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Saliency, Anchors & Frames: A Multicomponent Damages Experiment

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SALIENCY, ANCHORS & FRAMES: A MULTICOMPONENT DAMAGES EXPERIMENT

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Modern technology products contain thousands, sometimes hundreds of thousands, of different features. Nonetheless, when electronics manufacturers are sued for patent infringement, these suits typically accuse only one feature, or in more complex suits, a handful of features, of actual patent infringement. But damages verdicts often do not reflect the relatively small contribution an individual patent makes to an infringing product. One study observed that verdicts in these types of cases average 9.98% of the price of the entire product. While both courts and commentators have blamed the law of patent damages, the role cognitive biases play in these outsized damages awards has been understudied. Relying on decision-making concepts from other contexts, we hypothesize that two biases, namely, a saliency bias and anchoring, may be at work in a patent trial. Since the infringing feature is the most salient feature in a patent trial (i.e. the focus of the trial), jurors may tend to overvalue that feature. Moreover, a patentee's irrationally high damages demand may "anchor" the juries to that number.

We conducted an online 3x3x2 between-subjects experiment to test whether these biases exist and if so, whether particular debiasing techniques may reduce these biases. In eighteen different scenarios, mock jurors were asked to assess damages for different smartphone features. The three manipulations involved: 1) rotating three features so that they were either the feature underlying the plaintiffs' claim (the "feature-in-suit") or one of the other features defendant identified as contributing to the smartphone's overall value; 2) changing the jury verdict form so that mock jurors had to evaluate both the feature-in-suit and other features together; and 3) having the defendant explicitly call out the plaintiff for anchoring the jury in an irrationally high number.

The results suggest that some combination of the saliency bias and anchoring were at play when juries assessed damages for all three tested features. However, for the storage feature the results were only signficant for the feature's relative rank, but not its dollar valuation. That may be because mock juors are familir with the cost of the increased storage. Modifying the jury verdict form reduced, but did not eliminate, the primary effect of the saliency bias, while the defendant's tactic of exposing the plaintiffs' anchor did not significantly reduce

damages. In addition, qualitative comments suggested that some mock jurors resisted the jury instructions designed to compensate plaintiffs for the missing feature and instead assessed damages to punish the defendant.

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Introduction

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This article proceeds in six parts. Part I discusses the problem of large damages in multicomponent patent lawsuits. It explains how commentators have characterized the problem and how courts have sought to address the issue. In both cases, these experts have focused on legal fixes that do not take into account cognitive biases. By taking concepts from various decision-making studies, Part II describes the saliency bias and anchoring generally and then explains how they may operate in patent trials to inflate damages awards. Part II then explores two potential de-biasing techniques.

Part III describes the experiment, which was based on a product mislabeling lawsuit. The defendant mistakenly advertised a single feature that was not present in the smartphone that the plaintiffs purchased. Liability was conceded, and mock jurors only had to decide damages. Although our primary goal was to evaluate how juries determine patent damages, we based our experiment on a products misrepresentation case. The simpler legal requirements in a misrepresentation claim allowed us to rotate different smartphone features between the plaintiffs' case and the defendant's case more easily. The plaintiff would describe the feature-in-suit and request a high damages award. In response, the defendant would minimize the value of the feature-in-suit and would describe several other smartphone features to show that the feature-in-suit only contributed to a small part of the overall value of the smartphone. After mock jurors assessed damages, they were asked to also value the other features that the defendant described. By comparing the value of a feature when it was in the plaintiffs' case with the value of the same feature when it was in the defendant's case, we were able to determine whether saliency and anchoring were operating to increase damage awards. In our second manipulation, we changed the jury verdict form to require mock jurors to assess the value of the feature-in-suit together with other features to determine whether we can take advantage of other heuristics (in this case, a framing effect) to reduce the primary effect of the saliency bias (if any). Finally, in our third manipulation, we tested another debiasing technique. This time the defendant explicitly accuses the plaintiff of asking for irrationally high damages to take advantage of anchoring effects. The theory is that if the mock jurors understand that they may be manipulated, they will be less susceptible to that manipulation.

Part IV then describes our results. Our primary saliency-bias hypothesis was confirmed for two tested features (camera resolution and enhanced security). The values of these features were significantly more valuable when they were part of the plaintiffs' case than when they were part of the defendant's case. However, the findings with respect to a third feature (more storage) were more difficult to interpret. Mock jurors ranked the value of this feature higher when it was part of the plaintiffs' lawsuit, but their monetary valuation did not increase as well. That may be because the value of increased storage was familiar to mock jurors while the value of the other two features was not. Additionally, we had mixed results for our debiasing manipulations. Modifying the jury verdict form reduced damages by less than ten percent, while the defendant's tactic of calling out the anchor did not have any significant effect. Finally, Part IV also examines many of the comments mock jurors made after they rendered their decisions. Interestingly, many juries did not appear to follow the jury instructions. Specifically, some jurors appeared to focus on the defendant's culpability and sought to punish the defendant. In Part V, we discuss the limitations of our study. In

Part VI, we explore what our findings mean for real world litigations and suggest additional areas for follow-on research.

I. OUTSIZED DAMAGE AWARDS

Many technology products today are literally covered by hundreds of thousands of different patents.[1] For example, a smartphone likely has patents on the user interface, the microprocessors, memory chips, communication protocols and even the software that runs on one device. But patent lawsuits typically only involve one of these patents. In a few larger, more complex cases, the plaintiff asserts a few patents. Thus, even if only the most valuable patents make it to trial, we would expect damages awards to be only a relatively small percentage of the overall sales prices of these multicomponent products. But that is not the case. In 2007, Lemley and Shapiro found that reasonable royalty awards for a single component that was part of more complex multicomponent products averaged 9.98%.[2] This number seems particularly high given that the average royalty rate across all types of patents was 13.1% and for integrated product claims, 14.7%.[3] Several more recent high profile cases suggest that the same problems continue to be a problem today.[4]

These high damages rates suggest that patent law has been overcompensating patentees in these types of technology cases.[5] Existing legal doctrine has taken the blame.[6] The current test for determining reasonable roy-

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1. In 2011, RPX estimated that 250,000 patents apply to the smartphone. RPX Corp., Registration Statement 59 (Form S-1) (Sept. 2, 2011) ("Based on our research, we believe there are more than 250,000 active patents relevant to today's smartphones. . ."). Of course, smartphones have become even more complicated since 2011.

2. Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2032 tbl.1 (2007).

3. *Id.* at 2034. One would expect that the component royalty would be substantially smaller than rates found in other fields, but the royalties for all inventions was 13.1% and for integrated product claims 14.7%. See *id.*

4. *See, e.g.*, Wisconsin Alumni Research Found. v. Apple Inc., No. 14-CV-062-WMC, 2015 WL 6755209 (W.D. Wis. Oct. 19, 2015) (jury awarded over $234 million in damages for a patent involving microprocessors in Apple's iPhones); Carnegie Mellon Univ. v. Marvell Tech. Grp., No. 09-290, 2012 WL 6686094 (W.D. Pa. Dec. 26, 2012) (verdict form awarding $1.17 billion); Apple Inc. v. Samsung Elec.'s Inc., No. 11-CV-01846-LHK, 2012 WL 10208466 (N.D. Cal. Aug. 24, 2012) (verdict form awarding $1.049 billion); Uniloc U.S.A. Inc. v. Microsoft Corp., No. 03-440, 2009 WL 960940 (D. R.I. Apr. 8, 2009) (verdict form awarding approx. $582 million); Lucent Tech. Inc. v. Gateway Inc., No. 02-CV-2060 B (CAB), 2007 WL 892887 (S.D. Cal. Feb. 22, 2007) (verdict form awarding approx. $1.5 billion).

5. Lemley & Shapiro, *supra* note 2, at 2034 ("[W]e should expect to see a more significant reduction in the royalty rate if the system were working as intended.").

6. *Id.* ("[I]t is reasonable to conclude that the legal doctrines designed to make the reasonable royalty track the actual value of the patented contribution are not working, at least not fully.").

alties consists of weighing a mind-boggling fifteen *Georgia Pacific* factors.[7] While two *Georgia-Pacific* factors reflect the so-called "apportionment" principles—the royalty should only reflect the patent's relative contribution to the overall infringing product—it is unclear how much weight juries give these two factors.[8] Several commentators have argued that the *Georgia Pacific* test gives juries too much discretion and leads to damages awards that overvalue the patent at issue.[9] To aggravate the problem, the number and complexity of the factors hinders judges from effectively policing jury verdicts.[10] In response to complaints from technology companies, Congress worked on draft legislation to curb damages awards from 2007 to 2010.[11] Yet, at the same time, an unusually activist Federal Circuit argued that legislation was unnecessary and suggested that it could handle any problems in patent damages law.[12]

Although Congress eventually amended the patent laws in 2011, damages reform was not part of that legislation, most likely because of a lack of industry consensus.[13] But the Federal Circuit followed through on its promises by issuing several decisions rejecting different types of damages evidence and vacating large damages awards. In 2009, the Federal Circuit threw out a $358 million award against Microsoft in Lucent Technologies v.

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7. Ga.-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *modified sub nom.* Ga.-Pac. Corp. v. U.S. Plywood-Champion Papers, Inc., 446 F.2d 295 (2d Cir. 1971). Some courts are finally starting to give jury instructions that are no longer based on the Georgia Pacific factors. *See e.g.* Northern District of California Model Patent Jury Instruction 5.7 (updated Oct. 2019).

8. Factor 9 discusses the "advantages of the patent property over the old modes or devices" and factor 13 the "portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant features or improvements added by the infringer." *Id.*

9. Christopher B. Seaman, *Reconsidering the* Georgia-Pacific *Standard for Reasonable Royalty Patent Damages*, 2010 BYU L. REV. 1661, 1666 (2010) ("there is a growing body of evidence that Georgia-Pacific has resulted in the systematic overcompensation of patent owners in certain industries."); Bernard Chao, *The Case for Contribution in Patent Law,* 80 U. CIN. L. REV. 97, 108 (2011) (suggesting that juries must not be applying apportionment principles properly).

10. Seaman, *supra* note 9, at 1707 2010, BYU L. Rev at 1707 ("the amorphous nature of the Georgia-Pacific test makes it difficult for a jury's reasonable royalty award to be adequately reviewed during post-trial motions or on appeal"); Daralyn J. Durie & Mark A. Lemley, *A Structured Approach to Calculating Reasonable Royalties*, 14 LEWIS & CLARK L. REV. 627, 632-33 (2010) (arguing that the complexity of the current fifteen factor test for determining reasonably royalties allows judges to "simply give up and defer to whatever the jury awards").

11. Jonas Anderson, *Congress as Catalyst of Patent Reform at the Federal Circuit*, 63 AM. U. L. REV. 961, 990-99 (2014) (describing legislative efforts from 2007-2010 to reform patent law including provision regarding damages).

12. *Id*. at 995 (describing how Chief Judge Michel stated that the Federal Circuit was open to altering it damages case law and invited stakeholders to raise the issues on appeal).

13. In 2011, the American Invents Act was passed, but the proposed damages reforms found in earlier drafts were not included in the final version of the legislation. *Id.* at 1004.

