

# PREVENTING A (REPLICATION) CRISIS IN THE COURTROOM

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#### INTRODUCTION

In *Brown v. Entertainment Merchants Association*, Justice Stephen Breyer wrote a dissent in which he cited numerous psychological and social scientific studies, some finding that playing violent video games increased people's aggression.<sup>1</sup> Researchers later conducted these studies again, in an attempt to find the previously found result that playing the games increased aggression, but many did not find this effect.<sup>2</sup> Because researchers could not find the same effect through repeating the experiment, the finding was called into question due to a failure to repeat or replicate.

Examples such as this one raise important issues. If Justice Breyer's dissent had won the day, free speech would have been infringed because a court had relied on science that was later found to lack reliability.<sup>3</sup> It is not yet fully clear how frequently science that has failed to replicate has entered the courtroom and affected decisions made by judges and juries. However, scientists may continue to find studies that fail to replicate in the future. As replicability issues in science continue to be revealed, the court system will require mechanisms to incorporate awareness of this problem into the presentation of science in the courtroom. In this Note, I will propose that the preventative step of requiring disclosure about replicability issues (or the lack thereof) from experts could help keep science that is not replicating, or that is otherwise unreliable, out of expert testimony.

The replication crisis is a phrase used to describe a reckoning taking place in the sciences.<sup>4</sup> Scientists, many psychologists among them, are documenting and discussing patterns that show published experimental findings fail to pro-

<sup>1</sup> *Brown v. Ent. Merchs. Ass'n*, 564 U.S. 786, 852–55 (2011) (Breyer, J., dissenting).

<sup>2</sup> Christopher J. Ferguson, *Aggressive Video Games Research Emerges from Its Replication Crisis (Sort of)*, 36 CURRENT OP. PSYCH. 1 (2020); see also Allison Orr Larsen, *Factual Precedents*, 162 U. PA. L. REV. 59, 70 (2013) (describing Justice Breyer's statement as relying on a study "subsequently critiqued by neuroscientists").

<sup>3</sup> *Brown*, 564 U.S. at 791–92.

<sup>4</sup> Brian Resnick, *More Social Science Studies Just Failed to Replicate. Here's Why This is Good*, VOX (Aug. 27, 2018, 11:00 AM), <https://www.vox.com/science-and-health/2018/8/27/17761466/psychology-replication-crisis-nature-social-science> [https://perma.cc/D373-ZG55].

duce the same result when an experiment is conducted again.<sup>5</sup> The replication crisis could affect legal outcomes because experts often use research findings in their courtroom testimony.<sup>6</sup>

When faced with unreliable psychological science evidence in court, lawyers rarely challenge the evidence, and judges rarely exclude it.<sup>7</sup> Thus far, many scholars writing on the intersection of the replicability crisis in psychology and expert testimony have proposed reforms to improve how judges<sup>8</sup> and lawyers<sup>9</sup> assess the reliability of science.

However, I will argue that experts are particularly well-positioned to interpret and communicate the scientific reliability issues that form the backdrop of research findings. Rather than putting the onus on judges and lawyers, I will propose that experts should be required to interpret and contextualize the replicability of scientific findings through required disclosures in discovery. Specifically, I will propose Federal Rule of Civil Procedure (“FRCP”) 26(a)(2)(B)<sup>10</sup> should be amended to require that experts make a disclosure that I term a “replicability synopsis.” This amendment would require experts testifying in court to comment on whether (or not) replicability issues affect the science implicated in their testimony, and to comment on how replicability issues create or do not create a problem for the research findings.

I will also propose reforms that can be adopted more immediately than a Federal Rule can be amended. Namely, I will suggest changes to local jurisdictions’ court rules, to judicial chambers’ rules, and to attorney disciplinary rules that could encourage compliance with a requirement for experts to disclose replicability issues during discovery. Although my proposals will add new dimensions to solving the issue of keeping unreliable science out of the courtroom, they are also compatible with proposals from other scholars that could be adopted simultaneously.

In Part I, I will discuss how psychological findings and their replicability are implicated in experts’ courtroom testimony. I will provide examples of the types of psychological research that experts testify about, including eyewitness testimony, stereotyping, coerced confessions, and competency.

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<sup>5</sup> *Id.*

<sup>6</sup> Margaret Bull Kovera & Bradley D. McAuliff, *The Effects of Peer Review and Evidence Quality on Judge Evaluations of Psychological Science: Are Judges Effective Gatekeepers?*, 85 J. APPLIED PSYCH. 574, 577, 579 (2000) (finding in a study of Florida circuit judges the majority “reported hearing psychological testimony”).

<sup>7</sup> Tess M.S. Neal et. al., *Psychological Assessments in Legal Contexts: Are Courts Keeping “Junk Science” Out of the Courtroom?*, 20 PSYCH. SCI. PUB. INT. 135, 150, 152 (2019) (referring specifically to psychological assessment evidence).

<sup>8</sup> *E.g.*, Jason M. Chin, *Psychological Science’s Replicability Crisis and What It Means for Science in the Courtroom*, 20 PSYCH., PUB. POL’Y, & L. 225, 227 (2014).

<sup>9</sup> *E.g.*, Neal et al., *supra* note 7, at 156.

<sup>10</sup> FED. R. CIV. P. 26(a)(2)(B). When referring to the Federal Rules of Civil Procedure more broadly, I use “Federal Rule” or “Federal Rules” throughout this Note.

In Part II, I will define the replication crisis. In particular, I will discuss how the field of psychology has been active in recognizing and seeking to reform issues posed by the replication crisis.

In Part III, I will discuss how science is regulated in the courtroom. I will review the *Daubert* standard and examine how unreliable science can evade *Daubert* to enter the courtroom.

In Part IV, I will examine approaches scholars have proposed to address scientific replicability issues in the courtroom. Their proposals have focused on attorneys, judges, and law students; the court system; and experts. I will suggest that my proposal can improve upon proposals offered by scholars thus far.

In Part V, I will propose to amend FRCP 26(a)(2)(B) to require an expert disclosure of a replicability synopsis. I will review the current requirements for expert disclosures under FRCP 26(a)(2)(B), detail the process of amending a Federal Rule to create this change, and describe what a replicability synopsis would entail.

In Part VI, I will address potential objections to my proposal to require additional expert disclosure through an amendment to a Federal Rule. I will suggest supporting proposals that could more immediately be adopted to encourage experts to disclose replicability issues. Specifically, I will suggest judge- and lawyer-related proposals that could encourage experts' compliance. Further, I will detail how other scholars' proposals and my own could interface to improve the reliability of science that enters the courtroom.

## I. PSYCHOLOGICAL SCIENCE IN THE COURTROOM

Psychological research is often implicated in experts' courtroom testimony.<sup>11</sup> Issues such as coerced confessions, eyewitness memory, stereotyping, injury to a victim, and mental competency, all involve psychology.<sup>12</sup>

Legal scholar Erica Beecher-Monas has identified several cases in which trial courts and appellate courts have considered psychological testimony.<sup>13</sup> For instance, in *United States v. Hall*, the court considered psychological findings about coerced confessions.<sup>14</sup> Further, in *United States v. Norwood*, the court discussed the reliability of cross-race identification in eyewitness testimony

<sup>11</sup> Kovera & McAuliff, *supra* note 6, at 577, 579 (finding in a study of 144 Florida circuit judges that 75 percent of the judges "reported hearing psychological testimony").

<sup>12</sup> See generally AMINA MEMON ET AL., *PSYCHOLOGY AND LAW: TRUTHFULNESS, ACCURACY AND CREDIBILITY* (2d ed. 2003). Cf. John M. McCormick-Huhn, *Led Zeppelin*, "Stairway to Heaven," and *Cognitive Aging: Implications for Laches in the Copyright Context*, 21 NEV. L.J. 1261 (2021) (discussing the role of the psychology of memory and aging in witness testimony in copyright infringement lawsuits).

<sup>13</sup> Erica Beecher-Monas, *Blinded by Science: How Judges Avoid the Science in Scientific Evidence*, 71 TEMP. L. REV. 55, 58 n.16 (1998).

