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THE *CSI* EFFECT: POPULAR FICTION ABOUT FORENSIC SCIENCE AFFECTS THE PUBLIC'S EXPECTATIONS ABOUT REAL FORENSIC SCIENCE

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ABSTRACT: Two of a number of hypotheses loosely referred to as the CSI Effect suggest that the television program and its spin-offs, which wildly exaggerate and glorify forensic science, affect the public, and in turn affect trials either by (a) burdening the prosecution by creating greater expectations about forensic science than can be delivered or (b) burdening the defense by creating exaggerated faith in the capabilities and reliability of the forensic sciences. The present study tested these hypotheses by presenting to mock jurors a simulated trial transcript that included the testimony of a forensic scientist. The case for conviction was relatively weak, unless the expert testimony could carry the case across the threshold of reasonable doubt. In addition to reacting to the trial evidence, respondents were asked about their television viewing habits. Compared to non-CSI viewers, CSI viewers were more critical of the forensic evidence presented at the trial, finding it less believable. Regarding their verdicts, 29% of non-CSI viewers said they would convict, compared to 18% of CSI viewers (not a statistically significant difference). Forensic science viewers expressed more confidence in their verdicts than did non-viewers. Viewers of general crime programs, however, did not differ significantly from their non-viewing counterparts on any of the other dependent measures, suggesting that skepticism toward the forensic science testimony was specific to those whose diet consisted of heavy doses of forensic science television programs.

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In recent years, the television program *CSI* and its spin-offs have portrayed forensic science as high-tech magic, solving crimes quickly and unerringly. Of course, *CSI* is only fiction. One forensic scientist estimates that 40% of the "science" on *CSI* does not exist, and most of the rest is performed in ways that crime lab personnel can only dream about.[1]

The gap between fact and fiction has led *CSI* to be accused of (or credited with) having a variety of effects on American society.[2] Legal scholars, however, will be most interested in hypothesized effects related to trials, which come in two basic flavors: one posits that *CSI* adds to the burdens of the prosecution, and the other asserts that it adds to the burdens of the defense.[3]

The hypothesis heard most often is that *CSI* has raised the public's expectations for the kind of forensic-science evidence that could and should be offered at trials to such heights that jurors are disappointed by the real evidence with which they are presented. Jurors tutored by *CSI* have come to expect high-tech forensic science to exist for all kinds of crime scene residua and to be able to solve all kinds of crimes. Evidence actually offered at trials disappoints, because either too little (or no) forensic science is presented or what is presented is less impressive than what is seen on television. Either way, goes this theory, jurors are acquitting more defendants because in court they are not seeing enough forensic science to persuade them of guilt.[4]

An alternative hypothesis, which runs in the opposite direction, is that *CSI* has fooled the public into thinking that forensic science is far more effective and accurate than it actually is.[5] If true, jurors may be likely to readily accept whatever conclusions forensic science witnesses point them to.

The two hypotheses are not necessarily at war with each other. The prosecution might benefit when it presents any forensic-science evidence, and the defense might benefit when there is no forensic-science evidence.

Whether the "*CSI* Effect" helps the prosecution or the defense, the commentators seem to agree on one thing: that *CSI* is convincing the public that forensic science not only is science, but it is super science. If true, this is

1. Simon Cole & Rachel Dioso, *Law and the Lab: Do TV Shows Really Affect How Juries Vote? Let's Look at the Evidence*, WALL ST. J., May 13, 2005, at W13 (quoting forensic scientist Thomas Mauriello).

2. *Id*.; Kimberlianne Podlas, *"The CSI Effect": Exposing the Media Myth*, 16 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 429 (2006).

3. Other hypothesized "*CSI* effects" are that the program has educated the public about forensic science, that it has increased the public's interest in forensic science, and that it has increased the number of students who want careers in forensic science. *Id*. at 442.

4. *Id*. at 433.

5. *Id*. at 437.

occurring at an ironic time in the history of law and forensic science because courts and scientists are beginning to realize that there is surprisingly little science in some of what is called forensic science. In the world beyond the television screen, DNA exonerations suggest that forensic-science errors and fabrications are among the leading causes of false convictions.[6] Researchers have been detecting and analyzing forensic-science errors as well as conceptual and practical shortcomings of the fields, particularly in regard to the identification or individualization areas.[7] Further, after *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,[8] and *Kumho Tire Co. v. Carmichael*,[9] courts have begun to scrutinize such evidence with more skepticism and have been surprised to discover how scientifically weak some of the forensic-science fields are.[10] On this subject, television and reality have been moving in opposite directions.

