

# Replication Value in the Courtroom: a Commentary on Isager, van 't Veer & Lakens

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This commentary is a response to Isager, P. M., van 't Veer, A. E. & Lakens, D. (2025): Replication value as a function of citation impact and sample size. It argues that, in assessing "the value of of being correct about the truth status of a claim," it is important to try to capture nonscientific impact. This commentary focuses in particular on the impact that original research can have in a legal context.

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## Introduction

Original research is abundant and can propagate in unexpected ways. Results can be transmitted around the globe in seconds and can not only add to the collective knowledge of the scientific community, but also have an impact far outside of that community. They may show up in courtrooms, in policy debates, in boardrooms, and in classrooms, and wherever research results go, they might affect decision processes and end up affecting real people's lives. The "value of being correct about the truth status of a claim" (Isager et al., 2025) is even more important than the authors suggest.

To help researchers determine which claims to prioritize for replication, Isager et al. (2025) propose a sensible and simple approach, based primarily on citation counts (as a measure of value) and sample sizes (as a measure of uncertainty). When it comes to using citation counts as a measure of value, the authors acknowledge that clinical, political, and educational impact and other sources of value are unlikely to be captured fully by citation counts (Isager et al., 2025, pp. 10-12). In this commentary, I argue that citation counts represent a promising start for evaluating the value of a claim, but that it is important to try to capture nonscientific impact as part of assessing value, even if doing so will be more complex than assessing scientific impact. I will focus on the impact that original research can have in a legal context.<sup>1</sup> A full accounting for nonscientific impact will likely require significant follow-up work, but I believe that a beginning can be made within Isager et al.'s proposed framework.

## Scientific evidence in the courtroom

Scientific evidence typically comes into the courtroom through a scientific expert witness (or "expert")

who has been retained by one or more of the parties to present it. It typically takes one of two distinct forms: (1) framework evidence or (2) diagnostic evidence (Faigman et al., 2014). Framework evidence usually consists of "off-the-shelf" scientific evidence. It provides an empirical framework, built on a foundation of research, that is offered to help a jury (or judge)<sup>2</sup> understand a relevant topic of scientific inquiry. Framework evidence can inform the jury on matters such as how witnesses' memories or perception might be distorted, or the effects of trauma on human behavior (Faigman and Monahan, 2005). It might teach a jury about such topics as inattention blindness, change blindness, or other topics from visual metacognition (Jaeger and Levin, 2017). It is scientific evidence of a general nature, and while it is usually introduced in an effort to help the jury draw certain inferences with respect to the case they are evaluating, framework evidence is not specifically about the case. It is evidence about groups, populations, general trends, that jurors are invited to apply to the facts of the case. Diagnostic evidence, on the other hand, is evidence that specifically relates to the facts of the case, and that usually is specifically created for use in the case. A single expert witness may offer both types of evidence—e.g., explaining a framework and then applying it to the case at hand—or offer just one or the other.

<sup>1</sup>My commentary focuses on the US legal system. Courts in other countries, of course, also rely on scientific evidence, but the procedures and admissibility requirements of such evidence differ from jurisdiction to jurisdiction.

<sup>2</sup>In the US legal system, the finder of fact may be a jury or a judge. For readability's sake, this paragraph describes the process with respect to juries, but expert witnesses can be employed to explain scientific evidence to both juries and judges.

It is framework evidence where the truth status of published research results is most acutely at issue. When a scientific researcher publishes a claim relating to, e.g., the effect of distraction on memory, that claim could end up in an expert report the next day and presented in court a few weeks later. An expert who presents framework evidence in court oftentimes is not the researcher who performed the underlying research; the expert can be anyone who is “qualified as an expert by knowledge, skill, experience, training, or education” (“Federal Rule of Evidence 702,” 2023). If the original researcher were in the courtroom, they could be questioned about the details of their research process in a way that most experts witnesses cannot. An expert who summarizes a study for the jury might be able to answer questions about the details insofar as those details have been included in publications, but (especially for older published results) they will usually not be able to speak to the kinds of methodological details that can render research results unreliable and unreproducible—details that may not have been included in the published results. The methodological problems uncovered during the Replication Crisis are not widely known or understood within the legal community (Beerdson, 2021; Chin, 2014). It is therefore particularly important to vet studies that are being used in court, especially if they are widely used.<sup>3</sup>

### Proposals

Under Isager et al.’s proposal (2021), legal impact is likely not entirely invisible. If claims generated by a particular discipline are routinely used in court, then researchers working in that field may already be pursuing research that builds on past court-relevant research and generating citations that serve to grow the claims’  $RV_{Cn}$ . But scientific research projects, of course, are not necessarily driven by legal or other nonscientific uses of past research results, and so legal impact will not always be captured in citation counts.

