment, namely that of the majority. If one is interested in obtaining good probability estimates of case outcomes, one should try to identify lawyers who have a higher probability of spotting the majority. Therefore, we go on to examine the relevant predictors in Table 12. It reports the coefficients of a probit regression of respondents’ own judgment conforming to the majority. Three results stand out: First, women have a higher probability of deciding with the majority. The effect is significant statistically and of meaningful size; the coefficient estimate in specification (4) translates into a probability difference of around 10 percentage points when all other independent variables are set at their mean. Women seem to make better lawyers, at least to the extent that tracking the majority reflects legal ability.

Second, asking respondents for their own judgment before eliciting their JD estimate also appears to improve their ability to identify the majority view. The effect of the

different treatment is a probability increase by roughly 12 percentage points for the mean setting in specification (4). Ironically, lawyers seem to be more sensitive to where the majority stands when they start by forming their own legal judgment. One conjecture is that respondents paid more attention to the case when they were called to exercise their professional judgment as (prospective) lawyers. Remember that this not only leads to “better” judgment but also to more accurate JD estimates conditional on adopting the majority view (Table 11, specifications (1) and (4)).

A third and last finding is that adherents of the majority view are more confident in their judgment, both subjectively (*subjective confidence*) and in terms of their JD estimates (*estimated JD for own judgment*). This conforms to the predictions of our theoretical model: According to Figure 4, in all but the most uncertain cases the minority’s PE regarding its own judgment should be lower than the majority’s PE for its view.

	(1) own judgment	(2) own judgment	(3) own judgment	(4) own judgment
gender	-0.270*** (0.000)	-0.286*** (0.000)	-0.280*** (0.000)	-0.294*** (0.000)
semester	-0.024 (0.187)	-0.022 (0.283)	-0.025 (0.207)	-0.024 (0.267)
grade	0.017 (0.182)	0.017 (0.219)	0.021* (0.093)	0.020 (0.125)
role	0.050 (0.552)	0.023 (0.798)	0.041 (0.516)	0.027 (0.707)
own judgment first	0.291* (0.091)	0.286* (0.091)	0.380** (0.023)	0.367** (0.023)
legal intuition	-0.030 (0.602)	-0.022 (0.709)	-0.025 (0.670)	-0.020 (0.731)
subjective confidence		0.159** (0.040)		0.106* (0.070)
est. JD for own judgment			0.012*** (0.001)	0.011*** (0.000)
Constant	0.340* (0.086)	-0.209 (0.512)	-0.498 (0.112)	-0.776* (0.057)
Observations	836	835	827	826
Case controls	yes	yes	yes	yes

Table 12: The dependent variable of the probit regression is respondents’ own judgment (normalized so that 1 is the majority judgment). Case dummies are included as controls. p-values in parentheses are based on standard errors clustered for cases. Asterisks indicate the 1%, 5%, and 10% significance level, respectively.

5 Conclusion

The law serves to control behavior and to define initial entitlements as a basis for private bargaining. Even when the application of the law to a particular fact pattern is uncertain, the law could, in principle, perform its coordinating role if the players ascribe the same or roughly the same probabilities to the possible legal outcomes. For example, if the actor assumed a 50% probability of being found negligent when she fails to exercise due care, the court could simply double the penalty to induce optimal behavior (as suggested by Craswell and Calfee, 1986). Likewise, if the plaintiff and the defendant agree on the success probability of the plaintiff's case, they should face little difficulty to avoid litigation costs by settling the case. The main point of the present paper is that legal uncertainty often is a far greater impediment to the law's role in guiding behavior and defining the allocation of resources. Our analysis suggests that the existence of uncertainty implies that there cannot be a shared probability estimate of the parties involved. Therefore, it is not a promising policy recommendation, for instance, to adjust the penalty in liability schemes to the actor's evaluation of legal risk. Likewise, a private party should not place much confidence in the ability of their legal advisers to manage legal risk. Bargaining over entitlements under uncertainty faces greater obstacles than previously recognized.

Our theoretical analysis and experimental evidence comes with certain caveats and prompts new questions for future inquiry. One may ask whether the law students in the experiment are representative of actual judges and practicing lawyers. As mentioned before, empirical studies with legal professionals support the prediction that lawyers believe their own judgment to conform to the majority view. Yet the additional predictions of our model still await empirical testing with fully qualified legal practitioners. In this regard, it would be interesting to look for systematic differences between practitioner types (legal advisers vs. judges?) as well as across jurisdictions (common law vs. civil law judges?). Although not part of our explicit analysis, our model also highlights the benefit of soliciting the independent views of more than a single lawyer (see subsection 3.4.2). It is therefore natural to ask whether groups of lawyers provide better PEs and by how much. Similarly, it would be interesting whether greater effort in analyzing a legal issue translates into better probability estimates. Our surprising finding that forming one's own judgment first

improves gives a first hint that this may be the case. Besides investing more time and attention to a problem, lawyers can conduct legal research to enhance their predictions. Studying these questions will provide at least indirect evidence on the ubiquity and degree of uncertainty in the law.