That public expectations of science are born of fictional portrayals of science, rather than of scientific reality, has long been thought to be true of forensic science, where public beliefs have been shaped by fiction at least since Conan Doyle penned *Sherlock Holmes*.[11] But, as Professor Tom R. Tyler has commented recently, "[T]he *CSI* effect has become an accepted reality by virtue of its repeated invocation by the media," and while it is "consistent with empirical findings in other areas of legal psychology" and "accords with the intuitions of participants in the trial process," "no existing empirical research

6. Michael J. Saks & Jonathan Jay Koehler, *The Coming Paradigm Shift in Forensic Identification Science*, 309 SCIENCE 892, 892 (2005) (reporting from a database of DNA exonerations maintained by the Innocence Project at Cardozo Law School, finding that the trial evidence in 63% of DNA exoneration cases contained errors in results obtained by forensic-science expert witnesses (a rate of error that was second only to eyewitnesses) and that the testimony of expert witnesses in 27% of DNA exoneration cases contained fabricated or seriously misleading assertions (a rate higher than for any other category of witness)).

7. *See, e.g.*; *id*. 4 DAVID L. FAIGMAN ET AL., MODERN SCIENTIFIC EVIDENCE §§ 31:1–43:57 (2006–2007); Jane Campbell Moriarty & Michael J. Saks, *Forensic Science: Grand Goals, Tragic Flaws, and Judicial Gatekeeping*, 44 JUDGES' J., Fall 2005, at 16; D. Michael Risinger et al., *The* Daubert/Kumho *Implications of Observer Effects in Forensic Science: Hidden Problems of Expectation and Suggestion*, 90 U. CAL. L. REV. 1, 27–42 (2002); Michael J. Saks, *Merlin and Solomon: Lessons from the Law's Formative Encounters with Forensic Identification Science*, 49 HASTINGS L.J. 1069, 1082–86, 1094–127 (1998).

8. 509 U.S. 579 (1993).

9. 526 U.S. 137 (1999).

10. *See, e.g.*, United States v. Green, 405 F. Supp. 2d 104, 107 (D. Mass. 2005) (firearms identification); United States v. Hines, 55 F. Supp. 2d 62, 73 (D. Mass. 1999) (handwriting identification); United States v. Llera Plaza, 188 F. Supp. 2d 549, 565 (E.D. Pa. 2002) (fingerprint identification); United States v. Starzecpyzel, 880 F. Supp. 1027, 1034 (S.D.N.Y. 1995) (handwriting identification); Williamson v. Reynolds, 904 F. Supp. 1529, 1557 (E.D. Okla. 1995) (microscopic hair identification).

11. *See* John I. Thornton, *Criminalistics—Past, Present, Future,* 11 LEX ET SCIENTIA 1, 16 (1975).

shows that it actually occurs."[12] The supposed effects have been supported by nothing more than anecdotes.[13]

The present article reports an empirical study designed to test one fundamental element of the *CSI* Effect—whether people who are marinated in forensic-science fiction react differently to the more conventional kinds of forensic science that come to court. Specifically, do *CSI* viewers give forensic science more weight than it deserves? Or, by having had their expectations raised, have they become more skeptical?

12. Tom R. Tyler, *Viewing CSI and the Threshold of Guilt: Managing Truth and Justice in Reality and Fiction*, 115 YALE L.J. 1050, 1083 (2006). As of December 2006, no empirical tests of any of the hypothesized *CSI* effects could be found.

One reported empirical study purports to be a test of the *CSI* effect, but a careful examination of its methods indicates that it does not actually do so. *See* Kimberlianne Podlas, *"The CSI Effect": Exposing the Media Myth*, 16 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 429 (2006). Podlas presented a brief case summary to students acting as mock jurors, measured the frequency with which those students watched *CSI*, and asked them to render a verdict on the case summary. *Id*. at 454–56. The results showed no effect on verdicts or several other variables as a function of frequency of *CSI* viewing, which is the basis for the title's reference to a *CSI* effect "myth." *Id*. at 459–61. For reasons that are not explained, however, the case summary presented to Podlas's mock jurors was deliberately designed to render forensic-science evidence irrelevant to the issue of guilt or innocence:

> The criminal law scenario recounted an alleged rape, a crime common to *CSI*. Because the study investigated whether forensic or "*CSI* reasons" improperly influenced the verdict decision-making process, the scenario presented no critical issues pertaining to or that could be ascertained with reference to forensics. Instead, it presented only issues of witness credibility. In other words, the case was not a "whodunit" but a "what happened." The alleged victim claimed that she was forced to have non-consensual sex, whereas the defendant claimed that the sexual encounter was wholly consensual. Because there was no question of whether the defendant and alleged victim had engaged in sexual intercourse—but, rather, whether the intercourse was consensual—forensic evidence could not shed light on the critical issue of consent. This rendered any forensic evidence utterly irrelevant to a conclusion of "not guilty."

Id. at 455. (footnote omitted). Only a small percentage of Podlas's study participants gave insufficient forensic-science testing as the reason for their votes to acquit. *Id*. at 460. Podlas interprets this as showing that

> in rendering "not guilty" verdicts, frequent viewers of *CSI* are no more influenced by *CSI* factors than are non-frequent viewers. In fact, considering the small minority of *CSI* viewers who considered *CSI* factors in their verdicts, the data suggests that they are not influenced by such factors, or consider and are influenced by the very same factors as are non-frequent viewers. Consequently, the empirical evidence does not support any anti-prosecution "*CSI* Effect."

Id. at 461.

However, because forensic-science evidence was irrelevant to the case, the more likely explanation is that the great majority of participants saw that irrelevance. Any testing (such as fingerprints or DNA) that might show the defendant was in the complainant's bedroom or had sex with her would only confirm facts to which the parties already agreed. Why would anyone, including die-hard *CSI* fans, fault the government for not conducting irrelevant scientific tests that would do nothing to help resolve the disputed issues in the case?

13. *E.g.*, Cole & Dioso, *supra* note 1; Janine Robben, *The 'CSI' Effect: Popular Culture Finds the Justice System*, 66 OR. ST. B. BULL. 8 (2005); Kit R. Roane, *The CSI Effect*, U.S. NEWS & WORLD REP., Apr. 25, 2005, at 48; Richard Willing, *'CSI Effect' Has Juries Wanting More Evidence,* USA TODAY, Aug. 5, 2004, at 1A.

I. THE STUDY

We prepared a brief (11-page) simulated transcript of a criminal trial in which the principal item of inculpatory evidence was hair recovered from a ski mask that had been left at the crime scene by the perpetrator. During the trial, a forensic scientist testified that he had conducted a microscopic analysis of the crime scene hair and the defendant's hair and that it was his opinion that the hair from the crime scene originated from the defendant.[14] This microscopic hair analysis was the only forensic evidence offered and was similar in its essentials to the sort of testimony that a microscopic hair identification expert gives in trials when identifying a suspect as the source of questioned hair.[15] The transcript was presented to 48 university students, all of whom

14. The case involved the murder of a convenience store clerk during an attempted robbery. The inculpatory evidence consisted of (1) a doubtful eyewitness identification (the witness barely saw the perpetrator, at some distance, at night), and (2) microscopic hair comparison. The key statements by the examiner were the following:

> A: Yes. I obtained several hairs taken from a ski mask known to have been worn by the perpetrator at the time of the crime. I also removed a sample of hairs from the defendant. Then I compared the two sets of hairs under a microscope.
>
> A: The two sets of hairs appeared quite similar. They were alike in all microscopic detail.
>
> A: In my field, we examine 16 different attributes of hair, for example, color, structure, and thickness would be among them. As I make my comparisons, I think about how common or uncommon I believe the different characteristics are in the population, based on other hair I've examined. The more rare the characteristics are, the more significant it is if those characteristics are found in both the crime scene hair and the defendant's hair.
>
> A: It is my judgment that if a person were selected at random from the population, there is a very low probability that the person would have hair with the exact same attributes as the hair left at the crime scene by the perpetrator of this crime. That should give the jury a sense of the rarity of the crime scene hair and the improbability that the similarity between the defendant's hair and the perpetrator's is the result of random coincidence. So, although we cannot rule out the possibility that the hairs came from someone other than the defendant, the probability of that is low.
>
> A: Based on my analysis, I believe that the hair found at the crime scene belongs to the defendant.

Half of our mock jurors were presented with all of these statements (method described); the other half received only the final statement (conclusion only). No differences in responses resulted from their receiving the description of the method versus the conclusion alone.