Gateway.[14] The infringing feature was the so-called "date picker" feature, which allowed users to select dates without using a keyboard.[15] The Federal Circuit noted that the date picker was "but a tiny feature of one part of a much larger software program [Outlook]."[16] The decision identified several problems in the way damages were calculated. One notable flaw was how Lucent's expert effectively used the value of the sale of computers loaded with the software rather than the patented portions of the software to calculate damages.[17] That allowed Lucent to frame their damages request as a comparatively small percentage of the overall sales base. Since sales of the three infringing software products were approximately $8 billion, the 8% that Lucent sought was still $561.9 million.[18] The Federal Circuit rejected Lucent's approach and vacated the damages award.[19] More recent decisions have carried forth this analysis and now insist that royalties adequately apportion damages based on the relative contribution the patent makes.[20] One way the Federal Circuit has sought to prevent patentees from capturing the value of the larger product is to insist that royalties be based on the "smallest salable unit."[21] Patentees can only base sales on a larger more complex product if the patented feature provides the basis for customers' demand for the larger product.

Two years after *Lucent Technologies*, the Federal Circuit categorically rejected another approach blamed for disproportionately high damages awards: the 25% rule of thumb. In *Uniloc USA, Inc. v. Microsoft*, the patent covered a mechanism for combating casual copying by creating a unique registration number used to verify that a particular copy of a program was authorized.[22] A jury found that the Product Activation feature in Microsoft's

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14. Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1332 (Fed. Cir. 2009).

15. *Id.* at 1317. The court described the patent as "generally directed to a method of entering information into fields on a computer screen without using a keyboard." *Id.* at 1308.

16. *Id.* at 1332.

17. *Id.* at 1338-39.

18. *Id.* at 1323.

19. *Id.* at 1334.

20. Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1235 (Fed. Cir. 2014); Virnetx, Inc. v. Cisco Sys., Inc., 767 F.3d 1308, 1328 (Fed. Cir. 2014) ("[T]he district court should have exercised its gatekeeping authority to ensure that only theories comporting with settled principles of appointment were allowed to reach the jury.").

21. *See, e.g.*, Finjan, Inc. v. Blue Coat Sys., Inc., 879 F.3d 1299, 1310–11 (Fed. Cir. 2018) ("The smallest salable unit principle directs that 'in any case involving multi-component products, patentees may not calculate damages based on sales of the entire product, as opposed to the smallest salable patent-practicing unit, without showing that the demand for the entire product is attributable to the patented feature.'" (citation omitted)); Versata Software, Inc. v. SAP Am., Inc., 717 F.3d 1255, 1268 (Fed. Cir. 2013) ("[A] patentee may assess damages based on the entire market value of the accused product only where the patented feature creates the basis for customer demand or substantially creates the value of the component parts." (quoting SnyQor, Inc. v. Artesyn Techs., Inc., 709 F.3d 1365, 1383 (Fed. Cir. 2013))).

22. Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1296 (Fed. Cir. 2011).

Word XP, Word 2003, and Windows XP infringed the patent.[23] Relying in large part on the 25% rule, Uniloc's expert testified that Uniloc should be awarded $564,946,803.[24] Under that rule, "licensees pay a royalty rate equivalent to 25 per cent [sic] of its expected profits for the product that incorporates the IP at issue."[25] While the jury did not give Uniloc all that it requested, it did award $388 million. The Federal Circuit rejected the rule of thumb saying that it was "a fundamentally flawed tool for determining a baseline royalty rate in a hypothetical negotiation."[26]

Legal rules like requiring apportionment, basing royalties on the smallest saleable unit, and rejecting the 25% rule of thumb undoubtedly placed downward pressure on damages in multicomponent cases, but they did not solve the entire problem. Although patent trials are quite rare, there are still unusually high damages awards in multicomponent cases. Apple's clash with Samsung is one prominent example. The jury initially awarded Apple $1.05 billion for Samsung infringing three utility patents and two design patents.[27] However, these patents only covered a small portion of the technology found in Samsung's infringing smartphone and tablets.[28] Through numerous appeals, Samsung has successfully whittled away at the $1 billion award.[29]

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23. *Id.* at 1300-01.

24. *Id.* at 1311.

25. *Id.* at 1312(quoting Robert Goldscheider, John Jarosz, and Carla Mulhern, *Use Of The 25 Per Cent Rule in Valuing IP,* 37 LES NOUVELLES 123, 123 (2002).

26. *Id.* at 1315.

27. Amended Verdict Form at 15, Apple Inc. v. Samsung Elecs. Inc., No. 11-CV-01846-LHK (N.D. Cal. Aug. 24, 2012), ECF No. 1931 (awarding $1.049 billion).

28. The three utility patents asserted comprised of the '381 patent, the '915 patent, and the '163 patent. The '381 patent is directed to "a software feature known as the 'bounce-back' feature," which is "activated when the user is scrolling through a document displayed on the device. If the user attempts to scroll past the end of the document, an area beyond the edge of the document is displayed to indicate that the user has reached the document's end." Apple Inc. v. Samsung Elecs. Co., 678 F.3d 1314, 1318 (Fed. Cir. 2012). The '915 patent is directed to the "pinch-to-zoom" gesture, and the '163 patent is directed to the "double-tap-to-zoom" functionality. Apple Inc. v. Samsung Elecs. Co., 735 F.3d 1352, 1358 (Fed. Cir. 2013). The four design patents asserted are the '677 design patent, the '087 design patent, the '305 design patent, and the '889 patent. The '087 and the '677 design patents "are directed to designs that Apple contends are generally embodied in the iPhone . . . . Both patents claim a minimalist design for a rectangular smartphone consisting of a large rectangular display occupying most of the phone's front face." 678 F.3d at 1317. The '305 design patent "claims the ornamental design of the iPhone's graphical user interface, including the arrangement of rows of square icons with rounded corners." 735 F.3d at 1357. The '889 design patent is "directed to the design of a tablet computer" and "depicts a rectangular tablet with a polished reflective surface extending to the edge of the front side of the device." 678 F.3d at 1318.

29. *See*, Jacob Kastrenakes, *Apple and Samsung Settle Seven-Year-Long Patent Fight Over Copying the iPhone*, THE VERGE (Jun. 27, 2018, 2:59 PM) ("Most recently, the verdict had been whittled down to $539 million for Apple."); *see also* Pamela Samuelson & Mark Gergen, *The Disgorgement Remedy of Design Patent Law*, 108 CALIF. L. REV. (forthcoming 2020) (manuscript at 16-17 n.109), https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_

But while courts throw out some disproportionately high damages awards, these decisions do nothing to prevent subsequent juries from issuing similar awards in the future.[30] The problem is one of timing. Courts typically impose limits on damages after the jury issues its verdict. Trial courts can only grant a JMOL (judgment as a matter of law) discarding a damages verdict or remitter after the jury has rendered its verdict. Of course, any appeal to the Federal Circuit takes place even later. But these *ex post* solutions are inefficient. Both the parties and the trial court expend significant time and resources at trial. If possible, any intervention should help juries arrive at a proper damages verdict in the first instance.

The large number of *Georgia Pacific* factors complicate this task because it is often easy to find an argument for increased royalties under one of the test's fifteen factors, and it is easy for experts to latch on to the more subjective factors of the test and obfuscate the jury. We hypothesize that as long as attorneys can continue to make colorable arguments supporting an extremely high damages request, that request (i.e. the anchor) will have an unduly high impact on the ultimate verdict. That is because jurors (like everyone) are subject to a wide variety of cognitive biases. One or more of these biases may be at work when juries issue disproportionate damages awards in multicomponent patent cases. We describe our hypotheses in greater detail below.

II. THE PSYCHOLOGY OF PATENT DAMAGES

Beginning with Amos Tversky and Daniel Kahneman, social scientists have shown that people make irrational decisions in a wide variety of contexts.[31] That is because they take mental shortcuts called heuristics. Countless works have now identified a variety of forms of cognitive biases.[32] We

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ID3353536_code1664945.pdf?abstractid=3353536&mirid=1 (last visited Sept. 29, 2019) ("The $1.05 billion jury award in 2012 included damages for trade dress dilution and utility patent infringement as well as for design patent infringement. In post-verdict proceedings, the trial court adjusted the design patent award to $399 million. The 2017 jury awarded Apple $533.3 million for the design patent infringements, plus about $5 million as a reasonable royalty for utility patent infringement.").

30. Examples of damages rulings that effectively eliminate a jury decision abound. *See* Finjan, Inc. v. Blue Coat Sys., Inc., 879 F.3d 1299, 1312 (Fed. Cir. 2018) (remanding for potential new trial); Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429, 436 (2016) (remanded to determine damages again); Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1235-36 (Fed. Cir. 2014) (vacating jury's damages award and remanding for further proceedings).

31. *See* Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 SCIENCE 1124, 1124 (1974).

32. *See e.g.*, BEHAVIORAL LAW AND ECONOMICS (Cass R. Sunstein ed., 2000); THE LAW AND ECONOMICS OF IRRATIONAL BEHAVIOR (Francesco Parisi & Vernon L. Smith eds., 2005); Robert P. Abelson, *Psychological Status of the Script Concept*, 36 AM. PSYCHOLOGIST 715 (1981).

suggest that two such biases may be at work as juries decide patent damages for multicomponent products.[33]

A. *Potential Biases*

1. Saliency Bias

A form of saliency bias may cause juries to overvalue an infringing feature.[34] Saliency bias refers to the fact that individuals are more likely to focus on items or information that are more prominent (and salient) and ignore items and information that are less visible.[35] For example, individuals that have been recently exposed to news about violent crime tend to overestimate the likelihood of a violent crime occurring in that individual's neighborhood.[36] Psychologists have theorized that saliency bias stems from people's limited ability to process information. Since they cannot consider all the relevant facts, they naturally focus on particularly salient information. That information then tends to exert undue influence on the individual's decision-making.

In patent infringement cases involving multicomponent electronic products (*e.g.* a smartphone or a television), the majority of the trial time naturally focuses on the accused infringing feature. This is true even though a multicomponent product is likely to have thousands, if not hundreds of thousands, of other features.[37] Thus, information about the accused feature is

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33. Thomas Cotter has discussed how heuristics may affect patent damages and argued that courts should be aware of how these heuristics can affect both the decisions of judges and juries. Thomas F. Cotter, *Patent Damages Heuristics*, 25 TEX. INTELL. PROP. L.J. 159, 164 (2018).

34. *See* Shelley E. Taylor & Susan T. Fiske, *Salience, Attention, and Attribution: Top of the Head Phenomena*, *in* ADVANCES IN EXPERIMENTAL SOCIAL PSYCHOLOGY 249, 254 (Leonard Berkowitz ed., 11th ed. 1978).

35. Deborah H. Schenk, *Exploiting Salience Bias in Designing Taxes*, 28 YALE J. ON REG. 253, 254 (2011) ("In making decisions, individuals rely on heuristics or cognitive biases. One of these is salience, which refers to visibility or prominence. Individuals systematically focus on items or information that is prominent or salient and ignore information or items that are less visible.").

36. Daneil Romer et al., *Television News and the Cultivation of Fear of Crime*, J. OF COMM. 88, 91, 99 (2003) (In a national sample collected in 1997, perceived risk of crime was related to local television news exposure.); *see also* Allen E. Liska & William. Baccaglini, *Feeling Safe by Comparison: Crime in the Sewspapers*, 37 SOC. PROBS. 360, 366 (1990) (homicide stories in particular show the strongest relationship to public fear in the local news); Bryan H. Reber & Yuhmin Chang, *Assessing Cultivation Theory and Public Health Model of Crime Reporting*, 21 NEWSPAPER RES. J. 91, 99 (2001) (concluding that reporting salient rather than common crimes may convey a message that crime is more pervasive and relevant to a particular community);.