<sup>14</sup> *United States v. Hall*, 93 F.3d 1337, 1341-43 (7th Cir. 1996).

while relying on another court's use of such findings.<sup>15</sup> Courts have also considered findings about sex stereotyping in the workplace.<sup>16</sup> In addition, as psychologist Tess Neal and colleagues described, psychological assessment tools are commonly used in the courtroom to measure aptitude, achievement, personality, competence, risk, mental state, disability, and other forms of fitness, such as for duty.<sup>17</sup>

Jurors can be strongly affected by science and expert testimony.<sup>18</sup> For instance, one study found that mock jurors who viewed neuroscientific evidence were more likely to support a verdict of not guilty by reason of insanity than mock jurors who did not view such evidence.<sup>19</sup> Indeed, jurors may be more trusting of science they consider to be a "hard science," like neuroscience, than of science they consider to be a "soft science," like behavioral science.<sup>20</sup> To test this idea experimentally, psychologists Geoffrey and Cynthia Munro manipulated whether participants read about an expert who used either neuroscience or behavioral science to form the same opinion.<sup>21</sup> They found participants evaluated the same opinion as more reliable and valid when it was based in neuroscience than when it was based in behavioral science.<sup>22</sup> Thus, jurors' decisions may be affected by their own beliefs about what constitutes reliable science.

Flawed juror decisions are problematic because jurors' decisions can have important stakes, including "monetary compensation after a physical or psychological injury, loss of child custody, termination of parental rights, restrictions on liberty (e.g., civil commitment, community supervision, incarceration), or loss of life through the death penalty."<sup>23</sup> Trial and appellate judges' and justices' flawed decisions have the same consequences. Thus, if judges and jurors base their decisions on psychological research that has replicability issues, that research could be inappropriately relied on to reach a decision.

<sup>15</sup> *United States v. Norwood*, 939 F. Supp. 1132, 1137 (D. N.J. 1996) (citing *United States v. Smith*, 736 F.2d 1103, 1106 (6th Cir. 1984)).

<sup>16</sup> *E.g.*, *Price Waterhouse v. Hopkins*, 490 U.S. 228, 235 (1989); *Robinson v. Jacksonville Shipyards, Inc.*, 760 F. Supp. 1486, 1502–03 (M.D. Fla. 1991).

<sup>17</sup> Neal et al., *supra* note 7, at 140.

<sup>18</sup> *See, e.g.*, Philipp Kellmeyer, *Ethical and Legal Implications of the Methodological Crisis in Neuroimaging*, 26 CAMBRIDGE Q. HEALTHCARE ETHICS 530, 546 (2017).

<sup>19</sup> *Id.* at 546 & n.71 (reviewing findings of Jessica R. Gurley & David K. Marcus, *The Effects of Neuroimaging and Brain Injury on Insanity Defenses*, 26 BEHAV. SCIS. & L. 85 (2008)).

<sup>20</sup> Geoffrey D. Munro & Cynthia A. Munro, "Soft" vs. "Hard" Psychological Science in the Courtroom, 27 JURY EXPERT 26, 26, 28 (2015) (describing "[p]sychological science [as] includ[ing] research that is usually considered to be on the softer side of the continuum (e.g., behavioral science) as well as research that is usually considered to be on the harder side (e.g., neuroscience)").

<sup>21</sup> *Id.* at 27.

<sup>22</sup> *Id.*

<sup>23</sup> David DeMatteo et al., *Expert Evidence: The (Unfulfilled) Promise of Daubert*, 20 PSYCH. SCI. PUB. INT. 129, 132 (2019).

## II. THE REPLICATION CRISIS IN PSYCHOLOGICAL SCIENCE

A. *What Is the Replication Crisis?*

The replication crisis describes a scientific reckoning that occurred over the last decade when scientists discovered that several experiments—with published findings—failed to produce the originally-obtained results when the experiments were conducted again.<sup>24</sup> In a 2005 article, biostatistician and medical professor John Ioannidis demonstrated through mathematical modeling that certain study designs and features of experiments conducted in many scientific fields produce results that are likely to be false positives.<sup>25</sup> Developments in psychology drew attention to the replication crisis in 2011.<sup>26</sup> Namely, a case of scientific fraud,<sup>27</sup> the high-profile coverage of seemingly impossible findings conducted by a well-known psychologist that suggested people could tell the future, the reports that psychologists were often unwilling to share their data with other scientists, and the reports that particular psychological science practices could artificially create positive results, all combined to set off a firestorm in the field.<sup>28</sup>

The replication crisis has not been contained to psychology. Research findings in fields including cancer research,<sup>29</sup> neuroscience,<sup>30</sup> chemistry,<sup>31</sup> and vari-

<sup>24</sup> Resnick, *supra* note 4.

<sup>25</sup> John P.A. Ioannidis, *Why Most Published Research Findings Are False*, 2 PLOS MED. 0696, 0696, 0699 (2005); UNIV. HAWAII MANOA, *Practices of Science: False Positive and False Negatives*, EXPLORING OUR FLUID EARTH, <https://manoa.hawaii.edu/exploringourfluid-earth/chemical/matter/properties-matter/practices-science-false-positives-and-false-negatives> [<https://perma.cc/6GP8-WVYU>] (“A false positive is when a scientist determines something is true when it is actually false (also called a type I error).”).

<sup>26</sup> Harold Pashler & Eric-Jan Wagenmakers, *Editors’ Introduction to the Special Section on Replicability in Psychological Science: A Crisis of Confidence?*, 7 PERSPS. ON PSYCH. SCI. 528, 528 (2012).

<sup>27</sup> Although scientific fraud is a phenomenon related to replicability, it is a problem outside of the scope of what my proposal seeks to address. In my view, scientific fraud completely undermines the validity of scientific findings and is thus dissimilar to well-intentioned science that requires its findings be contextualized, rather than disregarded completely. *See e.g.*, Tom Bartlett, *A Dishonest Study on Dishonesty Puts a Prominent Researcher on the Hot Seat*, CHRON. HIGHER EDUC. (Aug. 27, 2021), <https://www.chronicle.com/article/a-dishonest-study-on-dishonesty-puts-a-prominent-researcher-on-the-hot-seat> [<https://perma.cc/7JG3-AZVT>] (describing examples of scientific fraud).

<sup>28</sup> *See* Pashler & Wagenmakers, *supra* note 26, at 528.

<sup>29</sup> *See, e.g.*, C. Glenn Begley & Lee M. Ellis, *Commentary, Raise Standards for Preclinical Cancer Research*, 483 NATURE 531, 531–33 (2012).

<sup>30</sup> *See, e.g.*, Anders Eklund et al., *Cluster Failure: Why fMRI Inferences for Spatial Extent Have Inflated False-Positive Rates*, 113 PROC. NAT’L ACAD. SCI. 7900, 7900 (2016).

<sup>31</sup> *See, e.g.*, Katharine Sanderson, *Bloggers Put Chemical Reactions Through the Replication Mill*, NATURE (Jan. 21, 2013), <https://www.nature.com/articles/nature.2013.12262> [<https://perma.cc/6U72-J4AH>].

ous social sciences<sup>32</sup> have undergone a similar crisis of confidence in the reliability of their results.

In my Note, I focus my analysis on the field of psychology because psychological evidence is common in expert testimony,<sup>33</sup> and psychology as a discipline has been actively engaged in efforts to reform its scientific practices in the wake of the replication crisis.<sup>34</sup> In Section II.B, I discuss aspects of psychological research that have contributed to the replication crisis in psychology. I also describe reforms many in the field have advocated for to improve psychological science's replicability.

