Strategic ignorance in persuasion

Preliminary draft

Matthew R. Jordan\textsuperscript{1*}, Deborah Beim\textsuperscript{2}

August 31, 2018

\textsuperscript{1}Yale University, Department of Psychology, New Haven, CT, USA
\textsuperscript{2}Yale University, Department of Political Science, New Haven, CT, USA

*Correspondence to:
Matthew R. Jordan
2 Hillhouse Avenue
New Haven, CT 06511
Email: matthew.jordan@yale.edu
Abstract

Expert witnesses are often called upon to testify in cases that require analysis from a specialist. The expert witness’s role is to interpret evidence that is otherwise too complicated for a laymen or non-specialist (i.e., the jury) to parse on their own, be it forensics, statistics, psychological evaluations, etc. In other words, such expert testimony is meant to be a stand-in for the juries own interpretation of that evidence. Therefore, in order for a jury to actually use the testimony coming from an expert witness, the jury must judge the expert’s testimony to be impartial. But, should juries interpret expert testimony as impartial? There is reason to think juries do not, and perhaps should not, view expert testimony as impartial. The reason is simple: most experts are chosen by the client for whom they are providing favorable testimony, which means a population of experts could be mined for a favorable opinion. Here we develop a simple model of how juries interpret carefully chosen, as opposed to court appointed, experts and show that juries should rely less on testimony from carefully chosen experts. We then develop a signaling game in which lawyers can signal the strength of their case to the jury by their choice of expert witness. We then show that people do, in fact, distrust testimony from carefully chosen experts, and that those choosing experts often don’t realize the implications of hand-selecting their expert witnesses. We discuss the legal and policy implications of juries discounting testimony from hand-selected experts in the adversarial judicial system.

Keywords: expert mining, Bayesian updating, perspective taking failure, adversarial judicial system
Introduction

The US judicial system is adversarial. Each side of a dispute presents its own version of the facts to the court, which then evaluates the evidence and decides the case. The adversarial system is premised on the notion that a free-market of ideas in the courtroom will help the judge or jury find the truth (see e.g. Dewatripont & Tirole, 1999; Kagan, 2003).

Many trials include testimony from experts, whose role it is to parse information that would be otherwise uninterpretable by laypeople. That is, when interpreting facts requires specialized domain knowledge (e.g., genetics, statistics, psychological evaluations, accounting, etc.), an expert may be called upon to offer her opinion in lieu of asking the jury to interpret the facts on their own. Expert testimony is of central consequence for many politically salient cases. Political scientists often serve as expert witnesses in cases about gerrymandering, election law and voter identification laws, for example. But political scientists know very little about expert witnesses as an academic matter. We begin by understanding how judges and juries understand expert testimony and how they make inferences about expert testimony.

In a typical case requiring expert testimony, each litigating party will offer an expert to testify on their behalf—meaning the court will hear from two qualified experts who disagree about what the facts entail. In other words, two experts peer into a black box, and each comes back with a different report of what she saw. The court hears these reports then makes a decision on the basis of what was said. This creates a complicated strategic environment. How should (and how does) a juror react to hearing conflicting information? Given that a lawyer can select any expert, whom should he choose? Which witness will be most persuasive?

In this paper, we analyze this choice. Specifically, we consider the optimal choice of an expert. We begin by presenting survey-experimental evidence that mock jurors update in a straightforward manner: they prefer unbiased experts. When presented with witnesses who have varying professional histories, respondents report more trust for those who have historically testified for both sides of a dispute than those who have always taken the same side. Similarly, when presented with either a carefully-chosen or a randomly-chosen expert witness, respondents
report more trust for randomly-chosen experts more than those chosen by adversaries and react more to their testimony. But, we then show that mock lawyers do not correctly anticipate this behavior: they prefer to retain control over the choice of expert. We conclude by presenting an early version of a game-theoretic model in which lawyers do signal the strength of their case through their choice of expert witness.

Related Literature

Our project speaks to three literatures: a literature in psychology on Bayesian thinking and perspective-taking; formal-theoretical work on optimal experimentation and signaling; and a small legal literature on the choice between adversarial experts and court-appointed experts. We briefly review each of these.

A jury who hears from an expert witness must evaluate the credibility of the witness’s testimony. Many traits of an expert witness—their demeanor, their credentials, their preferences—can influence how credible a witness seems. Beyond these innate characteristics, the means by which a witness is chosen can have consequences. The Federal Rules of Evidence were amended in 1975 to allow for judges to select a non-partisan expert to testify in cases requiring expert opinion (Robertson 2010). From the jury’s perspective, a court-appointed expert is effectively a random draw from a distribution of expert opinions, and is therefore diagnostic of the actual truth. This contrasts with the standard litigator-selected expert, who is hand chosen by a party to testify on their behalf. Although the jury doesn’t know for sure that the expert is a hired gun—the expert may have been randomly chosen—the fact that it is possible that the expert was hand-selected for their deviant opinion makes their testimony seem less diagnostic of the truth.

Although making the inference that randomly chosen opinions are more diagnostic of the truth than carefully chosen opinions requires sophisticated Bayesian reasoning, two separate lines of research in psychology make it clear that people are highly capable in this domain.

Work in developmental psychology has shown that infants as young as 8 months understand that they cannot learn anything about a population when the population is not sampled at random
(Schulz 2012; Xu and Garcia 2008). For example, when 8-month olds observe an experimenter with a preference for red marbles look into a bag and remove a red marble on three consecutive draws, they make no inferences about the contents of the bag. But, when an experimenter draws three red marbles in a row without looking into the bag, infants infer a high proportion of red marbles. Similarly, 20-month olds can make inferences about an experimenter’s preferences based on the same kinds of violations of random drawing as we just mentioned (Kushnir, Xu, and Wellman 2010). Unsurprisingly, these kinds of inferences are also made by adults (Nisbett et al. 1983).

