

PRELIMINARY DRAFT—DO NOT CITE (July 2014)

**AN EXPERIMENTAL ASSESSMENT
OF THE PRESUMPTION OF VALIDITY**

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ABSTRACT

In a patent trial, the presumption of validity is typically mentioned in the jury instructions as a preface to the “clear and convincing” standard for proving invalidity. Accused infringers believe that jurors are overly deferential to the U.S. Patent & Trademark Office (PTO), such that the express mention of the presumption in the jury instructions is perceived to further bias the jury in favor of the patentee. In order to “level the playing field” in front of the jury, some accused infringers have sought to introduce evidence on the operational realities of the PTO (e.g., patent quality issues, the application backlog, etc.). However, trial judges typically exclude such information.

This raises the question whether instructing the jury on the presumption of validity acts more as a mechanism for injecting bias in a patent trial than as a procedural device for properly allocating the burden of proof on the issue of invalidity.

This Article reports the results of a survey experiment designed to test the conventional wisdom concerning: (1) the impact of informing the jury about the presumption of validity; and (2) whether the presumption may be undermined by information about the PTO’s shortcomings. The results suggest that the presumption may introduce a substantial degree of bias, but that it might also serve a prophylactic role in counteracting the influence of highly prejudicial information. This Article argues that the common practice of instructing the jury on the presumption should be changed to one in which the presumption is mentioned only when the totality of the

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circumstances require it to counteract highly prejudicial information.

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INTRODUCTION

“We don’t know exactly how often the presumption makes a difference to a case outcome.”

*Doug Lichtman & Mark Lemley*¹

In patent law, the presumption of validity exerts a profound influence on litigation strategy.² It has attracted criticism—not only from academics³ but

¹ Doug Lichtman & Mark A. Lemley, *Rethinking Patent Law’s Presumption of Validity*, 60 STAN. L. REV. 45, 70 (2007).

² For example, accused infringers may prioritize noninfringement defenses over invalidity defenses because of the heightened burden associated with proving invalidity. See, e.g., Roger Allan Ford, *Patent Invalidity Versus Noninfringement*, 99 CORNELL L. REV. 71, 118 (2013) (observing that “the elevated burden of proof that applies to invalidity . . . stems from the statutory presumption that a patent is valid unless proved otherwise, makes it relatively more difficult to win an invalidity defense than a noninfringement defense even if the two defenses would otherwise have similar merits”).

³ See, e.g., Lichtman & Lemley, *supra* note 1 at 47 (“[T]he law makes [patent] issuance mistakes hard to reverse. The culprit is a legal doctrine known as the presumption of validity.”); F. Scott Kieff, *The Case for Preferring Patent-Validity Litigation over Second-Window Review and Gold-Plated Patents: When One Size Doesn’t Fit All, How Could Two Do the Trick?*, 157 U. PA. L. REV. 1937, 1955 (2009) (“[A] weakening of the presumption of validity would be particularly good for the ‘Davids’ of the system who face

also from at least one federal judge⁴—for making weak patents difficult to invalidate. When mentioned to the jury, the presumption is perceived to exert a powerful pro-patentee influence that overshadows its nominal procedural function of allocating the burden of proving invalidity.⁵

Despite its apparent importance, hardly any empirical studies exist on whether and to what extent the presumption may affect how jurors decide invalidity issues, leaving many basic questions unanswered. For example, does mentioning the presumption to the jury actually introduce any appreciable bias in favor of the patentee, as some accused infringers believe? If so, to what degree? If the presumption assumes a level of administrative correctness,⁶ should the jury ever be informed of the operational realities (e.g., application backlog, quality of examiner review) of the U.S. Patent & Trademark Office (PTO) that result in the issuance of low quality patents?⁷ Would such information undermine the presumption of validity or, alternatively, would it counter any pro-patentee bias introduced by mentioning the presumption?

To help answer these questions, this Article reports the results of the first experimental study designed to gauge the impact of expressly instructing the jury on the presumption of validity. The impact on case outcomes when the presumption is mentioned, and whether criticisms about the PTO might counteract it (or vice versa), have long been the province of speculation and anecdotes. Experimental analysis may provide additional insights that could help refine intuitions about whether a presumption instruction may be prophylactic or potentially prejudicial.

off against the ‘Goliaths.’ It directly protects them from the in terrorem effect of junk patents . . .”).

⁴ See, e.g., William Alsup, *Memo to Congress: A District Judge’s Proposal for Patent Reform; Revisiting the Clear and Convincing Standard and Calibrating Deference to the Strength of the Examination*, 24 BERKELEY TECH. L.J. 1647, 1648 (2009) (“A central reason for the litigation boom is the presumption of validity and the ‘clear and convincing’ standard . . . This presumption of validity applies equally to all patents—even those that are almost certainly invalid. This is a huge advantage for the patent holder—and it is often an unfair advantage . . .”).

⁵ See, e.g., William G. Childs, *The Implementation of FDA Determinations in Litigation: Why Do We Defer to the PTO but Not to the FDA?*, 5 MINN. J.L. SCI. & TECH. 155, 172 (2004) (“The psychological impact of this presumption of validity is difficult to measure. However, it is not insignificant that a jury is instructed by the one nominally neutral person in the courtroom that it must begin deliberations with the belief that the patent is valid.”).

⁶ *Applied Materials v. Advanced Semiconductor Materials Am.*, 98 F.3d 1563, 1569 (Fed. Cir. 1996) (“The presumption of validity is based on the presumption of administrative correctness of actions of the agency charged with examination of patentability.”).

⁷ See, e.g., Doug Lichtman & Mark A. Lemley, *Rethinking Patent Law’s Presumption of Validity*, 60 Stan. L. Rev. 45, 49 (2007).

Based on the data, this Article argues that the invocation of the presumption of validity in front of the jury should not be a routine occurrence (which is the current practice), but instead limited only to those circumstances in which it can serve a prophylactic role. The results suggest that if the jury has already been instructed that the accused infringer has the burden of proving invalidity by clear and convincing evidence, an additional instruction that expressly mentions the presumption of validity may introduce a substantial pro-patentee bias. However, the prejudicial strength of the presumption may be redirected for a beneficial purpose when it is necessary to counteract any extraneous or highly prejudicial information that might lead the jury to either ignore or apply the wrong standard of proof.

Part I of this Article provides background information on the presumption of validity that is relevant to the experimental study. Part II describes the methodological design of a survey experiment used to test the conventional assumptions regarding the effect of mentioning the presumption during trial. The results are reported in Part III. Based on the data, Part IV analyzes the role that the presumption instruction should play in jury trials, and is followed by a brief conclusion.

I. BACKGROUND

The presumption of validity, which was originally a common-law presumption that is now codified at 35 U.S.C. § 282,⁸ has been treated by the courts as providing the normative foundation for the “clear and convincing” standard of proof for invalidating a patent.⁹ The Federal Circuit views the presumption of validity and the clear and convincing standard for rebutting it as “different expressions of the same thing.”¹⁰ Indeed, in most adjudicatory contexts, separating the effect of the presumption from the standard of proof is difficult because the former is analytically subsumed in the latter. For example, if an accused infringer files a motion for summary judgment on an invalidity issue, the judge’s analysis in deciding the motion will focus on whether the movant has carried his burden under the clear and convincing standard. The presumption of validity, to the extent it is part of the judge’s analysis, is inherent the evaluation of whether the movant has satisfied the applicable standard of proof because the legal effect of the

⁸ 35 U.S.C. § 282(a) (“A patent shall be presumed valid.”).

⁹ *Microsoft Corp. v. i4i Ltd. P’ship*, 131 S. Ct. 2238, 2246 (2011).

¹⁰ *Chiron Corp. v. Genentech, Inc.*, 363 F.3d 1247, 1258 (Fed. Cir. 2004) (“[T]he presumption of validity and heightened burden of proving invalidity ‘are static and in reality different expressions of the same thing - a single hurdle to be cleared.’” (quoting *Am. Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350, 1360 (Fed. Cir. 1984))).

presumption is limited to placing the burden of proving invalidity on the patent challenger, rather than on the patent holder.¹¹

Where a focus on the presumption itself (separate and apart from the clear and convincing standard) might actually affect case outcomes would be during a jury trial. This is because the conventional wisdom among practitioners and judges suggests that including an instruction on the presumption of validity communicates a powerful normative message to a lay jury about the need to respect the decisions of the PTO.¹²

In a patent trial, the presumption of validity is typically mentioned in the jury instructions in conjunction with the clear and convincing standard for proving invalidity. Under Federal Circuit law, the presumption need *not* be explicitly mentioned to jurors so long as they are informed that the burden rests on the accused infringer to prove invalidity by clear and convincing evidence.¹³ This is because the presumption, which has no evidentiary value,¹⁴ is simply a procedural device that allocates the burden of proof.¹⁵ It may appear then, that mentioning the presumption is essentially redundant if the jury instructions already recite the clear and convincing standard. However, the perceived value to the patentee of instructing the jury on the presumption, which, by itself, does not add much substantive information beyond the standard of proof, appears to lie in creating an atmosphere in the courtroom that discourages jurors from second-guessing the PTO. That is, the “expressive function” of the presumption of validity¹⁶ may take a more

¹¹ 35 U.S.C. § 282; *New Eng. Braiding Co. v. A.W. Chesterton Co.*, 970 F.2d 878, 882 (Fed. Cir. 1992) (“The presumption acts as a procedural device which places the burden of going forward with evidence and the ultimate burden of persuasion of invalidity at trial on the alleged infringer.”).