### B. Psychology's Role in the Replication Crisis

Psychologists are increasingly discussing and publishing articles about replicability. A basic search in the database APA PsycInfo, between the years 1986 and 2021, reveals there have been 212 peer-reviewed academic journal articles concerning "replication crisis."<sup>35</sup> Of these articles, 166 have been published since 2018.<sup>36</sup> Psychologists have published both diagnoses of what is contributing to psychology's replication crisis, and proposals for how to fix the crisis. For example, psychology professor Scott Maxwell and colleagues suggested failure to replicate may be because psychologists conduct studies with too few participants, which affects the reliability of statistical tests of the effects (i.e., experimental findings).<sup>37</sup> Maxwell and colleagues suggested psychologists also overlook the need to find an effect multiple times before drawing conclusions about any one effect's existence.<sup>38</sup>

Professors, including Neil Martin and Richard Clarke, have also begun analyzing how editorial practices differ when scholars publish replications rather than novel findings in peer-reviewed journals.<sup>39</sup> Martin and Clarke found that journals rarely, if ever, explicitly encouraged submissions of replications.<sup>40</sup> The authors argued a part of the problem is that "[a]cademic publishing is a commercial enterprise, as well as an academic one, and publishers may wish to see published in their journals findings that are unique and meaningful and

<sup>32</sup> Colin F. Camerer et al., *Evaluating the Replicability of Social Science Experiments in Nature and Science Between 2010 and 2015*, 2 NATURE HUM. BEHAV. 637, 637 (2018).

<sup>33</sup> Kovera & McAuliff, *supra* note 6, at 577, 579.

<sup>34</sup> See, e.g., OPEN SCI. COLLABORATION, *An Open, Large-Scale, Collaborative Effort to Estimate the Reproducibility of Psychological Science*, 7 PERSPS. ON PSYCH. SCI. 657, 657 (2012).

<sup>35</sup> APA PSYCINFO (conducting search for "replication crisis" and filtering to display results from academic journal articles).

<sup>36</sup> *Id.*

<sup>37</sup> See Scott E. Maxwell et al., *Is Psychology Suffering from a Replication Crisis?*, 70 AM. PSYCH. 487, 487, 493 (2015).

<sup>38</sup> *Id.*

<sup>39</sup> G. N. Martin & Richard M. Clarke, *Are Psychology Journals Anti-Replication? A Snapshot of Editorial Practices*, 8 FRONTIERS PSYCH. 1, 1 (2017).

<sup>40</sup> *Id.* at 3.

which will increase the journals' attractiveness, submission rates and, therefore, sales."<sup>41</sup> Thus, with incentive to publish new findings but not to test previous ones, psychology's very publishing practices may be contributing to the replication crisis.

Psychologists have also put forth proposals to reform the replicability crisis. For instance, the Open Science Collaboration was founded by a group of scholars in 2011 to "increase openness, integrity, and reproducibility of scientific research."<sup>42</sup> In 2015, the group published a large-scale replication project of attempts to replicate one hundred psychological studies.<sup>43</sup> In what has been termed the "open science movement," psychologists have focused on sharing scientific data and materials with one another and engaging in attempts to replicate previous findings.<sup>44</sup>

Fixing the replicability crisis is not an easy problem to solve because focusing on only one feature of psychology's reliability may result in limiting the knowledge produced. As psychologist Natalie Sabik and colleagues described, focusing only on reproducing findings may result in patterns in which researchers overlook important reasons *why* a finding failed to replicate.<sup>45</sup> For instance, the role of participants' social group memberships, sociohistorical context, and power and privilege, can be overlooked when the focus is narrowly on reproducing the same effect with the same group of people.<sup>46</sup> To address a problem as intertwined with disciplinary practices as replicability issues, psychologists Harold Pashler and Eric-Jan Wagenmakers recommended that psychology should enact "parallel reforms across the whole range of academic practices—from journals and journal reviewing to academic reward structures to research practices within individual labs—and find[] out which of these prove effective and which do not."<sup>47</sup> Thus, the process of reforming psychology to address the replicability crisis is complex, and which solutions are most effective remains in flux.

However, as discussed above, psychology as a field is proposing and instituting reforms to address issues of replicability. I argue, building on this foundation of reform, psychology's experts are well positioned to consider the complexity of replicability issues when testifying in court, and to lead the way for other disciplines' experts to follow.

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<sup>41</sup> *Id.* at 4.

<sup>42</sup> See BRIAN A. NOSEK, CENTER FOR OPEN SCIENCE: STRATEGIC PLAN 1 (Version 1 2017).

<sup>43</sup> OPEN SCI. COLLABORATION, *Estimating the Reproducibility of Psychological Science*, 349 SCI. 943, 943 (2015).

<sup>44</sup> See Mary C. Murphy et al., *Open Science, Communal Culture, and Women's Participation in the Movement to Improve Science*, 117 PROCS. NAT'L ACAD. SCIS. 24154, 24154 (2020).

<sup>45</sup> Natalie J. Sabik et al., *Bringing an Intersectional Lens to "Open" Science: An Analysis of Representation in the Reproducibility Project*, 45 PSYCH. WOMEN Q. 475, 475–76 (2021).

<sup>46</sup> *Id.* at 475.

<sup>47</sup> Pashler & Wagenmakers, *supra* note 26, at 529.



As scientists continue to discover that more studies suffer from replication issues, a problem could emerge if that replicability information is not conveyed in expert testimony. Without information about replicability, jurors and judges may inappropriately rely on science with replicability issues to reach decisions. An additional problem is that science later shown to be unreliable can still be used in future trials because law relies heavily on precedent.<sup>48</sup> Currently, the court system's primary method to keep unreliable science out of the courtroom is the *Daubert* standard.

### III. THE REGULATION OF SCIENCE IN THE COURTROOM

#### A. *The Bar to Unreliable Science: The Daubert Standard*

The Supreme Court's *Daubert* opinion, in conjunction with its two later opinions that together constitute "[t]he *Daubert* Trilogy," is the standard for admitting scientific evidence in federal courts, many state courts, and in Canada.<sup>49</sup> Before *Daubert*, scientific evidence in the courtroom was assessed according to the *Frye* standard.<sup>50</sup> The *Frye* standard required judges to admit or exclude scientific evidence based solely on whether the science was "sufficiently established to have gained general acceptance in the particular field in which it belongs."<sup>51</sup>

In *Daubert*, the Court developed a four-factor test for judges to assess experts' scientific testimony in the courtroom. The first factor judges consider is whether the "theory or technique . . . can be (and has been) tested."<sup>52</sup> The second factor is "whether the theory or technique has been subjected to peer review and publication."<sup>53</sup> Third, judges consider "the known or potential rate of error."<sup>54</sup> And, fourth, judges use the previous *Frye* standard to assess "general acceptance."<sup>55</sup>

The Supreme Court clarified aspects of *Daubert*'s judicial gatekeeping factors in two subsequent cases, *Joiner* and *Kumho*. In *Joiner*, the Court held that within the *Daubert* standard, the district judge has "discretion to conclude that the studies upon which the experts relied were not sufficient, whether individually or in combination, to support their conclusions."<sup>56</sup> Subsequently, in *Kumho*, the Court held that the district judge's "'gatekeeping' obligation" under

<sup>48</sup> See Larsen, *supra* note 2, at 62 (defining what she terms "factual precedents" as "the tendency of lower courts to over-rely on Supreme Court opinions and to apply generalized statements of fact from old cases to new ones").

<sup>49</sup> Chin, *supra* note 8, at 226.

<sup>50</sup> *Id.*

<sup>51</sup> *Frye v. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923).

<sup>52</sup> *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 593 (1993).

<sup>53</sup> *Id.*

<sup>54</sup> *Id.* at 594.

<sup>55</sup> *Id.*

<sup>56</sup> *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146–47 (1997).

*Daubert* “applie[d] not only to testimony based on ‘scientific’ knowledge, but also to testimony based on ‘technical’ and ‘other specialized’ knowledge.”<sup>57</sup> The *Kumho* Court further held that the reliability of the scientific, technical, or specialized knowledge should be determined by the district judge “in light of the particular facts and circumstances of the particular case.”<sup>58</sup>

In sum, the *Daubert* standard excludes unreliable scientific evidence from experts by relying on judges to act as gatekeepers of scientific reliability. Further, the adversarial nature of law depends on attorneys challenging an opposing expert’s scientific evidence as unreliable. Thus, for *Daubert* to effectively bar unreliable evidence from the courtroom, both judges and attorneys must understand what constitutes reliable science.