In addition to developmental work on statistical reasoning, there has been a considerable volume of work that has revealed the ways in which our reasoning is specific to social situations. Consider the following puzzle, called the Wason selection task (Cosmides 1989; Wason 1968). There are four cards, and each has a letter on one side and a number on the other. Right now, you can see the following cards: “B”, “C”, “23”, and “16”. Your goal is to determine whether the cards violate the rule “If a card shows a “B” on one side, then it shows an odd number on the other side”. Which card or cards do you need to turn over to verify whether that rule holds? This problem is challenging, but we can make the problem easier without changing its underlying logic. Now consider four cards that each represent what a person is drinking on one side, and their age on the other: “Beer”, “Coke”, “23”, and “16”. Which cards do you need to check to verify the rule “If a person is drinking beer, they must be at least 21”? Just as is the case in the first, abstract example, in which you must check “B” (to verify if p, then q) and “16” (to verify the contrapositive if not q, then not p), so too you must check the age of the beer drinker and the drink of the underage person in the second example. Despite the logical equivalence of these two problems, less than one in four people solves the first, whereas more than three in four solves the second. The reason for this dramatic change in performance across logically identical tasks is that the second task is social, and our minds can solve sophisticated logical problems when they are framed in ways that are relevant to everyday life (Cosmides 1989).

To the extent that juries apply statistical reasoning and social scrutiny to the selection of expert witnesses in the ways we have describe above, we ought to expect juries to be shrewd in their interpretation of expert selection processes and expert testimony. Naively—that is, without first
constructing a game-theoretic model played between litigators and jurors—we expect juries to interpret litigant-selected experts as non-random, strategically-chosen draws from a distribution of opinions. This inference means that juries should rely less on such experts’ testimony, and, irrespective of the particular testimony the expert provides, the mere fact that a litigant chooses their own expert indicates they are less likely to be on the correct side of the truth. On the contrary, we expect juries to interpret court-appointed experts as random draws from the distribution of truth. This inference ought to be reflected in increased reliance on court-appointed experts by juries, as well as a belief that litigants who elect for a court-appointed expert are more likely to be on the right side of the truth.

Because a carefully chosen expert is preferentially selected from part of the distribution that favors the selecting litigant, their opinion is not diagnostic of the truth. It’s as if the litigant looked into a bag and drew a red marble: that doesn’t mean the bag is full of red marbles, it only means that he likes red and there was at least one red marble in the bag. Similarly, had the litigant known that the bag was 95% red marbles, he wouldn’t need to peek in order to demonstrate the redness of the bag.

Thus far, we have presented evidence that suggests we ought to expect juries to be Bayesian in how they interpret expert selection and expert testimony. This raises a new question: do litigants anticipate that juries will make such rich inferences, and adjust their expert selection strategy accordingly? There is very little in the psychology literature that can speak to this. Furthermore, recent formal-theoretic work indicates the selection of an optimal expert is non-obvious. The ally principle may not hold, and there may be non-monotonicity in the decision to become informed (see e.g. Alonso and Camara 2017, Bhattacharya and Mukherjee 2013, Kamenica and Gentzkow 2011). In other words, our intuitions about which expert a litigant should select may be incorrect: the optimal choice may be complicated. Moreover, as a practical matter, it may be a significant challenge to optimally select an expert (either in terms of the expert’s opinion or the mode of selecting the expert). Lastly, lawyers have many factors to consider when choosing an expert (e.g., Will the expert pass Daubert test? Will the expert be friendly? Will the expert be a good explainer of concepts and findings? Will the expert be charming and persuasive? Etc.), and a
review of trade publications (Couture 2010) suggests that how the jury will interpret the method of choosing an expert is not on the list of considerations.

*Expert blinding, expert mining, and hired guns*

In the past decade, legal scholars have begun to scrutinize some of the issues that can arise from how expert witnesses are typically chosen. As we noted above, in the adversarial system, each litigating party selects an expert who will testify on their behalf. Robertson (2010) makes the observation that being selected as an expert for a particular litigant is a selection event, and one that selects for quirky, minority expert opinions. Critically, any given expert can give their honest assessment of the facts, but the fact that a deviant opinion will be selected for by one of the litigants is problematic. Further, because there are only two opinions, each of which was selected by a litigant for their purposes, the jury has no way of knowing where on the distribution of opinions each expert lies. This is what gives rise to the fundamental informational differences between litigant-selected and court-appointed experts.

Robertson advocates for what he calls blinded experts—experts who produce reports without knowing who they are testifying for—rather than court-appointed experts. He does so partially on procedural grounds that we won’t address, but also on the grounds that court-appointed experts may be seen by juries as being infallible. Of course, it is possible that a court-appointed expert may err, but a jury would not be wrong, on our model, to weight testimony from a court-appointed expert much more heavily. That being said, we will leave it to the legal scholars to determine whether blinded expert or court-appointed experts are more feasible in practice, as our model of jury inference and litigant signaling will hold no matter how a random-draw system is implemented.

There has also been some empirical work on how juries think about blinded experts and so-called hired-gun experts (Cooper and Neuhaus 2000; Robertson and Yokum 2012). The results are generally in accordance with what we would expect. For example, experts who are highly paid or who have a history of testifying on behalf of one type of litigant are believed less. One issue with studies of this kind is that juries are given the inference we would expect them to make on their own: juries are told that they should rely more on blinded experts. Here, we are
more interested in the extent to which juries can make those inferences on their own, rather than whether they can understand why they ought to make that inference.

*The current study*

Here, we present a series of studies that demonstrate juries are exceptionally shrewd in making inferences about the process by which experts are selected. We then present studies that demonstrate that those acting as litigants fail to realize juries make such inferences. Furthermore, those acting as litigants can be prompted to understand how juries will interpret the careful selection of an expert, but readily confabulate the irrelevance of this jury inference through the belief that they will be better able to choose competent and persuasive experts than the court. In future versions of the paper, we will produce a formal model of how juries ought to interpret litigant-selected and court-appointed expert testimony. We will then build that decision-making process into a signaling model wherein litigants can signal the strength of their case by opting for a court-appointed expert.

**Which expert-history is most convincing?**

Some experts overwhelmingly testify on behalf of corporations, others overwhelmingly testify on behalf of those those opposing corporations. Some experts testify only for the Democratic party, or only for the prosecutor, or only in favor of the claim that a district’s boundaries were illegally drawn. Some experts, though, have a more evenly mixed history. That is, some experts might be seen as ideologues or partisans, while others are seen as more even-handed. In fact, some legal thinkers have suggested that one ought to select experts with evenly mixed prior opinions in order to be more compelling to the jury. In this study, we test how jurors interpret testimony from experts with various histories of opinions. Do juries interpret testimony that is inconsistent with an expert’s history as surprising? As convincing? Do juries trust ideologues or balanced experts?