15. Astute readers might note that the final statement made by the forensic scientist in our simulated trial transcript described in the preceding footnote is inappropriate for testimony about microscopic hair examination, which is considered unable to zero in on a single individual, but only to narrow the pool of suspects. First of all, notwithstanding textbook admonitions about the impropriety of microscopic hair examination testimony identifying a single individual as the source of the crime scene hair, it is not unusual for such expert testimony to do so. *See, e.g.*, Gregory v. City of Louisville, 444 F.3d 725 (6th Cir. 2006); Williamson v. Reynolds, 904 F. Supp. 1529 (E.D. Okla. 1995); John I. Thornton & Joseph L. Peterson, *The General Assumptions and Rationale of Forensic Identification*, in FAIGMAN ET AL., *supra* note 7, §§ 31:1–31:47. More important, in essential respects the expert's opinion regarding hair identification in our simulated trial typifies other forensic-science identification testimony, such as that given by examiners of handwriting, firearms, fingerprints, and bitemarks. Our respondents have no way of knowing that hair identification is an exception (formally, though not always in practice). Finally, our forensic scientist performed an examination that is typical of other fields of forensic individualizations: she makes a visual observation and draws a subjective inference. It is this sort of unscientific, low-tech procedure that stands in contrast to what is portrayed in so much of CSI.

were jury-eligible (over 18 years of age and citizens of the United States), who assembled in small groups for the purpose of participating in the study.[16]

After reading the transcript, participants completed a questionnaire that assessed their perceptions of both the trial as a whole and the forensic-science evidence specifically. Most questions called for responses on seven-point scales. Finally, the participants were asked about the frequency with which they viewed both forensic-science themed programs (for example, *CSI, CSI Miami,* and *CSI New York*) and general crime-themed programs (for example, *Law and Order, Cold Case,* and *Without a Trace*).

II. RESULTS

Participants were grouped according to the frequency with which they reported viewing the forensic science and general crime television programs. Those participants who reported never watching were classified as nonviewers, and those who reported watching one or more shows per month were classified as viewers.[17]

Participants who were forensic-science viewers rated themselves as having a better understanding of the tasks that forensic scientists perform (M = 5.00) than nonviewers (M = 3.42).[18] More importantly, forensic-science viewers were more critical of the forensic evidence presented in our trial. When asked about the extent to which they accepted as true the outcome of the hair analysis (that the hairs shared a common source), forensic-science viewers rated the evidence significantly less believable (M = 4.09) than nonviewers did (M = 4.86).[19] In addition, while not statistically significant, difference was found between the verdicts rendered (29% guilty verdicts by nonviewers compared to 18% by viewers); forensic-science viewers expressed marginally more confidence in their verdicts (M = 4.95) than did nonviewers (M = 4.21).[20]

Like those who watch forensic-science television programs, viewers of general crime shows reported that they had a better understanding of the tasks of a forensic scientist (M = 4.57) than those who do not watch any crime shows (M = 3.42).[21] Yet those who regularly view general crime programs did

16. We trust that most Jurimetrics readers are sufficiently familiar with inferential statistics that they understand the results we report in the margin. For those readers who desire more detailed explanations, we recommend the following texts: WILLIAM LEE HAYS, STATISTICS (5th ed. 1994); JAMES JACCARD & MICHAEL BECKER, STATISTICS FOR THE BEHAVIORAL SCIENCES (4th ed. 2001). Preliminary analyses (power analyses) suggested a sample size of 48 would be sufficient to detect the CSI effect, if it existed. In addition, the subsequent significance tests adjust for sample size by holding smaller samples to a higher standard when determining statistical significance. In other words, finding that a difference is statistically significant is the same as saying that the sample size was of sufficient size to test for the effect.

17. Eleven participants fell into neither of these groups.

18. The participants rated themselves on a scale of 1–7. Statistical analyses were conducted with one-way analyses of variance, $F(1, 35) = 15.21$, $p = 0.001$, $\eta^2 = 0.30$.

19. $F(1, 35) = 4.81$, $p = 0.035$, $\eta^2 = 0.12$.

20. $F(1, 34) = 2.36$, $p = 0.13$, $\eta^2 = 0.07$.

21. $F(1, 40) = 6.10$, $p = .018$, $\eta^2 = 0.13$.

not differ from their non-viewing counterparts on any of the other dependent measures. Skepticism toward the forensic-science testimony was limited to those whose diet consisted of regular doses of forensic-science television programs.

