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Perceived realism and the CSI-effect

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Abstract: Anecdotal claims from legal professionals suggest that jurors are increasingly expecting DNA evidence in criminal trials, due to the popularity of crime-drama television programs such as *Crime Scene Investigation* (CSI). This study extends research on the “CSI-effect” by investigating whether mock jurors’ verdict decisions differ as a function of the perception that television reflects real-life practices (perceived realism), evidence type, and evidence strength. Participants read a trial transcript in which the prosecution presented either strong or weak DNA/fingerprint/eyewitness evidence. They then provided a verdict and answered a questionnaire to assess their perceived realism of television programs, including crime-drama. For all three types of evidence, jurors high in perceived realism were more likely to convict than those low in perceived realism. Additionally, jurors were more likely to vote guilty if presented with DNA or fingerprint evidence compared to eyewitness testimony, while evidence strength only influenced verdicts in the eyewitness conditions. Results suggest that perceived realism is not associated with jurors’ expectations that DNA evidence be presented in court, and thus do not provide support for the purported CSI-effect. Perceived realism may actually be a desirable trait for prosecutors, as jurors high in perceived realism were in general more likely to convict.

Subjects: Criminal Justice - Criminology; Forensic Science - Law; Criminal Justice

Keywords: CSI-effect; perceived realism; juror decision-making; DNA; fingerprint; eyewitness testimony; evidence strength

ABOUT THE AUTHORS

Logan A. Ewanation is a PhD student in the psychology program at Carleton University, whose research primarily focuses on racial discrimination in the context of jury decision-making, as well as perceptions of evidence. Along with Susan Yamamoto and Jordan Monnink, he works in the Legal Decision-Making Lab run by Dr Evelyn M. Maeder. The lab investigates a number of issues in both the US and Canadian legal systems, with a particular emphasis on factors that may inappropriately influence jury decision-making. We aim to draw attention to these extra-legal factors in an attempt to ensure that defendants are provided with a fair and impartial trial, a central tenet of the criminal justice system.

PUBLIC INTEREST STATEMENT

Research has demonstrated that crime-drama television exaggerates the extent to which forensic techniques are used in criminal investigations. With the popularity of such shows, lawyers have expressed concern that jurors expect that forensic evidence will be presented, and are becoming increasingly likely to acquit when it is not. Previous research has focused on the quantity of crime drama that jurors consume. In the current study, we tested whether jurors’ perceived realism of crime drama is related to their verdict decisions in the presence or absence of forensic evidence. We found that regardless of the type of evidence presented, jurors who displayed higher levels of perceived realism were more likely to convict than jurors who held more skeptical views. Additionally, jurors were more likely to vote guilty if they were shown DNA or fingerprint evidence as compared to eyewitness testimony, regardless of their perceptions of realism in television programming.

In 2005, Robert Blake was acquitted of the charges he faced for allegedly murdering his wife. The case was reportedly lost due to the prosecution's inability to provide forensic evidence. The jury maintained that the prosecution "could not put the gun in his hand" when it failed to produce fingerprint evidence on the murder weapon or find gunshot residue on Blake's clothing (Cable News Network, 2005). This case demonstrates an emerging belief among legal professionals that jurors have unrealistic expectations that forensic evidence be presented in serious criminal trials (Cole & Dioso-Villa, 2009), even though it is often unavailable (Mancini, 2011). Researchers have proposed that this phenomenon, dubbed the "CSI-effect", is due to jurors gaining their information about scientific evidence primarily through popular crime drama television shows, such as *Crime Scene Investigation* (CSI; Tyler, 2006). Studies have shown that among different forms of forensic evidence, DNA is particularly influential (Lieberman, Carrell, Miethe, & Krauss, 2008; Maeder, Ewanation, & Monnink, 2016). Not only do jurors tend to see DNA as the infallible gold standard (Lieberman et al., 2008), but crime dramas often portray the collection and analysis of DNA as a simple, inexpensive, and error-free process (Cole & Dioso-Villa, 2007). McQuiston-Surrett and Saks (2009) additionally note that the complexity of DNA matching is often difficult for jurors to properly comprehend, which may cause them to rely on heuristic cues while evaluating this type of evidence (Koehler, 2011; Lieberman et al., 2008). As a result, jurors' evaluation of DNA analysis might be particularly vulnerable to media portrayals, and they might be especially suspicious of cases that do not have this form of evidence.