**Methods**

We recruited 600 participants ($M_{age} = 36.86$, 281 males) from Amazon Mechanical Turk. Participants were asked to assume the role of a juror in an arson case: the defendant was charged with arson in the course of filing a fire insurance claim. (Stimuli for each experiment can be
found in the appendix.) We analyzed the jurors’ degree of reliance on the expert and the likelihood the defendant started the fire.

Participants were randomly assigned to a condition using a 3-by-2 between-subjects design in which we varied expert history (always for insurance companies, always for defendants, or an even mix) and varied the expert’s testimony (favorable or unfavorable). The expert history conditions were as follows. The expert with a history of testifying in favor of insurance companies had testified in 100 cases like the one participants read about, and in each of those cases had testified that the defendant had caused the fire. The expert with a history of testifying in favor of defendants had testified that the fire was an accident in 100 similar cases. The expert with an even mix had sided with insurance companies and defendants equally in 100 similar cases. We asked participants how much they would rely on the expert’s testimony and how likely they thought it was that the defendant had caused the fire.

**Results**

We examined the effects of expert history and testimony using regression.

Experts with an even mix of testimonies (M = 5.08, SE = 0.10) were marginally more relied upon than those with a history of testifying for defendants (M = 4.86, SE = 0.10), β = -0.26, SE = 0.15, p = 0.086, and significantly more relied upon than those with a history of testifying for insurance companies (M = 4.58, SE = 0.10), β = -0.51, SE = 0.15, p < 0.001. Those with a history of testifying for defendants were marginally more relied upon than those with a history of testifying for insurance companies, β = -0.25, SE = 0.15, p = 0.091.

There was no effect of testimony for experts with an evenly-mixed professional history. Testimony for (M = 5.11, SE = 0.14) versus against (M = 5.06, SE = 0.14) did not affect reliance on experts with an even mix, β = 0.05, SE = 0.20, p = 0.805, but testimony did affect reliance on experts with the other histories. For experts with a history of testifying for defendants, participants relied more on experts who provided unfavorable testimony (M = 5.37, SE = 0.14) than those who provided favorable testimony (M = 4.33, SE = 0.14), β = -1.04, SE = 0.20, p < 0.001. The pattern reversed for experts with a history of testifying for insurance companies, such
that participants relied more on experts who provided favorable testimony \((M = 5.32, SE = 0.14)\) than experts who provided unfavorable testimony \((M = 3.84, SE = 0.14)\), \(\beta = 1.47, SE = 0.20, p < 0.001\).

When we examined judgments about the likelihood that the defendant caused the fire, we found main effects of testimony, \(\beta = -31.96, SE = 1.71, p < 0.001\), such that participants believed the defendant was less likely to have cause the fire when the expert provided favorable \((M = 32.45, SE = 1.22)\) as opposed to unfavorable testimony \((M = 64.41, SE = 1.21)\). We also found a main effect of expert history such that participants judged the defendant as less likely to be guilty when he chose an expert with a history of testifying for insurance companies \((M = 38.82, SE = 1.47)\) compared to experts with an even mix of prior testimony \((M = 50.58, SE = 1.48)\), \(\beta = -11.87, SE = 2.09, p < 0.001\). Participants also judged a defendant to be less likely to be guilty when choosing an expert with an even mix of prior testimony than a history of testifying for defendants \((M = 56.40, SE = 1.50)\), \(\beta = 5.71, SE = 2.11, p = 0.007\). The difference between likelihood judgments was largest between defendants who chose experts with a history of testifying for insurance companies compared to defendants, \(\beta = -17.59, SE = 2.10, p < 0.001\). We found no evidence of an expert history by testimony interaction, all \(\beta\)'s < |0.72|, SE’s > 4.21, p’s > 0.864.

**Figure 3.** A) Reliability judgments about experts with various histories of testimony and testimony in this case. Participants relied less on experts who provided testimony congruent with their history of testimony (favorable/defendant and unfavorable/insurance company). Experts with an even mix of testimony in the past did not show this effect. B) Judgments about the likelihood that the defendant caused the fire. Participants believed it was especially unlikely that the defendant caused the fire if he chose an expert with a history of testifying for insurance companies.
Experts with a history of testifying for insurance companies, who provide favorable testimony for a defendant, are more relied upon than experts with a history of testifying for defendants. Furthermore, participants interpret choosing an expert with a history of testifying for insurance companies as a signal of the strength of the defendant’s case, and this is reflected in the fact that participants said it was less likely that the defendant caused the fire when he and his lawyer chose an expert with a history of testifying for insurance companies than either the expert with an even mix of past testimonies or a history of testifying for defendants.

**Are court-appointed or adversarially-chosen experts more convincing?**

We reinforce these findings by illustrating differences in how mock jurors react to randomly chosen versus carefully chosen experts. To do so, we conducted another survey experiment on Amazon’s Mechanical Turk which varied the selection method—whether the expert was chosen by a lawyer or by the court—and asked respondents to act as jurors and evaluate the credibility of expert witnesses. We asked again about an arson case.

Our goal is to evaluate whether 1) carefully chosen experts who provide favorable testimony should not be relied upon as much as a judge-selected expert who provides favorable testimony, and 2) allowing the judge to choose an expert should be interpreted as indicating that (at least in these cases) the defendant is more likely to be arguing for the objectively true state of the world. Moreover, here we interrupt the information the respondent receives to evaluate the independent effects of the mode of selection and the expert’s testimony.

**Results**

After learning about how the expert was selected—but before learning what the expert said—participants said they would rely more on randomly chosen experts (M=5.3) than carefully chosen experts (M=4.3), b = 1.05, SE = 0.13, p < 0.001. Similarly, they thought that a defendant who had randomly chosen an expert (M=30.5) was less likely to be guilty than one who had carefully chosen an expert (M=48.4), b = -17.97, SE = 2.33, p < 0.001. In other words, there is signaling value to choosing an unbiased expert.
Participants said they would rely more upon a randomly-chosen witness who provided favorable testimony (M = 5.61) than a carefully-chosen witness who provided the same favorable testimony (M=4.45). This is an estimated difference of 1.16 (SE = 0.19, p < 0.001). We found no difference in reliance upon randomly chosen (M=5.16) versus carefully chosen witness (5.13) who each provided unfavorable testimony (a difference of 0.03, SE = 0.19, p = 0.870).