¹² See, e.g., David C. Bohrer, *Knocking the Eagle Off the Patent Owner’s Shoulder: Chiron Holds that Jurors Don’t Have to be Told that a Patent Is Presumed Valid*, 21 SANTA CLARA COMPUTER & HIGH TECH. L.J. 259, 282-83 (2004).

¹³ *Chiron Corp. v. Genentech, Inc.*, 363 F.3d 1247, 1258-1259 (Fed. Cir. 2004).

¹⁴ *SSIH Equip. S.A. v. United States Int’l Tr. Comm’n*, 718 F.2d 365, 375 (Fed. Cir. 1983) (“The presumption of validity afforded by 35 U.S.C. § 282 does not have independent evidentiary value. Rather the presumption places the burden of going forward, as well as the burden of persuasion, upon the party asserting invalidity.”).

¹⁵ 35 U.S.C. § 282(a) (“The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity.”); *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1534 (Fed. Cir. 1983) (“The presumption, like all legal presumptions, is a procedural device, not substantive law. It does require the decisionmaker to employ a decisional approach that starts with acceptance of the patent claims as valid and that looks to the challenger for proof of the contrary.”).

¹⁶ See Mark D. Janis, *Reforming Patent Validity Litigation: The “Dubious Preponderance”*, 19 BERKELEY TECH. L.J. 923, 927 (2004) (“[A]cknowledgment of the presumption’s expressive function reminds us that the fact that we have a presumption of patent validity is as significant as the precise verbal formulation that we use for the standard of evidence for overcoming the presumption.”). For a general discussion of the

salient role during trial than during the pretrial stage. As Mark Janis has observed, the presumption itself carries an overlying message that has significance independent of the standard of proof.¹⁷

To patentees and accused infringers alike, an explicit statement in the jury instructions that a patent is presumed valid is not simply a “different expression”¹⁸ of the applicable standard of proof. Rather, they view it as a powerful mechanism for injecting pro-patentee bias, particularly because it is being delivered by the judge, who is the sole neutral authority-figure in the courtroom.¹⁹ While jurors are commonly perceived to be highly deferential to the PTO,²⁰ it is unclear to what extent that deference may be attributable to jurors feeling strongly discouraged from second-guessing the PTO upon being instructed on the presumption.²¹ In addition, it is possible that lay individuals may confuse the presumption with evidence.²² Although such concerns have been recognized by some judges and practitioners, who have prepared alternative model patent jury instructions that do not mention the presumption,²³ expressly informing the jury of the presumption of validity is common practice.²⁴ Indeed, the model jury instructions prepared by some circuits,²⁵ as well as by certain national intellectual property bar organizations such as the American Intellectual Property Law Association (AIPLA)²⁶ and the Federal Circuit Bar Association (FCBA),²⁷ which reflect

law’s expressive function, see Cass R. Sunstein, *On the Expressive Function of Law*, 144 U. PA. L. REV. 2021 (1996).

¹⁷ *Id.* at 930 (“[T]here is no strict, inevitable correlation between the words of the evidentiary standard and the overlying message delivered by the presumption of validity. The message is independently significant for purposes of patent policy . . .”).

¹⁸ See *supra* note 10 and accompanying text.

¹⁹ See *supra* note 5 and accompanying text.

²⁰ See Kimberly A. Moore, *Juries, Patent Cases, & A Lack of Transparency*, 39 HOUS. L. REV. 779, 787 (2002) (“[P]ractitioners and scholars alike have frequently opined that juries are not likely to invalidate patents because juries favor inventors and are unlikely to second-guess the Patent Office that has technically trained examiners who already issued the patents.”).

²¹ See, e.g., Bohrer, *supra* note 12 at 282-83.

²² See The National Jury Instruction Project, MODEL PATENT JURY INSTRUCTIONS (2009) at 33 (“[I]nstructing the jury on the presumption in addition to informing it of the highly probable burden of proof may cause jury confusion as to its role in deciding invalidity.”).

²³ See, e.g., MODEL PATENT JURY INSTRUCTIONS FOR THE NORTHERN DISTRICT OF CALIFORNIA (2011); The National Jury Instruction Project, MODEL PATENT JURY INSTRUCTIONS (2009) at 33.

²⁴ See *supra* notes 26-27 and accompanying text.

²⁵ See, e.g., Seventh Circuit Court of Appeals, *Federal Civil Jury Instructions of the Seventh Circuit* (2009) at 236, available at [https://www.ca7.uscourts.gov/Pattern Jury Instr/7th civ instruc 2009.pdf](https://www.ca7.uscourts.gov/Pattern%20Jury%20Instr/7th%20civ%20instruc%202009.pdf).

²⁶ American Intellectual Property Law Association, MODEL PATENT JURY INSTRUCTIONS (2012) at 9 (mentioning both presumption and clear and convincing

the prevailing “best practices” among practitioners, mention both the presumption and the clear and convincing standard.²⁸

To level the playing field against the patentee in front of the jury, some accused infringers may file motions *in limine* to exclude any mention of the presumption,²⁹ while others may attempt to introduce evidence during trial on the operational realities of the PTO (e.g., patent quality issues, the application backlog, funding issues, etc.).³⁰ Patentees, for their part, may file motions *in limine* to bar accused infringers from mentioning anything to the jury that may disparage the PTO.³¹ Although trial judges usually exclude evidence or arguments critical of the PTO on the ground that such information would be highly prejudicial and would undermine the presumption of validity,³² some judges have reserved the right to allow such information if the patentee tries to argue to the jury that deference to the PTO is owed at a level beyond that required by the law.³³ The Federal

standard).

²⁷ Federal Circuit Bar Association, MODEL PATENT JURY INSTRUCTIONS (2012) at 36 (clear and convincing standard), 48 (presumption of validity).

²⁸ In some jury instructions, the presumption and the clear and convincing standard may not necessarily be mentioned in the same paragraph, but in different sections. *See, e.g.*, Federal Circuit Bar Association, MODEL PATENT JURY INSTRUCTIONS (2012) at 36 (clear and convincing standard), 48 (presumption of validity).

²⁹ *See, e.g., ATC’s Memorandum of Points and Authorities in Support of its Motion in Limine No. 1 to Preclude References to the Presumption of Validity of the ‘356 Patent*, Presidio Components Inc. v. Am. Tech. Ceramics Corp., Case No. 3:08-cv-00335-IEG-NLS (S.D. Cal. Oct. 19, 2009) ECF No. 209-1 (defendant’s motion in limine to exclude mention of presumption of validity by patentee during trial); *see also* *Voda v. Cordis Corp.*, 2006 U.S. Dist. LEXIS 97321, at *7 (W.D. Okla. May 10, 2006) (granting defendant’s motion to preclude plaintiff from referring to the presumption of validity).

³⁰ *See* Christi J. Guerrini, *The Decline of the Patent Registration Exam*, 91 NEB. L. REV. 325, 327 n.5 (2012) (“Complaints about PTO examiners are so common that some defendants try to use them to undermine the presumption of validity that attaches to issued patents.”).

³¹ *See, e.g., Cook’s Motion in Limine No. 5*, Cook Inc. v. Endologix, Inc., Case No. 1:09-cv-01248-TWP-DKL (S.D. Ind. Aug. 10, 2012) ECF No. 255 (plaintiff’s motion to preclude defendant from offering argument or evidence denigrating PTO).

³² *See, e.g., Bausch & Lomb, Inc. v. Alcon Labs., Inc.*, 79 F. Supp. 2d 252, 255 (W.D.N.Y. 2000) (“I find such testimony [concerning problems with the PTO] to be inadmissible. It appears that the purpose of this testimony would be to attempt to undermine the presumption of validity under 35 U.S.C. § 282 by inviting the jury to speculate about possible defects, errors, or omissions in the application process . . .”); *Applied Materials, Inc. v. Advanced Semiconductor Materials Am., Inc.*, C 92-20643 RMW, 1995 WL 261407 (N.D. Cal. Apr. 25, 1995), at *3.

³³ *See, e.g., Bausch & Lomb, Inc. v. Alcon Labs., Inc.*, 79 F. Supp. 2d 252, 256 (W.D.N.Y. 2000) (“I caution plaintiff that if it opens the door by suggesting that some extraordinary deference is due in this case the court may revisit this ruling [barring argument concerning the PTO’s problems].” (internal quotations and citation omitted)); *Applied Materials, Inc. v. Advanced Semiconductor Materials Am., Inc.*, C 92-20643

Circuit generally views criticisms about the PTO as being inflammatory, but will order a new trial only if warranted by the totality of the circumstances.³⁴

Whether and under what circumstances the presumption of validity (or, in some cases, criticisms of the PTO) should be mentioned to the jury is a question for which empirical analysis may be useful in helping to test the conventional assumptions and anecdotes that drive trial strategy. Despite this need, there appears to be only one prior empirical study that has attempted to collect data on the presumption of validity separately from the clear and convincing standard.³⁵ However, that study did not focus on jury trials but rather Federal Circuit decisions.³⁶ In addition, it used a sample size that was too small to allow any potential impact of the presumption to be reliably assessed separately from that of the evidentiary standard of proof.³⁷

Although the impact of an instruction on the presumption of validity has not been specifically analyzed in previous empirical research relating to jury trials, the clear and convincing evidentiary standard has been the subject of a recent experiment with mock jurors. In 2013, David Schwartz and Christopher Seaman published a study in which they used a survey experiment to investigate the effect of modifying the standard of proof on a juror's decision to find a patent invalid.³⁸ They presented mock jurors with a patent case hypothetical where the ultimate issue to be decided was

RMW, 1995 WL 261407 (N.D. Cal. Apr. 25, 1995), at *3 (“The court will reconsider this ruling [barring mention of the PTO’s operational realities], however, if Applied opens the door by presenting evidence suggesting that some extraordinary deference is due in this case.”)