Although legal professionals have expressed concern about jurors failing to convict due to the lack of forensic evidence, existing empirical research has been unable to convincingly demonstrate such an effect (Podlas, 2006; Schweitzer & Saks, 2007; Shelton, Kim, & Barak, 2006). However, the majority of this literature has only measured the amount of crime drama that jurors watch, without taking into account how accurately they perceive the programs to reflect reality. Therefore, the current study examined the potential influence of participants' perceived realism of crime-drama television for cases involving strong vs. weak DNA analysis, fingerprint evidence, and eyewitness testimony. This design allowed us to understand whether controlling for mock jurors' perceptions of crime drama programs might uncover the elusive CSI-effect, and if so, whether it would apply differently to two alternate forms of forensic evidence. At the same time, we assessed jurors' ability to differentiate between low and high quality forms of each evidence type.

1. Perceptions of DNA evidence

Undoubtedly, DNA can be highly beneficial to the litigation process. For example, because DNA is a precise and accurate identifier when proper care is taken in the analysis process (Saks & Koehler, 2005), it allows judges and jurors to be more confident in their final decisions. It is perhaps unsurprising that DNA matching is regarded as the "gold standard" for which other forms of scientific evidence are to be admitted and judged in a courtroom setting (Clancy & Bull, 2015; Hans, Kaye, Dann, Farley, & Albertson, 2011; Lieberman et al., 2008). Lieberman et al. (2008) found that the majority of mock jurors rated DNA evidence as the most accurate and persuasive form of evidence as compared to fingerprints, fiber analysis, videotape footage, alcohol/drug tests, expert testimony, suspect confession, victim testimony, and eyewitness testimony. Other types of forensic evidence requiring scientific analysis (e.g. fingerprinting) were also perceived as more accurate and persuasive than non-forensic evidence, such as eyewitness testimony or victim identification. Golding, Stewart, Yozwiak, Djadali, and Sanchez (2000) similarly showed that mock jurors tended to vote guilty more often when DNA evidence was presented either alone or with a child's testimony as compared to the testimony alone. Jurors also tended to list DNA evidence as the most influential factor when asked about their reasons for convicting. Granted, the researchers also found that the addition of a contradictory alibi lessened this effect.

However, obtaining strong DNA evidence tends to result in plea bargains, thus avoiding trial (Goodman-Delahunty & Tait, 2006). Hence it is much more likely that when DNA evidence is presented in a criminal trial, it is because of clear weaknesses in its collection or analysis. Yet, some researchers have shown that jurors are unable to recognize the limitations of DNA evidence (e.g. deficiencies in lab proficiency testing or environmental contaminants; Lieberman et al., 2008). When DNA is presented at trial, experts testify on the likelihood that a random individual in the respective

population would have the same genetics as the DNA sample, known as the random match probability (RMP; McQuiston-Surrett & Saks, 2009). This probability is often described to jurors in the form of base rates, which can be difficult to interpret (McQuiston-Surrett & Saks, 2009). Researchers have suggested that when presented with these complicated base rates, jurors use heuristic cues to evaluate the DNA evidence (Koehler, 2011; Lieberman et al., 2008). Stemming from Tversky and Kahneman's (1973) availability heuristic—estimating the prevalence of an event according to the ease of retrieving similar examples from memory—Koehler (2011) argued that jurors find DNA matches more compelling when they cannot easily call to mind similar statistical comparisons. Thus, jurors may find even weak DNA evidence highly persuasive.

More recently, Maeder et al. (2016) confirmed the weight that jurors allocate to DNA analysis compared to other forms of evidence. Participants read a trial transcript in which either strong or weak DNA evidence was presented, with contradictory strong or weak eyewitness testimony being offered by the opposing trial party. Jurors preferred DNA analysis over eyewitness testimony in every instance, providing favorable verdict decisions to the litigating party that presented DNA. Contrary to Lieberman et al.'s (2008) research, jurors were less likely to convict when given strong compared to weak exonerating DNA evidence, and were more likely to convict when given strong compared to weak incriminating DNA evidence.