When we looked at participants' judgments about the likelihood that the defendant was guilty, we found that randomly choosing made the defendant appear less guilty by -15.08 (SE = 2.52, p < 0.001). We also found that favorable testimony is good for the defendants (28.9, SE = 2.52, p < 0.001). We also found a mode of choosing by testimony interaction, b = 11.01, SE = 5.01, p = 0.029. Participants who heard favorable testimony from a carefully chosen witness (M=45.2) believed it was more likely that the defendant was guilty than those who heard favorable testimony from a randomly chosen witness (M=24.6)—an effect size of 20.5 (SE = 3.02, p < 0.001). Similarly, those who heard unfavorable testimony from a carefully chosen witness (M=68.6) believed it was more likely that the defendant was guilty than those who heard the same testimony from a randomly chosen witness (M=59.1)—an effect size of 9.50 (SE = 3.57, p = 0.008).

**Whom do lawyers select?**

Would-be jurors rely less on the testimony of carefully-chosen witnesses and believe that defendants who choose expert witnesses carefully are more likely to be guilty. This suggests that, when in the mindset of a juror, people understand that only those who are confident that the facts will support their position are willing to let any expert provide an opinion. Thus, to the extent that someone chooses carefully, they might be signaling a position of weakness. But, do those who are doing the choosing understand that this is the inference others are making about their choice? To evaluate this, we asked M Turk respondents to act as though they were lawyers.

Recall that in the prior studies, participants interpreted deciding to let the judge choose an expert as a signal that the defendant was not guilty. Therefore, if those assuming the role of the lawyer in this scenario understand that they can signal the strength of their case to the jury by letting the judge choose, they should be more likely to do so when they have a strong case than when they
have a weak case. In addition, to the extent that people assuming the role of lawyer in this scenario do not realize, but could appreciate, the fact that they could signal the strength of their case by letting the judge choose, prompting them to think about how the jury would perceive careful choosing ought to induce more people to let the judge choose. We test both of these notions in this study.

Methods
We recruited 602 new participants \( (M_{\text{age}} = 36.31, 331 \text{ males}) \) from AMT. Participants were asked to assume the role of attorney for the defendant in the arson scenario described above. Participants were randomly assigned to a condition using a 3 (strength of case: no information/strong/weak) X 2 (order of choice: decide how to choose expert first/after considering jury perceptions of that choice) between-subject design. In the no-information condition, participants read only about the arson case. In the strong case condition, participants read that their client had a strong case, while in the weak condition, participants read that their client had a weak case. All participants answered a question (on a scale from 0 “Rely more on you and your client’s choice” to 100 “Rely more on judge’s choice”) about how the jury would perceive careful versus random choosing: “Consider how the jury would interpret you and your client choosing your own expert witness versus asking the judge to choose and expert witness on your behalf. Do you think the jury would rely more on the testimony of an expert you and your client chose, or would they rely more on the testimony of an expert the judge chose alphabetically?” Half of participants answered this question prior to deciding how to choose an expert, the other half answered this question after they had decided how to choose their expert. Our key outcomes were whether the participant decided to choose their expert carefully or let the judge choose the judge choose and how participants thought the jury would interpret careful versus random choosing. Judgments about the likelihood that the client caused the fire was collected as a manipulation check.

Results
Our strength of case manipulation was effective. Participants who were told they had a strong case \( (M = 32.26, \ SE = 1.40) \) thought their client was less likely to be guilty than those who were given no information \( (M = 44.33, \ SE = 1.43) \), who thought their client was less likely to be
guilty than those who were told they had a weak case (M = 55.43, SE = 1.44), all β’s > |11.08|, SE’s < 2.01, p’s < 0.001.

We used logistic regression to determine the effect of the strength of the case and order of choice on whether participants would decide to choose their expert carefully or let the judge choose. We found a marginal effect of strength of case such that those in the no information condition (M = 0.64, SE = 0.03) were marginally more likely to choose carefully than those in the weak case condition (M = 0.55, SE = 0.03), β = 0.40, SE = 0.22, p = 0.070, and those in the strong case conditions (M = 0.55, SE = 0.03), β = 0.40, SE = 0.22, p = 0.067. There was no difference in probability of choosing carefully between those in the strong case condition and those in the weak case condition, β = -0.001, SE = 0.22, p = 0.997.

We found a main effect of order of choice, β = 1.60, SE = 0.18, p < 0.001, such that those who decided how to choose their expert before considered how that would be perceived by the jury (M = 0.76, SE = 0.02) were more likely to choose carefully than those who decided how to choose their expert after considering how the jury would perceive careful choosing (M = 0.40, SE = 0.03). We found no evidence of an interaction between strength of case and order of choice, all β’s < |0.59|, SE’s > 0.44, p’s > 0.182.

We used linear regression to examine judgments about how the jury would perceive careful choosing versus letting the judge choose using participant choice about whether to choose carefully and whether that choice came before or after considering jury perceptions as predictors. We found a main effect of how participants decided to choose their expert, β = -22.94, SE = 1.86, p < 0.001, such that those who decided to let the judge choose (M = 82.48, SE = 1.46) believed the jury would rely more on a randomly chosen expert than those who decided to choose their expert carefully (M = 60.06, SE = 1.17). We did not find evidence that deciding how to choose their expert before or after considering how the jury would perceive that mode of choice affected assessments of jury perceptions, β = 2.59, SE = 1.83, p = 0.158. We found a marginally significant mode of choosing by jury perception interaction, β = 7.35, SE = 3.74, p = 0.050. To understand this interaction, we looked at the effect of order of choice among those who chose their expert carefully or let the judge choose. Among those who chose carefully, those
who considered jury perceptions of mode of choice first (M = 62.79, SE = 1.37) thought the jury would rely more on a judge-selected expert than those who made their expert choice after (M = 57.31, SE = 1.91), $\beta = 5.48$, SE = 2.35, $p = 0.020$. The direction of that effect was (although not statistically significantly so) reversed among those who decided to let the just choose (expert choice first: M = 81.55, SE = 2.47; expert choice after considering jury perception: M = 83.41, SE = 1.55), $\beta = -1.87$, SE = 2.91, $p = 0.522$.