37. *See* Jorge L. Contreras, *Technical Standards, Standards-Setting Organizations and Intellectual Property: A Survey of the Literature (With an Emphasis on Empirical Approaches)*, *in* 2 RES. HANDBOOKS ON ECON. OF INTELL. PROP. L. (forthcoming 2019) (manuscript at

particularly salient to the jury's primary task. Jurors must focus on the accused feature to assess whether it infringes the patent. Meanwhile, information about the thousands of other features is not relevant to infringement. The only time the juror is asked to consider these features is when the defendant points out that they also contribute value to the product. Thus, a patent infringement trial may create a context where jurors overvalue the infringing feature.

2. Anchoring

Another form of cognitive bias called "anchoring" may also cause juries to overvalue an infringing feature. Anchoring generally refers to the observation that an initial number inordinately influences an individual's later numerical determinations.[38] Anchoring effects have previously been demonstrated in the context of both personal injury and punitive damages cases.[39] Numerous studies have confirmed that as the demand increases, so does the award. Indeed, one study's title provocatively suggests that "the more you ask for, the more you get."[40] Of course, attorneys are familiar with this phenomenon and often ask for damages awards far in excess of what they think their case is worth or that the jury will issue.[41] Indeed, one might suspect that is precisely what Apple's attorneys were doing when they asked for a $100 royalty on a $199 smartphone for infringing three graphical user interface patents.[42] The surprisingly simple demonstrative exhibit depicted here was presented during the testimony of Dr. John Hauser, an MIT business school professor and Apple's expert. Although Dr. Hauser testified that his conclusions relied on a sophisticated survey technique called "conjoint analysis," his direct testimony lasted less than three minutes. There was no effort to explain the details of "conjoint analysis." This may have been due

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8-10), https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID3342570_code1335192.pdf?abstractid=2900540&mirid=1 (last visited Sept. 30, 2019)(listing studies that identified thousands to hundreds of thousands of patents that potentially cover various technical standards).

38. Tversky & Kahneman, *supra* note 31, at 1128–30.

39. Reid Hastie et al., *Juror Judgments in Civil Cases: Effects of Plaintiff's Requests and Plaintiff's Identity on Punitive Damage Awards*, 23 L. & HUM. BEHAV., 445, 463 (1999) (summarizing several studies).

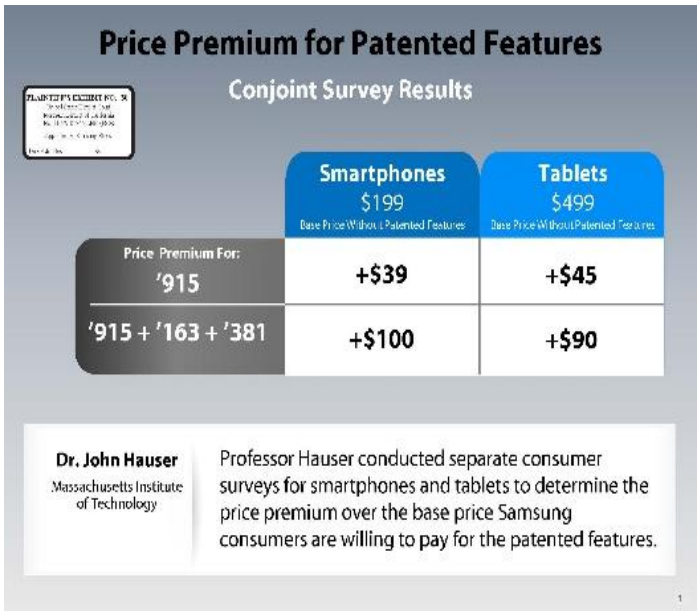
40. Gretchen B. Chapman & Brian H. Bornstein, *The More You Ask for, the More You Get: Anchoring in Personal Injury Verdicts*, 10 APPLIED COGNITIVE PSYCHOL. 519, 522 (1996).

41. Ken Broda-Brahm, *When Arguing Damages, "Drop Anchor" Even in Murky Waters*, PERSUASIVE LITIGATOR (Aug. 29, 2011), https://www.persuasivelitigator.com/2011/08/damages-anchoring.html ("It is now common sense among plaintiffs that you should give jurors an anchor number, especially, for the less evidence-grounded general damages categories.").

42. *See* Dan Levine, *Analysis: In Apple v. Samsung, Alchemy of Damages Takes the Stage*, REUTERS (Aug. 22, 2012, 4:31 PM), https://in.reuters.com/article/idINL2E8JK02J20120822 (noting that the marketing expert from MIT took "all of three minutes").

to time constraints imposed by the court, or it could have been a tactical decision. Apple's attorneys could have been just trying to anchor the jury in the highest number it could introduce.[43] Shortly thereafter, the jury returned a $1 billion verdict in favor of Apple.[44] In sum, it is these types of inordinately high anchors that may be another factor in disproportionately high damages awards in multicomponent patent lawsuits.

FIGURE 1



43. Samsung unsuccessfully sought to have the expert report on conjoint analysis excluded. *See* Order Granting in Part and Denying in Part Motions to Exclude Certain Expert Opinions, Apple Inc. v. Samsung Electronics Co. LLC., No. 12-cv-00630-LHK (PSG), 2012 WL 3793136, at *27 (Feb. 25, 2014).

44. *See* Josh Lowensohn, *Jury Awards Apple More Than $1B, Finds Samsung Infringed*, CNET (Aug. 24, 2012, 8:02 PM), https://www.cbsnews.com/news/jury-orders-samsung-to-pay-1b-to-apple/. That award has been reduced through subsequent litigation and retrial on damages. Johnny Lieu, *Apple Wins $539 Million in Damages in Patent Battle with Samsung*, MASHABLE (May 24, 2018), https://mashable.com/2018/05/24/samsung-apple-retrial-decision/.

B. *Potential Debiasing Strategies*

To the extent that the biases discussed above distort damages determinations, the judicial system should seek ways to either eliminate or reduce them. We hypothesize how two potential debiasing techniques might work here.

1. Imposing Frames

Our first proposal takes advantage of the concept of coherence. Studies have proven that people's relative valuations appear orderly. For example, one study showed that while people's estimates of the price of everyday objects were unduly influenced by an irrelevant number (e.g. writing down their social security number), the same subjects performed well when asked which items were more or less expensive.[45] This observation suggests that courts can make jury decision-making more accurate by providing more reference points.[46] Indeed, the debiasing technique of providing more reference points has helped decision makers in other areas of the law, such as workers' compensation and sentencing guidelines.[47]

Here, we suggest that juries can create their own reference points. Judges could instruct jurors to value the feature-at-issue simultaneously with the other features of the multicomponent device. Currently, jurors are instructed to determine a value for the infringing feature by itself.[48] As a result, the jury's entire focus is on the infringing feature. By prompting the jurors to value various other features contained in the multicomponent device at the same time, courts might be able to reduce the saliency bias. This approach is reinforced by the principle of coherence. A jury verdict form that forces the jury to simultaneously render decisions on different features necessarily re-

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45. Dan Ariely, George Lowenstein & Drazen Prelec, *"Coherent Arbitrariness": Stable Demand Curves without Stable Preferences,* 118 Q.J. OF ECON. 73, 77 (2003) ("Subjects, it seems, did not know how much they valued these items, but they did know the relative ordering within the categories of wine and computer accessories.").

46. *See* Bernard Chao*, The Case for Contribution in Patent Law,* 80 U. CIN. L. REV. 113, 134–35 (2011) (suggesting that courts should allow defendants in multicomponent patent lawsuits to implead their suppliers; that will then provide the jury with another important reference point, the price of the component, for calculating damages); Reid Hastie, *The Challenge to Produce Useful "Legal Numbers"*, 8 J. EMPIRICAL LEGAL STUD. 6*,* 8-9 (2011) (discussing three approaches to give decision makers more useful information to make numerical decisions).

47. Cass R. Sunstein, Daniel Kahneman & David Schkade, *Assessing Punitive Damages (with Notes on Cognition and Valuation in Law)*, 107 YALE L.J. 2071, 2124-25 (1998); *see also* Hillel Bavli & Reagan Mozer, *The Effects of Comparable-Case Guidance on Awards for Pain and Suffering and Punitive Damages: Evidence from a Randomized Controlled Trial*, 37 YALE L. & POL'Y REV. 405 (2019) (showing that mock jury decision were less variable when given information on prior awards).

48. *See, e.g.*, Verdict Form, Uniloc U.S.A., Inc. v. Microsoft Corp., No. 03-004 S, 2009 WL 960940 (D.R.I. April 8, 2009).

quires them to also consider relative valuations. We hypothesize that together these two mechanisms will yield a more accurate valuation for an infringing feature in a multicomponent suit.

In theory, it makes sense to assess the value of a particular feature in the context of determining the value of all the other inputs to the product simultaneously. This approach is consistent with what others have proposed: assessing damages by determining the incremental value of the patented feature.[49] Simultaneous valuation has the added benefit of preventing valuations that lead to unreasonable results – namely, the patent system should not lead to situations where the sum of the parts are larger (at least not substantially larger) than the value of the product as a whole.

In practice, neither courts nor researchers can ask people to look at thousands of features simultaneously. Unless they were heavily invested in the outcome, people do not have the time or patience to carefully perform these tasks.[50] However, having mock jurors evaluate a few features as part of the defendant's case is a closer approximation of the ideal approach than when the feature is valued alone in the plaintiffs' case.

2. Exposing the Anchor

One of the authors has previously studied potential strategies to respond to anchoring in the context of medical malpractice lawsuits.[51] The study tested three potential strategies a defendant might use against a disproportionately high damages demand: 1) offering a significantly lower anchor (the "counter" condition), 2) not offering an alternative number but critiquing the plaintiffs' request (the "ignore" condition), and 3) using the plaintiffs' high demand to attack the plaintiffs' credibility (the "attack" condi-

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49. Several others have advocated measuring damages based on the incremental value of the patented technology. *See* Jorge L. Contreras & Richard J. Gilbert, *A Unified Framework for RAND and Other Reasonable Royalties*, 30 BERKELEY TECH. L.J. 1451, 1499 (2015) (endorsing the incremental value and explicitly excluding switching costs); Taylor *infra* at note 66 at 95-96 (suggesting that damages based on the value of the patent would be "the amount of money that a user of patented technology can save or otherwise obtain based upon the difference between a world where the patented technology is used and a world where the patented technology is not used.").

50. There are other reasons why this approach might not work. Jurors may suffer from cognitive overload when they have to value too many features together. *See* Paul E. Green & V. Srinivasan, *Conjoint Analysis in Marketing: New Developments with Implications for Research and Practice*, 54 J. MARKETING 3, 8 (1990) (suggesting that upper limit may be as small as six people); *see also* Zelin Yang, *Damages Royalties: An Overview of Reasonable Royalty Damages,* 29 BERKELEY TECH. L.J. 647, 665 (2014) (discussing how limiting the number of features may lead to manipulation).