Despite jurors' apparent deficiencies in considering the flaws of DNA evidence, some have argued that US citizens are becoming more confident in their understanding of its reliability (Brewer & Ley, 2010). Researchers have found that individuals who reported viewing "heavy" amounts of television saw DNA evidence as more reliable than those who were "light" viewers, and that those who watched crime-drama and true-crime television reported a higher understanding of DNA evidence (Brewer & Ley, 2010). Thus, the general public may acquire their information regarding DNA and forensic evidence through media sources.

2. The CSI-effect

Modern empirical research regarding the CSI-effect has predominantly drawn on cultivation theory, with some interaction from social cognitive theory and audience reception studies (Brewer & Ley, 2010; Hayes & Levett, 2013; Ley, Jankowski, & Brewer, 2012). Cultivation theory proposes that television is the primary manner in which people receive their information, and that higher frequency viewers are more likely to be influenced by the messages provided through this form of media (Gerbner & Gross, 1976; Potter, 1986).

Early research exploring the CSI-effect conducted by Podlas (2006) categorized participants as either frequent or infrequent viewers of crime drama television. Participants were asked to read a trial transcript, render a verdict, and provide reasoning for their verdicts. Podlas (2006) predicted that frequent viewers would give more "CSI-related reasons" for their not-guilty verdicts compared to infrequent viewers; however, no differences between the two groups emerged. In similar work looking at a variety of case types, Shelton et al. (2006) found that "CSI-watchers" demonstrated slightly higher expectations for scientific evidence compared to "non-CSI-watchers," although these differences were only significant in attempted homicides or crimes involving a gun. However, there was no significant difference between the two groups' verdicts. Other researchers have observed that viewers of crime-dramas were more critical of hair-matching evidence than non-viewers, although again, no significant differences in final verdicts resulted (Schweitzer & Saks, 2007).

Using the cultivation theory framework, Brewer and Ley (2010) found that the amount of time that participants reported watching crime-television programming was correlated with higher ratings of self-perceived understanding of DNA and belief in its reliability. However, the frequency of crime-drama consumption was not related to final verdicts in a series of jury decision-making scenarios. Importantly, this study makes the assumption that crime dramas portray forensic investigative techniques in unrealistic manners. It is thus beneficial that research has begun to examine these shows' content in order to guide future studies.

Ley et al. (2012) conducted a content analysis of the popular show CSI's portrayal and use of DNA. Of the episodes sampled, DNA was searched for in 66% of the cases and in 86% of the episodes. The process of searching for DNA was consistently depicted as a simple and routine procedure, and the show's investigators were successful in their search for DNA in 84% of the episodes. The authors concluded that the show's portrayal of DNA analysis is unrealistically straightforward, reliable, and crucial to solving cases (Ley et al., 2012). Unsurprisingly, a forensic consultant for the television show admits that 40% of the scientific techniques depicted in the program do not actually exist (Houck, 2006). This content analysis provides support that CSI and similar programming indeed portray DNA and forensic evidence in a manner that exaggerates real-world techniques (Ley et al., 2012). Some may argue, however, that heavy viewers are aware that a large portion of the content exists for the purposes of entertainment. This may lead such viewers to become more critical of the media content that they consume. Therefore, we argue that studies examining the CSI-effect can no longer merely look at consumption quantity, but must also consider the degree to which viewers believe the programs reflect real life. It stands to reason that CSI-effects are more likely to be active in individuals who believe that crime dramas offer accurate portrayals of forensic techniques.