Figure 4. Mode of expert selection across conditions. Participants were more likely to ask the judge to choose an expert when they first considered how the jury would perceive their mode of choosing and expert. When participants considered how the jury would perceive their mode of choosing did not interact with the strength of their case.

These results suggest that people do not intuitively realize that it is possible to signal the strength of one’s case to the jury by letting the judge choose an expert. This is evident from the fact that we did not find strong effects of our strength of case manipulation on mode of choosing. Yet, we found a strong effect of considering how the jury would perceive careful choosing prior to deciding how to choose an expert, which suggests that, once prompted, participants understood how jurors might interpret careful choosing. In spite of this realization, we found no evidence that our strength of case manipulation interacted with considering jury interpretations of careful choosing, which suggests that whatever participants understood about what mode of choosing signals to jurors, it was not deeply integrated into decision-making. Had it been deeply
integrated, we should have seen that those who considered how the jury would perceive careful choosing, who were also told they had a strong case, should have been especially likely to let the judge choose. This was not the case.

Thus, we have shown that those assuming the role of jurors are highly sensitive to the signals sent by modes of choosing experts and the testimony history of experts. But, those assuming the role of lawyers, fail to realize what kind of signal they are sending, and can convince themselves that they ought to choose experts carefully because they are particularly adept at choosing the best expert (which is highly dubious in the context of our study).

**Interpretation and theory-building**

We have shown that mock jurors are more persuaded by court-appointed experts than by adversarially-chosen experts, and more persuaded by experts who have a history of testifying for both sides of a typical dispute. We have also shown that mock lawyers do not seemingly act to optimize the opinion of the jury. Our results speak to a growing legal literature on court-appointed experts and to a psychological literature on how people update, and failures in “perspective taking” by those *interacting* with people who update. Our results also speak to a theoretical literature in political science on how to persuade decision-makers. We discuss that briefly.

A growing literature on Bayesian persuasion (see e.g. Kamenica and Gentzkow 2011) interrogates the circumstances under which two individuals can come to share beliefs about the state of the world, and when communication is advantageous for the would-be persuader. In these models (unlike more traditional signaling models, like Gilligan and Krehbiel 1987 and Cameron, Segal, and Songer 2000) neither party possesses more information than the other. Instead, the communicator’s role is to design an experiment. The results of the experiment will always be truthful, but the communicator can choose the rate at which the experiment yields Type I and Type II errors. This creates an opportunity for the communicator to influence the decisions the receiver makes.
Although the communicator doesn’t know what the results of the experiment will be, he can design an experiment he expects will yield outcomes advantageous to him. Kamenica and Gentzkow (2011), the seminal paper in this burgeoning literature, find the optimal experiment when there is one sender and one receiver (neither of whom possess any private information.) When the facts are in the sender’s favor, the experiment reveals this with error—sometimes the experiment shows the facts are in the sender’s favor, and other times the experiment shows the facts are not in the sender’s favor. However, when the true facts are not in the sender’s favor, the experiment reveals this perfectly. As a result, whenever the experiment shows the facts are in the sender’s favor, the receiver knows with certainty that the facts are in the sender’s favor. Kamenica and Gentzkow show it is possible for the communicator to design an experiment that leads him to win more often than not.

Building off of this result, a number of economists have developed more complex games of experimental design and Bayesian persuasion. Two such examples are particularly relevant for our own work. Kamenica and Gentzkow (2017) show that with two senders (and no private information), there is always complete revelation of the true state of the world. Alonso and Câmara (2018) consider when a sender benefits by becoming more informed about the state of the world. (A small number of papers in political science have adopted this technology, including Gehlbach and Sonin 2014 and Schnackenberg 2017, among others.)

Our model also speaks to work on signaling with multiple senders (e.g. Battaglini 2004; Beim 2017; Bhattacharya and Mukherjee 2013; Dewatripont and Tirole 1999; Epstein 1998; McGee and Yang 2013; Minozzi 2011) and is related to the formal-theoretic literature on information and trial strategy, including Froeb et al. (2016) and Daughety and Reinganum (Forthcoming).

**Our model**

There are two states of the world. In one state of the world, the defendant should win. In the other state of the world, the plaintiff should win. This state of the world is a summary of questions of fact and law in a given case. When the game begins, everyone—the plaintiff, the defense, and the court—believe the states of the world are equally likely. (This assumption is reasonable in light of Priest and Klein’s (1984) argument that other cases should settle.) The
plaintiff and the defense then each independently receive a private signal about the state of the world. This can be thought of as conversations between the party and the lawyer, where the two sort out how strong the case is and how likely they are to win. This private signal is accurate with probability $p$ and inaccurate with probability $1-p$, where $p > .5$.

Having seen the private signal, each side then chooses an expert witness to testify in the trial. Since each side has private information, this choice has signaling value. There are three witnesses from which to choose: a defense-persuasive witness, a plaintiff-persuasive witness, and an unpredictable witness. Each witness will see and process information about the true state of the world, then truthfully testify to the court. The choice of a witness is the choice of how true information will be processed. On which questions is accuracy most important? On which questions can the witness be more relaxed? We construct the available witnesses based on insights from the literature on Bayesian persuasion. Namely: an experiment that always reveals unfavorable facts when they exist, but only sometimes identifies favorable facts when they exist, is particularly persuasive. This is because any evidence of favorable facts must mean there are favorable facts. Thus, a persuasive witness is one who always testifies against the party when the facts are against that party, and mixes when the facts are in the party's favor.

A defense-persuasive witness always testifies for the plaintiff when the facts support the plaintiff. When the facts support the defense, the defense-persuasive witness testifies with error. When the facts support the defense, the defense-persuasive witness testifies the facts support the defense with probability $x$. With probability $1-x$, the defense-persuasive witness testifies the facts support the plaintiff. $x$ is strictly between .5 and 1, so that the witness is always right more often than not and never perfectly informative.

Likewise, a plaintiff-persuasive witness always testifies for the defense when the facts support the defense. When the facts support the plaintiff, the plaintiff-persuasive witness testifies as much with probability $x$, and with probability $1-x$ testifies the facts support the defense.