51. John Campbell, Bernard Chao, Christopher Robertson & David Yokum, *Countering the Plaintiffs' Anchor: Jury Simulations to Evaluate Damages Arguments*, 101 IOWA L. REV. 543 (2016).

tion).[52] Although the study found that countering the plaintiffs' $5,000,000 demand with a significantly lower number ($50,000) was slightly more effective than attacking the demand, the difference was small. Average damages in the counter condition were $200,261 while they were $341,872 in the attack condition.[53] The anchoring effect dominated the three attempts to counter it.

Some scholars have suggested that a different tactic might work: educating jurors about their potential biases.[54] One recent study sought to test this theory in the criminal sentencing context.[55] The experiment tested four potential responses to a prosecutor's anchor (*i.e.* demand for a long sentence): (1) ignoring, (2) identifying, (3) countering (offering a lower alternative anchor), and (4) identifying and countering.[56] In the two identifying conditions, defense counsel specifically called out the prosecutor for throwing out a "ridiculously high number" and labeled it "a psychological manipulation."[57] Interestingly, identifying anchoring by itself had no effect on sentencing outcomes, but when it was combined with a lower anchor, the defense was able to significantly reduce sentencing outcomes by between 37% and 45%.[58] We sought to determine if the same tactic would be effective in determining damages in a multicomponent patent case.

III. THE EXPERIMENT

Although our primary subject of interest is assessing how juries decide damages in multicomponent patent cases, our experiment was based on a product mislabeling case rather than a patent infringement case. Our experimental design required us to identify and describe three different features in a multicomponent product and repeatedly switch the context in which mock jurors valued these three features. Thus, in different scenarios, either the plaintiff or the defendant would be explaining the value of any given feature. When discussing features, we sought to use the same arguments re-

52. *Id.* at 555; *see also*, Tina L. Decker, Effects of Counter-Anchoring Damages During Closing Argument, 49–50 (2006) (unpublished Ph.D. dissertation, University of Kansas) (on file with authors).

53. Campbell et al. *supra* note 51, at 560.

54. Rebecca K. Helm, Valerie P. Hans & Valerie F. Reyna, *Trial by Numbers*, 27 CORNELL J.L. & PUB. POL'Y 107, 132 (2017); Wilson et al., *A New Look at Anchoring Effects: Basic Anchoring and Its Antecedents*, 125 J. EXPERIMENTAL PSYCHOL.: GEN. 387 (1996) (warning participants about their potential bias mitigated but did not nullify anchoring biases).

55. Christopher T. Stein & Michelle Drouin, *Cognitive Bias in the Courtroom: Combating the Anchoring Effect in Criminal Sentencing*, SSRN (uploaded June 23, 2017) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2991611.

56. *Id.* at 11.

57. *Id*. at 19.

58. *Id*. at 31. The 37% reduction occurred in low anchor condition and the 45% reduction occurred in the high anchor condition. *Id.*

gardless of whether that feature was being discussed by the plaintiff or the defendant. Introducing infringement arguments would have frustrated that design because the parties would never discuss whether features not in suit infringed a patent. Thus, the product mislabeling lawsuit gave us the best opportunity to isolate the cognitive biases we were seeking to test.

What follows is a description of the "basic" case that is common to all the different scenarios mock jurors viewed. The case involves the mislabeling of the fictional Ultra smartphone. Both the marketing and actual packaging mistakenly referred to a feature that was not present in smartphones the defendant manufacturer sold. The plaintiffs are the class of consumers that purchased the Ultra smartphone for an average of $489/smartphone. The defendant does not dispute liability. Moreover, both sides agree that the defendant should pay the consumers the difference between the phone as described and the phone as delivered. However, they differ on what that amount is. In pre-testing, mock jurors sought to punish the defendant for its conduct when assessing damages. Consequently, the basic case was revised to include facts that minimized the defendant's blame. The defendant sent accurate instructions to a third-party marketing company that made the mistake. Unfortunately, that party is bankrupt, and the defendant manufacturer has willingly accepting responsibility but is disputing the value of the missing feature.

All the different versions consist of three narrated PowerPoint parts: a judge, the plaintiffs' attorney and the defendant's attorney. The presentations were combined and rendered into a single video.[59] A judge introduces the basic dispute and provides short jury instructions after the two sides' arguments. The plaintiff points to various benefits that the promised feature-at-issue has and asks the jury to award $99 per smartphone. In response, the defendant downplays the significance of the missing feature-at-issue's benefits and points to all the other features found in the smartphone. As part of this argument, the defendant highlights three particular features found in the smartphone and also briefly mentions a host of other important features that contribute to the value of the smartphone. The defendant's bottom line is that $99 is far too much given the countless number of features in the smartphone, and the defendant suggests that $4.85/smartphone should be sufficient compensation.[60] Just as they would in a real trial, mock jurors were then asked to assess damages by determining the value of the missing feature. But unlike in a real trial, we also asked mock jurors to estimate the value of the other features that the defendant specifically identified as contributing to the value of the smartphone and everything else (i.e., all the un-

59. Each presentation used a different person's voice to help participants distinguish between the different roles of judge, plaintiffs' counsel, and defendant's counsel.

60. While pre-testing the experiment, the defendant suggested that $1.25 should be sufficient compensation. However, several mock jurors suggested that $1.25 was absurdly low.

mentioned features) that went into the smartphone. As explained below, these questions were asked in three different ways.

The task that our mock jurors were given is substantially similar to what real patent juries must do when they decide damages in a multicomponent case. First, in patent cases, the balance of the case focuses on the infringing feature. Here, the balance of the case focused on the missing feature. Second, the patent plaintiff typically demands a relatively large royalty as a percentage of the overall product. Here, the plaintiffs asked for $99 in damages. Since the smartphone sold for $489, the request was slightly less than 20% of the price of the smartphone. We selected that number because it seemed irrationally high, but still within the range of what a plaintiff might actually request.[61] Third, defendants in patent cases invariably attempt to diminish the value of the infringing feature by pointing to everything else found in the infringing product. The defendant in our case discussed three other particular features that contributed to the value of the smartphone and briefly mentioned several other categories of features as well.

A. *The Manipulations*

In order to test the cognitive biases and various potential counters described above, manipulations were made in three different dimensions. This allowed us to conduct a 3x3x2 between-subjects experiment with a total of 18 experimental conditions as illustrated in Table 1. We describe each of the manipulations in more detail below.

TABLE 1
EXPERIMENTAL CONDITIONS

	Camera	Storage	Security
Ind5/ No Debias	1	7	13
Tog5/ No Debias	2	8	14
Tog8/ No Debias	3	9	15
Ind5/ Debias Anchor	4	10	16
Tog5/ Debias Anchor	5	11	17
Tog8/ Debias Anchor	6	12	18

61. Since Lemley and Shapiro observed that damages average slightly less than 10% in multicomponent cases, a damages demand reflecting slightly less than 20% of the product's price seemed realistic. *See* Lemley & Shapiro, *supra* note 2, and accompanying text.

1. Testing Saliency & Anchors (x3)

Our first manipulation involved three Ultra smartphone features: (A) the camera quality (12-megapixel vs. 8-megapixel), (B) the amount of storage capacity (128 gigabyte vs. 96 gigabyte), and (C) the type of encryption technology (6-key vs. 4-key).

Early testing of our experiment revealed that some mock jurors thought that the defendant should fix the problem by adding features through a software upgrade. To eliminate this possibility, all the features that were involved in the final experiment were part of the smartphone's hardware. The defendant's presentation also informs the mock jurors that it could not simply substitute a smartphone with the missing feature because the defendant actually did not make such a phone.

In the first version, the misrepresentation related to the type of built-in camera.[62] The packaging and advertising said that the smartphone had a 12-megapixel camera when it really only had an 8-megapixel camera. The plaintiff explains why this feature is beneficial and demands $99/unit. The defendant responds, in part, by pointing to other features to suggest that the smartphone is far more than its camera. Among those features are the large 128 GB storage capacity and the sophisticated 6-key encryption. The defendant argues that $4.85/unit is entirely adequate to compensate the plaintiffs.

In the 2nd version of this manipulation, we rotate the storage capacity into the plaintiffs' case while rotating the camera feature out of the plaintiffs' case and into the defendant's case.[63] In the 3rd version, we rotate the 6-key encryption feature into the plaintiffs' case while the defendant discusses the other two features.[64]

Since we ask mock jurors to assess damages based on the missing feature and to value the other features as well, we can observe if the value of each feature changes based on the context. Our hypothesis is that mock jurors would assign more value when each feature is the focus of the plaintiffs' lawsuit. That would suggest that a combination of the saliency effect and anchoring is pushing damages upwards.

We selected these three features because they represented a range of different values. Presumably, most customers understand the value of more memory and believe it is useful. Thus, we expected that mock jurors would award slightly higher damages for this feature. However, it was unclear to us that people would think that a 12-megapixel camera was significantly more valuable than an 8-megapixel camera. While almost everyone uses the

62. Conditions 1-6.
63. Conditions 7-12.
64. Conditions 13-18.

camera in their smartphones, most people don't need an extremely high-quality image. Thus, we expected mock jurors to award slightly less damages for the less powerful camera. Finally, we thought that so long as the smartphone was password protected, most people would not care about the number of digits comprising the password. Accordingly, we expected damages for the difference between the 6-key password and 4-key password to be nominal.

Because only the plaintiff suggested that particular features were worth $99, this manipulation only allowed us to measure the combined effect of any saliency and anchoring biases. While we could have designed an experiment that attempted to isolate the saliency effect from anchoring, we chose a design that more closely approximated how damages are litigated in real cases.

2. Jury Verdicts (x3)

A second manipulation focused on a potential counter to the anchoring bias. This counter attempted to change the way mock jurors assessed damages. First, our control condition (Independent 5) reflected the way real jurors assess damages. The verdict simply asked the mock juror to assess damages on the feature-in-suit – either the camera, storage, or security feature. The specific instructions told mock jurors to measure damages by comparing the difference between what was promised and what was received.[65] After that task was complete, mock jurors were sent to another page (that did not permit backtracking). This page asked the mock juror to rank the value of the feature-in-suit, the two features that were the subject of defendant's presentation (two of camera, storage, and security that were not the feature-in-suit) as well as improved voice recognition software, and "[t]he combination of everything else in the Ultra Smartphone." They were then asked to assess how valuable the three features and "everything else" were in dollars.

In a second condition (Together 5), we asked the mock jurors to perform all the same tasks in our first condition except we asked them to rank

65. This instruction looks much like a patent jury instruction would if it focused on the next best non-infringing alternative, an idea many commentators have endorsed. *See, e.g.*, Lemley & Shapiro, *supra* note 2, at 2039 ("the danger that reasonable royalties will be set too high in component cases will be sharply reduced if the courts base their estimates of reasonable royalties on an assessment of the value of the patented component in comparison with the next best, noninfringing alternative way to create that component"); Douglas A. Melamed & William F. Lee, *Breaking the Vicious Cycle of Patent Damages*, 101 CORNELL L. REV. 385, 422 (2016) ("Properly understood, however, the alternatives put a ceiling on the amount a willing licensee would pay ex ante because it would not pay more than the patent is worth com-pared the alternative of not taking a license."); David O. Taylor, *Using Reasonable Royalties to Value Patented Technology*, 49 GA. L. REV. 79, 96 (2014) ("All approaches consider the value of the patented technology as compared with the next best alternative technology . . .").

the five items first and then value the five items together (including the feature-in-suit).[66] In scenarios with this condition, the final instruction in the jury verdict form said, "Please tell us what damages you award the plaintiffs as well as what value you attributed to other features of the Ultra smartphone that defendants identified." The feature-in-suit was listed followed by each of the other features identified.