3. Perceived realism

Research suggests that those who perceive what they are viewing to be reflective of reality will be more influenced by its content than those who do not (Potter, 1986; Quick, 2009). For instance, Taylor (2005) found that participants who viewed sexual content and rated it as realistic endorsed more sexually permissive attitudes than participants who rated the content as less realistic. Additional work exploring the relationship between television consumption and perceived realism has provided support for a positive relationship between these two variables and viewers' decision-making. For example, Busselle (2001) observed a relationship between participants' amount of television consumption and their responses to social judgments regarding extra-marital affairs and shootings. Furthermore, participants' perceived realism of television crime was positively related to the frequency in which they believed people were shot with guns in real life. Similarly, Quick (2009) found a positive association between the frequency of watching the medical drama *Grey's Anatomy* and perceptions of the show's credibility. Quick (2009) further demonstrated that participants who perceived the show's depiction of doctors as realistic also believed actual doctors to be courageous (in line with how they are depicted on the show). Although not conducted on a crime-drama, this research suggests that similar genre-specific effects could be found, as both *CSI* and *Grey's Anatomy* exaggerate depictions of the subject matter that they present.

Specifically looking at crime-dramas, Maeder and Corbett (2015) observed no effect of television consumption quantity or perceived realism on participants' verdicts in a mock juror study in which DNA evidence was presented by the prosecution and eyewitness testimony was presented by the defense. However, participants who perceived crime television as more realistic had more favorable attitudes towards both types of evidence. This relationship was subsequently explored with a path analysis, revealing significant direct and indirect effects on juror verdicts, operating through attitudes and perceptions of the DNA and eyewitness testimony. Moreover, participants who perceived crime-drama programming as reflective of reality were more influenced by the DNA evidence presented by the prosecution.

The study by Maeder and Corbett (2015) reveals new pathways in which perceived realism of crime-drama television may impact on juror verdicts in particular criminal cases. It also supports earlier research that consumption alone does not manifest CSI-effects amongst potential jurors (Podlas, 2006; Schweitzer & Saks, 2007; Shelton et al., 2006). Importantly, however, this study only included conditions in which the prosecution presented DNA evidence. Given that the CSI-effect reflects the concern that jurors who watch crime dramas may expect forensic evidence, and thus be unwilling to convict in its absence, it is essential to understand how perceived realism might operate in cases in which the prosecution presents other forms of forensic and non-forensic evidence in the absence of DNA.

4. Purpose and hypotheses

Building on previous research, it seems that CSI-effects must no longer be evaluated through dichotomous comparisons of viewers and non-viewers (Podlas, 2006; Schweitzer & Saks, 2007; Shelton et al., 2006). Maeder and Corbett's (2015) study examined the relationships among the prosecution's use of DNA evidence, the defense's use of eyewitness testimony, the amount of crime-drama television participants watched, and the degree to which they believed those programs reflected real-life practices. Though a good starting point, further examination of situations in which the prosecution fails to present DNA evidence is required, given that the principal complaint amongst legal professionals is that jurors will not convict in those cases (Cole & Dioso-Villa, 2009). As such, this study explores juror decision-making as a function of the presence or absence of DNA evidence presented by the prosecution, while examining the association between perceived realism of crime drama television and verdict outcomes. Additionally, we examined other forensic evidence (i.e. fingerprint analysis) as well as eyewitness testimony, and manipulated evidence strength, to gain a better understanding of potential heuristics that jurors use when evaluating different types of evidence.

Hypothesis 1. Given previous research showing that jurors view DNA as the most persuasive form of evidence (Koehler, 2001; Lieberman et al., 2008), we predicted that conviction rates would be significantly greater when the prosecution presented DNA analysis than when it presented fingerprint evidence or eyewitness testimony (Golding et al., 2000; Lieberman et al., 2008; Maeder et al., 2016).

Hypothesis 2. As predicted by the CSI-effect, we believed that participants who perceived television to be reflective of reality would convict less often in conditions when DNA was not present (Busselle, 2001; Maeder & Corbett, 2015; Quick, 2009).

Hypothesis 3. We predicted that participants who scored high on perceived realism would report more positive attitudes towards all types of evidence than participants who scored low on this scale (Busselle, 2001; Maeder & Corbett, 2015).