³⁴ See, e.g., *Novo Nordisk A/S v. Becton Dickinson & Co.*, 304 F.3d 1216, 1220 (Fed. Cir. 2002) (“[O]n balance, we conclude that a new trial is not warranted in the circumstances that here prevailed, for the issues of examiner competence . . . were not raised by post-trial motion; this inaction . . . suggests that in the overall context of the two-week trial, these aspects were less inflammatory than [the patentee] now maintains.”).

³⁵ See Etan S. Chatlynne, *UPDATE: Investigating Patent Law’s Presumption of Validity*, Patently-O (Nov. 7, 2010), available at <http://patentlyo.com/patent/2010/11/update-investigating-patent-laws-presumption-of-validity.html> [hereinafter Chatlynne study]. This blog post is an update of the results reported in Etan S. Chatlynne, *Investigating Patent Law’s Presumption of Validity--An Empirical Analysis*, 2010 PATENTLY-O PAT. L.J. 37, available at <http://patentlyo.com/media/docs/2010/03/chatlynne.presumptionofvalidity.final.pdf>.

³⁶ See Chatlynne study, *supra* note 35.

³⁷ In a dataset compiling 119 invalidity challenges, Chatlynne reported that the Federal Circuit expressly applied the presumption of validity or the evidentiary standard in its analysis a total of 26 times. *Id.*

³⁸ David. L. Schwartz & Christopher B. Seaman, *Standards of Proof in Civil Litigation: An Experiment from Patent Law*, 26 HARV. J.L. & TECH. 429 (2013).

obviousness.³⁹ The mock jurors were then randomly assigned to one of three jury instructions that contained different versions of the standard of proof: (1) clear and convincing evidence; (2) clear and convincing evidence with an additional instruction based on *Microsoft Corp. v. i4i Ltd. Partnership*⁴⁰ pertaining to new evidence not considered by the PTO; and (3) preponderance of the evidence.⁴¹ The results of Schwartz & Seaman's experiment suggest that jurors' decisions to find invalidity are affected substantially by the standard of proof.

Given that jury instructions on the clear and convincing standard have been the subject of experimental analysis, a logical next step would be to explore the effect of instructing the jury on the presumption of validity.

II. RESEARCH DESIGN

As previously discussed,⁴² the conventional wisdom surrounding the inclusion of the presumption of validity in jury instructions raises a variety of normative questions, some of which may be amenable to experimental study. This Article seeks to explore two such questions. *First*, does mentioning the presumption to the jury actually introduce a bias in favor of the patentee, such that an invalidity decision is less likely? (If so, what is the magnitude of that bias, given that juries are perceived to be generally deferential to the PTO and view inventors positively?⁴³) *Second*, if the accused infringer were to introduce information critical of the PTO (e.g., backlog, funding issues, patent quality concerns, etc.) during trial, to what extent could this counteract the presumption of validity?

To explore these issues, an online survey experiment⁴⁴ was conducted in which mock jurors were presented with a hypothetical patent case and were asked whether the asserted patent was invalid for obviousness. To mitigate potential response bias and “demand effects,”⁴⁵ a “between-subjects”

³⁹ *Id.* at 432.

⁴⁰ 131 S. Ct. 2238 (2011).

⁴¹ Schwartz & Seaman, *supra* note 38, at 432.

⁴² See *supra* Part I.

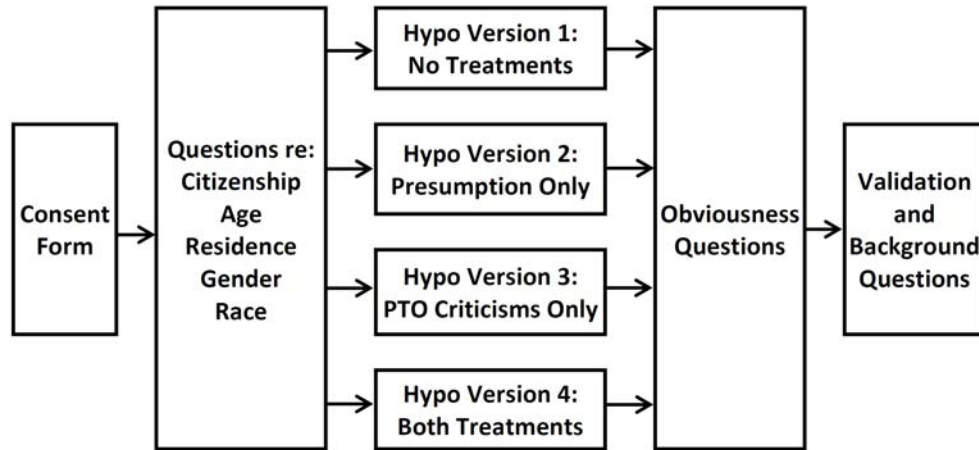
⁴³ See *supra* note 20 and accompanying text.

⁴⁴ A survey experiment is different from a regular survey in that it involves a “treatment” component, which is an element of the survey that is systematically varied in relation to a “control” or a baseline, so as to allow causal inferences to be drawn.

⁴⁵ See Rachel Croson, *Why and How to Experiment: Methodologies from Experimental Economics*, 2002 U. ILL. L. REV. 921, 933 (2003) (“[T]he researcher must be careful to avoid demand effects—avoid suggesting the desired results to the subjects either explicitly or implicitly.”).

design⁴⁶ was used for the survey: Each respondent was allowed to take the survey only once, and there were no questions that asked about the same issue both before and after the hypothetical. The general flow of the survey experiment is shown below:

Figure 1: Flow Diagram of Survey Experiment



As shown in Figure 1, the survey experiment begins with the consent form and elicits basic demographic information about the respondent who will serve as a mock juror. The respondent is then randomly assigned to one of four versions of the hypothetical.⁴⁷ Each version of the hypothetical presents the identical fact pattern except for the selective presence (or absence) of either the presumption of validity in the jury instructions or criticisms about the PTO in the accused infringer’s arguments or both. After the hypothetical, the respondent is asked whether the patent described in the hypothetical is invalid for obviousness.⁴⁸ The respondent is then presented with validation questions that test whether he understood basic facts about the hypothetical—if the respondent answers the validation questions incorrectly, his answers would be excluded from the analysis. Finally, the survey concludes with questions that ask about the respondent’s background, such as patent-related experiences, education, jury service, and

⁴⁶ See Christopher Slobogin & Lauren Brinkley-Rubinstein, *Putting Desert in Its Place*, 65 STAN. L. REV. 77, 100 n.101 (2013) (“In a between-subjects design (to be distinguished from a ‘within-subjects’ design), the manipulation is hidden from the subjects; its effect is studied by using two or more samples, ideally matched in all relevant respects, with each sample receiving a different independent variable . . .”).

⁴⁷ An annotated version of the hypothetical is provided in Appendix 1.

⁴⁸ The questions on the obviousness issue are provided in Appendix 2.

political orientation.

The hypothetical⁴⁹ and the associated questions relating to the obviousness issue⁵⁰ were adapted from Schwartz and Seaman's "standards of proof" experiment.⁵¹ The hypothetical, which describes a patent dispute over golf ball design, is presented in three parts: the overview, the parties' arguments, and the jury instructions for deciding whether the asserted patent is invalid for obviousness. Using Schwartz and Seaman's hypothetical provided several advantages. *First*, it was already field-tested as being reasonably understandable to lay subjects without any background in science or engineering.⁵² *Second*, the hypothetical was based on a case that had two jury verdicts that reached opposite conclusions concerning invalidity, which may indicate that there is no clear "right" answer.⁵³ *Finally*, the similarities between the hypothetical used in this experiment, which explores the presumption of validity, with that used in Schwartz and Seaman's experiment, which explored the clear and convincing standard, may facilitate comparisons between the two studies.

For the purposes of this study, Schwartz and Seaman's hypothetical was modified as follows:

- A single standard of proof (clear and convincing) was recited in the instructions, as opposed to the three different standards used in Schwartz and Seaman's study.
- A key prior art reference was deemed to have been considered⁵⁴ by the patent examiner in order to better isolate the effect of an instruction on the presumption of validity. In Schwartz and Seaman's study, the hypothetical specified that the key prior art reference had *not* been considered by the examiner, which allowed them to assess the impact of varying the standard of proof.
- Two treatment blocks were added in order to test the effects of mentioning the presumption of validity and criticisms of the PTO to the jury.

⁴⁹ See Appendix 1.

⁵⁰ See Appendix 2.

⁵¹ Schwartz & Seaman, *supra* note 38, at 451-56, 474-78.

⁵² Schwartz & Seaman, *supra* note 38, at 451.

⁵³ *Id.*

⁵⁴ In practice, when a prior art reference is submitted to the PTO, it is rare that the submitted reference will be substantively analyzed in an Office action. See Christopher A. Cotropia, Mark A. Lemley, Bhaven Sampat, *Do Applicant Patent Citations Matter?* 42 RESEARCH POLICY 844 (2013) (finding that "patent examiners did not use applicant-submitted art in the rejections that narrowed claims before these patents issued, relying almost exclusively on prior art they find themselves"). Submitted references that are not substantively analyzed are still deemed to have been "considered" by the examiner.