6 Bibliography

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7 Appendix

7.1 Individual actor's probability estimate

The actor does not know the court's signal. To her, it is a random variable \tilde{x}_C distributed according to a probability density function $g(k)$, which is conditional on the actor's signal \hat{x}_A :

$$p(x; \hat{x}_A) \equiv \Pr(x > \tilde{x}_C | \hat{x}_A) = \int_0^x g(k) dk \quad (3)$$

To determine $g(k)$, note that \tilde{x}_C is the sum of two random variables, namely the true standard (conditional on the actor's signal) and an error due to the fact that the court's signal is noisy, too:

$$\tilde{x}_C = \tilde{x}_A^* + \tilde{\varepsilon} \quad (4)$$

The distribution of \tilde{x}_A^* is given by $F_A(x)$ in equation (2) above. The actor knows that the court's signal stems from a uniform distribution that is symmetric around the true standard x^* and ranges from $x^* - \Delta$ to $x^* + \Delta$. From this, she concludes that $\tilde{\varepsilon}$ in equation (4) is uniformly distributed between $-\Delta$ and Δ . Accordingly, the density function of $\tilde{\varepsilon}$ is

$$h(\varepsilon) = \begin{cases} \frac{1}{2\Delta} & \text{for } -\Delta \leq \varepsilon \leq \Delta \\ 0 & \text{for } \Delta < |\varepsilon| \end{cases} . \quad (5)$$

It follows that

$$g(k) = \int_0^\infty f_A(y) h(k - y) dy, \quad (6)$$

where $f_A(x)$ is the density function corresponding to $F_A(x)$. Given the simple form of $f_A(\cdot)$ and $h(\cdot)$, this gives us

$$g(k) = \begin{cases} \frac{2\Delta - |\hat{x}_A - k|}{4\Delta^2} & \text{for } \hat{x}_A - 2\Delta \leq k \leq \hat{x}_A + 2\Delta \\ 0 & \text{for } k > |\hat{x}_A - 2\Delta| \end{cases} \quad (7)$$

A primitive of $g(k)$ is

$$G(k) = \begin{cases} \frac{2\Delta - \hat{x}_A}{4\Delta^2}k + \frac{1}{8\Delta^2}k^2 & \text{for } \hat{x}_A - 2\Delta \leq k < \hat{x}_A \\ \frac{2\Delta + \hat{x}_A}{4\Delta^2}k - \frac{1}{8\Delta^2}k^2 & \text{for } \hat{x}_A \leq k \leq \hat{x}_A + 2\Delta \\ 0 & \text{for } k > |\hat{x}_A - 2\Delta| \end{cases} \quad (8)$$

Using $G(k)$, we obtain $p(x; \hat{x}_A)$. For $\hat{x}_A - 2\Delta < x \leq \hat{x}_A$, it is

$$p^L(x; \hat{x}_A) = \frac{1}{8\Delta^2}(x^2 + \hat{x}_A^2) + \frac{1}{2\Delta}(x - \hat{x}_A) - \frac{1}{4\Delta^2}\hat{x}_A x + \frac{1}{2}. \quad (9)$$

For $\hat{x}_A < x < \hat{x}_A + 2\Delta$, the corresponding expression is

$$p^R(x; \hat{x}_A) = -\frac{1}{8\Delta^2}(x^2 + \hat{x}_A^2) + \frac{1}{2\Delta}(x - \hat{x}_A) + \frac{1}{4\Delta^2}\hat{x}_A x + \frac{1}{2}. \quad (10)$$

Overall, the probability of liability as a function of behavior x , conditional on the actor's signal \hat{x}_A , is the following:

$$p(x; \hat{x}_A) = \begin{cases} 0 & x \leq \hat{x}_A - 2\Delta \\ p^L(x) & \hat{x}_A - 2\Delta < x \leq \hat{x}_A \\ p^R(x) & \hat{x}_A < x < \hat{x}_A + 2\Delta \\ 1 & x \geq \hat{x}_A + 2\Delta \end{cases} \quad (11)$$

7.2 Expected probability estimates across actors

$\mu(x)$ is the expected PE across all actors as a function of behavior x :

$$\begin{aligned} \mu(x) &\equiv E(p(x; \hat{x}_A)) = \int_{x^* - \Delta}^{x^* + \Delta} f(k)p(x; k) dk \\ &= \frac{1}{2\Delta} \int_{x^* - \Delta}^{x^* + \Delta} p(x; k) dk \end{aligned} \quad (12)$$