Hypothesis 4. Previous research regarding jurors' sensitivities to the differences between strong and weak DNA evidence has been conflicting (Lieberman et al., 2008; Maeder et al., 2016). This may be due to the fact that in these studies, participants' perceived realism of crime-drama television was not measured. Because of crime dramas' exaggerated portrayal of forensic analysis as unrealistically simple and reliable (Ley et al., 2012), we hypothesized that participants high in perceived realism would not be sensitive to differences between strong and weak physical evidence (fingerprints and DNA), but would be less likely to convict when given weak eyewitness testimony compared to strong eyewitness testimony. In comparison, we expected that participants low in perceived realism would be influenced by evidence strength for all three types of evidence.

5. Method

5.1. Participants

Three hundred and eighty-six participants were recruited using Amazon's Mechanical Turk (MTurk). Some researchers have raised ethical concerns regarding the use of crowdsourcing services like MTurk, particularly surrounding the low rate of pay that many participants receive (Fort, Adda, & Cohen, 2011; Pittman & Sheehan, 2016). However, some have argued that workers in MTurk tend to frame their earnings from participating in studies differently than money made at a conventional workplace, and that it is therefore inappropriate to evaluate MTurk payment rate in terms of salaries/hourly wages (Jiang, Wagner, & Nardi, 2015). As Mason and Suri (2012) noted, most workers do not rely on MTurk as their main source of income, and they have complete autonomy in selecting tasks. In any case, according to Horton and Chilton (2010), workers on MTurk have a median wage of \$1.38/h. Our study took an average of 22 min to complete, and participants were compensated with \$2 upon completion. Therefore, we paid our participants a higher hourly wage compared to the median rate in an attempt to fairly compensate them for their time and effort.

All participants were eligible for US jury duty (citizens at least 18 years old, having no felony charges or convictions without a full pardon). Of the total participants, 11 failed an attention check and 93 discontinued the survey after starting. Thus, the final sample included 282 participants (100 [35%] men, 181 [64%] women, 1 [0.5%] transgender), who ranged in age from 18 to 71 ($M = 36.5, SD = 11.2$). The majority of participants were White (74.1%), while 6% were Hispanic/Latino, 8.5% Black, 5.3% East-Indian, 4.3% Asian, 1.1% Native American, and 0.7% Middle Eastern.

5.2. Design

This study used a 3 (Evidence type: DNA vs. Fingerprint vs. Eyewitness Testimony) \times 2 (Evidence strength: Strong vs. Weak) factorial design, resulting in a total of six conditions. The trial transcripts were the same for all conditions, except for manipulations made to the evidence presented by the prosecution (described in further detail below).

5.3. Materials

5.3.1. Trial transcript

Participants read a trial transcript (approximately eight pages in length, depending on condition) involving a murder that took place in a local park. The case describes how the victim was stabbed and killed while jogging alone late at night (around 11:45 pm) in a park located in an urban area. As the victim's watch, running shoes, and MP3 player were missing, prosecutors believed that the perpetrator had taken these items as well. Hours after the incident was thought to have occurred, a police officer on patrol spotted a White man pacing anxiously around a 24h diner near the park, with blood on his shirt. The officer approached the man, asking if he needed help. The man said he worked as a cook for the diner, and his friend had cut himself earlier on in the shift, but that everything was fine. When the officer heard of the murder the next day, he encouraged detectives to look for the man he had seen. The detectives found the man in the park where the murder had occurred. When questioned by officers, he stated that he had been at the park the night the murder had occurred, but had left shortly after dark and walked around downtown before starting his shift. The Defense argued that the police arrested the first suspect that they found in order to appease angry citizens who were concerned that such a violent crime could take place in their local park.