### B. *Unreliable Science Can Evade Daubert*

Despite additional safeguards to bar unreliable science under *Daubert* as compared to what was provided under *Frye*, unreliable science continues to enter the courtroom. The law’s reliance on precedent, attorneys’ reluctance to challenge unreliable science, and judges’ reluctance to exclude unreliable evidence, may all contribute to the problem.

#### 1. *Unreliable Science and Precedent*

Some cases decided before *Daubert* remain precedential even though they relied on scientific evidence that would now fail to satisfy *Daubert*.<sup>59</sup> For instance, in *Moore v. Duckworth*, the Court upheld the constitutionality of using lay opinion testimony to determine an individual’s insanity, rather than requiring specialized testimony from an expert to do so.<sup>60</sup> Similarly, in *Barefoot v. Estelle*, the Court upheld the constitutionality of psychiatrists testifying to individuals’ mental capacity for future dangerousness.<sup>61</sup> The Court did so despite acknowledging it was “aware that many mental health professionals have questioned the usefulness of psychiatric predictions of future dangerousness in light of studies indicating that such predictions are often inaccurate . . . [and are] wrong two out of three times.”<sup>62</sup>

Although the mental capacity evidence the Court relied on in *Duckworth* and *Barefoot* is unlikely to survive a *Daubert* analysis today, the Court’s rules from these cases can still be applied today as precedent. As legal scholar Erica Beecher-Monas and medical scholar Edgar Garcia-Rill identified, lower courts, such as courts in Texas that adopted standards substantially identical to *Daub-*

<sup>57</sup> *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 141 (1999).

<sup>58</sup> *Id.* at 158.

<sup>59</sup> Erica Beecher-Monas & Edgar Garcia-Rill, *The Law and the Brain: Judging Scientific Evidence of Intent*, 1 J. APP. PRAC. & PROCESS 243, 270 (1999).

<sup>60</sup> *Id.* at 270–71 (describing the holding of *Moore v. Duckworth*, 443 U.S. 713 (1979)).

<sup>61</sup> *Id.* at 271 (describing *Barefoot v. Estelle*, 463 U.S. 880 (1983)).

<sup>62</sup> *Barefoot*, 463 U.S. at 900.

ert, “continue to allow testimony regarding future dangerousness without subjecting it to a strict *Daubert* analysis.”<sup>63</sup> Thus, courts following pre-*Daubert* precedent may continue to admit unreliable science in the post-*Daubert* age.

Further, unreliable science can enter the courtroom post-*Daubert* even when courts are not relying on pre-*Daubert* precedent. For instance, in *McKune v. Lile*, the Supreme Court relied on evidence that “the rate of recidivism of untreated [sex] offenders has been estimated to be as high as 80%.”<sup>64</sup> The Court subsequently referenced the recidivism rate relied on in *McKune* in its opinion in *Smith v. Doe*.<sup>65</sup> Later, it was discovered that the source for this recidivism rate was an article in the lay magazine, *Psychology Today*, that lacked citation to any scientific studies to support its statistic.<sup>66</sup> Thus, although the particular evidence relied on in *McKune* and *Smith* is now known to be unreliable, subsequent case law can continue to use this unreliable science by following precedent.<sup>67</sup>

## 2. Attorneys and Judges Faced with Unreliable Science

Another issue perpetuating unreliable science in the courtroom is attorneys’ and judges’ reactions to such science. In a study of 364 psychological assessment tools used in legal cases, psychologist Tess Neal and colleagues found that only about 40 percent of the assessments were rated favorably by authorities that examine the technical quality of psychological tests.<sup>68</sup> The researchers further examined how likely attorneys were to challenge these psychological assessments in the courtroom. An analysis of 372 cases discussing an exemplar assessment tool revealed that attorneys only challenged an assessment’s admissibility, or the admissibility of testimony relying on the assessment, 5.1 percent of the time.<sup>69</sup> Very few of the challenges that occurred were challenges based on features like scientific validity (i.e., does the assessment measure what it is supposed to).<sup>70</sup>

In addition, Neal and colleagues analyzed how judges in these cases responded to attorneys’ challenges of the psychological assessments. The results revealed that only 32 percent of the time, in six out of nineteen cases in which the attorneys challenged the assessments, did the challenges succeed.<sup>71</sup> In sum,

<sup>63</sup> Beecher-Monas & Garcia-Rill, *supra* note 59, at 274 & n.103 (citing *Nenno v. Texas*, 970 S.W.2d 549, 561 (Tex. Crim. App. 1998), as an example).

<sup>64</sup> *McKune v. Lile*, 536 U.S. 24, 33 (2002).

<sup>65</sup> *Smith v. Doe*, 538 U.S. 84, 103 (2003).

<sup>66</sup> Ira Mark Ellman & Tara Ellman, “Frightening and High”: *The Supreme Court’s Crucial Mistake About Sex Crime Statistics*, 30 CONST. COMMENT. 495, 498 (2015).

<sup>67</sup> *Id.* at 497 (citing *State v. Seering*, 701 N.W.2d 655, 664 (Iowa 2005); *State v. Mossman*, 281 P.3d 153, 160 (Kan. 2012)).

<sup>68</sup> Neal et al., *supra* note 7, at 138, 143.

<sup>69</sup> *Id.* at 150.

<sup>70</sup> *Id.* at 152.

<sup>71</sup> *Id.*

Neal and colleagues' findings suggest attorneys are highly unlikely to challenge scientific evidence (unchallenged 94.9 percent of the time), and judges are more likely than not to deny challenges that are raised and to admit the evidence (68 percent of challenges denied).

Studies in which lawyers and judges were asked to make decisions about hypothetical evidence have further revealed that the internal validity and reliability of scientific evidence had little effect on their decisions. Psychologists Jacqueline Austin Chorn and Margaret Bull Kovera manipulated validity by presenting evidence as obtained under different testing conditions, and they manipulated reliability by providing statistics that indicated reliability of varying degrees.<sup>72</sup> Their research showed that neither validity nor reliability affected how likely attorneys were to move to exclude expert testimony.<sup>73</sup> The researchers' findings suggest that even when attorneys do move to exclude evidence, those attorneys are unlikely to emphasize specific concerns of validity and reliability that would assist judges.<sup>74</sup>

Chorn and Kovera's findings with judges revealed a similar pattern to their findings with attorneys. Replicating a previous finding,<sup>75</sup> the researchers found that judges' evaluations of scientific expert evidence were unaffected by differences in the scientific validity.<sup>76</sup> Results showed that the judges were also unaffected by the reliability of the scientific evidence.<sup>77</sup> However, judges' justifications for their admissibility decisions revealed they were less likely to admit evidence they thought was invalid or unreliable.<sup>78</sup> Critically, Chorn and Kovera's findings suggest then that the problem is not that judges are choosing to admit unreliable or invalid science despite its flaws, but rather that judges struggle to recognize when the evidence is invalid or unreliable.<sup>79</sup>

To be sure, there are attorneys attentive to issues of scientific reliability. For instance, some have even questioned experts in trial<sup>80</sup> and in deposition<sup>81</sup> specifically about replicability issues. There are also judges who "apply[]

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<sup>72</sup> Jacqueline Austin Chorn & Margaret Bull Kovera, *Variations in Reliability and Validity Do Not Influence Judge, Attorney, and Mock Juror Decisions About Psychological Expert Evidence*, 43 L. & HUM. BEHAV. 542, 546 (2019).

<sup>73</sup> *Id.* at 551.

<sup>74</sup> *Id.*

<sup>75</sup> Kovera & McAuliff, *supra* note 6, at 582 (finding in a study of Florida circuit judges' decisions to admit hypothetical expert evidence that "the methodological quality of the psychological research presented to the judges did not influence their admissibility decisions or their evaluations of the study's validity").

<sup>76</sup> Chorn & Kovera, *supra* note 72, at 550.

<sup>77</sup> *Id.*

<sup>78</sup> *Id.*

<sup>79</sup> *Id.*

<sup>80</sup> *Chinn v. Whidbey Pub. Hosp. Distr.*, C20-995 TSZ, 2021 WL 5200171, slip op. at \*2-\*3 (W.D. Wash. Nov. 9, 2021); *see Federoff v. Geisinger Clinic*, 571 F. Supp. 3d 376, 389 (M.D. Pa. 2021).