The treatment blocks used in the hypothetical were: (i) an explanation of the presumption of validity in the section providing the instructions for deciding the invalidity issue; and (ii) a description of common criticisms of the PTO in the accused infringer's argument section.⁵⁵ The treatment blocks are reproduced below:

Presumption Treatment Block⁵⁶:

Under the law, Acme's patent is presumed to be valid. In other words, it is presumed to have been properly granted. When a party attacking the validity of a patent relies on prior art that was specifically considered by the patent examiner, that party bears the burden of overcoming the deference due a qualified government agency official who is presumed to have performed his or her job correctly. The presumption of validity that is accorded a duly-issued patent can be overcome by "clear and convincing" evidence of obviousness.

PTO Criticisms Treatment Block⁵⁷:

That the patent examiner might have made a mistake should not be surprising. As recognized by numerous academic researchers, poor patent quality is a serious problem. The PTO is underfunded and has a backlog of approximately 600,000 patent applications that are awaiting examination.⁵⁸ The patent examiners are overworked, and are simply not given enough time to review patent applications thoroughly.⁵⁹ Indeed, according to one academic study, about half of all patents that are litigated in court are found to be invalid.⁶⁰

⁵⁵ If a court were to ever allow information critical of the PTO to be presented, it would most likely be presented by a patent law expert called by the accused infringer.

⁵⁶ The presumption of validity treatment block is an amalgam of the relevant language from the AIPLA and FCBA model jury instructions. *See supra* notes 26-27.

⁵⁷ The footnotes to supporting sources were not included in the version of the survey experiment as-administered.

⁵⁸ PTO Dashboard at <http://www.uspto.gov/dashboards/patents/main.dashxml> (last visited Dec. 19, 2013).

⁵⁹ FEDERAL TRADE COMMISSION, *To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy A Report by the Federal Trade Commission* (October 2003) at 10, available at <http://www.ftc.gov/sites/default/files/documents/reports/promote-innovation-proper-balance-competition-and-patent-law-and-policy/innovationrpt.pdf>.

⁶⁰ John R. Allison & Mark A. Lemley, Empirical Evidence on the Validity of Litigated Patents, 26 AIPLA Q.J. 185, 205-06 (1998).

The selective inclusion of the treatment blocks yielded four versions of the hypothetical to which the mock jurors were randomly assigned:

- (1) *No Treatments* version: Neither the presumption of validity nor criticisms of the PTO were included in the hypothetical.
- (2) *Presumption Only* version: The presumption was included but PTO criticisms were not.
- (3) *PTO Criticisms Only* version: PTO criticisms were included, but the presumption was not.
- (4) *Both Treatments* version: Both the presumption and PTO criticisms were included.

An annotated version of the hypothetical showing the treatment blocks is provided in Appendix 1. Because the presumption of validity was contained in a treatment block, all versions of the hypothetical mentioned the clear and convincing standard of proof, as required under Federal Circuit law.⁶¹

The mock jurors were recruited via Amazon Mechanical Turk (MTURK), which is a website run by Amazon.com, Inc. where individuals may sign up to perform online “Human Intelligence Tasks” for pay. MTURK is a popular platform for social science survey research.⁶² The respondent sample was limited to the demographic profile of jury-eligible adults, i.e., U.S. citizens who are at least 18 years old, and who are currently residing in the U.S. The MTURK site readily allows the respondent pool to be restricted to individuals who are at least 18 years of age who reside in the U.S. because anyone who signs up to work on MTURK must provide verification of their age and residency.⁶³ The imposition of additional demographic criteria—namely, U.S. citizenship—was based solely on self-identification. Although MTURK allows the respondent pool to be further

⁶¹ See *supra* note 13 and accompanying text.

⁶² Several recent experimental studies in the intellectual property field have used MTURK. See, e.g., Christopher Buccafusco, Zachary Burns, Jeanne Fromer, Christopher Sprigman, *Experimental Tests of Intellectual Property Laws’ Creativity Thresholds*, 92 TEX. L. REV. 1921 (2014); Christopher Buccafusco & Paul Heald, *Do Bad Things Happen When Works Enter the Public Domain? Empirical Tests of Copyright Term Extension*, 28 BERKELEY TECH. L.J. 1 (2013); Christopher Sprigman, Christopher Buccafusco & Zachary Burns, *What’s a Name Worth? Experimental Tests of the Value of Attribution in Intellectual Property*, 93 B.U. L. REV. 1389, 1405 (2013); Schwartz & Seaman, *supra* note 38.

⁶³ Each worker who registers on MTURK must provide verification of their residence in order for MTURK to process tax information. See Amazon Mechanical Turk Participation Agreement (Nov. 1, 2012), <https://www.mturk.com/mturk/conditionsfuse>.

restricted based on a respondent's general approval rating on the site, this option was not used in order to ensure that the widest cross-section of respondents could participate. Each respondent was paid \$1.00 for successfully completing the survey experiment, which ran on MTURK for two days in July 2014.

Initially, 2,616 respondents accessed at least the first page of the survey, of which 2,412 respondents progressed through survey termination. Of these respondents, 667 were eliminated because of quality issues that would render their responses unreliable, such as: speeding through the survey,⁶⁴ failing to correctly answer basic factual questions about the hypothetical,⁶⁵ and providing logically inconsistent answers to certain questions.⁶⁶ This yielded 1,745 respondents for analysis. The respondent tally for each of the four treatment versions of the hypothetical is shown below:

Table 1

Treatment Scenario	Respondents (Mock Jurors)
No Treatments	441
Presumption Only	430
PTO Criticisms Only	436
Both Treatments	438
Total	1,745

The mean age of the respondents was 34 years, while the median age was 30. They were 49% female and 78% white. A majority (59%) had at least a college degree.⁶⁷ For comparison, recent demographic statistics of

⁶⁴ Because the hypothetical related to patent law, a field with which the vast majority of the American public has little to no familiarity, it was important that the respondents read at a pace that allowed for comprehension. According to one measure, the average adult reads at the rate of 300 words per minute, while the average college professor reads at the rate of 675 words per minute. Brett Nelson, *Do You Read Fast Enough To Be Successful?*, Forbes.com (June 4, 2012) <http://www.forbes.com/sites/brettnelson/2012/06/04/do-you-read-fast-enough-to-be-successful/>. Respondents who read each page of the patent case hypothetical faster than three times the average adult, i.e., 900 words per minute, had their responses eliminated from the analysis.

⁶⁵ These were basic factual questions about the hypothetical.

⁶⁶ For example, if a respondent specified in one question that he did not serve on a jury but specified in another question that he served as a juror in a civil case, his answers were eliminated from the final analysis.

⁶⁷ This tally does not include individuals who attended college without obtaining a degree.

federal juries are not available.⁶⁸ However, a few statistics from a study conducted in 2004⁶⁹ of people who reported for jury duty in King County, Washington (which has a population of over 2 Million)⁷⁰ may be instructive. According to that study, the individuals who appeared for jury duty in county court (N=1,545)⁷¹ had a median age of 48, 69% were college graduates, 54% were female, and 86% were White.⁷² In contrast, the general county census indicated that its residents had a median age of 46, 43% were college graduates, 51% were female, and 74% were White. Notably, this 2004 study reveals that individuals who showed up for jury duty had higher rates of having a college degree than the general population.⁷³ In addition, the demographics of those who were eventually sworn in as jurors were similar to those who showed up for jury duty.⁷⁴ When the King County study is compared to the MTURK respondents, the most salient difference is the median age, where the MTURK respondents, as a group, are substantially younger.

III. RESULTS

Overall, the results confirm (somewhat) the conventional assumptions of patentees, accused infringers, and judges on the likely effect of informing the jury about the presumption of validity and criticisms about the PTO. The data suggest that instructing the jury on the presumption has a substantial biasing effect in favor of upholding validity. Informing the jury of criticisms about the PTO has a biasing effect of similar magnitude in the opposite direction—such that when both the presumption and PTO criticisms are presented to the jury, their effects seemingly cancel each other. These results raise normative questions about the desirability of the common practice of mentioning the presumption of validity to the jury.

A. *Treatment Scenarios*

The rates at which the mock jurors found invalidity based on obviousness are graphically summarized below for each of the four

⁶⁸ See Schwartz & Seaman, *supra* note 38 at 458 n.183.

⁶⁹ John Gastil et al., *THE JURY AND DEMOCRACY: HOW JURY DELIBERATION PROMOTES CIVIC ENGAGEMENT AND POLITICAL PARTICIPATION* (Oxford 2010) at 53.

⁷⁰ <http://quickfacts.census.gov/qfd/states/53/53033.html>

⁷¹ *Id.* at 65 tbl. 4.3

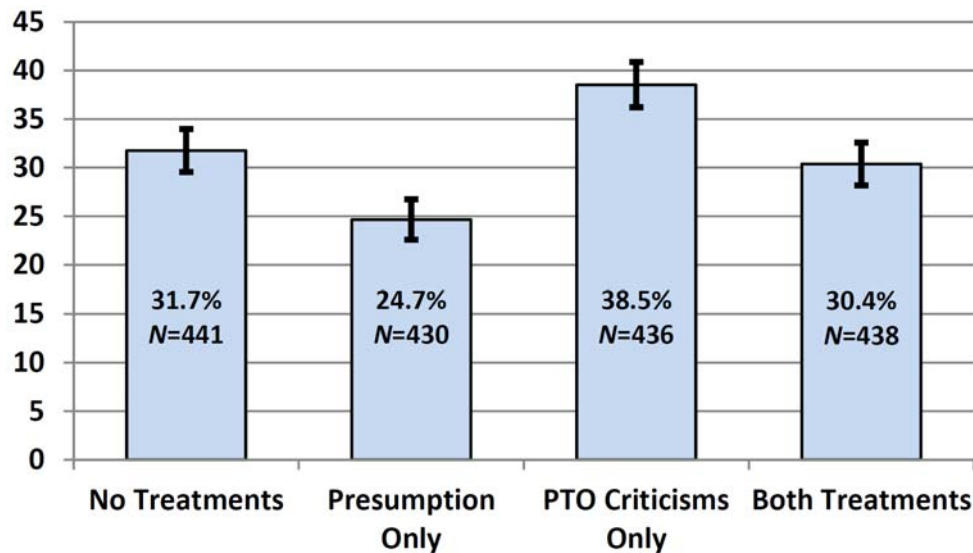
⁷² *Id.* at 61, tbl. 4.2.