An unpredictable witness is unbiased and noisy. The witness testifies correctly with probability $y$ and testifies incorrectly with probability $1-y$. 


We seek an equilibrium in which a party’s choice of witness is informative and the witness’s testimony is also informative. We identify one such perfect Bayesian equilibrium. In this equilibrium, a party chooses a witness persuasive to its own side when the private signal suggests the facts are in its favor, and chooses an unpredictable witness when the private signal suggests the facts are not in its favor. Because a predictable witness always testifies against his party when the facts are indeed against his party, a litigant who has received a bad signal expects the testimony of a persuasive witness to be bad for him. He therefore prefers an unpredictable witness. In contrast, a party who has received a good signal expects the testimony of the persuasive witness not to be quite so bad, and so he is willing to gamble.

We note also that it is strictly advantageous to choose an unpredictable witness above one who is biased in one’s own favor. This is because the Bayesian signaling value of a witness who over-testifies that the facts support his party is not credible in the eyes of the court. As a result, both parties that think they have a strong case and parties that think they have a weak case prefer an unpredictable witness to a witness biased in their own favor. The key difference between this model and the initial intuition laid out is that it is better still to choose a witness who is biased against the party. Such a witness will be particularly persuasive.

The equilibrium rationalizes some of the experimental results we found, but raises questions about others. The results of our model indicate that it is not straightforward to a lawyer to simply choose a witness only on the basis of the signaling power of said choice—since the witness’s testimony is itself informative. In particular, although a litigant who knows he has a weak case may wish to behave as though he had a strong case, he knows that choosing a persuasive witness will ultimately be detrimental to his success. However, the results of our model do indicate that choosing a witness who always testifies in one’s favor is not an optimal decision. This witness’s testimony is not informative. This theoretical result is consistent with our experimental results.

**Conclusion and next steps**

Our experimental results suggest a quandary about expert witnesses. Experts whose testimony is biased in favor of the side that employed them are believed less than less-biased experts. But,
mock lawyers in general do not select witnesses on the basis of this expectation. We present results from a number of related experiments interrogating this empirical finding. Then, we present an initial sketch of a game-theoretic model about the choice of expert witnesses. We are continuing to work on this model, and are continuing to strengthen the ties between the experiments and theory presented here.
References


Appendix: Vignettes and Survey Details

Below are the prompts and dependent measures for each study. The bold is added here to facilitate finding the between-subjects variations, but was not present in the studies.

**Death penalty (jury)**
Imagine you are a juror in a criminal case. The criminal defendant, Smith, claims he is mentally ill—a determination which must be made by an expert witness like a psychologist—and should therefore go to a locked rehabilitation center rather than to jail.

The judge offers to randomly select a psychologist to testify on behalf of Smith, by choosing alphabetically from a list of psychologists in the area. Or, he offers for Smith to talk with as many psychologists as he wishes, and choose his own from the list. Smith and his attorney [ask the judge to choose/ask to choose their own]. As is always the case, the state will pay for the expert’s time.

In court, the expert testifies that Smith [is/is not] mentally ill.

How much would you rely on the expert's testimony in forming your decision about whether Smith is mentally ill? [1 = Not at all, 7 = Completely]

How likely do you think it is that Smith is mentally ill? [0% to 100%]

**Arson (jury)**
Imagine you are a juror in a fire insurance case. Smith's house burned down and he filed an insurance claim for the damage. The insurance company denied the claim, because they argue Smith caused the fire. Now, Smith and his insurance company are in court to adjudicate what happened. Smith will present an arson expert to testify on his behalf.
The judge offers to randomly select an expert to testify on behalf of Smith, by choosing alphabetically from a list of experts in the area. Or, he offers for Smith to talk with as many experts as he wishes, and choose his own from the list. Smith and his attorney [ask the judge to choose/ask to choose their own]. As is always the case, Smith will pay for the expert’s time.

In court, the expert testifies that [the fire was an accident not caused by Smith/Smith caused the fire].

How much would you rely on the expert's testimony in forming your decision about whether Smith caused the fire? [1 = Not at all, 7 = Completely]

How likely do you think it is that Smith caused the fire? [0% to 100%]

Arson (lawyer)

Imagine you are a lawyer. Your client's house burned down and he filed an insurance claim for the damage. The insurance company denied the claim, because they argue your client intentionally caused the fire. Now, your client and his insurance company are in court to adjudicate what happened. You and your client decide to present an arson expert to testify on his behalf.

The judge offers to randomly select an expert to testify on behalf of your client, by choosing alphabetically from a list of experts in the area. Or, he offers for you and your client to talk with as many experts as you wish, and choose your own from the list. In either case, your client will pay for the expert’s time.

[Having reviewed the evidence, you think the case could come out either way. Neither the insurance company nor your client seem to have an airtight argument. / Having reviewed the evidence, you think the insurance company's case seems weak. You feel relatively confident that you can persuade the jury that your client did not cause the fire. /]
Having reviewed the evidence, you think the insurance company's case seems strong. You do not feel very confident that you can persuade the jury that your client did not cause the fire.]

Consider how the jury would interpret you and your client choosing your own expert witness versus asking the judge to choose an expert witness on your behalf. Do you think the jury would rely more on the testimony of an expert you and your client chose, or would they rely more on the testimony of an expert the judge chose alphabetically? [0 = Rely more on you and your client’s choice, 50 = Rely on both equally, 100 = Rely more on judge’s choice]

Would you advise your client that you and he choose an expert on your own, or would you suggest the judge choose alphabetically from the list? [Choose the expert, Ask the judge to choose]

How likely do you think it is that your client caused the fire? [0% to 100%]
Appendix: Additional experiments on careful versus random choice

Arson

We recruited 405 new participants (M\text{age} = 36.38, 200 males) from AMT. Here, the defendant was charged with arson in the course of filing a fire insurance claim. Participants were randomly assigned to conditions using a 2-by-2 fully between-subjects design, in which we varied the mode of choosing expert—that is, whether the witness was carefully chosen or randomly chosen—and the favorability of the testimony—that is, whether it was favorable or unfavorable.