Our third condition (Together 8) was substantially like our second condition.[67] However, three more features that the defendant briefly mentioned were added to the jury verdict form. They were: "the tempered shatter resistant glass", "the user-friendly backup system," and "allowing the smartphone to communicate over wireless networks" (i.e., Wi-Fi).

By asking the jury to assess the value of the other features at the same time they assessed damages for the feature-at-issue, the jury verdict manipulation allowed us to examine whether forcing context on the mock juror's decision making process results in a lower damages award than it otherwise would. Our hypothesis is that mock jurors will place a lower value on the feature-at-issue when valuing all of the features together as compared to valuing the feature-at-issue individually without consideration of the other features not at issue in the case. We also suspect that adding more features to the jury form will increase that effect.

3. The Defendant's Argument (x2)

To test whether defendants could debias the plaintiffs' anchor with an argument that specifically says the plaintiff is using an anchor, we created two experimental conditions. In the control condition, the defendant said nothing about anchoring. However, in the "Debias Anchor" condition, the defendant smartphone manufacturer argued that: "[t]he plaintiffs are only throwing out the $100 number to anchor your view in this ridiculously high number; it is a well-known psychological manipulation." If the results of previous studies are true, our hypothesis is that mock jurors will return a lower damages award in the trial variants that include the counter-anchor argument as compared to the trial variants that do not include the counter-anchor argument.

B. *The Mock Jurors*

In the summer of 2018, we performed an online 3x3x2 between-subjects experiment. Participants were recruited from Amazon Mechanical Turk, an online crowd-sourcing marketplace, and each participant was paid

66. Conditions 2, 5, 8, 11, 14, and 17.
67. Conditions 3, 6, 9, 12, 15, and 18.

$3.00 each.[68] Each participant was randomly assigned to one of 18 experimental conditions. In our initial experiment, we had an implementation issue with four of our experimental conditions.[69] Consequently, we dropped all the data from those four conditions and ran them again. We then combined the two data sets for our analysis. Although this approach means that the randomization was less than ideal, we have no reason to believe that the two populations were systematically different.

Depending on the condition, mock jurors watched a video that lasted between 10 minutes 36 seconds to 14 minutes and 3 seconds. Together 1,059 mock jurors (847 in the first run and 212 in the second run) passed two attention check questions and were allowed to submit a verdict. We then ran a series of quality checks. The quality checks were designed to eliminate mock jurors who did not take the task seriously. First, we disqualified mock jurors that valued too many features as $0 on the theory that they were rushing through the verdict form without really considering the value of all the features. For the Independent5 and Together5 jury verdict forms, we excluded mock jurors that valued three or more at $0. For the Together8 scenario, we excluded mock jurors that valued five or more items at $0. This filter disqualified sixty-eight mock jurors. We also disqualified another four mock jurors that valued the feature-in-suit at $0 on the theory that they were not taking the jury instructions seriously. Finally, we disqualified another fourteen mock jurors who valued any single feature at $489 or above for the same reason, since the entire smartphone itself was valued at $489 (and both plaintiff and defendant stipulated to this fact). This left 973 valid responses.

Of the valid responses, 497 participants identified as female, 474 identified as male, and 2 identified as neither. The sample was younger, more educated, less racially diverse, and more politically liberal than the population

68. Mechanical Turk ("MTurk") has become a large and robust platform for social science research, with proven reliability through the replication of many known results. *See* Adam J. Berinsky, Gregory A. Huber & Gabriel S. Lenz, *Evaluating Online Labor Markets for Experimental Research: Amazon.com's Mechanical Turk*, 20 POL. ANALYSIS 351, 362–63 (2012) (successfully replicating three experiments using MTurk); Gabriele Paolacci, Jesse Chandler & Panagiotis G. Ipeirotis, *Running Experiments on Amazon Mechanical Turk*, 5 JUDGMENT & DECISION MAKING 411, 415-17 (2010) (replicating three classical experiment on MTurk and finding that MTurk workers "exhibit the class heuristics, biases and pay attention to directions at least as much as subjects from traditional sources").

69. In two cases, we omitted the link to the video and mock jurors assigned to those conditions understandably failed attention checks. In two others conditions, we realized that the jury verdict form did not precisely match those in other conditions. Consequently, we discarded the data from those conditions, reran conditions 8, 9, 11 & 12, and combined the two datasets. While having our respondents divided in non-random fashion is obviously not ideal, we have no reason to believe that the two MTurk respondent pools were systematically different.

at large; gender and median income, however, were more representative of the U.S. Census data.[70]

IV. RESULTS

Although our results were consistent with what Lemley & Shapiro observed for real patent awards, the results of our experiment still surprised us.[71] Given that the average price of the Ultra smartphone was $489, we were struck by the large size of the awards in all the conditions. As shown in Table 2 below, damages for the higher resolution camera (12-megapixel vs. 8-megapixel) were $68.59 (n=308). Damages for the higher storage amount were $57.80 (n=299). As predicted, the lowest damages awards were for the increased security feature (6-digit encryption vs. 4-digit encryption), but they were still $43.49 (n=366).

Given the tens of thousands of features in a smartphone, we were quite surprised that at least some of these numbers weren't much lower. Perhaps the price of the security feature was the most surprising. We attempted to identify both features that consumers valued (*i.e.* more storage) and those that they did not value at all (*i.e.* 6-digit passcode vs 4-digit passcode to unlock a smartphone) with the higher resolution camera falling somewhere in the middle. As it turns out, mock jurors viewed the high-resolution camera as the most valuable of the three tested features.

A. *Features Are More Valuable in the Plaintiffs' Case*

Our first hypothesis is that a combination of saliency bias and anchoring increases damages awards. To test this theory, we compared the damages that mock jurors awarded when the feature was part of the plaintiffs' suit with the value when mock jurors assessed that feature when it was part of the defendant's suit.

For two of the three features (camera and security), the values decreased significantly when they were moved from the plaintiffs' case to the defendant's case. However, for our third feature, storage, we found no effect at all. These results are depicted in Table 2 below. The first column represents the average value of the feature when it was the feature-in-suit (i.e. part of the plaintiffs' case). The second column represents the average value of the same feature when the defendant discussed that feature in order to

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70. Specifically, the sample demographics are as follows: mean and median age 36.33 and 34 years, respectively; 81.4% White, 9.5% African American, 5.3% Asian, 1.4% American Indian, and the remainder classified as Other; 7.8% Hispanic; 51.5% with a bachelor's degree or higher; and 52.2% preferred Democrats, 28.8% preferred Republicans, and 19% had no political preference.

71. Lemley & Shapiro, *supra* note 2 at 2032 tbl.1 (observing an average royalty rate of 9.98% for a single component in a larger multicomponent product).

minimize the value of the feature-in-suit. Both the first and second columns also contain the number of participants (n) representing that category. The third and fourth columns contain calculations to determine statistical significance using t-tests.[72]

TABLE 2
AVERAGE DAMAGES, FEATURE-IN-SUIT VS. FEATURE NOT IN SUIT

	Plaintiff Average (n)	Defendant Average (n)	p-value (t-test)	Effect Size 95% Confidence Intervals
Camera	$65.89 (308)	$56.95 (665)	$p < 0.001$	-$3.49 -$14.40
Storage	$57.80 (299)	$60.84 (674)	$p = 0.34$	$9.28 -$3.19
Security	$43.49 (366)	$23.46 (607)	$p < 1.5e\text{-}15$	-$15.23 -$24.81

The average value of the higher quality camera decreased 13.57%. In absolute terms, that was an $8.94 reduction with a 95% confidence interval that the effect was between -$3.49 and -$14.40. As for percentage of overall value, the average value of the improved security feature had a much larger drop in value, 46.1% which represented a $20.03 decrease. The 95% confidence interval was -$15.23 to - $24.81. In both cases, the results yielded extremely low *p* values providing a high level of confidence in the findings. Thus, these two comparisons support our hypothesis. Some combination of the saliency bias and anchoring effect cause mock jurors to value the two features higher when it is part of the plaintiffs' lawsuit.

However, the results for the storage feature were not consistent with this hypothesis. When the storage feature was at issue, the average damages value was $57.80, whereas the average damages value for the storage feature when it was not at issue was $60.84. Indeed, the minimal difference suggests that the saliency bias and anchoring effect might not be operating in this context. However, we did see an effect when we examined how mock jurors ranked the value of the different features.

72. We did not perform a regression analysis comparing the feature in suit vs. value when it was not in suit. Such an analysis would require us to use each response three times, once for the feature in suit, and again for each of the other features. The value of the feature in suit and features NOT in suit are related because the total will presumably be close to the value of the entire product, $489. For the results of a standard regression analysis to be reliable, the different outcomes have to be independent. Thus, a regression analysis was not appropriate here.

After they determined damages, mock jurors were also asked to rank the value of the different features in the smartphone from highest to lowest. In two of the three jury verdict forms (Traditional and Together5), mock jurors ranked five features: the three features of interest (camera, storage, and security) as well as the "newest and most accurate voice recognition software" and "a combination of everything else that went in the [] smartphone." In the Together8 jury verdict, we added three more features for the mock jury to rank. They were: "tempered shatter resistant glass," "user friendly backup system," and "[a]llowing the smartphone to communicate over wireless networks (in other words Wi-Fi)." The results are shown in Table 3 below.[73] The first number shows the average rank for the feature in interest, the second number shows how many features participants were asked to rank in that experimental condition and the third number in parentheticals shows how many valid responses are found in that condition.

Comparing the ranking of the three primary features when they were part of the plaintiffs' lawsuit against their ranking when they were part of the defendant's suit gives us another way to test the combination of saliency and anchoring. In every case, the ranking of the feature was higher when it was part of the plaintiff's case than when it was part of the defendant's case. Moreover, we performed a Wilcoxon rank-sum test that showed that all the results were statistically significant ($p < .0001$).

TABLE 3
AVERAGE RANKING FOR EACH FEATURE

	Ranking in Plaintiffs' Case (n)	Ranking in Defendant's Case (n)
Camera Trad/Together5	1.74/5 (201)	2.78/5 (459)
Camera Together	2.22/8 (95)	3.35/8 (187)
Storage Trad/Together5	1.81/5 (208)	2.35/5 (461)
Storage Together8	2.42/8 (81)	2.87/8 (201)
Security Trad/Together5	2.73/5 (251)	3.88/5 (418)
Security Together8	3.50/8 (106)	5.09/8 (176)

($p < .0001$ for all comparisons between Ranking Plaintiffs' case and Ranking Defendant's case).