⁷³ *Id.* (median age 48; 70% college graduates; 53% female; 88% White).

⁷⁴ *Id.*

treatment scenarios:

Figure 2: Invalidity Decisions (Percentages with Standard Error Bars)



As an initial step, each pair of treatment scenarios was compared using a Chi-square test to determine if the differences in the invalidity rates were statistically significant. A comparison of the *No Treatments* and the *Presumption Only* scenarios (both of which do not contain any criticisms about the PTO) shows a statistically significant drop in invalidity decisions when the presumption is mentioned (31.7% vs. 24.7%; $p=0.020$). Where criticisms about the PTO were present in both of the scenarios being compared, a statistically significant drop in invalidity decisions occurred, again, if the presumption was added, as shown by a comparison of the *PTO Criticisms Only* scenario and the *Both Treatments* scenario (38.5% vs. 30.4%; $p=0.011$). These results lend support to the belief of accused infringers that instructing the jury on the presumption of validity may substantially bias the outcome in favor of upholding validity.

As for the conventional assumption of judges and patentees that criticisms about the PTO are highly prejudicial and may undermine the presumption of validity, the results confirm this somewhat. The difference in the invalidity rates between the *No Treatments* and the *PTO Criticisms Only* scenarios is statistically significant (31.7% vs. 38.5%; $p=0.035$). However, a comparison of the typical patent case scenario where the presumption instruction is given (*Presumption Only*) and the scenario where, in addition to the presumption, PTO criticisms are also introduced (*Both Treatments*), reveals a difference in the invalidity rate that is sizeable

but not statistically significant (24.7% vs. 30.4%; $p=0.060$).

Of the pair-wise comparisons, perhaps the most intriguing result is the comparison of the *No Treatments* and the *Both Treatments* scenarios, where the former has neither the presumption instruction nor the PTO criticisms, while the latter has both treatments. It appears as if the effect of the two treatments cancel each other (31.7% vs. 30.4%; $p=0.658$). This result is somewhat unexpected, given that negative information is generally deemed more potent than positive or neutral information.⁷⁵ As discussed later,⁷⁶ this result suggests that a presumption instruction might be better suited in a more limited role in a patent trial—in the capacity of countering highly prejudicial information.

And finally, the difference between the *Presumption Only* and the *PTO Criticisms Only* scenarios is, unsurprisingly, highly statistically significant (24.7% vs. 38.5%; $p < 0.001$).

To confirm whether the significance levels reported by the Chi-square tests would continue to hold after controlling for various demographic and background characteristics of the mock jurors, a series of logistic regression models were used, as shown in Appendices 3 and 4. The dependent variable corresponds to a finding of invalidity by reason of obviousness. The predictor variables were the different treatment scenarios and various personal characteristics of the respondents. Overall, the regression models confirmed the statistical significance (or, in some cases, the lack thereof) of the differences in the rate at which the mock jurors found invalidity.

In the regression models, each of the four treatment versions of the hypothetical was represented by a dummy variable, where one of the versions served as the base variable to which the other three were compared. Two general models were used for the logistic regression: Model A (with sub-models A1 through A4)⁷⁷ and Model B (with sub-models B1 through B4).⁷⁸ In Model A, the *No Treatments* scenario served as the base comparison variable to which the other treatment scenarios were compared. Using the *No Treatments* scenario as the base comparison variable is an intuitive choice by virtue of the absence of any treatments. In Model B, the *Presumption Only* scenario was the base comparison variable, which is of analytical interest because it reflects a common practice in actual patent trials, in which the jury is informed of the presumption but is not provided

⁷⁵ See Roy F. Baumeister, Ellen Bratslavsky, Catrin Finkenauer, Kathleen D. Vohs, *Bad Is Stronger Than Good*, 5 REV. GEN. PSYCHOL. 323, 323 (2001) (“When equal measures of good and bad are present, however, the psychological effects of bad ones outweigh those of the good ones.”).

⁷⁶ See Part IV.A.

⁷⁷ See Appendix 3.

⁷⁸ See Appendix 4.

any information critical of the PTO.

Each Model consists of four sub-models, numbered 1 through 4. Sub-models A1-A4 and B1-B4 use the same corresponding sets of variables in the regression, except for the base comparison variable for the treatment scenarios. The sub-models were created to mitigate or avoid potential multicollinearity issues.⁷⁹ Specifically, the variable “College Graduate,” which indicates whether a respondent’s level of education is at least a college degree, is in a separate sub-model from one that uses the variable “Science Degree,” which indicates that the respondent has a college or graduate degree in science, engineering, or mathematics. Similarly, the variable “Jury Service,” which indicates whether a respondent has served on a jury, is in a different sub-model from the variables “Civil Jury” and “Criminal Jury,”⁸⁰ which indicates whether a respondent served on a civil jury or a criminal jury, respectively. A total of four sub-models were used to capture the various combinations of alternative variables (i.e., “College Graduate” vs. “Science Degree”; “Jury Service” vs. “Civil Jury” and “Criminal Jury”).

Turning now to the results of the logistic regression, Model A⁸¹ reveals that, when compared to the *No Treatments* scenario, the *Presumption Only* scenario decreased the odds, by a statistically significant margin, that the mock juror in this study would find invalidity.⁸² By contrast, the *PTO Criticisms Only* scenario increased the odds of an invalidity finding by a statistically significant margin. The *Both Treatments* scenario did not result in a statistically significant change in the odds. These relationships held across sub-models A1-A4, confirming the earlier pair-wise Chi-square analysis.

The results for Model B⁸³ tell a similar story. Compared to the *Presumption Only* scenario, which served as the base variable, the *No Treatments* scenario resulted in a statistically significant increase in the odds of an invalidity finding, and, unsurprisingly, the *PTO Criticisms Only* scenario resulted in a highly statistically significant increase in the odds.

⁷⁹ See Andrew Siegel, PRACTICAL BUSINESS STATISTICS 32 (6th ed. 2011) (explaining that multicollinearity makes it “difficult for multiple regression to distinguish between the effect of one variable and the effect of another”).

⁸⁰ Twenty-one respondents served in both civil and criminal cases—they were counted in both the “Civil Jury” and the “Criminal Jury” variables. Fifteen respondents served on a jury but were not sure of the type of case—they were included in the “Jury Service” variable, but not in the “Civil Jury” or the “Criminal Jury” variables.

⁸¹ See Appendix 3.

⁸² The logistic regression results are reported as “odds ratios.” At a conceptual level, an odds ratio that is greater than 1.0 refers to an increase in the odds, while an odds ratio that is less than 1.0 refers to a decrease in the odds.

⁸³ See Appendix 4.

The *Both Treatments* scenario did not result in a statistically significant change in the odds of an invalidity finding when compared to the *Presumption Only* scenario, although the *p*-value came close to the 0.05 threshold.⁸⁴ These relationships held across sub-models B1-B4, again confirming the earlier pair-wise Chi-square analysis.

In addition to being asked to decide whether the patent in the hypothetical was invalid for obviousness, the mock jurors were also asked to specify the likelihood of obviousness on a scale of 0% (Certainly Not Obvious) to 100% (Certainly Obvious).⁸⁵ A comparison of the likelihood estimates of the different treatment versions might indicate whether the mock jurors' impressions of the likelihood of obviousness changed depending on the treatment.⁸⁶ The mean likelihood estimates are listed below:

Table 2: Likelihood of Obviousness

Treatment Scenario	Mean	Std. Dev.
No Treatments	44.5	28.3
Presumption Only	42.4	26.5
PTO Criticisms Only	49.3	27.9
Both Treatments	46.5	28.2

A one-way ANOVA with a Bonferroni correction reveals that a highly statistically significant difference exists between the mean estimates of the likelihood of obviousness for the *Presumption Only* and the *PTO Criticisms Only* scenarios.⁸⁷ This is unsurprising given the highly statistically significant difference in the invalidity rate between those two scenarios. This was the only pair-wise comparison for which the difference in the mean obviousness likelihood was statistically significant to any degree.

⁸⁴ In sub-models B1-B4, the *p*-values for the *Both Treatments* scenario ranged between 0.056 to 0.060.

⁸⁵ This question is provided in Appendix 2.

⁸⁶ The likelihood estimate also served as another way to check whether the jurors understood the hypothetical, especially the applicable standard of proof (clear and convincing). This question was adapted from a similar question used by Schwartz and Seaman, who had used it as a check on the respondents' answers. Schwartz & Seaman, *see supra* note 38 at 461-62. A respondent was eliminated if he answered that the patent was obvious but separately indicated that the likelihood of obviousness was less than 40%, or, alternatively, if he found nonobviousness, but indicated that the likelihood of obviousness was at least 90%. Only 18 respondents were excluded on this basis.