<sup>81</sup> Transcript of Deposition at 17-18, *Bentley v. United States*, Doc # 82-2 (Oct. 30, 2020).

*Daubert* routinely and well.”<sup>82</sup> However, overall, attorneys’ and judges’ evaluations of scientific evidence seem to be unaffected by the science’s reliability and validity. Attorneys further appear unlikely to challenge the admissibility of scientific evidence, and when they do, judges often do not exclude the challenged evidence. Thus, intervention is required to make lawyers and judges aware of issues of scientific replicability so they can keep unreliable science out of the courtroom.

#### IV. APPROACHES TO THE REPLICABILITY CRISIS IN THE COURTROOM THUS FAR

Scholars have proposed changes both inside and outside the courtroom to prevent unreliable science from entering trials. I review the approaches scholars have put forth thus far, and I then turn to my proposed intervention in Part V.

##### A. Judge-, Attorney-, and Law Student-Focused Approaches

One proposal to keep unreliable science out of the courtroom is to provide judges, lawyers, and law students with scientific training. For instance, psychologists Bradley McAuliff and Jennifer Groscup suggested continuing education seminars for judges that focus on empirical methods.<sup>83</sup> Psychologist David DeMatteo and colleagues similarly suggested continuing education seminars for attorneys and judges focused on science, programs for judges and other federal employees through the Federal Judicial Center, and both a basic science course and a course specifically on admissibility of scientific evidence for law students.<sup>84</sup> Some research has supported the potential effectiveness of training, finding that judges who had received scientific undergraduate or graduate school training were more likely to favorably evaluate internally valid evidence than judges without prior scientific training.<sup>85</sup>

Another form of training that has been proposed is the development of scientific databases that judges and lawyers could access. For instance, Neal and colleagues suggested low-cost resources that are currently available for lawyers and judges to download from the American Psychological Association and

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<sup>82</sup> Beecher-Monas & Garcia-Rill, *supra* note 59, at 245. *But see* Margaret A. Berger, *Eliminating General Causation: Notes Towards a New Theory of Justice and Toxic Torts*, 97 COLUM. L. REV. 2117, 2129 (1997) (describing difficulty courts have applying *Daubert* to assess “scientific evidence relied on to prove causation” in toxic tort cases).

<sup>83</sup> Bradley D. McAuliff & Jennifer L. Groscup, *Daubert and Psychological Science in Court: Judging Validity from the Bench, Bar, and Jury Box*, in *PSYCHOLOGICAL SCIENCE IN THE COURTROOM: CONSENSUS AND CONTROVERSY* 26, 47 (Jennifer L. Skeem et al. eds., 2009).

<sup>84</sup> DeMatteo et al., *supra* note 23, at 132.

<sup>85</sup> Kovera & McAuliff, *supra* note 6, at 580 (finding judges with scientific training rated an internally valid study as higher in legal admissibility (average legal admissibility rating of 2.99 on a scale of 1–7, with higher numbers indicating higher admissibility) than judges without scientific training did (average legal admissibility rating of 2.03)).

from companies that evaluate the technical quality of psychological assessments.<sup>86</sup> Neal and colleagues also suggested that treatises on scientific evidence may be similarly useful.<sup>87</sup>

Although the training and databases that scholars have proposed have some advantages, there are some drawbacks to these solutions too. Trainings often tend to have a particular agenda or perspective,<sup>88</sup> which may affect their consequences. Some forms of training for judges and lawyers could have a self-selection problem because judges and lawyers may simply opt out of attending scientific training programs. Law-student training brings the difficulty of competing curricular demands and waiting for a critical mass of new law students to enter the field in enough force that they could change practices systemwide. Databases and treatises may also bring the problem of only being understood by those with scientific training. Although training and accessible material about science may contribute to fixing the problem of unreliable science entering the courtroom, it may be an insufficient fix on its own.

## B. Approaches Focused on Changing the Court System

### 1. Court-Appointed Experts

Scholars have also proposed interventions for the court system itself. One proposal is for courts to appoint experts who can serve as neutral experts during trials.<sup>89</sup> The appointment of expert witnesses is explicitly provided for under Federal Rule of Evidence (“FRE”) 706, and it may be available at the state level under state counterparts to the FRE as well.<sup>90</sup>

However, McAuliff and Groscup mentioned that judges have expressed concerns in surveys that court-appointed experts may interfere with the adversarial process because jurors are often particularly influenced by experts.<sup>91</sup> The Advisory Committee to the FRE has expressed similar concerns that court-appointed experts could be evaluated as more credible than traditional adversarial experts.<sup>92</sup> McAuliff and Groscup concluded that experimental tests of

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<sup>86</sup> Neal et al., *supra* note 7, at 157.

<sup>87</sup> *Id.* at 156 (citing DAVID L. FAIGMAN ET AL., *MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY* (2018–2019 ed. 2018) as providing “[g]eneral guidance for judges and lawyers for assessing the validity of experts’ methodology”).

<sup>88</sup> See Francesca Gino & Katherine Coffman, *Unconscious Bias Training That Works*, HARV. BUS. REV., Sept.–Oct. 2021, at 114, 117 (finding that most organizations that provided unconscious bias training made participation voluntary because they were concerned with “backlash;” thus, the organizations’ trainings attracted only those “already familiar with bias and interested in reducing it”).

<sup>89</sup> McAuliff & Groscup, *supra* note 83, at 45.

<sup>90</sup> *Id.*

<sup>91</sup> *Id.*

<sup>92</sup> *Id.*

whether jurors are unduly influenced by court-appointed experts have thus far resulted in inconsistent findings.<sup>93</sup>

Psychologists Gerald Young and Jane Goodman-Delahunty advocated for changes that seek to overcome resistance to the use of court-appointed experts. The authors suggested looking to courts in Europe as a model, where use of court-appointed experts is common.<sup>94</sup> In addition, they suggested that court-appointed experts could be drawn from broad expert databases to testify to a number of scientific issues that arise in court.<sup>95</sup> To counter potential concerns of interference with the adversarial system, they suggested judges could consider appointing a neutral court expert that both parties jointly recommended to the judge for the trial.<sup>96</sup> The adversarial nature of the trial can further remain undisturbed, despite the expert being appointed by the court, through parties cross-examining the expert.<sup>97</sup> The authors also proposed that judges' reluctance to use court-appointed experts could be mitigated by educating judges about the potential value of doing so.<sup>98</sup>

## 2. Court-Appointed Scientific Advisors

A related proposal scholars have put forth is that courts could appoint scientific advisors rather than experts. McAuliff and Groscup described that one way to appoint advisors is through judges' authority to "appoint either Special Masters or U.S. Magistrates" tasked with making evaluations of evidence and recommendations to judges.<sup>99</sup> Alternatively, judges could appoint what McAuliff and Groscup referred to as a "science court," or a panel of experts who assess scientific quality.<sup>100</sup> Young and Goodman-Delahunty emphasized that the role of technical advisors could be more limited than that of a court-appointed expert in a trial.<sup>101</sup> However, unlike the appointed expert, the technical adviser would not be subject to cross-examination.<sup>102</sup> Thus, Young and Goodman-Delahunty highlighted a potential risk of court-appointed technical advisors: as special masters, they may play too large a role in deciding ultimate issues and thus infringe on the factfinder's role.

In sum, questions remain about the effects on the court system of introducing court-appointed experts and technical advisors. In particular, one issue is

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<sup>93</sup> *Id.* at 45–46.

<sup>94</sup> Gerald Young & Jane Goodman-Delahunty, *Revisiting Daubert: Judicial Gatekeeping and Expert Ethics in Court*, 14 PSYCH. INJ. & L. 304, 307 (2021).

<sup>95</sup> *Id.* at 308.

<sup>96</sup> *Id.*

<sup>97</sup> *Id.*

<sup>98</sup> *Id.*

<sup>99</sup> McAuliff & Groscup, *supra* note 83, at 46.