Notably, unlike our monetary value analysis, the ranking of the storage feature dropped significantly when it was moved from the plaintiffs' case to the defendant's case. These results certainly suggest that mock jurors think about features differently when they are part of the plaintiffs' case as op-

73. The total number of participants in Table 3 was 951, 23 less than in Table 2 which indicates that 22 mock jurors completed the valuation question and then dropped out before completing the ranking questions.

posed to being part of the defendant's case. Oddly, that different perspective does not always affect monetary valuations. We can theorize why the valuation of the storage feature did not change when it moved to the defendant's case. First, the amount of storage may be one of the few features that mock jurors have experience valuing. Smartphones often price different models with different amounts of storage. Although those pricing differences often represent more than storage, mock jurors may not understand that subtlety, or they may simply be using those prices as reference points. Indeed, it is possible that mock jurors did a quick online search to see how storage was priced. In contrast, mock jurors are probably less familiar with the number of megapixels in their smartphone camera, and even if they are, it is unclear how to tease out the price of that feature from different smartphone models. Finally, jurors are probably the least familiar with how much more valuable 6-digit encryption is as compared to 4-digit encryption. In fact, we simply made up this feature believing that mock jurors will attach very little value to it. Thus, it may be that the cognitive biases play a larger role in decision making when individuals have less personal information they can access.

Finally, we should note that our results probably underestimate the real size of the saliency/anchoring effect. That is because the plaintiffs' and defendant's valuation arguments were not precisely the same. Specifically, the defendant explained why the feature-in-suit was not valuable. However, there was no counterpart to this argument in the plaintiffs' case. The plaintiff never argued that the "other" features that the defendant discussed were not valuable. If we assume that the defendant's arguments placed some downward pressure on the mock juror's valuations of the feature-in-suit, the value of the features at issue were lower than they otherwise would have been. Of course, we could have omitted the defendant's argument. However, the omission of such an obvious argument has its dangers too. Mock jurors might have interpreted that omission to be a concession that the plaintiffs' arguments were correct. Consequently, we chose to keep the argument. This had the added benefit of making our presentation more realistic.

B. *Valuing Multiple Features Together Reduced Damages*

Our second hypothesis was that requiring mock jurors to assess multiple features simultaneously would reduce any saliency effect by focusing their attention on the value of other features and forcing to think coherently about the value of different features. In short, we found that our novel jury verdict form reduced damages modestly.

The results of varying the jury verdicts are found in Table 4. The second column shows the average damages awards relying on the traditional jury verdict form, which simply asks the jury to determine damages for the feature-in-suit. The damages for three features are $68.25 for the higher resolution camera, $61.79 for the additional storage, and $46.95 for the im-

proved security feature. The Together5 column provides the average damages for the same features when the jury verdict form asked mock jurors to rank five features and then value those five features together. Damages were uniformly smaller ($66.52 for the camera, $56.96 for storage, and $39.15 for security), but the differences were not large and in fact quite small for the camera, $1.73.

TABLE 4
AVERAGE DAMAGES BY JURY VERDICT FORM

	Independent Avg. Damages (Traditional) (n)	Together5 Avg. Damages (n)	Together8 Avg. Damages (n)
Camera	$68.25 (108)	$66.52 (106)	$62.65 (97)
Storage	$61.79 (119)	$56.96 (95)	$53.15 (85)
Security	$46.95 (131)	$39.15 (126)	$44.34 (109)

Two results stand out. The traditional verdict form yields the highest result for every feature. But there does not appear to be much difference between the Together5 and Together8 verdicts. We performed a regression analysis to see if these differences were significant. In our basic model, the average damages were $69.34 when the traditional verdict was used.[74] The Together5 verdict form decreased damages by $5.04, but the results were not quite statistically significant (p=.09).[75] The Together8 verdict had a slightly larger effect lowering damages by $5.44, but again this effect was not quite statistically significant (p=.08). In an attempt to obtain more statistical power, we combined the results of Together 5 and Together 8. This model predicted that when mock jurors had to value other features together with the feature-in-suit, the together verdict forms lowered damages by $5.44. Presumably because of larger combined sample size, these results were statistically significant (p=.049).[76]

In short, we found that changing the jury verdict form to require the jurors to value many features together lowered damages modestly. A superficial look at the descriptive statistics also might suggest that the more fea-

74. *See* Table 2 in Appendix A.

75. *See* Table 3 in Appendix A. The 95% confidence interval was between -15.9% and +1.4%.

76. *Id.* The 95% confidence interval suggested that the together verdict forms reduced damages between -15.1% to -0.03%.

tures jurors value, the lower the damages. While that may very well be true, our results say nothing about this hypothesis. Our sample size was too small to determine if differences of these sizes were significant.

C. *Exposing the Anchor Had No Effect*

Our third hypothesis is that mock jurors would be less susceptive to an anchor if they were expressly told about that bias. Consequently, in half of our scenarios, the defendant accused the plaintiffs of asking for an irrationally high damages number to "anchor" mock jurors around that number.

We found no statistical differences when the defendant explicitly called out the plaintiffs for anchoring. As Table 5 illustrates, when the defendant employed the debiasing technique, average damages decreased between $0.22 and $5.23 depending on the feature at issue. Using t-tests we calculated 95% confidence intervals. All the intervals crossed zero indicating that none of these decreases were statistically significant. Our regression analysis examined conditions for each feature in suit, but it also failed to find a significant effect.[77]

TABLE 5
DEBIASING THE ANCHORING EFFECT

	Control Average (n)	Debias Anchor Average (n)	p-value	95% Confidence Intervals
Camera	$66.00 (159)	$65.78 (149)	0.96	$-7.71 to $8.14
Storage	$57.88 (152)	$57.72 (148)	0.97	$-9.60 to $9.92
Security	$46.03 (188)	$40.80 (178)	0.22	$-3.18 to $13.66

In short, we did not find that exposing the plaintiffs' anchor in combination with providing a lower counter anchor reduced damages as compared to simply providing a lower counter anchor.

D. *Demographics*

Before the experiment began, we asked a variety of basic demographic questions. The only area where we found significant demographic effects was in political ideology. Mock jurors were asked to identify their political preference on a seven-point Likert scale: Strong Democrats, Democrats,

77. *See* Table 1 in Appendix A.

Slight Democrats, No Preference, Slight Republicans, Republicans, and Strong Republicans. Our regression analysis showed that jurors who favored Democrats awarded higher damages than jurors who favored Republicans. For example, the difference between those jurors that strongly favored Democrats and the different categories of Republicans ranged from $12.85 to 16.07.[78] Other empirical studies regarding civil litigation damages awards show similar effects of Republican mock-jurors awarding lower damages than Democrat mock-jurors.[79]

E. *Mock Jury Comments*

We asked mock jurors to provide written comments about the basis for their decisions and their views on the case. These comments revealed some interesting insights on how mock jurors made their decisions. In particular, their comments revealed a disconnect between the jury instructions and the decisions that at least some mock jurors made.

Both the judge and the jury verdict forms instructed mock jurors to assess damages by determining the difference in value between "what the plaintiffs were promised" and "what they actually received."[80] This instruction was designed to mimic the question that patent cases ask.[81] We were curious whether mock jurors would follow these instructions as they made their damages determinations. Other studies have shown that jurors sometimes do not follow instructions and simply rely on their own intuitions about what is just.[82]

To get a sense of what motivated the decision of our mock jurors, we asked them to answer three questions after they filled out the jury verdict

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78. *See* Table 4 in Appendix A.

79. *See, e.g.*, Hastie, *supra* note 39, at 455 ("One other individual difference, political preference, appeared to be related to awards when considered by itself; Republicans set lower awards than mock-jurors with more liberal political orientations ($r = +.21$, $p < .05$), although this variable did not enter significantly into the summary linear model.").

80. For example, the jury verdict form for the camera scenario with the traditional verdict form that only asked for the jury to calculate damages said "To determine the plaintiffs' damages, you must determine the difference in value in what the plaintiffs were promised, an Ultra smartphone with a 12-Megapixel camera, and what they actually received, an Ultra smartphone with a 8-Megapixel camera. What damages do you award the plaintiffs for each smartphone they purchased?" The judge gave a similar instruction verbally during his presentation.

81. The Supreme Court has defined patent damages in terms of its compensatory function – that is, "the difference between [the patent owner's] pecuniary condition after the infringement, and what his condition would have been if the infringement had not occurred." Aro Mfg. Co. v. Convertible Top Replacement Co., 377 U.S. 476, 507 (1964).

82. *See, e.g.*, W. Kip Viscusi, *Deterrence Instructions: What Jurors Won't Do*, *in* PUNITIVE DAMAGES: HOW JURIES DECIDE 142, 164 (Cass Sunstein et al. eds., 2002) (finding that mock jurors "appear quite willing to abandon the jury instructions when they have other rationales for setting punitive damages that they find to be either more convenient or more compelling.").

form. The first question asked mock jurors to, "[e]xplain why you gave the plaintiff the amount you did." The second and third questions asked them to "[e]xplain what you thought" of the plaintiffs' and defendant's arguments. The following responses suggest that many jurors appeared to try to faithfully follow the instructions.

Juror 73 Memory is one of the most expensive upgrades in new phones, market rate is about $100 to go from 64 to 128 GB. So going from 96 to 128 should be about $50.

Juror 704 The difference in price, according to the plaintiff, between a 4-character passcode Ultra smartphone and a 6-character passcode Ultra smartphone is $99. That means plaintiffs should receive the difference in the price between what they paid for what they were getting and what they actually got.

Juror 796 I chose that amount because I felt that was the amount the extra storage was worth. I also chose that amount because I felt customers would have paid less if they knew about the true storage.

However, other mock jurors appeared to ignore the jury instructions and assessed damages based on other factors. Many of these mock jurors focused on the defendant's blameworthy conduct. These mock jurors wanted to either punish the defendant or deter the defendant or others from engaging in this kind of conduct again. The following comments are representative of this view.

Juror 215 Customers chose to buy this phone because it had that security feature which didn't exist. The company misrepresented the phone.

Juror 237 I believe that the damages sustained by the plaintiff are negligible, and that even $5 was perhaps being a bit too generous. There should, however, be some compensation for a falsely advertised feature than [sic] cannot be changed.

Juror 641 Yes, the smartphone has other important features but they intended to mislabel the boxes to mislead their customers, they are untrustworthy and should be punished.

We observed these kinds of punitive responses in pre-testing and modified our basic case to minimize the manufacturer's fault by placing all the blame on a negligent third-party contractor that was now bankrupt. Apparently, this revision was not entirely effective. Some jurors still found sufficient fault with the defendant and apparently calculated damages based on

blameworthiness. These comments are consistent with the Hans-Reyna gist-based model of decision-making.[83] That model suggests that jurors engage in gist-based reasoning (*i.e.* damages should be low, medium or high) to determine damage awards. Once they determine damages are warranted, they will make an ordinal gist judgment about the amount of damages that are appropriate (*e.g.* low or high).[84] As part of that process, jurors will consider the defendant's culpability (*e.g.* degree of negligence).[85]

This is an example of fusion, a process where jurors allow evidence of liability to influence damage decisions or evidence of damages to influence liability decisions.[86] For our purposes, the most relevant studies have found that mock jurors tend to award higher damages when the underlying conduct is more blameworthy.[87] In our case, this appears to be true even when the level of culpability was small.

But the high average damage awards are clearly not entirely attributable to the defendant's bad conduct. If we look back at the first set of comments above, we observe that some mock jurors appeared to faithfully follow the jury instructions and still arrived at substantial damages numbers. Still other jurors appeared to simply split the difference between what the plaintiffs demanded and what the defendant suggested was fair. Below are two representative comments.