⁸⁷ *p*=0.002.

What is notable, however, is that there were no statistically significant differences in the mean likelihood estimates between certain treatment scenarios that have statistically significant differences in the rates of finding obviousness. For example, the *No Treatments* and the *Presumption Only* scenarios have a statistically significant difference in the invalidity rate but not in the mean estimate of the likelihood of obviousness. A similar observation may be made about the *No Treatments* and the *PTO Criticisms Only* scenarios.

Looking at both the rates of finding obviousness and the estimates of the likelihood of obviousness, two conclusions might be drawn from the data. The first conclusion is that, on the whole, the treatments do not appear to materially affect the mock jurors' subjective estimates of the relative inventiveness of the patented subject matter compared to that of the prior art. The second conclusion is that the treatments instead appear to affect the mock jurors' willingness to declare that the clear and convincing standard has been met. That is, the *Presumption Only* treatment appears to effectively raise the standard of proof, while the *PTO Criticisms Only* treatment scenario seemingly lowers it.

The final obviousness-related question asked the mock jurors to specify their level of confidence in their answers regarding the two prior obviousness questions, on a scale of 1 (Not Confident At All) to 7 (Extremely Confident).⁸⁸ The mean levels of confidence are reported below:

Table 3: Level of Confidence in Answers

Treatment Scenario	Mean	Std. Dev.
No Treatments	5.35	1.17
Presumption Only	5.37	1.15
PTO Criticisms Only	5.39	1.10
Both Treatments	5.31	1.27

A one-way ANOVA with a Bonferroni correction revealed no statistically significant difference in the means.⁸⁹ The data suggest that informing the mock jurors of the presumption of validity or criticisms about the PTO does not appear to have a material effect on how confident they are in finding invalidity or estimating the likelihood of obviousness.

⁸⁸ See Appendix 2.

⁸⁹ $p=0.811$.

B. Other Predictors

In addition to the treatment scenarios, the regression models included several variables based on the mock jurors' physical characteristics, experience, education, jury service, and political orientation. The demographic data were collected solely based on self-identification.

The regressions revealed no statistically significant effect on the odds of an invalidity decision based on age.⁹⁰ Because the median age of the respondents was 30, it is possible that the relatively low concentration of older respondents⁹¹ might have prevented a statistically significant effect from being discerned. Regarding gender, men were far more likely than women to find invalidity—this difference was highly statistically significant.⁹² This result confirms a similar finding in Schwartz and Seaman's experiment relating to the standard of proof, which found that women were less likely than men to find a patent invalid, by a highly statistically significant margin.⁹³ Whether a mock juror was a racial minority had an effect on the border of statistical significance: depending on which of the four sub-models was used, the *p*-value ranged between 0.042 to 0.057.

Concerning experience relevant to the subject matter of the hypothetical, the respondents were asked whether they had played golf: 955 out of 1,745 (54.7%) had. Golf experience, however, did not have a statistically significant effect on invalidity decisions, which confirms a similar finding by Schwartz and Seaman.⁹⁴ With respect to personal experiences relating to patents, only one respondent had served as a juror in a case involving an allegation of patent infringement; nine had either applied for or owned a patent; and twenty-five had work experience, expertise, or training in patent law. In total, only thirty-five respondents out of 1,745 (2%) had any personal experiences relating to patents. Given its relative rarity, personal patent experience was not included as a variable in the regression models because any indication of statistical significance (or not) was unlikely to be reliable.

With respect to educational background, there was no statistically significant difference in the odds of an invalidity decision depending on whether the mock juror was a college graduate (1,035 out of 1,745; 59%) or had a degree (college or graduate) in science, engineering or mathematics

⁹⁰ Across the various models, the *p*-value ranged between 0.113 to 0.180.

⁹¹ For example, only 146 out of 1,745 respondents (8.4%) were aged 55 and over.

⁹² *p*=0.001.

⁹³ Schwartz & Seaman, *see supra* note 38 at 479-80.

⁹⁴ Schwartz & Seaman, *see supra* note 38 at 479-80.

(316 out of 1,745; 18%). This confirms a similar finding by Schwartz and Seaman.⁹⁵ There were twenty-nine respondents (1.7%) who attended (or were currently attending) law school. A “Law School” variable was not included in the regression models because of reliability concerns arising from the low cell count.

Regarding jury service, 263 respondents (15.1%) have previously served on a jury, of which 95 served in a civil case, 132 served in a criminal case, 21 served in both types of cases, and 15 were unsure of the type of case. In contrast, approximately a quarter of adults in the United States have served on a jury.⁹⁶ The regression models reveal no statistically significant difference in the odds that a respondent would find invalidity based on prior jury service or the type of case (criminal or civil) for which the respondent had served as a juror. The latter result was unexpected, given the differences in the standard of proof for civil trials (preponderance and clear and convincing) and criminal trials (beyond a reasonable doubt).

Because invalidity arguments put the correctness of an act by a government agency at issue, a mock juror’s political orientation was also added as a variable. The respondents were asked to self-identify whether they were liberal, moderate, or conservative on social issues, and separately, on economic issues.⁹⁷ For use in the logistic regression models, the respondents were classified as “Liberal” or “Conservative” if they selected the same political orientation for both social issues and economic issues. Respondents who selected “Moderate” for either question or different political orientations (e.g., social liberal but economic conservative) were classified as “Moderate.” In total, there were 589 (33.8%) Liberals, 968 (55.5%) Moderates, and 188 (10.8%) Conservatives.⁹⁸ In the logistic regression models, “Moderates” constituted the base variable to which Liberals and Conservatives were compared. Notably, those who self-

⁹⁵ Schwartz & Seaman, *see supra* note 38 at 479-80.

⁹⁶ 2008 Poll by Harris Interactive (reporting that 24% of adults have served on a jury).

⁹⁷ The following questions were asked to gauge the respondents’ political preferences:

On social issues, your political views tend to be:

- Liberal
- Moderate
- Conservative

On economic issues, your political views tend to be:

- Liberal
- Moderate
- Conservative

To avoid any potential priming or demand effects, these questions were asked at the end of the survey, after the hypothetical and the obviousness questions were asked.

⁹⁸ The numbers add up to more than 100.0% because of rounding.

identified as “Conservative” were more likely to find invalidity, by a statistically significant margin, over Moderates.⁹⁹ The results were not entirely unexpected given that conservatives are known to favor limited government and less regulation, such that they may be more open to the idea that the government erred, whether in granting a patent or on other issues.

Overall, the data suggest that the strongest predictor of whether an individual juror may find invalidity is gender, followed by the treatment scenarios and political orientation. The influence of race was on the border of statistical significance. Although statistically significant effects were not shown for age, educational background, prior jury service, and experience related to the subject matter of the case, caution is warranted before drawing any conclusions about the relative impact (or lack thereof) of any of those variables. This is because juries deliberate in groups, such that individuals who are perceived to be more experienced or knowledgeable might exert a disproportionate influence in the jury room. The absence of group deliberation in the survey experiment is a substantial limitation on the external validity of this study.

IV. IMPLICATIONS

A. Repurposing the Presumption

The data confirm the conventional assumption that instructing the jury on the presumption of validity introduces a substantial degree of bias that favors the patentee. Similarly, criticisms about the PTO have been shown to introduce a bias that increases the likelihood of an invalidity finding. In short, both types of information are highly prejudicial. However, the data also provide clues on what might be the appropriate roles for these two types of information in modern patent litigation.

Specifically, the data suggest the possibility that the presumption instruction might be suitable as a limited-purpose procedural safeguard against prejudicial anti-PTO information introduced during trial (whether accidentally or otherwise) that has little, if any, probative value. Instructing the jury on the presumption has been shown to counteract the prejudicial impact of information critical of the PTO, as indicated by the similar invalidity rates of the *No Treatments* and the *Both Treatments* scenarios. If the presumption of validity were to be used in this manner as a procedural

⁹⁹ In the various Models, the *p*-value ranged between 0.033 to 0.037.

safeguard, then the baseline scenario used in patent trials should be the *No Treatments* scenario, where the jury is informed of neither the presumption of validity nor any criticisms about the PTO at any time during the proceedings. (This may require the attorneys to refrain from mentioning such items in their opening and closing arguments.)

Otherwise, when there is no danger of the jury being swayed by extraneous information, the presumption instruction may introduce an unfair bias in favor of the patentee. The data show that the strength of the presumption is such that, in whatever context it is introduced—whether criticisms about the PTO are present or not—it may result in a statistically significant drop in the odds of an invalidity finding. For this reason, the presumption instruction should not be given as a matter of routine practice in every case, but only when the jury has been exposed to highly prejudicial, extraneous information such that a substantial risk exists that the jury may decide an invalidity issue based on considerations other than the evidence. In essence, the new role of the presumption of validity instruction involves redirecting its prejudicial effect to counteract other more harmful, prejudicial information.

This new role for the presumption instruction—as a limited-purpose, procedural safeguard—is supported by Federal Circuit caselaw, which does not require the jury to be informed of the presumption so long as an instruction on the clear and convincing standard has been given. Furthermore, the nature of the new role for the presumption is not without precedent if we look to a presumption in another area of the law: the presumption of innocence in criminal law. During a criminal trial, a judge’s failure to provide an instruction on the presumption of innocence—even when requested by the defendant—is not always reversible error.¹⁰⁰ Rather, an instruction on the presumption of innocence is constitutionally required only when the circumstances of the trial create “a genuine danger that the jury would convict . . . on the basis of . . . extraneous considerations, rather than on the evidence introduced at trial.”¹⁰¹ Like the presumption of innocence, the presumption of validity need not be invoked as a matter of routine, but rather only where a “genuine danger” exists that the jury would reach an invalidity verdict based on considerations other than the evidence presented at trial.