In the transcript, we manipulated both the type and strength of evidence presented by the prosecution, while all other details were held constant. This evidence consisted of either an expert presenting DNA analysis, an expert presenting fingerprint analysis, or an eyewitness who saw the crime take place. In the strong DNA condition, a clean blood sample was found at the crime scene and was analyzed by an independent forensics laboratory with proper accreditations. In the weak DNA condition, the forensics laboratory was not accredited and possible contamination issues were made salient. For the strong fingerprint analysis condition, a highly experienced expert testified that the fingerprints taken from the murder weapon were of high quality and easily comparable to the fingerprints taken from the defendant. In the weak fingerprint condition, a relatively inexperienced technician testified with a lesser degree of confidence that he believed there was a fingerprint match between the defendant and the prints taken from the murder weapon. Finally, in the strong eyewitness condition, a park custodian testified with a high degree of confidence that the defendant was the murderer. The custodian witnessed the defendant in the park earlier in the evening, and the defendant ran right past him as he was fleeing the scene. In contrast, the custodian in the weak eyewitness condition had a low degree of confidence in his identification. Although eyewitness accuracy is not necessarily related to confidence (Brewer, Potter, Fisher, Bond, & Luszcz, 1999; Odnot, Wolters, & van Giezen, 2013), numerous researchers have identified that jurors place great weight on eyewitness' confidence when evaluating their testimony (Benton, Ross, Bradshaw, Thomas, & Bradshaw, 2006; Brewer & Burke, 2002; Magnussen, Melinder, Stridbeck, & Raja, 2010). Furthermore, in the weak eyewitness condition, the custodian saw the assailant for a lesser amount of time before

the crime, the lighting conditions were poor, and the murderer ran in the opposite direction of the witness when fleeing the scene. Across all conditions, the defense presented the testimony of a witness who provided an alibi for the defendant. The testimony regarding DNA evidence was adapted from a transcript used by Lieberman et al. (2008), while the current authors wrote the remainder of the transcript.

5.3.2. Juror instructions

Following the case summary and trial transcript, participants were provided with jury instructions discussing the burden of proof, the reasonable doubt standard, and the murder charge. These instructions were adapted from the Judicial Council of California Criminal Jury Instructions.

5.3.3. Measures

After reading the jury instructions, participants rendered a verdict (guilty or not guilty) regarding the murder charge. Following this, participants responded to an inventory, scored from 1 to 10, which assessed their attitudes toward the various evidence types. The DNA Evidence scale (adapted from Lieberman et al., 2008) showed good internal consistency in this sample ($\alpha = 0.81$), and featured five items (e.g. “if detectives obtain a blood sample from a crime scene, they can easily compare that DNA to a suspect’s DNA”). The Fingerprint Analysis Scale was also internally consistent ($\alpha = 0.83$), and featured five items (e.g. “Fingerprints are some of the best forensic evidence that can be collected”). Likewise, the Eyewitness Testimony Scale (Narby & Cutler, 1994) was internally consistent ($\alpha = 0.87$), featuring nine items (e.g. “the strongest evidence is provided by eyewitnesses”). Mean scores were compiled for each of the evidence types, with higher scores indicating more positive attitudes toward that type of evidence. Finally, participants answered a Perceived Realism scale (Busselle, 2001) that asked them to evaluate how accurately they believe television reflects particular aspects of everyday life, on a scale of -3 (not at all true) to 3 (very true). Sample items include “the crime you see on TV crime shows is very similar to crime in real life” and “the romantic relationships portrayed in drama programs are not all like romantic relationships in the real world.” This scale demonstrated good internal consistency in our sample ($\alpha = 0.85$).

5.4. Procedure

Participants were Mturk workers who completed the study online. Participants were randomly assigned to a condition after giving informed consent, at which point they read the corresponding trial transcript and responded to the juror measures. Upon completion, they were thanked for their time, debriefed, and compensated. This study received ethics clearance from the Carleton University Psychology Research Ethics Board (reference no. 15-034), and was conducted in compliance with ethical guidelines set forth by the American Psychological Association.

6. Results

Analyses were conducted on a total of $N = 282$ participants. Table 1 displays a breakdown of verdicts by evidence type and strength. As seen in Table 1, overall, 127 (45%) participants voted guilty, while 155 (55%) participants voted not guilty.