Because of the peculiar form of $p(x)$ in expression (11), we need to distinguish five cases. Firstly, for sufficiently small x all actors will assume a zero probability of liability, namely for $x \leq x^* - 3\Delta$. For larger x , specifically $x^* - 3\Delta < x \leq x^* - \Delta$, the mean probability estimate is

$$\mu^L(x) = \frac{1}{2\Delta} \int_{x^*-\Delta}^{x+2\Delta} p^L(x; k) dk, \quad (13)$$

where $p^L(x; k)$ is taken from expression (9) above. For x in a medium range, namely $x^* - \Delta < x \leq x^* + \Delta$, it is

$$\mu^M(x) = \frac{1}{2\Delta} \int_{x^*-\Delta}^x p^R(x; k) dk + \frac{1}{2\Delta} \int_x^{x^*+\Delta} p^L(x; k) dk, \quad (14)$$

with $p^R(x; k)$ from equation (10). For even larger x with $x^* + \Delta < x \leq x^* + 3\Delta$ the mean probability estimate is

$$\mu^R(x) = \frac{1}{2\Delta} \int_{x^*-\Delta}^{x-2\Delta} 1 dk + \frac{1}{2\Delta} \int_{x-2\Delta}^{x^*+\Delta} p^R(x; k) dk. \quad (15)$$

Finally, for x beyond $x^* + 3\Delta$, everybody assumes liability with probability one.

To calculate the expected PE of actors conditional on their own judgment, we assume that actors apply their own signal \hat{x}_A as the standard (based on the decision rule that liability is justified when $F_A(x) > .5$). For actors who believe that behavior x violates the standard and triggers liability, we have

$$\mu_L(x) = \frac{1}{x-x^*+\Delta} \int_{x^*-\Delta}^x p^R(x; k) dk. \quad (16)$$

The corresponding expected PE of those who consider the behavior permissible is

$$\mu_{NL}(x) = \frac{1}{x^*+\Delta-x} \int_x^{x^*+\Delta} p^L(x; k) dk. \quad (17)$$

7.3 Cases

German original	English translation
<p>[Case 1] Vermieter V möchte seinem Mieter M fristgerecht kündigen. Dafür müsste M die Kündigung bis zum 3. Februar 2012, einem Freitag, zugegangen sein. V hat zufällig erfahren, dass M ab dem 30. Januar 2012 für zwei Wochen in Urlaub ist und während dieser Zeit niemand seinen Briefkasten leert.</p> <p>[Question role condition “judge”] Stellen Sie sich vor, Sie müssten als Richter in einem Rechtsstreit entscheiden: Wurde der Mietvertrag fristgerecht gekündigt, wenn V das Schreiben am Mittwoch, den 1. Februar 2012, in den Briefkasten des M wirft?</p> <p>[Question role condition “legal adviser”] Stellen Sie sich vor, Sie sind Rechtsanwalt und beraten V. Was antworten Sie auf seine Frage: Wurde der Mietvertrag fristgerecht gekündigt, wenn V das Schreiben am Mittwoch, den 1. Februar 2012, in den Briefkasten des M wirft?</p>	<p>[Case 1] Landlord V wants to terminate the lease with his tenant M by providing timely notice. This would require the notice to be received by M no later than Friday, February 3rd, 2012. By coincidence, V discovers that M will be on vacation for two weeks starting on January 30th, 2012, and that during this time no one will empty his mailbox.</p> <p>[Question role condition “judge”] Imagine yourself as the deciding judge in a lawsuit: Was notice of the termination given on time if V dropped the letter in M’s mailbox on Wednesday, February 1st, 2012?</p> <p>[Question role condition “legal adviser”] Imagine yourself as an attorney advising V. How do you answer his question: Was notice of the termination given on time if V dropped the letter in M’s mailbox on Wednesday, February 1st, 2012?</p>
<p>[Case 2] A beauftragt und bevollmächtigt seinen Freund F, für ihn einen wertvollen alten Schreibtisch bei Kunsthändler K zu kaufen. Als F den Schreibtisch bei K kauft, wird vereinbart, dass dieser in einer Woche von F abgeholt und bezahlt werden wird. Im Verkaufsgespräch erwähnt F nicht, dass er von A geschickt wurde.</p> <p>[Question role condition “judge”] Stellen Sie sich vor, Sie müssten als Richter in einem Rechtsstreit entscheiden: Ist ein Kaufvertrag zwischen K und A zustande gekommen? (Beachte: Es ist <i>nicht</i> nach einem Vertrag zwischen K und F gefragt.)</p> <p>[Question role condition “legal adviser”] Stellen Sie sich vor, Sie sind Rechtsanwalt und beraten A. Was antworten Sie auf seine Frage: Ist ein Kaufvertrag zwischen K und A zustande gekommen? (Beachte: Es ist <i>nicht</i> nach einem Vertrag zwischen K und F gefragt.)</p>	<p>[Case 2] A instructs and authorizes his friend F to buy an old valuable writing desk from K, an arts dealer. When F buys the desk from K, they agree that F will pick up the desk and pay for it after one week. During the sales conversation F never mentions that he has been sent by A.</p> <p>[Question role condition “judge”] Imagine yourself as the deciding judge in a lawsuit: Has a sales contract been concluded between K and A? (Mind: The question does <i>not</i> concern a sales contract between K and F.)</p> <p>[Question role condition “legal adviser”] Imagine yourself as an attorney advising A. How do you answer his question: Has a sales contract been concluded between K and A? (Mind: The question does <i>not</i> concern a sales contract between K and F.)</p>
<p>[Case 3] K betreibt eine Kfz-Werkstatt. Zum Anheben von Fahrzeugen verfügt er über eine hydraulische Hebebühne des Herstellers W. Im Betriebsanleitung der Hebebühne heißt es: „Ein ungefährlicher Betrieb ist nur gewährleistet, wenn die Hebebühne mindestens einmal jährlich von einem unserer Servicepartner gewartet wird.“ Weil die Servicepartner von W hohe Wartungsgebühren verlangen, lässt K die Hebebühne nur ungefähr alle zwei Jahre von einem unabhängigen Wartungsunternehmen überprüfen.</p> <p>[Question role condition “judge”] Stellen Sie sich vor, Sie müssten als Richter in einem Rechtsstreit entscheiden: Handelt K mit diesem Verhalten fahrlässig?</p> <p>[Question role condition “legal adviser”] Stellen Sie sich vor, Sie sind Rechtsanwalt und beraten K. Was antworten Sie auf seine Frage: Handelt K mit diesem Verhalten fahrlässig?</p>	<p>[Case 3] K operates an automobile repair service. He uses a hydraulic platform produced by manufacturer W to lift cars. The platform’s manual contains the following language: “Safe operation of the platform requires servicing by one of our maintenance partners at least once per year.” Because W’s maintenance partners charge high service fees, K is having the platform checked by independent service contractors approximately every two years.</p> <p>[Question role condition “judge”] Imagine yourself as the deciding judge in a lawsuit: Is K acting negligently?</p> <p>[Question role condition “legal adviser”] Imagine yourself as an attorney advising K. Is K acting negligently?</p>