III. DISCUSSION

After reading a transcript of a criminal trial containing forensic-science expert testimony, participants who were viewers of forensic-science television programs claimed a greater understanding of forensic-science tasks, greater confidence in their verdicts, and greater skepticism about the results of a forensic hair analysis. These findings provide initial support for one important component of the hypothesized *CSI* Effect, namely, that people who watch such television programs regularly expect better science than what they often are presented with in courts (particularly when what the government is offering is expert testimony from one of the subfields of traditional forensic individualization science).[22] In other words, *CSI* leads viewers to expect high-tech science and something more than the intuition of the witness, so that when in court they are presented with much lower-tech science and the witness's subjective judgment, they are likely to find it less convincing than do non-*CSI*-viewers. To this extent, our data support the claims of those who have argued that the *CSI* effect increases the prosecution's burden.

By separately analyzing viewers with a regular diet of forensic-science television and viewers with a regular diet of non-forensic-science crime television, and finding a *CSI* Effect to exist only for the former group, we can infer that the effect is specific to exposure to forensic-science fiction, not to just any kind of crime fiction. Furthermore, the fact that those participants whom we regarded as viewers included those with a *CSI* diet of as little as once per month suggests that real-world manifestations of the *CSI* effect may not be limited to the heaviest consumers of forensic-science television shows.

On the other hand, no impact was found on votes to convict or acquit. The explanation might be methodological: measures of skepticism about the forensic-science evidence specifically are more sensitive than the verdict, which is a measure of judgments about the whole case. Another possibility is that with a larger sample and the resulting increased statistical power, significant differences in verdicts might be detected. (Note that the trends in verdicts were in the hypothesized direction.) A more substantive possibility is that the reduced weight given the forensic-science evidence by our *CSI* viewers, and the greater weight accorded by the non-*CSI* viewers, was not

22. *CSI* viewers seem to have a reaction similar to that articulated by the federal judge in *United States v. Green*, who was concerned to discover that the forensic firearms expert who had testified

> conceded, over and over again, that he relied mainly on his subjective judgment. There were no reference materials of any specificity, no national or even local database on which he relied. And although he relied on his past experience with these weapons, he had no notes or pictures memorializing his past observations.

405 F. Supp. 2d 104, 107 (D. Mass. 2005).

enough of a difference to affect verdicts when they evaluated the whole case, even in our simulated case where the forensic-science evidence constituted an unusually large portion of the evidence. If true, this finding would suggest that at the end of the day *CSI* does not alter verdicts as readily as some commentators have hypothesized.

Other qualifications should be kept in mind. Our study tests only a few aspects of the complex of hypotheses that constitute the *CSI* Effect in the context of one case with its particular fact pattern. Furthermore, it uses only one forensic-science technique as its vehicle for testing those possible effects. Studies of other aspects of the *CSI* Effect might obtain different findings. In addition, findings might be specialty-specific because people probably have different stereotypes of different areas of forensic science. Moreover, our mock jurors made individual decisions rather than deliberating as a jury would. Deliberation might blunt the observed differences (as the perceptions of viewers and nonviewers are compromised) or it might magnify them (in a variant on the polarization effect common to group decision making).

Assuming our findings were replicated using other trial scenarios and other forensic-science techniques, the direction of the causal arrow cannot be made unambiguously clear from this or any correlational study. Such a design cannot rule out the possibility that the causal arrow goes in the opposite direction, namely, that those with unusually high hopes for forensic science are drawn to forensic-science fiction. Though that possibility may seem unlikely, it nevertheless might be worth testing (by experimentally exposing people to different diets of television shows and seeing if the effect we have found persists).

The best, and perhaps the only, cure for distorted beliefs about forensic science caused by *CSI* is the same as that for remedying distorted impressions coming from other sources: that is, to counter bad information with good information, whether in public discourse or in trials themselves. The law can do nothing to control what the writers of *CSI* say on television, but it can do a far better job of controlling what forensic scientists say on the witness stand.[23]

23. Possible methods of "judicial gatekeeping" include limiting admission of forensic evidence, ensuring the proposed expertise fits with the issue at hand, limiting misleading terminology, allowing competing opinions into evidence, and providing limiting jury instructions. Moriarty & Saks, *supra* note 7, at 29–30.