All participants were told that, when it came time to find an expert witness, the judge offered two options: either the judge could choose randomly from a list of qualified experts or the defense could talk with as many experts as they like from the list and choose their own. Those in the carefully-chosen expert conditions were told that the defense elected to choose their own witness, while those in the randomly-chosen condition were told that the defense elected to have the judge choose for them. Favorable testimony meant the expert testified that the defendant had not started the fire, while unfavorable testimony meant the expert testified that the defendant had started the fire. We seek to understand the degree to which respondents would rely on the expert’s testimony, measured on a seven-point Likert scale (from 1, “Not at all”, to 7, “Completely”). We also asked respondents their opinion on how likely it was that the defendant had started the fire (0%-100%). We analyzed the degree of reliance on the expert and the likelihood the defendant started the fire.

Results

Regression revealed no main effect of either mode of choosing an expert, $\beta = 0.05$, SE = 0.12, $p = 0.675$, or testimony, $\beta = 0.13$, SE = 0.12, $p = 0.267$. To understand this interaction, we looked at the effect of mode of choosing within type of testimony. Among experts providing favorable testimony, participants relied more on those who were randomly chosen ($M = 5.65$, SE = 0.11) than those who were carefully chosen ($M = 5.18$, SE = 0.12), $\beta = 0.47$, SE = 0.16, $p = 0.004$. Among experts providing unfavorable testimony, participants relied more on those who were carefully chosen ($M = 5.48$, SE = 0.11) than those randomly chosen ($M = 5.10$, SE = 0.12), $\beta = -0.38$, SE = 0.16, $p = 0.020$. 
When we examined participants’ judgments of the likelihood that the defendant caused the fire, regression showed a main effect of mode of choosing, $\beta = -8.21$, $SE = 2.07$, $p < 0.001$, such that participants judged the defendant as less likely to have caused the fire when the expert was randomly chosen ($M = 44.91$, $SE = 1.46$) than when the expert was carefully chosen ($M = 53.12$, $SE = 1.46$). This is a similar effect size as what we found in the death penalty example. We also found a main effect of testimony, $\beta = -40.68$, $SE = 2.07$, $p < 0.001$, such that participants who heard favorable testimony judged the defendant as being less likely to have caused the fire ($M = 28.82$, $SE = 1.45$) than those who heard unfavorable testimony ($M = 69.50$, $SE = 1.46$). When we looked only likelihood of guilt judgments among participants who heard favorable testimony, we found a simple effect of choosing randomly, $\beta = -11.58$, $SE = 2.90$, $p < 0.001$, such that those who saw favorable testimony from a randomly chosen expert thought it was less likely that the defendant caused the fire ($M = 23.04$, $SE = 1.98$) than those who heard the same testimony from a carefully chosen expert ($M = 34.62$, $SE = 2.12$). We did not find evidence of a mode of choosing by testimony interaction, $\beta = -6.80$, $SE = 4.12$, $p = 0.100$.

**Figure 2.** A) Reliability judgments across testimony types and mode of choosing. Randomly chosen experts who provide favorable testimony are relied upon more than carefully chosen experts who provide the same testimony. B) Likelihood judgments about whether the defendant cause the fire. Across testimony types, defendants who choose experts randomly are seen as less likely to be guilty.

Again, we found evidence that experts who are selected by a judge and provide favorable testimony are relied upon more than carefully chosen experts who provide favorable testimony. Further, participants believed it was less likely that the defendant caused the fire when he and his lawyer opted to let the judge select the expert, irrespective of testimony.
**Death Penalty**

We recruited 201 participants ($M_{\text{age}} = 36.7$, 115 males) from Amazon’s Mechanical Turk (AMT). Participants were instructed to imagine they were part of a jury in a criminal case in the sentencing phase. The defendant claimed to be mentally ill, and should therefore not receive the death penalty, and participants were told that an expert witness was required to determine whether the defendant’s claim was true.

**Results**

We began by examining the extent to which participants said they would rely on the testimony from the expert (on a 7-point Likert scale). Respondents rely on the testimony of all experts witnesses, but on average, respondents rely on randomly-chosen experts .49 points more than on carefully-chosen experts—a 10% increase.

We found slight evidence of a main effect of testimony, $\beta = -0.38$, SE = 0.21, $p = 0.078$, such that participants relied more on an expert who provided unfavorable testimony ($M = 5.39$, SE = 0.15) than one who provided unfavorable testimony ($M = 5.01$, SE = 0.14). These main effects were qualified by a mode of choosing by testimony interaction, $\beta = 0.98$, SE = 0.42, $p = 0.022$, such that participants relied less on a carefully chosen expert who testified in favor of the defendant ($M = 4.44$, SE = 0.24) than a carefully chosen expert who provided unfavorable testimony ($M = 5.32$, SE = 0.18) and a randomly chosen expert who provided favorable ($M = 5.42$, SE = 0.18) or unfavorable ($M = 5.32$, SE = 0.24) testimony. Critically, among experts who provided favorable testimony, we found an effect of mode of choosing, $\beta = 0.98$, SE = 0.30, $p < 0.001$, such that carefully-chosen experts are less relied upon, even when fixing their testimony as favorable.

---

1 Regression revealed a main effect of the mode by which the expert was chosen, $\beta = 0.49$, SE = 0.21, $p = 0.023$, such that participants relied more on a randomly chosen expert ($M = 5.44$, SE = 0.15) than a carefully chosen expert ($M = 4.95$, SE = 0.15).
Next, we considered participants’ judgments about how likely it was that the defendant was mentally ill on a scale from 0%-100%. The defendant-friendly position is to be found mentally ill in order to avoid the death penalty.

Regression revealed a main effect of the mode by which the expert was chosen, $\beta = 13.55$, $SE = 3.35$, $p < 0.001$, such that participants who heard from a randomly chosen expert believed it was more likely that the defendant was mentally ill ($M = 53.05$, $SE = 2.36$) than participants who heard from a carefully chosen expert ($M = 39.46$, $SE = 2.40$). Similarly, we found a main effect of the testimony provided, $\beta = 29.81$, $SE = 3.35$, $p < 0.001$, such that participants who heard favorable testimony believed it was more likely that the defendant was mentally ill ($M = 61.114$, $SE = 2.349$) than those who heard unfavorable testimony ($M = 31.29$, $SE = 2.39$). We found no evidence of a mode of choosing by testimony interaction, $\beta = 5.44$, $SE = 6.80$, $p = 0.418$. Just as was the case with reliance judgments, we found a simple effect of mode of choosing among participants who heard from experts providing favorable testimony, $\beta = 16.27$, $SE = 4.73$, $p < 0.001$, such that participants judged the defendant as more likely to be mentally ill when the expert was randomly chosen ($M = 69.05$, $SE = 2.35$) than when the expert was carefully chosen ($M = 52.78$, $SE = 4.54$).