Given the nature of the presumption of validity, its new role would benefit only patentees. Might there be an analogous mechanism that could

¹⁰⁰ *Kentucky v. Whorton*, 441 U.S. 786, 789 (1979) (“[T]he failure to give a requested instruction on the presumption of innocence does not in and of itself violate the Constitution. . . . [S]uch a failure must be evaluated in light of the totality of the circumstances . . . to determine whether the defendant received a constitutionally fair trial.”).

¹⁰¹ *Taylor v. Kentucky*, 436 U.S. 478, 488 (1978).

benefit accused infringers? More to the point, if the presumption of validity can be used as a procedural safeguard that counteracts extraneous information presented during trial by the accused infringer that is unfairly prejudicial to the patentee on the issue of validity, should criticisms of the PTO be used for the same purpose against extraneous information introduced by the patentee that is unfairly prejudicial to the accused infringer? Although some district judges have contemplated the latter scenario,¹⁰² it is unclear whether using criticisms about the PTO as a procedural safeguard is a viable option, given that the Federal Circuit considers such information to be inflammatory.¹⁰³ However, the Federal Circuit does not deem the mention of PTO criticisms as automatically necessitating a new trial.¹⁰⁴ If a district judge permits criticisms of the PTO to be introduced in order to counteract unfair prejudice, the risk on appeal is that the Federal Circuit, upon evaluating the totality of the circumstances, might disagree about the prophylactic effect of the PTO criticisms and order a new trial.

Unlike the new role for the presumption, which can be implemented by the district courts now, the viability of a prophylactic role for PTO criticisms appears much less certain, given the “totality of the circumstances” nature of Federal Circuit review regarding the propriety of allowing such information during trial. In light of this asymmetry in feasibility, and the highly prejudicial nature of the information, the case could be made—based on fairness concerns—for not mentioning the presumption or criticisms about the PTO to the jury under *any* circumstances (this corresponds to the *No Treatments* scenario). In such cases, any extraneous, prejudicial information would need to be controlled more strictly using conventional procedural tools, but such tools would at least be equally available to both the patentee and the accused infringer.

B. Study Limitations

There are several aspects of this study that may limit its external

¹⁰² Specifically, some judges have mentioned that they would reconsider a ruling barring the introduction of information critical of the PTO if the patentee tried to argue that the PTO’s decision to grant a patent should be accorded more deference than warranted by the clear and convincing standard of proof. *See supra* note 33 and accompanying text.

¹⁰³ *See, e.g.,* Novo Nordisk A/S v. Becton Dickinson & Co., 304 F.3d 1216, 1220 (Fed. Cir. 2002).

¹⁰⁴ *Id.*

validity.

First, some courts will show the jury an informational video about the PTO that is produced by the Federal Judicial Center (FJC), which has received mixed reviews from practitioners, some of whom believe the video helps the patentee more than the accused infringer.¹⁰⁵ The FJC video was not used in this study because it would have more than doubled the length of the survey (the video is 18 minutes long), and overly long surveys may adversely affect the number and quality of respondents. The content of the FJC video is highly relevant to the presumption of validity because it provides an extended discussion of the process of obtaining a patent at the PTO. Future research could use the FJC video to explore whether the relationships reported in this Article would still hold.

Second, because the survey was conducted online, the hypotheticals were provided as a text document. During trial, information is presented to the jury in both audible and visual forms, which may affect the retention and salience of certain information.¹⁰⁶ In addition, juries deliberate in groups, not individually, such that the decisions of many separate individuals might not be representative of a decision reached by a group.¹⁰⁷ Future research could endeavor to replicate the experiment with changes to the manner in which the hypothetical was presented and how the mock jurors deliberated.

Finally, an inherent limitation of survey experiments is that, unlike a real trial, which presents a substantial amount of information to the jury over several days,¹⁰⁸ the relative brevity of the experiment¹⁰⁹ may enhance the prominence of the treatments, which may skew the results to show a greater effect than may be possible under real-life circumstances.¹¹⁰ It is likely that the brevity of the survey experiment might have considerably amplified the effect of the criticisms of the PTO, relative to the presumption instruction. In an actual trial, there would be a substantial time delay between when the jury would be exposed to critical information about the PTO in the accused infringer's arguments, and when they would learn about the presumption of validity in the jury instructions. As a result, it is

¹⁰⁵ See, e.g., John D. Gilleland, *The Debate Is On: Is the Federal Judicial Center's Patent Tutorial Video Too Pro-Plaintiff?*, TrialGraphix 2 (May 1, 2012), available at www.trialgraphix.com/SiteAssets/file/Articles/patent-tutorial-video-too-proplaintiff-john-gilleland.pdf ("Defense teams claim the video is too pro-plaintiff in that it dedicates a good chunk of its running time to extolling the virtues of the patent system").

¹⁰⁶ Schwartz & Seaman, *supra* note 38 at 470-71.

¹⁰⁷ *Id.* at 471.

¹⁰⁸ *Id.* at 471.

¹⁰⁹ On average, the mock jurors took 12.3 minutes to complete the survey.

¹¹⁰ Jason Barabas & Jennifer Jerit, *Are Survey Experiments Externally Valid?* AM. POL. SCI. REV. at 227.

possible that this study might actually understate the relative impact of the presumption instruction.

CONCLUSION

Based on the data collected through a survey experiment, this Article argues against routinely instructing the jury on the presumption of validity. The biasing effect associated with the presumption cautions against its use in every instance. Rather, if the presumption is to be mentioned at all, it should be mentioned to the jury only when, based on the totality of the events that occurred during the trial, there is a genuine danger that the jury might rely on extraneous information, rather than on the admitted evidence, in deciding an invalidity issue.

APPENDIX 1: HYPOTHETICAL

OVERVIEW OF THE DISPUTE

This dispute is between Acme Golf, Inc., and Bravo Sporting Goods Company. Acme and Bravo are competing manufacturers of golf balls.

Historically, golf balls consisted of two parts: a solid core and a cover-layer with dimples. Some balls had a relatively hard plastic cover-layer because they were designed to travel long distances when struck by a club. However, this hard cover created an undesirable “feel” when struck, and made it difficult for some golfers to control the ball’s direction or spin. In contrast, other balls had a soft cover-layer made of polyurethane in order to provide the proper “feel” when struck and greater control for shorter shots. But soft-cover balls had the disadvantage of travelling less distance than their hard-cover counterparts, and were less durable. Both hard-cover and soft-cover balls were well known in the field since at least the 1950s.

In 2005, Acme designed a three-piece golf ball with: (1) a solid core, (2) a hard inner layer, and (3) a softer outer cover-layer of polyurethane covered with dimples. This three-piece design resulted in a “dual personality” ball capable of traveling long distances due to the hard inner layer, but also had the desirable control and “feel” characteristics of soft-cover balls due to the polyurethane cover-layer. Acme timely applied for a patent on this three-piece golf ball in 2005.

In the United States, patents are granted by the U.S. Patent & Trademark Office, also known as the PTO, which is an agency of the federal government. To obtain a patent, one must first file a patent application with the PTO. A technically-trained patent examiner then reviews it to determine whether the claimed invention is patentable. During this process, the patent examiner searches for and reviews certain information called “prior art,” which is any publicly-available information about the technology existing before the date the patent application was filed. The patent examiner reviews the “prior art” to determine whether the claimed invention is truly an advance over existing technology.

One requirement for obtaining a patent is that the invention is not “obvious” in light of the prior art. A claimed invention is “obvious” if an ordinary-skilled person in the relevant field of technology—who was

familiar with the prior art—would have also been able to come up with the invention at the time the invention was made.

In this case, the patent examiner reviewed the prior art regarding both hard- and soft-cover golf balls. The prior art the patent examiner reviewed included a patent granted to an inventor named Charles in 2000—which is five years prior to when Acme invented its golf ball. The prior art Charles patent discloses a three-piece golf ball with a solid core, a hard inner layer, and an outer cover-layer consisting of a very hard resin covered with dimples. This hard resin surface had the advantage of making the golf ball extremely durable. The Charles patent does not mention polyurethane, nor does it suggest trying to use a softer material for the outer cover-layer of the ball. After reviewing the prior art, including the Charles patent, the patent examiner determined that Acme’s three-piece golf ball was not obvious and allowed a patent to be issued to Acme.

Earlier this year, Acme sued Bravo for selling golf balls that allegedly infringe Acme’s patent. In response, Bravo has asserted that Acme’s patent is invalid for obviousness in light of the prior art—that is, the technology already in existence at the time Acme invented its golf ball. Under the patent law, there is no liability for infringement if the invention claimed in a patent would have been obvious.

THE PARTIES’ ARGUMENTS

BRAVO’S ARGUMENTS:

Bravo argues that Acme’s patent is invalid for obviousness because it merely combines pre-existing items that were already well-known in the prior art. Specifically, Bravo claims that the prior art Charles patent discloses a three-piece golf ball with inner and outer layers of different hardness. It would have been obvious to an ordinary golf ball manufacturer, Bravo contends, to modify the Charles three-piece ball to have a soft, outer cover-layer of polyurethane, which has been widely used in traditional two-piece soft-cover balls since the 1950s. Because of this polyurethane cover, a golf ball maker would expect such a ball to have the desirable control and “feel” characteristics of soft-cover balls. Bravo argues that the jury should not defer to the patent examiner’s conclusion that the Acme three-piece ball was patentable because the patent examiner did not thoroughly analyze the

prior art. In short, Bravo argues that the patent examiner made a mistake in allowing Acme's patent to issue.