<p>[Case 4] B betreibt einen Bootsverleih am Bodensee. Dort vermietet er für halbe oder ganze Tage Jollen (kleine Segelboote) an Touristen. Für das Führen einer Jolle ist gesetzlich weder ein Bootsführerschein noch ein Mindestalter gefordert. B setzt das Mindestalter für seine Kunden auf 13 Jahre fest.</p> <p>[Question role condition “judge”] Stellen Sie sich vor, Sie müssten als Richter in einem Rechtsstreit entscheiden: Handelt B mit der Festsetzung dieser Altersgrenze fahrlässig?</p> <p>[Question role condition “legal adviser”] Stellen Sie sich vor, Sie sind Rechtsanwalt und beraten B. Was antworten Sie auf seine Frage: Handelt B mit der Festsetzung dieser Altersgrenze fahrlässig?</p>	<p>[Case 4] B runs a boat rental service at Lake Constance. He rents out jollyboats (small sailing boats) on a half-day or all-day basis. There is no legal minimum age and no boat driver’s license requirement for operating a jollyboat. B requires a minimum age of 13 of his customers.</p> <p>[Question role condition “judge”] Imagine yourself as the deciding judge in a lawsuit: Is B acting negligently by setting this age limit?</p> <p>[Question role condition “legal adviser”] Imagine yourself as an attorney advising B. Is B acting negligently by setting this age limit?</p>
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Each case question was followed by the following subjective confidence question:

German original	English translation
<p>[Question role condition “judge”] Wie sicher sind Sie sich bei Ihrem Urteil?</p> <p>[Question role condition “legal adviser”] Wie sicher sind Sie sich bei Ihrem Rat?</p>	<p>[Question role condition “judge”] How confident are you in your judgment?</p> <p>[Question role condition “legal adviser”] How confident are you in your advice?</p>
<p>[Five-value Likert scale] „sehr unsicher“ (1) to „sehr sicher“ (5)</p>	<p>[Five-value Likert scale] „very certain“ (1) to „very uncertain“ (5)</p>

The following question was used to solicit respondents’ estimated judgment distribution:

German original	English translation
<p>Wie viele von 100 Ihrer Mitstudierenden würden antworten: Ja: ____ Nein: ____ (Summe muss 100 ergeben)</p>	<p>How many out of 100 of your fellow students would answer: Yes: ____ No: ____ (Sum must be 100)</p>