Jury 692	i [sic] felt that $99 was too high so I just split the amount. I feel the customer's [sic] could have returned the phone.
Juror 832	. . . . What the defendant suggests is an appropriate reparation (appx $4 and some change) does not seem adequate given the significant different [sic] in storage that was promised; yeah, they didn't intend on falsely advertising their product, but they are ultimately responsible for their product—including managing all parties involved with the marketing of their product. The

83. *See* Valerie P. Hans & Valerie F. Reyna, *To Dollars from Sense: Qualitative to Quantitative Translation in Jury Damage Awards*, 8 J. EMPIRICAL LEGAL STUD. 120, 146 (2011).

84. *Id.* at 129-30.

85. Valerie F. Reyna et al., *The Gist of Juries: Testing a Model of Damage Award Decision Making*, 21 PSYCHOL. PUB. POL'Y & L. 280, 291 (2015) (describing an experiment where jury perceptions of negligence predicted damages awards).

86. *See* Roselle L. Wissler et al., *The Impact of Jury Instructions on the Fusion of Liability and Compensatory Damages*, 25 L. & HUM. BEHAV. 125, 125–39 (2001) (fusion refers both to the concept that liability facts influence jury decision on damages and that damage facts influence their decision on liability).

87. *See, e.g.*, John M. Darley & Charles W. Huff, *Heightened Damage Assessment as a Result of the Intentionality of the Damaging-Causing Act*, BRIT. J. OF PSYCHOL. 29, 181-88 (1990) (showing higher damages when defendant's actions were more intentional); Chapman & Bornstein, *supra* note 40, (clearer evidence of the danger of birth control pills caused jurors to give higher damages); Dale W. Broeder, *The University of Chicago Jury Project*, 38 NEB. L. REV. 744, 760 (1959) (clearer evidence of liability led to higher compensatory damages).

> plaintiffs' demand for $99 also felt excessive because, again, in the actual sense—they got what they paid for. But I also understand they may have chosen a different product if they realized the product was not what it seemed, so I empathize with them on that point. Given that there is some merit to both arguments, I decided to split down the middle (roughly) at $40.

Others have also found that some jurors tend to "split the baby" and make decisions that reflects compromises.[88] This shows one way anchoring can work to increase damages. When a plaintiff asks for an irrationally high number, that will push the mid-point higher. This tactic does work as well for defendants. While a defendant could respond by suggesting an irrationally low damages award, it faces a lower bound, zero. In cases where damages might reasonably be close to zero, the defendant cannot suggest a far lower number.

Still other mock juries considered categories of damages that were not found in the instruction. Specifically, they wanted to compensate the plaintiffs for the inconvenience associated with receiving a phone without all the promised features.

> Juror 24I . . ., although I realize that the camera probably does not cost $99 on it's [sic] own, it is very expensive to get a smartphone, and you should get what is advertised when you purchase one. If you do not receive what was advertised you have to go through the hassle of returning the phone, and then finding a new phone and purchasing that phone, or simply living with the phone you bought that doesn't actually have the features that you wanted.

> Juror 808 I gave them the amount I did ($40) because I figured that was roughly the amount that was fair for the inconvenience of receiving less storage than they originally believed, but wasn't the most important reason for purchasing this phone.

In short, while our experiment has shown that a combination of the saliency and anchoring effects likely increase damages assessments for individual components, our qualitative data suggests there are likely other factors that contribute to high valuations. Jurors may be awarding damages for cat-

88. *See, e.g.*, Mark Kelman, Yuval Rottenstreich & Amos Tversky, *Context-Dependence in Legal Decision Making*, 25 J. OF LEGAL STUD. 287, 301 (1996) (describing two experiments that show that subjects were more like to choose a verdict when it was a compromise between more extreme choices); Sunstein, Kahneman & Schkade, *supra* note 47, at 2132 ("In the context of pain-and-suffering awards, anchors appear to be especially important . . . Some jurors appear to split the difference between the figures suggested by the plaintiff and the defendant . . . .").

egories that are not permitted under the law. These include punitive damages and incidental damages (*i.e.* for the hassle of getting the wrong phone).

V. LIMITATIONS

First, we tested the combined effect of saliency and anchoring together. In other words, we never isolated either bias individually. We did this consciously in an attempt to make this experiment as realistic as we could. In theory, it would have been possible to isolate the saliency effect by eliminating the patentee's anchor is some experimental conditions. However, that never happens in real cases. The patentee always asks the jury for a specific damages number. Likewise, it would also be possible for the defendant to tell the jury what value the other features (not in suit) were worth. But it would have been unrealistic for the defendant to say that features not in suit were worth $99. A real defendant would undoubtedly have used a much smaller number for each of the other features that contributed value to the smartphone. Comparing the value of a particular feature as it moved between plaintiffs' case and defendant's case under these circumstances would have been unhelpful. Perhaps, in future experiments, subjects could determine the value of features outside the context of a trial in a way that would allow us to test each bias separately. We leave that possibility for the future. But for now, we can only say that saliency and anchoring together increase mock jury valuations.

Second, we asked mock jurors to evaluate the value of different features in the context of a product misrepresentation case instead of a patent case. While there were legitimate logistical reasons for doing so, there are undoubtedly significant differences between these kinds of lawsuits. Indeed, the qualitative comments from our experiment showed that many mock jurors did not just focus on the value of the features at interest. Instead, their damages calculation considered the defendant's culpability, which was unique to the misrepresentation context. We suspect that similar lines of thinking might influence patent juries. While patent juries may be instructed to focus on the value of the infringing feature, they may assess damages by considering why the defendant failed to avoid infringement. More work needs to be done to verify this hypothesis.

Third, we did not discuss the three extra features (tempered glass, back-up system, and Wi-Fi/Bluetooth communications) that were part of the Together8 verdict form. Thus, a reason why we may not have seen a significant effect between the Together5 and Together8 verdict forms is because of a lack of saliency of the three extra features in the mock trial. If the defendant had discussed these three extra features in detail (like the defendant did with the other 4 features – camera, storage, security, and voice recognition), then we may have seen a greater allocation of value to those three features, thereby further decreasing the damages award for the feature-at-issue.

Fourth, our experiment condensed a trial to roughly ten to fourteen minutes of narrated PowerPoint slides. The respondents were not able to see the attorneys, experts, or judge and witness their body language during the presentation at the trial, which can affect the verdict in many cases. This abbreviated format allowed us to utilize a randomized controlled trial experimental design, which is the gold standard for scientific research.[89] However, there are still reasonable concerns about whether shortening the trial will change the way individuals make decisions.

Fifth, we did not study real jurors. Prior research has shown that "the population of Mechanical Turk is at least as representative of the U.S. population as traditional subject pools."[90] Known experimental results have been replicated using the MTurk population.[91] Nonetheless, MTurkers may be more easily distracted from the trial compared to real jurors and may even provide junk responses (e.g., those who failed to watch the entire video without hearing all the arguments and rendered a verdict). It may be that real jurors are more earnest in their efforts to provide meaningful responses or that real jurors determine liability differently knowing that the outcomes will affect real individuals and companies.

Lastly, our study involved single mock jurors. Consequently, our mock jurors did not deliberate with other jurors as they would do in a real trial. Nonetheless, others have shown that individual juror decisions are quite predictive of jury decisions. Dennis Devine summarized the literature by saying, "[r]esearch has consistently shown a strong and robust relationship between the verdict preferred by the majority of jurors at the start of deliberation and the jury's ultimate verdict."[92] With respect to damages, the work that has been done suggests that individual juror decisions underestimate what juries will decide after deliberation.[93] If this held true for valuing indi-

89. As we mentioned earlier, our experiment was not randomized perfectly because of a failure in four conditions of our first attempt. *See supra* note 71.

90. Paolacci, Chandler & Ipeirotis, *supra* note 70, at 411.

91. Berinsky, Huber & Lenz, *supra* note 70, at 61–65 (2012).

92. Dennis J. Devine, JURY DECISION MAKING: THE STATE OF THE SCIENCE, 158 (2012); *see also* Maggie Wittlin*, The Results of Deliberation*, 15 U.N.H. L. REV. 161, 185 (2017) (summarizing studies that show that individual juror decisions are predictive of jury decisions).

93. *See id*. at 176 ("deliberating tends to increase jury awards in relation to the mean of the jurors' predeliberation amount preferences"); *see also* Shari S. Diamond, Michael J. Saks & Stephan Landsman, *Juror Judgments About Liability and Damages: Sources of Variability and Ways to Increase Consistency*, 48 DEPAUL L. REV. 301, 316 (1998) ("jury awards in this case were higher than the average mean and median juror awards, a pattern found in several other studies of damage awards"); Shari S. Diamond & Jonathan D. Casper, *Blindfolding the Jury to Verdict Consequences: Damages, Experts, and the Civil Jury*, 26 LAW & SOC'Y REV. 513, 553 (1992) ("A clear inflation of damage awards occurred between the individual and the group level. On average the juries produced awards about $56,000 (or 26%) higher than the average of their members prior to deliberation.").

vidual features in complex products, that would suggest that juries would award even higher damages for individual features.

VI. IMPLICATIONS

A. *Valuing a Multicomponent Feature*

Our results showed that mock jurors value some features more when the plaintiffs argued that the feature is valuable than when the defendant made the same argument. Because the arguments did not change from plaintiff to defendant, the difference in valuations cannot be attributed to the merits of any particular argument. Instead, we suggest that a combination of saliency and anchoring is distorting mock jurors' decisions. While we uniformly found this affect when we examined how mock jurors ranked the relative value of the different features, we did not observe changes in monetary valuation in the experimental conditions concerning the storage feature. But it is very unlikely that the two positive results were mere flukes. The statistical analysis showed that there was less than a 1 in 1000 likelihood that the finding with respect to the camera feature was due to chance. Moreover, the finding with respect to the security feature was even stronger.

That still leaves an open question. Why did we fail to observe an increase in the valuation of the storage feature when it was the feature-at-issue as compared to when it was not the feature-at-issue? Given that the storage feature's ranking decreased, this result is particularly puzzling. We hypothesize that mock jurors may have much more experience with the price of smartphone storage and are thus less subject to cognitive bias when placing a dollar value on that feature. Further research would have to be done to prove or disprove this theory.

These results suggest that the same cognitive biases may be at play in multicomponent patent cases. In short, jurors are likely awarding disproportionately high awards in multicomponent patent cases because of cognitive biases. To ameliorate those effects, courts should focus on particular kinds of rules directed at these biases. Our jury verdict manipulations attempted to test one potential reform, but there are clearly other possibilities.[94]

B. *Jury Verdicts and Framing*

Although our results showed that asking jurors to value many features together decreases the value they assess for the feature-in-suit, we were sur-

94. For example, one defendant unsuccessfully argued that juries should be explicitly told about problems with patent hold-up and royalty stacking. *See* Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1229 (Fed. Cir. 2014) ("D–Link requested that the district court instruct the jury regarding the dangers of patent hold-up and royalty stacking in RAND-related contexts.").

prised to see how modest that decrease was: less than 10% of the baseline damages award. Still, for cases that involve many millions of dollars, 10% is still a large amount. The upshot is that for those that think that patent damages in multicomponent cases are too high, giving the jury this novel jury verdict form that lists the feature-at-issue alongside other features of the multicomponent device is likely to lower damages. Moreover, there are reasons to think that a standard verdict form wrongly focuses all the jury's attention on one feature. This creates a saliency bias and leaves the juror without meaningful reference points to help frame their analysis. In contrast, if a jury were required to value different features simultaneously, two benefits would likely emerge. It would reduce (but not eliminate) any saliency bias, and it would also force the jury to create its own reference points (i.e. the value of other features) to aid it in calculating the final damage awards.