ⁱ[[That the patent examiner might have made a mistake should not be surprising. As recognized by numerous academic researchers, poor patent quality is a serious problem. The PTO is underfunded and has a backlog of approximately 600,000 patent applications that are awaiting examination. The patent examiners are overworked, and are simply not given enough time to review patent applications thoroughly. Indeed, according to one academic study, about half of all patents that are litigated in court are found to be invalid.]]

ACME'S ARGUMENTS:

Acme argues that its patent is not obvious for several reasons. Acme asserts that none of the prior art discloses the combination of items that resulted in the patented invention. Acme contends that this combination is worthy of a patent because it creates a golf ball with the unique benefits of the control and "feel" of a two-piece soft-cover ball, combined with the long distance of a hard-cover ball. Acme insists that nothing in the prior art suggests that this combination would create a ball with these favorable characteristics. According to Acme, the prior art Charles patent does not make Acme's patented invention obvious because the golf balls in the Charles patent were designed to solve a very different problem—the lack of durability. Acme further claims that there is nothing in the Charles patent that would suggest to an ordinary golf ball manufacturer that using a softer cover like polyurethane on a three-piece ball might be a good idea. Finally, Acme argues that the jury should defer to the decision of the technically-trained patent examiner, who was in the best position to determine whether Acme's claimed invention was obvious.

ⁱ This is the treatment block that contains criticisms about the PTO. This block was present in the following versions of the hypothetical: *PTO Criticisms Only* and *Both Treatments*.

INSTRUCTIONS FOR DECIDING OBVIOUSNESS

There are several rules you must follow in deciding whether Acme’s patent is invalid for obviousness. The fact that the PTO grants a patent on a claimed invention does not necessarily mean that it in fact deserves protection under the patent laws. A party can argue in court that it is not liable for infringement because the patent is invalid. Here, Bravo is arguing that Acme’s patent is invalid on the ground that the patent examiner made an error in determining that Acme’s invention was not obvious.

ⁱⁱ[[Under the law, Acme’s patent is presumed to be valid. In other words, it is presumed to have been properly granted. When a party attacking the validity of a patent relies on prior art that was specifically considered by the patent examiner, that party bears the burden of overcoming the deference due a qualified government agency official who is presumed to have performed his or her job correctly. The presumption of validity that is accorded a duly-issued patent can be overcome by “clear and convincing” evidence of obviousness. In other words,]] [[I]]nⁱⁱⁱ order to prevail, Bravo must persuade you that the claimed invention in the Acme patent is obvious by “clear and convincing” evidence.

“Clear and convincing” evidence means that it is highly probable that a factual assertion is true. This is a higher standard of proof than a “preponderance of the evidence,” which means “more probable than not.” However, “clear and convincing” evidence is lower than the “beyond a reasonable doubt” standard used in criminal cases.

An invention is “obvious” if a person of ordinary skill in the relevant technical field—who knew about the prior art and the state of technology that existed at the time the invention was made—would have also come up with the invention at that time. In deciding obviousness, you must avoid using hindsight; that is, you should not consider what is known today or what was learned from the teachings of Acme’s patent. In addition, you should not use Acme’s patent as a road map for selecting and combining items of prior art.

ⁱⁱ This is the treatment block that mentions the presumption of validity. This block was present in the following versions of the hypothetical: *Presumption Only* and *Both Treatments*.

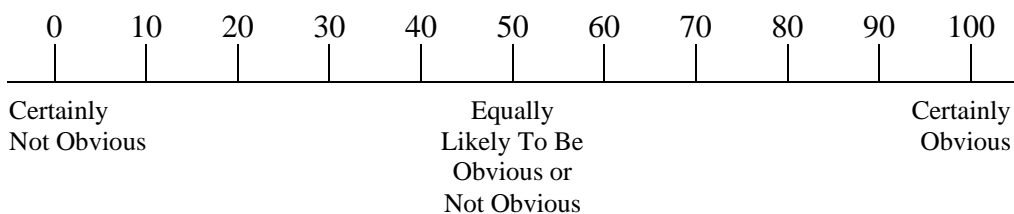
ⁱⁱⁱ When the presumption treatment block was present, this word was spelled “in.” Otherwise, it was spelled “In.”

APPENDIX 2: OBVIOUSNESS QUESTIONS^{iv}

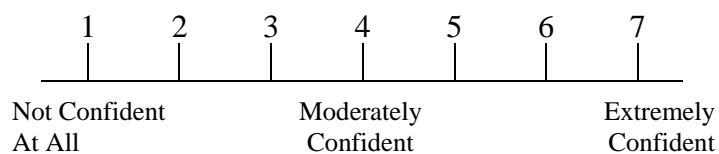
B1. In your opinion, did Bravo prove by clear and convincing evidence that Acme's patent was obvious?

- ☐ Yes (Obvious)
☐ No (Not Obvious)

B2. On a scale of 0% to 100%, how likely do you think it is that Acme's patent was obvious?



B3. On a scale of 1 to 7, how confident are you in your answers to the previous two questions (Questions B1 and B2)?



^{iv} The questions are adapted from Schwartz and Seaman's study, with slight modifications in the wording and order. *See* Schwartz & Seaman, *supra* note 38 at 478.

APPENDIX 3: LOGISTIC REGRESSION MODELS A1-A4^v

Variable	Model A1	Model A2	Model A3	Model A4
No Treatment	---	---	---	---
Presumption Only	.6956* (.1063)	.6949* (.1061)	.6903* (.1055)	.6910* (.1057)
PTO Criticisms Only	1.3545* (.1941)	1.3576* (.1946)	1.3653* (.1959)	1.3621* (.1954)
Both Treatments	.9285 (.1364)	.9302 (.1366)	.9264 (.1363)	.9248 (.1361)
Age	.9926 (.0048)	.9923 (.0048)	.9933 (.0048)	.9935 (.0049)
Male	1.4163** (.1549)	1.4180** (.1554)	1.4236** (.1562)	1.4225** (.1557)
Minority	1.2751 (.1608)	1.2724 (.1608)	1.2897* (.1632)	1.2931* (.1633)
Golf Player	.9836 (.1076)	.9800 (.1070)	.9826 (.1073)	.9864 (.1079)
College Graduate	.9477 (.1015)	---	---	.9494 (.1018)
Science Degree	---	1.0102 (.1375)	1.0178 (.1388)	---
Jury Service	1.0167 (.1556)	1.0140 (.1554)	---	---
Civil Juror	---	---	.6653 (.1539)	.6678 (.1543)
Criminal Juror	---	---	1.1885 (.2238)	1.1929 (.2246)
Liberal	1.1809 (.1352)	1.1807 (.1352)	1.1778 (.1350)	1.1779 (.1350)
Conservative	1.4322* (.2466)	1.4366* (.2474)	1.4440* (.2491)	1.4395* (.2483)
Constant	.4467 (.0997)	.4359 (.0958)	.4245 (.0934)	.4353 (.0973)
Pseudo R ²	0.0197	0.0196	0.0214	0.0215

^v In Models A1-A4, the *No Treatments* scenario is the base comparison variable to which the other treatment scenarios were compared. Odds ratios are reported with (standard errors). Significance levels denoted: *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$.

APPENDIX 4: LOGISTIC REGRESSION MODELS B1-B4^{vi}

Variable	Model B1	Model B2	Model B3	Model B4
No Treatment	1.4375* (.2196)	1.4391* (.2198)	1.4488* (.2215)	1.4471* (.2213)
Presumption Only	---	---	---	---
PTO Criticisms Only	1.9472*** (.2928)	1.9537*** (.2936)	1.9780*** (.2978)	1.9712*** (.2969)
Both Treatments	1.3348 (.2053)	1.3386 (.2058)	1.3421 (.2065)	1.3384 (.2061)
Age	.9926 (.0048)	.9923 (.0048)	.9933 (.0048)	.9935 (.0049)
Male	1.4163** (.1549)	1.4180** (.1554)	1.4236** (.1562)	1.4225** (.1557)
Minority	1.2751 (.1608)	1.2724 (.1608)	1.2897* (.1632)	1.2931* (.1633)
Golf Player	.9836 (.1076)	.9800 (.1070)	.9826 (.1073)	.9864 (.1079)
College Graduate	.9477 (.1015)	---	---	.9494 (.1018)
Science Degree	---	1.0102 (.1375)	1.0178 (.1388)	---
Jury Service	1.0167 (.1556)	1.0140 (.1554)	---	---
Civil Juror	---	---	.6653 (.1539)	.6678 (.1543)
Criminal Juror	---	---	1.1885 (.2238)	1.1929 (.2246)
Liberal	1.1809 (.1352)	1.1807 (.1352)	1.1778 (.1350)	1.1779 (.1350)
Conservative	1.4322* (.2466)	1.4366* (.2474)	1.4440* (.2491)	1.4395* (.2483)
Constant	.3108 (.0706)	.3029 (.0676)	.2930 (.0656)	.3008 (.0685)
Pseudo R ²	0.0197	0.0196	0.0214	0.0215

^{vi} In Models B1-B4, the *Presumption Only* scenario is the base comparison variable to which the other treatment scenarios were compared. Odds ratios are reported with (standard errors). Significance levels denoted: *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$.