<sup>100</sup> *Id.*

<sup>101</sup> Young & Goodman-Delahunty, *supra* note 94, at 309.

<sup>102</sup> *Id.*

how to convince judges to adopt these practices uniformly, across states and districts.

### C. *Expert-Focused Approaches*

#### 1. *Pre-trial Expert Meetings and Expert Codes of Ethics*

Some proposals have focused on expert-level interventions. Psychologist and legal scholar Jason Chin proposed that opposing experts could meet before trial to discuss areas of difference and consensus in their testimonies.<sup>103</sup> He suggested that opposing experts could also sign an ethical code in advance of this meeting in which they commit to “a duty to acknowledge the strength of the data supporting an opinion.”<sup>104</sup> Chin’s proposal drew on a report from Canada, the Goudge Report, that was created in response to flawed science affecting case decisions.<sup>105</sup> These interventions from the Goudge Report have been adopted by courts in England and Wales.<sup>106</sup>

Similarly, experts in criminal and civil trials in Australia abide by “an Expert Witness Code of Ethics” that involves acknowledging “any limitations to their opinions.”<sup>107</sup> Young and Goodman-Delahunty proposed an expert witness code should be adopted in the United States.<sup>108</sup> The authors developed a list of components that should be considered in a potential code, drawing on American Psychological Association guidelines.<sup>109</sup>

Thus, reforms from other countries to keep unreliable science out of the courtroom may be instructive. However, questions remain as to the effectiveness of an ethical code for experts. For instance, it is unclear if such a code would have legal force.

#### 2. *Scientist-Focused Approaches*

In addition, proposals target improving reliability of science in the courtroom by focusing on changes scientists can make. For instance, Neal and colleagues suggested that psychological assessments should be required to be tested and published in peer-reviewed journals before they are disseminated for

<sup>103</sup> Chin, *supra* note 8, at 234.

<sup>104</sup> *Id.*

<sup>105</sup> *Id.* (citing STEPHEN T. GOUDGE, INQUIRY INTO PEDIATRIC FORENSIC PATHOLOGY IN ONTARIO (2008)). A search does not suggest there have been studies conducted on the effectiveness of these models in England or Wales. However, conducting studies on their effectiveness—for example through a survey of experts, attorneys, or judges—could be an informative avenue for future research to either support or suggest against potential adoption of the model.

<sup>106</sup> *Id.*

<sup>107</sup> Young & Goodman-Delahunty, *supra* note 94, at 310.

<sup>108</sup> *Id.*

<sup>109</sup> *Id.* at 310–11.



use.<sup>110</sup> The authors further proposed the following: (1) scientists working in forensic fields should strive to use measures consistently to create cumulative knowledge about measures' effectiveness; (2) scientists could create a database of measures for use specifically in clinical practice; and (3) that measures that constitute open materials and have been independently tested should be relied on more than untested methods that are only available for sale.<sup>111</sup> Young and Goodman-Delahunty also identified scientists as part of the solution, calling on scholars to make suggestions about how to improve expert admissibility issues by publishing on the topic.<sup>112</sup>

This set of proposals acknowledges that some of the blame for unreliable science entering the courtroom rests with those who produced the science themselves. However, as reflected in issues raised by the replication crisis, relying on fields to self-correct—often with little incentive to do so—can be a difficult and slow-moving task.

### 3. *Expert Disclosure in Discovery*

Another proposal has focused on requiring experts to make disclosures about scientific reliability in discovery. Specifically, legal scholar Edith Beerdsen suggested changes for experts who conduct litigation science, or scientific tests for a particular trial.<sup>113</sup> Beerdsen drew on lessons from the replicability crisis to suggest litigation science could be more reliably conducted through changes such as requiring experts to commit to research plans before conducting studies.<sup>114</sup> She further proposed that litigation science experts should be required to disclose during discovery information about how they conducted the study and any deviations they made from the predetermined research plan.<sup>115</sup> However, Beerdsen acknowledged such requirements could face resistance from courts and litigants if transparent reporting of this nature was perceived to conflict with the adversarial system.<sup>116</sup>

Beerdsen's proposal to mandate disclosure of scientific reliability from litigation science experts could more broadly be applied to experts who either testify to general patterns in the field, or to science they have personally conducted for academic reasons rather than for trial. What could be added to Beerdsen's proposal is an actionable plan to mandate more disclosure.

To address an issue as "complex" as barring unreliable science from the courtroom, "court[s] should not rely on a single reform agenda."<sup>117</sup> I propose

<sup>110</sup> Neal et al., *supra* note 7, at 155.

<sup>111</sup> *Id.* at 156.

<sup>112</sup> Young & Goodman-Delahunty, *supra* note 94, at 312–13.

<sup>113</sup> See generally Edith Beerdsen, *Litigation Science After the Knowledge Crisis*, 106 CORNELL L. REV. 529, 529–30 (2021).

<sup>114</sup> *Id.* at 573.

<sup>115</sup> *Id.* at 582.

<sup>116</sup> See *id.* at 583.

<sup>117</sup> Young & Goodman-Delahunty, *supra* note 94, at 307.

that amending FRCP 26(a)(2)(B) to mandate experts disclose replicability information about science would be compatible with many of the proposals scholars have put forth. However, I argue amending FRCP 26(a)(2)(B) would also avoid many potential problems with the interventions suggested thus far. Namely, I suggest a replicability synopsis amendment (1) would alert attorneys and judges to issues of replicability when questioning experts or ruling, respectively; (2) would be a remedy attorneys and judges could not opt out of; (3) would create a uniform solution in the federal courts; (4) could subject attorneys and possibly experts to sanctions for violating the rule and thus could incentivize experts to be ethical; and (5) would provide an actionable way to mandate replicability information from experts through discovery disclosure.

#### V. AMEND FEDERAL RULE OF CIVIL PROCEDURE 26(A)(2)(B): A PROPOSAL TO REQUIRE EXPERTS TO DISCLOSE REPLICABILITY ISSUES

I propose to amend FRCP 26(a)(2)(B) to require an expert disclosure of a replicability synopsis. In this Part, I describe the current requirements for expert disclosures under FRCP 26(a)(2)(B), the process for amending a rule, and what my proposed amendment to include a replicability synopsis would entail.

##### A. *Expert Disclosure Required Under FRCP 26(a)(2)(B)*

Under the current version of FRCP 26(a)(2)(B), experts who give testimony in court are required to provide a written report with several disclosures.<sup>118</sup> Many of the required disclosures relate to the specific data the expert will present in court.<sup>119</sup> Specifically, under FRCP 26(a)(2)(B), experts must disclose “a complete statement of all opinions the witness will express and the basis and reasons for them; the facts or data considered by the witness in forming [the opinions]; [and] any exhibits that will be used to summarize or support [the opinions].”<sup>120</sup> The expert is also required to disclose their qualifications, their recent history testifying as an expert in other cases, and the amount they are being compensated for their testimony or for the study they are conducting for the litigation.<sup>121</sup> My proposed amendment to FRCP 26(a)(2)(B) would require an additional disclosure from the expert about the specific data they are relying on in their testimony.

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<sup>118</sup> FED. R. CIV. P. 26(a)(2)(B) (providing that “[u]nless otherwise stipulated or ordered by the court, this disclosure must be accompanied by a written report—prepared and signed by the witness—if the witness is one retained or specially employed to provide expert testimony in the case or one whose duties as the party’s employee regularly involve giving expert testimony”).

<sup>119</sup> See FED. R. CIV. P. 26(a)(2)(B)(i)–(iii).

<sup>120</sup> *Id.*

<sup>121</sup> FED. R. CIV. P. 26(a)(2)(B)(iv)–(vi).