But even if courts were sympathetic to these arguments, there remain a number of practical questions. How should attorneys and the courts determine what other features can be fairly added to the jury verdict form? How many other features can the jury really value?[95]

C. *Exposing the Anchor*

When defendants specifically told mock jurors that plaintiffs were not serious about their high demand ($99 in our experiment) and that the plaintiffs were simply trying to take advantage of anchoring, damages verdicts were not significantly reduced. Thus, our findings were not consistent with Stein & Drouin's.[96] More work will have to be done to see if Stein and Drouin's tactic can be replicated. It may well be that exposing the anchor to the decision maker works in some contexts but not others. For now, we still have not identified a particularly effective response to a plaintiff that anchors the jury in an irrationally high number.[97]

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95. Expert witnesses are now using a survey technique called conjoint analysis to value a specific feature. This involves asking survey respondents to value products with different combinations of features and then calculate what the individual features are worth. See J. Gregory Sidak & Jeremy O. Skog, *Using Conjoint Analysis To Apportion Patent Damages*, 25 FED. CIR. B.J. 581 (2016), for a description of the use of conjoint analysis in calculating patent damages. However, researchers have pointed out that using this technique on products with large numbers of features may have "strained the methodology" by overloading respondents with too much information. *See* Green & Srinivasan, *supra* note 50, at 8. Similarly, jurors may suffer from cognitive overload when they have to value one feature in a complex multicomponent product. This may place some limit on the number of features that the law can meaningfully ask juries to value.

96. Of course they tested this particular debiasing strategy in a different context, criminal sentencing. *See* Stein & Drouin, s*upra* note 55, at 31.

97. *See supra* notes 56 and 58 and accompanying text (describing the results of a prior study assessing how different responses to anchoring works).

D. *Punitive Damages*

As many of the comments suggest, some mock jurors did not assess damages by simply comparing the value of the product as delivered to the value of the product as promised. Instead, these mock jurors imposed damages to either punish the defendant for its previous conduct or deter the defendant (or others) from doing something similar in the future. This was true despite clear jury instructions and even though the defendant's conduct did not exhibit the kind of willful disregard of the rights of others that is typically required to award punitive damages.[98]

There is a patent analog to this narrative because the same psychological effects at play in the experimental product misrepresentation case we created are also likely at play in patent cases. In patent cases, juries may not be strictly following the *Georgia Pacific*[99] factors for calculating a reasonable royalty or the *Panduit*[100] factors for calculating lost profits.[101] Instead it is quite possible that they are also punishing defendants for infringing a patent. This may be true even when enhanced damages are not uncalled for. In patent law, 35 U.S.C. § 284 permits courts to award treble damages for "egregious cases of culpable behavior" like intentionally infringing a patent.[102] The Supreme Court has called this a "punitive sanction," presumably to deter others from doing the same.[103] Notably, the jury determines whether the case qualifies for enhanced damages, but the court must determine whether to actually enhance the damages.[104] In other words, patent juries do not determine the size of any punitive damages.

To be clear, we are not suggesting that this experiment proves that juries in patent cases are awarding punitive damages. It does not. This experiment only shows that some number of mock jurors appear to punish the defendant in this misrepresentation case. However, it does not take a large leap in logic to hypothesize that something similar might be occurring when juries calculate patent damages. Indeed, as discussed earlier, our results are

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98. *See, e.g.*, Simon v. San Paolo U.S. Holding Co., 113 P.3d 63, 76 (Cal. 2005) ("At a minimum, California law requires conduct done with 'willful and conscious disregard of the rights or safety of others' or despicable conduct done 'in conscious disregard' of a person's rights."); State Farm Mut. Auto. Ins. Co. v. Campbell, 538 U.S. 408, 419 (2003) (quoting BMW of N. Am., Inc. v. Gore, 517 U.S. 559, 575 (1996) (suggesting punitive damages are appropriate when defendant's conduct is sufficiently "reprehensible")).

99. *See* Ga.-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *modified sub nom.* Ga.-Pac. Corp. v. U.S. Plywood-Champion Papers, Inc., 446 F.2d 295 (2d Cir. 1971).

100. Panduit Corp. v. Stahlin Bros. Fibre Works, 575 F.2d 1152, 1156 (6th Cir. 1978). The *Panduit* factors are typically used in jury instructions on lost profits. *See, e.g.*, Federal Circuit Bar Association Model Jury Instruction 6.2 (2016).

101. *See supra* note 9 and accompanying text.

102. Halo Elecs., Inc. v. Pulse Elecs., Inc., 136 S. Ct. 1923, 1932 (2016).

103. *Id.* at 1936.

104. 35 U.S.C. § 284 (2012).

entirely consistent with other studies that found that juries tend to award higher damages when the underlying wrongful conduct is more blameworthy.[105] Further work will need to be done to establish if, when, and to what extent, the same phenomenon is occurring for patent damages. What percentage of jurors punish and how much is that punishment? If the frequency is small or the degree of punishment is not large, this may simply be noise that is characteristic to any legal system.

However, if this is significant, several issues arise. It would suggest that juries may be usurping the judge's role under § 284. This would mean that patent damages ordinarily couched in terms of compensation are being inflated for the purpose of deterring future infringers.[106] If the type of infringement does not reflect egregious cases of culpable behavior, that would suggest overcompensation. However, even if it does, that may mean patentees are receiving a double recovery, one award of punitive damages from the jury and another from the judges. Courts could respond by seeking ways to reduce the punitive portion of these awards with better jury instructions or by bifurcating the case so that juries are blinded to the defendant's blameworthy conduct.[107]

But there is another side to this argument. It could be that legal standards that require higher levels of blameworthy conduct before calling for punitive damages are overly protective of defendants.[108] They are not consistent with the public's perception of when punishment is deserved. Perhaps juries should not follow the letter of law in these cases. Our point is not to answer these larger jury nullification questions, but to simply provide empirical evidence of how juries will react when they are told to award compensatory damages.

CONCLUSION

Our study suggests that some combination of saliency bias and anchoring cause juries to award higher damages for two tested features (camera resolution and enhanced security), but not a third (amount of storage). For the third feature, these heuristics affected how jurors ranked the value of the feature, but this effect did not appear to lead to an equivalent change in the

105. *See supra* note 86 and accompanying text.

106. Amy L. Landers, *Let the Games Begin: Incentives to Innovation in the New Economy of Intellectual Property Law*, 46 SANTA CLARA L. REV. 307, 335-40 (2006) (providing a detailed discussion of how different types of damages in patent law either serve to compensate patentees or punish or deter infringers).

107. *See* BLINDING AS A SOLUTION TO BIAS: STRENGTHENING BIOMEDICAL SCIENCE, FORENSIC SCIENCE, AND LAW (Christopher Robertson & Aaron S. Kesselheim eds., 2016) (providing many examples of how blinding decision makers to bias can improve decisions in various contexts).

108. *See* NEIL VIDMAR & VALERIE P. HANS, AMERICAN JURIES: THE VERDICT ch. 11 (2007) (exploring the topic of jury nullification in depth).

monetary valuation. Modifying the jury verdict form to require mock jurors to assess the value of many features simultaneously reduced damages modestly while the defendant's tactic of exposing the anchor did not. In addition, qualitative comments suggested that some mock jurors resisted the jury instructions designed to compensate plaintiffs for the missing feature and instead assessed damages to punish the defendant.

These results are nuanced and cause us to ask as many questions as we answer. Why is saliency and anchoring so powerful with two features, but less effective in another? What other factors are interacting with our findings to enhance or reduce them in particular contexts? Can our findings be replicated with a patent case, particularly with respect to the mock jurors' desire to use damages to punish? We cannot answer these questions now, but hope that this article causes both policymakers and commentators to start thinking more seriously about how the psychology of jury decision-making might affect patent damages. It is clearly not enough to lay down a set of well thought out rules if juries will not follow them, albeit unintentionally. To the extent that patent damages in multicomponent cases are irrationally large, much work remains to be done to determine why some juries disagree, much less nudge their decisions downward. Our study shows that revising the jury verdict form only provides limited benefits in this direction.

Appendix A

Table A1 illustrates the "All Model" where the base case is set at "Camera" when the camera is the feature-at-issue. For example, the average storage damages value was $7.10 less than the average awarded camera damages value.

Table A1 – All Model

Variable	Basic Model	Basic + Verdict	Basic + Debias	Basic + Political ("Strong Dems")	All Model
Feature-At-Issue (Intercept set at Camera Value)	65.89***	69.34***	66.90***	73.02***	63.70***
Storage Feature	-$7.10*				
Security Feature	-$22.50***				
Verdict (rank 5)		-5.04			-4.78
Verdict (rank 8)		-5.44			-4.72
Debias (ON)			-2.09		-1.56
Gender (male)					+0.06
Age					+0.16
Education (leveled at "some high school education")					-0.79
Income (leveled at "less than $10,000")					+4.21
Politics (Slight Republican)				-16.06***	-10.73*
Politics (Repubs)				-15.47***	-9.96*
Politics (Strong Repubs)				-12.85*	-5.79

Basic + Framing (isolate Framing effect)

Table A2 shows how different jury verdicts affected damages. The base case is the standard jury verdict form, where each respondent valued the feature-at-issue separately, rather than simultaneously with either 5 or 8 other features. Table A2 also contains 95% confidence intervals.

TABLE A2 – BASIC + FRAMING

	Average Damages Award	Std. Error	t value	p-value	Confidence Intervals
Normal (Intercept)	$69.34	2.87	24.20	1.50e-101	$63.72 to $74.96
Together5	-$5.04 from intercept	3.05	-1.65	0.09	-$11.03 to $0.96
Together8	-$5.44 from intercept	3.15	-1.73	0.08	-$11.63 to $0.74
Together5+8	-$5.23	2.65	-1.97	0.049*	-$10.44 to -$0.02

Basic + Debiasing (isolate Debiasing effect)

Table A3 shows the effect on damage values when the defendant accused the plaintiffs of anchoring. The base case is the "no counter" argument, where the plaintiff does not expose the defendant's psychological "anchoring" techniques during the trial. Table A3 also contains 95% confidence intervals.

TABLE A3 – BASIC + EXPOSING THE ANCHOR

	Average Damages Award	Std. Error	t value	P-value	Confidence Intervals
No Counter (Intercept)	$66.90	2.59	25.87	1.38e-112	$61.82 to $71.98
Counter ON	-$2.09 from intercept	2.56	- 0.82	0.41	-$7.10 to $2.93

Political Regression

Table A4 illustrates how damages values are affected based on political leanings. The base case is set to the average damages value for respondents who strongly preferred Democrats and where the feature at issue was the security feature.

TABLE A4 – POLITICS

	Average Damages Award	Std. Error	t value	p-value
(Intercept)	$50.75	3.03	16.77	< .001 ***

FAIcam	$22.27	3.07	7.27	< .001 ***
FAIsto	$15.31	3.11	4.93	< .001 ***
Dems	-$8.86	4.11	2.15	.031*
Slight Dems	-$4.47	4.46	-1.00	.32
No Preference	-$6.78	3.98	-1.74	.083
Slight Repubs	-$16.07	4.80	-3.35	< .001 ***
Repubs	-$15.47	4.62	-3.35	< .001 ***
Strong Repubs	-$12.85	5.28	-2.43	.015*