**Figure 1.** A) Reliability judgments across the four between-subjects conditions. Participants said they would rely less on a carefully chosen expert who provided favorable testimony. B) Likelihood judgments about the defendant’s capacity. Participants believed it was more likely that the defendant was mentally ill, as he claimed to be, when he and his lawyer chose an expert randomly.
In this study, we found evidence for both of the predictions our model generates. First, we found that participants rely less on a carefully chosen expert who provides favorable testimony than a judge-selected expert who provides favorable testimony. Second, we found that participants thought it was more likely that the defendant was mentally ill (the desired judgment from the perspective of the defendant) when he and his lawyer opted to let the judge choose their expert witness, irrespective of testimony, which suggests that jurors interpret letting the judge choose as a signal of confidence in one’s case.
Appendix. What do lawyers optimize?
When studying whom lawyers choose, we showed that participants were nearly twice as likely to ask a judge to choose their witness when they consider jury perceptions of this choice prior to making it (76% versus 40%). One possible explanation for why participants might elect to choose an expert themselves, rather than let the judge choose, is that they believe they are more likely to choose the best expert for their purposes. If this is the case, we should find that the effect of considering how the jury would perceive careful choosing is attenuated when participants also answer questions about their own ability to pick the most qualified expert and other such questions. That is, unpacking the advantages of choosing carefully may counteract the advantages of signaling the strength of one’s case by letting the judge choose an expert.

Methods
We recruited 607 new participants (M_{age} = 36.81, 257 males) from AMT. This study followed the same procedure as Study 4, with the exception that participants answered a set of questions about their ability to choose the best expert for their purposes (along with the same question from last study about how much the jury would rely on a carefully chosen versus judge-selected expert). Participants responded to the following question on a scale from 0 to 100: 1) Do you think the expert you choose would be more competent than the expert the judge chooses?; 2) Do you think the expert you choose would be more likely to provide testimony that is favorable to your client than the expert the judge chooses?; 3) Do you think you would be better able to find the most qualified expert than the judge?; 4) Do you think you would be better able to find the most persuasive expert than the judge?; 5) How likely would you be to talk to several experts to determine which one is most likely to provide testimony that is favorable to your client?; 6) What percentage of experts do you think are qualified? We randomized the order in which participants answered these questions.

Results
Our strength of case manipulation was effective. Participants who were told they had a strong case (M = 28.42, SE = 1.44) thought their client was less likely to be guilty than those who were given no information (M = 40.70, SE = 1.42), who in turn thought their client was less likely to
be guilty than those who were told they had a weak case (M = 55.76, SE = 1.44), all β’s > |11.96|, SE’s < 2.02, p’s < 0.001.

We used logistic regression to determine the effect of strength-of-case and order-of-choice on mode of choosing an expert. We found no evidence of a main effect of strength of case. Those in the no information condition (M = 0.75, SE = 0.03) were no more likely to choose carefully than those in the strong case condition (M = 0.76, SE = 0.03), β = 0.06, SE = 0.23, p = 0.815, or weak case condition (M = 0.72, SE = 0.03), β = -0.15, SE = 0.23, p = 0.524. There was also no difference in likelihood of choosing carefully between the strong case and weak case condition, β = 0.20, SE = 0.23, p = 0.380. We did find a main effect of order of choosing on mode of choosing an expert, β = -0.65, SE = 0.19, p < 0.001, such that those who decided how to choose an expert first (M = 0.81, SE = 0.02) were more likely to choose carefully than those who first considered jury perceptions of, and reasons for, choosing carefully (M = 0.68, SE = 0.03). We did not find evidence of a strength of case by order of choice interaction, all β’s < 0.47, SE’s > 0.46, p’s > 0.311.

The central question this study was designed to answer was whether providing reasons why one might want to choose carefully would attenuate the effects of considering how the jury would perceive careful choosing. To address this question, we combined the data from Study 4 with the data from this study and used logistic regression to predict mode of choosing an expert using when that choice was made (prior to, or after, considering jury perceptions) and study number. We found a main effect of deciding how to choose an expert, β = 1.17, SE = 0.13, p < 0.001, such that those who decided how to choose an expert first (M = 0.79, SE = 0.02) were more likely to choose carefully than those who chose an expert after (M = 0.54, SE = 0.02). We also found a main effect of study β = 0.81, SE = 0.13, p < 0.001, such that participants were more likely to choose carefully in this study (M = 0.75, SE = 0.02) than last study (M = 0.58, SE = 0.02). Critically, these main effects were qualified by an order of choice by study interaction, β = -0.95, SE = 0.26, p < 0.001. That is, the effect of deciding how to choose an expert prior to versus after considering jury perceptions of choosing carefully and giving reasons for choosing carefully was significantly smaller (12.1 percentage points) than when participants only considered how the jury would perceive choosing carefully (36.8 percentage points). In other
words, two-thirds of the effect of considering how the jury would perceive careful choosing on mode of choosing was eliminated when participants also considered various advantages they may have in hand-picking an expert (none of which there is good evidence for).

**Figure 5.** Mode of expert selection across conditions. Participants who considered how the jury would perceive their mode of choosing and expert, along with a set of questions about their abilities to choose the best expert for their purposes, prior to choosing their mode of selection were only slightly less likely to choose carefully than those who considered those questions after. This significantly reduced the effect of considering jury perceptions of careful choosing.

These results paint a clearer picture of the psychology that underlies how people decide to choose their own experts. On the one hand, our participants appreciated the fact that asking the judge to choose a witness would signal the strength of one’s case to the jury and/or would be more persuasive to the jury. On the other hand, participants’ assessments of their abilities to choose the best expert for their purposes significantly counteracts the signaling value of letting the judge choose, thereby leading people to choose carefully in spite of losing the ability to signal to the jury by doing so.