One way to build on the framework proposed by Isager et al. would be to expand variable “C” to include not only citations in scientific publications, but also non-scientific references. To measure impact in courtroom settings specifically, such an effort could include searching legal databases for documents referencing a study. A fully comprehensive survey of all courtroom uses of a particular scientific study is likely not possible with currently available research tools. Trial transcripts and other hearing transcripts, for example, are (unfortunately for these purposes) not systematically included in publicly available databases. Additionally, not every court’s opinions are systematically indexed and included in legal databases (Hoffman et al., 2007). That

said, if a study did turn up in court opinions, motions, indexed expert reports, or other filings, this would provide an indication that the study had courtroom impact that should be considered along with its scientific impact as determined through a scientific citation count.

How to combine scientific citation counts with legal references, for purposes of calculating  $RV_{Cn}$ , is a complex question. Perhaps in the future there will be replication projects specifically targeting claims with an impact in a specific (legal, clinical, policy, educational, etc.) setting. For now, choosing how to combine different types of impact necessitates some subjective choices. The most straightforward option would be to give a single legal reference the same weight as a single scientific citation. If a scientific citation represents a researcher’s use of an article as support for a research decision (Isager et al., 2025, p. 10) then a legal reference represents the use of the article by a legal actor (usually an expert, lawyer, or judge) as support for a legal or factual argument. Whether a research decision has more, less, or equal importance compared to a court-based argument that may affect a person’s freedom or financial situation is a question to which there is no objective answer.

Another option—one taking into account the relative frequency of scientific references in science and in law—might suggest giving a legal reference a bit more weight than a scientific citation, not because legal use of research results is inherently more “weighty” than scientific use, but in recognition of the disciplines’ different citation practices. Most scientific articles cite numerous sources, which dilutes the value of a single citation as a marker of support for a research decision. Legal proceedings, conversely, will rarely generate references to more than a select few studies, even when considering only those proceedings that involve some form of scientific evidence. A scientific study cited in a legal proceeding, then, arguably represents a larger spotlight on the article than the study’s appearance in the reference list of another scientific article, and by implication represents a greater article-specific impact.

To some extent, legal impact could also be taken into account within the framework proposed by Isager et al. The authors envision a four-step process for selecting claims for replication (Isager et al., 2025, pp. 27-28). Step 3 involves an in-depth study of replication candidates. The authors acknowledge that the details of this step are “a topic of discussion.” Their discussion suggests that one of the likely criteria, “the perceived value of the research claim,” could be a measure that is dis-

<sup>3</sup>Studies have consistently found that experts are used in more than half of civil cases that reach trial. (Champagne et al., 1991; Gross, 1991; Jurs, 2016).

tinct from the citation count used to assess  $V$  (and from there  $RV_{C_n}$ ) in Step 2. Perhaps the in-depth study at this stage could include indicia of value that lie outside of citation counts, including legal impact but also clinical, political, and educational impact. Of course, such an approach would fail to capture all legal impact, because it would be performed only on replication candidates that have made it to Step 3 of the process. A claim that has significant nonscientific impact but somehow has not garnered many citations in scientific journals would be assigned a low  $RV_{C_n}$  and would be filtered out at an earlier stage.

### Conclusion

Isager et al.'s proposal is a thoughtful first step toward determining which claims to include in replication studies. As the authors acknowledge, it does leave out any nonscientific impact that a claim might have. The legal system does not currently have a strong ability to evaluate the reliability of published research results, and yet the use of scientific evidence can change the outcome of a lawsuit. Of course, the legal community is not the only nonscientific community that makes use of scientific findings and there are likely numerous areas where the impact of research results is significant. For that reason, assessing the value of a claim based on scientific citations alone is risky.

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### Open Science Practices

This is purely conceptual and as such is not eligible for Open Science badges. The entire editorial process, including the open reviews, is published in the online supplement.

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