*B. The Process to Amend a Federal Rule*

Proposing a change to a Federal Rule is something members of the public, including academics, judges, and attorneys, can do.<sup>122</sup> The federal judiciary invites people to do so by submitting proposals via email or mail to the Committee on Rules of Practice and Procedure or the Standing Committee.<sup>123</sup> Suggested changes are then considered by an advisory committee.<sup>124</sup> The advisory committee analyzes the proposed change, makes recommendations, and may solicit empirical research support from the Federal Judicial Center to further examine the potential change.<sup>125</sup>

If the advisory committee concludes the proposed change has merit, a draft amendment, with supplemental explanation from the advisory committee, will be sent to the Standing Committee.<sup>126</sup> If the Standing Committee determines the proposed change has merit, it will publish a preliminary draft and invite both public comment and hearings on the proposed draft.<sup>127</sup> Through this process, a proposed change suggested by a member of the public can be adopted as a later change to the FRCP. Thus, FRCP 26(a)(2)(B) could be changed to mandate expert disclosure in discovery about replicability issues.

*C. The Proposed Amendment to FRCP 26(a)(2)(B): A Replicability Synopsis*

I propose that FRCP 26(a)(2)(B) should be amended to require experts to specifically disclose information about scientific replicability. My amendment would require experts testifying in court to comment on whether (or not) replicability issues affect the science implicated in their testimony and on how replicability issues create or do not create a problem for the research findings. That is, identifying a replication issue for a particular finding does not always mean there is a problem, as there can be various reasons why a particular finding does not always replicate (e.g., different population of participants in the replication sample).<sup>128</sup> Building on FRCP 26(a)(2)(B)(i)–(iii),<sup>129</sup> my amendment would add another subpart to FRCP 26(a)(2)(B) that requires experts disclose information about the facts or data involved in their testimony in a written report. Below, I provide an example of what a replication synopsis rule could look like, with my proposed language in italics.

The report must contain: . . .

<sup>122</sup> U.S. CTS., *How to Suggest a Change to Federal Court Rules and Forms*, <https://www.uscourts.gov/rules-policies/about-rulemaking-process/how-suggest-change-federal-court-rules-and-forms> [https://perma.cc/9D4G-STCR].

<sup>123</sup> *Id.*

<sup>124</sup> *Id.*

<sup>125</sup> *Id.*

<sup>126</sup> *Id.*

<sup>127</sup> *Id.*

<sup>128</sup> See Sabik et al., *supra* note 45, at 487.

<sup>129</sup> FED. R. CIV. P. 26(a)(2)(B)(i)–(iii).

*a description of whether any replicability issues affect the facts or data considered by the witness in forming the opinions, including a statement of whether and to what extent replicability issues pose a problem to such facts or data.*<sup>130</sup>

The replicability synopsis would explicitly require experts to state whether or not replicability issues affect the basis of their expert testimony. Therefore, an expert who testifies to customs or practices of an industry or who generally educates about technical or other specialized knowledge could simply indicate that the replicability synopsis does not apply to their testimony. However, experts commenting on scientific findings, either conducted specifically for the litigation or conducted separately from the litigation to inform their opinions, would provide replicability information about the findings. In such a situation, the expert could identify successful replications, failed replications, or a lack of attempts to replicate the finding at issue. The expert could further explain how a single failed replication in the context of a large number of studies supporting the finding may indicate, for instance, something unique about the way the replication attempt was conducted,<sup>131</sup> rather than a problematic replicability issue. The replicability synopsis further allows the expert to explain why even a pattern of replicability issues may not present a problem that fully outweighs other indications of the evidence's reliability (e.g., a situation where there are few studies conducted on the relevant issue in a case).

For lawyers, I suggest the replicability synopsis would emphasize issues of scientific reliability that they may want to cross-examine the expert witness about. For judges, I suggest that the replicability synopsis should be treated as one factor judges weigh to determine the reliability of the expert evidence. Rather than treating replicability issues as the sole factor to determine if evidence should be admitted or excluded, judges should consider such issues as one factor weighed to determine the evidence's reliability.

A replication synopsis amendment to FRCP 26(a)(2)(B) is a feasible change that could help keep unreliable science from entering the courtroom. A significant advantage of the replicability synopsis is that it puts the onus on experts to interpret and communicate scientific reliability issues pertinent to their testimony. Unlike lawyers and judges who may be unfamiliar with the replication crisis and its methodological concerns, experts are ideally positioned to disclose and contextualize replicability issues known in their fields. Further, experts are especially well suited to comment on how replicability issues may affect the data that is the basis for their courtroom testimony. Rather than relying on lawyers to reveal flaws in the science through cross-examination without being alerted to the issue, or on judges to exclude testimony because of unreliable methods or data without warning, a replicability synopsis makes this information available from the expert—by default.

<sup>130</sup> FED. R. CIV. P. 26(a)(2)(B). My proposed language is italicized.

<sup>131</sup> See Sabik et al., *supra* note 45, at 487; Maxwell et al., *supra* note 37, at 487.

## VI. POTENTIAL OBJECTIONS AND ADDITIONAL PROPOSALS TO BUILD ON SCHOLARS' PROPOSALS THUS FAR

Objections may be raised against the proposal to amend a Federal Rule to fix the problem of unreliable science from entering the courtroom. Here, I detail some possible objections and responses to those objections. I also suggest additional proposals that could be adopted simultaneously to encourage experts to disclose replicability issues. In addition, I discuss how my proposals are compatible with the adoption of proposals from other scholars to address issues of unreliable science in the courtroom.

A. *Potential Objections and Responses*

One potential objection to a replicability synopsis amendment to FRCP 26(a)(2)(B) may be that this additional disclosure will result in legal battles with parties arguing that all scientific expert testimony is unreliable. However, the replicability synopsis should actually prevent confusion and arguments that all science lacks reliability. For one thing, the replicability synopsis requires experts to explain if their data is consistent with findings that do *not* have replicability issues. Thus, the synopsis helps to identify science that is especially reliable.

Further, even if the expert's data is consistent with findings that have failed to replicate, the expert is required by the replicability synopsis to explain why past replication failures may not present an issue for the particular data in this case. For instance, differences from the original studies—such as the data was collected in a different context, the data was collected with a different population of subjects, or the data was collected using different methods (e.g., larger sample size)—may suggest past replication failures do not strongly affect the data the expert is relying on.<sup>132</sup> Rather than creating confusion that all science is unreliable, the replicability synopsis requires experts to clarify when and how replicability issues are a problem for scientific evidence.

Another objection may be that the replicability synopsis harms parties by making it more difficult to convince judges that expert evidence should be admitted in court. For example, perhaps plaintiffs in civil cases will suffer more severe harms from additional barriers to admitting scientific evidence than civil defendants will (e.g., harm of not being able to pay medical bills and get adequate treatment compared to economic loss suffered by a hospital or doctor that can be offset through insurance). Whether certain parties will be more likely than others to have their evidence excluded with the inclusion of the replicability synopsis is an open question. However, the replicability synopsis is only one factor that should be weighed in the decision to admit or exclude evidence. Further, it is possible that parties on both sides of litigation will equally benefit

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<sup>132</sup> See Sabik et al., *supra* note 45, at 487.

from the replicability synopsis becoming a factor in decisions surrounding reliability of expert evidence.

A further objection to the proposal to amend FRCP 26(a)(2)(B) may be that getting the proposed change adopted could be difficult. Indeed, the process to amend a Federal Rule requires the proposed rule be evaluated by several committees and subjected to public comments and hearings before a finished form of an amended rule is agreed to.<sup>133</sup> An additional objection may be that the amendment process could take years before any change is adopted.<sup>134</sup>

However, I argue these potential objections are outweighed by advantages. Although the process may take time, and may result in the proposed amendment being reshaped, the ultimate result of a discovery rule that requires experts to disclose replicability issues would be a uniform practice in federal courts of experts providing information about scientific replicability by default. Such a practice would alert lawyers and judges to issues of replicability *before* scientific evidence enters the courtroom through expert testimony. Thus, lawyers would be alerted that they should question the expert witness about scientific reliability, and judges would be made aware of possible scientific reliability concerns—addressing the very problems that Neal and colleagues and Chorn and Kovera experimentally identified that attorneys and judges have when faced with unreliable science.<sup>135</sup>

### B. Additional Proposals

In addition to amending FRCP 26(a)(2)(B), other proposals that encourage experts to disclose replicability during discovery could be adopted simultaneously. I detail a potential judge-level and lawyer-level proposal that could keep unreliable science out of the courtroom by putting the onus on experts to disclose issues of replicability.

At the judge level, federal judges could adopt local rules or individual chambers' rules that require experts to make a replicability synopsis during discovery.<sup>136</sup> Adopting rules at the local or individual level would be a piecemeal approach rather than a uniform federal approach. However, because federal jurisdictions and judges have “considerable autonomy” to implement court rules,

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<sup>133</sup> See *supra* Section V.B.

<sup>134</sup> See U.S. CTS., *Rules Suggestions*, <https://www.uscourts.gov/rules-policies/records-and-archives-rules-committees/rules-suggestions> [<https://perma.cc/DS2Z-324Y>] (providing dates that suggestions were received and the status of the suggestions' consideration).

<sup>135</sup> Neal et al., *supra* note 7, at 154; Chorn & Kovera, *supra* note 72, at 550–51.

<sup>136</sup> See e.g., U.S. CTS., *Judges and Judicial Administration—Journalist's Guide*, <https://www.uscourts.gov/statistics-reports/judges-and-judicial-administration-journalists-guide> [<https://perma.cc/3DX4-T9HQ>] (“Each appellate, district, and bankruptcy court has its own set of local rules, addressing procedural matters not uniformly governed by federal statute, Judicial Conference policy, or the Federal Rules of Procedure. In some jurisdictions, individual judges also have a set of rules that govern cases in their courtrooms. Local rules and individual judges' rules are posted on court websites.”).

the individual-adoption approach could allow for a quicker adoption of the replicability synopsis than the FCRP-amendment approach may offer.<sup>137</sup>

In addition, the proposal to amend a Federal Rule may not reach state courts if state courts choose not to adopt the Federal Rules.<sup>138</sup> However, state courts could also adopt local rules that require experts to make a replicability synopsis.<sup>139</sup> Although some state courts may tend to wait for federal rule changes to be made before adopting such a change themselves, states could adopt the replicability synopsis before the federal courts and act as state “laborator[ies].”<sup>140</sup> Thus, encouraging the adoption of a replicability synopsis rule at the local level could reach jurisdictions that may not be affected by a change to a Federal Rule.

At the lawyer level, lawyers could be incentivized to ensure experts disclose replicability issues in discovery by facing disciplinary sanctions for not doing so. For instance, if the jurisdiction a lawyer practices in has adopted the American Bar Association’s Model Rules for Lawyer Disciplinary Enforcement, the lawyer could be sanctioned under Rule 10.<sup>141</sup> Raising replicability issues in expert evidence could be considered a duty lawyers owe to the legal system.<sup>142</sup> Thus, if lawyers “intentionally, knowingly, or negligently” put forth an expert’s testimony that is based on faulty science, their actions could cause injury to parties and to the court system and thus be deserving of sanctions.<sup>143</sup> Without, or in addition to, a formal amendment to FRCP 26(a)(2)(B), the imposition of ethical violation sanctions on lawyers could be another route to encourage experts to comply with disclosing replicability issues.

### C. *Proposals Complement Those of Other Scholars*

A replicability synopsis amendment to FRCP 26(a)(2)(B), as well as proposals for changes to local rules, judge rules, and lawyer ethical obligations, are compatible with many of the proposals other scholars have put forth to address

<sup>137</sup> See *id.* (describing local and individual judge rules as an area where “federal courts have considerable autonomy”). Such rules can be adopted when they are not inconsistent with the Federal Rules. I argue the replicability synopsis would not be inconsistent with FRCP 26(a)(2)(B) because it would function as an additional disclosure requirement, similar to and consistent with disclosures required by subparts i–iii of FRCP 26(a)(2)(B).

<sup>138</sup> See, e.g., John B. Oakley, *A Fresh Look at the Federal Rules in State Courts*, 3 NEV. L.J. 354, 355 (2003) (finding that “the trend toward state conformity to the federal rules stopped accelerating”).

<sup>139</sup> See, e.g., SUP. CT. NEV., *Rules of Practice for the Eighth Judicial District Court of the State of Nevada*, <https://www.leg.state.nv.us/courtrules/eighthdcr.html> [<https://perma.cc/Z26R-CHPB>] (providing local rules for courts in Clark County, Nevada).

<sup>140</sup> See *New State Ice Co. v. Liebmann*, 285 U.S. 262, 311 (1932) (describing state courts as having the ability to “if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country”).

<sup>141</sup> MODEL RULES FOR LAWYER DISCIPLINARY ENFORCEMENT 10 (AM. BAR ASS’N 2020).

<sup>142</sup> *Id.*

<sup>143</sup> *Id.*

unreliable science entering the courtroom. Here, I discuss how adopting proposals from other scholars would be consistent with requiring that experts make a replicability synopsis disclosure in discovery.

Adopting a requirement that experts disclose replicability issues in discovery would be compatible with proposals to increase the scientific literacy of judges, lawyers, and law students. Developing scientific training courses for judges, as McAuliff and Groscup have proposed,<sup>144</sup> and for judges, lawyers, and law students, as DeMatteo and colleagues have proposed,<sup>145</sup> would enhance the ability of courtroom actors to engage with experts' replicability synopsis disclosures. Developing databases and treatises for lawyers and judges to educate themselves, as Neal and colleagues have proposed,<sup>146</sup> would similarly improve courtroom actors' ability to assess experts' information about scientific replicability. Thus, simultaneously requiring more of experts and increasing the scientific awareness of legal actors would be a mutually beneficial set of changes to ensure unreliable science is excluded from the courtroom.

In addition, the proposal to require experts to disclose replicability issues could even be compatible with proposals to appoint additional experts. Although requiring more from parties' experts in discovery conflicts with replacing parties' experts with neutral court-appointed experts, as proposed by Young and Goodman-Delahunty,<sup>147</sup> such a proposal could work in harmony with appointing scientific advisors to courts, as McAuliff and Groscup proposed.<sup>148</sup> By requiring parties' experts to comment on replicability issues, a scientific panel of experts, just like legal actors, could make more informed evaluations.

My replicability synopsis proposal could be adopted in tandem with other expert-focused proposals. Experts who make replicability synopses could also meet with opposing party experts in pre-trial meetings to discuss data issues and to sign ethical codes about their representations, as proposed by Chin.<sup>149</sup> As proposed by Neal and colleagues, experts could be especially attentive to the assessments and data they use to form courtroom opinions.<sup>150</sup> And scientists conducting litigation science could adopt the practices for reproducible experiments that Beerdsen proposed.<sup>151</sup> Each of these proposals could be adopted with the replicability synopsis to create additional safeguards before expert science enters the courtroom.

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<sup>144</sup> McAuliff & Groscup, *supra* note 83, at 47.

<sup>145</sup> DeMatteo et al., *supra* note 23, at 132.

<sup>146</sup> Neal et al., *supra* note 7, at 156–57.

<sup>147</sup> Young & Goodman-Delahunty, *supra* note 94, at 307–08.

<sup>148</sup> McAuliff & Groscup, *supra* note 83, at 46.

<sup>149</sup> Chin, *supra* note 8, at 234.

<sup>150</sup> Neal et al., *supra* note 7, at 155.

<sup>151</sup> Beerdsen, *supra* note 113, at 573, 582.



## CONCLUSION

The replication crisis has come to the sciences, and it is only a matter of time before it could come to the courtroom through admitted expert testimony. A focus on issues related to scientific replicability should not be misconstrued as a call to doubt all scientific testimony. Rather, the court system needs to require more of experts so that lawyers know when to question experts about unreliable evidence and judges know when to exclude such evidence.

Requiring experts to disclose replicability issues during discovery is one intervention that could keep unreliable science out of the courtroom. By amending FRCP 26(a)(2)(B), experts would be mandated to provide information about pertinent replicability issues before scientific evidence is admitted in court. Adopting related rules in local jurisdictions and judges' chambers, and creating a new lawyer ethical violation, could further promote expert disclosure. Other scholars' proposals to adopt training for legal actors and to encourage experts to base their opinions in reliable sources could also be simultaneously adopted. By acting now to develop safeguards that require experts to disclose replicability issues, we could prevent a scientific crisis in the courtroom.

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