Table 1. Summary of verdict decisions across conditions

Evidence type	Evidence strength	Verdict	
		Guilty	Not guilty
DNA	Strong	31	14
	Weak	26	26
Eyewitness	Strong	22	28
	Weak	3	41
Fingerprint	Strong	22	22
	Weak	23	24

We used logistic regression analyses—a statistical technique that allowed us to predict the effect of our manipulated independent variables (evidence strength and evidence type) on a binary dependent variable (verdict). The resulting values indicate the relative likelihood of a guilty verdict in the presence of different evidence strengths and types. We conducted two hierarchical logistic regressions to examine the effect of evidence type on verdict (hypothesis 1) and test the interaction between evidence strength and evidence type (hypothesis 4). These regressions also explored whether participants who reported high perceived realism were less likely to convict when DNA was not present (hypothesis 2), as well as whether perceived realism moderated the relationship between evidence strength and evidence type (hypothesis 4). The use of dummy-coding allowed us to directly compare verdicts between the three types of evidence presented in the trial. As the first regression used DNA analysis as a reference group, verdicts in the eyewitness testimony and fingerprint analysis conditions could be directly compared to the verdicts in the DNA condition. To investigate differences in verdicts between the fingerprint analysis and eyewitness testimony condition, a second regression was performed with fingerprint analysis as the reference group.

The first regression (which used DNA analysis as the reference group for evidence type) is summarized in Table 2. In the first step of this regression, we entered in dummy-coded variables for the eyewitness and fingerprint evidence, along with evidence strength and perceived realism. Perceived realism was computed by summing the scores on Busselle’s (2001) Television Perceived Realism scale (after reverse-coding where appropriate). As expected, there was a significant main effect of eyewitness testimony ($b = -1.67, p < 0.001, OR = 0.19$), such that when the prosecution presented DNA analysis, jurors were over five times more likely to convict as compared to when the prosecution used eyewitness testimony. Similarly, evidence strength also significantly predicted jurors’ verdicts ($b = 0.97, p < 0.001, OR = 2.62$), as jurors in the strong evidence conditions were more than twice as likely to vote guilty compared to those who were in the weak evidence conditions. The effect of perceived realism was also significant ($b = 0.04, p < 0.001, OR = 1.04$), indicating that jurors higher in perceived realism were more likely to convict in general. In other words, the more participants believed that television reflects real life, the more likely they were to convict the defendant. In comparison, there was no significant main effect of fingerprint evidence ($b = -0.48, p = 0.14, OR = 0.62$), indicating that there was no difference in verdicts between the DNA and fingerprint conditions. In the second and third steps of the regression, we added the respective two and three-way interactions. As seen in Table 2, none of these interactions were significant.

Table 2. Summary of hierarchical logistic regression analysis for predicting jurors’ verdicts

Predictor	<i>b</i>	SE	OR
<i>Step 1</i>			
Eyewitness testimony	-1.67*	0.35	0.19
Fingerprint analysis	-0.48	0.33	0.62
Evidence strength	0.97*	0.28	2.62
Perceived realism	0.04*	0.01	1.04
<i>Step 2</i>			
Eyewitness × Evidence strength	1.48	0.86	4.41
Fingerprint × Evidence strength	-0.73	0.63	0.48
Realism × Eyewitness	0.05	0.03	1.05
Realism × Fingerprint	-0.01	0.02	0.99
Realism × Evidence strength	0.01	0.02	1.01
<i>Step 3</i>			
Realism × Evidence strength × Eyewitness	-0.03	0.009	0.98
Realism × Evidence strength × Fingerprint	0.07	0.05	1.07

Note: DNA and weak evidence were used as the reference groups for comparison.

* $p < 0.05$.

Table 3. Summary of hierarchical logistic regression analysis predicting jurors' verdicts

Predictor	b	SE	OR
<i>Step 1</i>			
Eyewitness testimony	-1.19*	0.35	0.31
DNA evidence	0.48	0.33	1.66
Evidence strength	0.97*	0.28	2.62
Perceived realism	0.04*	0.01	1.04
<i>Step 2</i>			
Eyewitness × Evidence strength	2.21*	0.85	9.15
DNA Evidence × Evidence strength	0.73	0.63	2.07
Realism × Eyewitness	0.06	0.03	1.06
Realism × DNA evidence	0.01	0.02	1.01
Realism × Evidence strength	0.01	0.02	1.01
<i>Step 3</i>			
Realism × Evidence strength × Eyewitness	-0.10	0.09	0.91
Realism × Evidence strength × DNA	-0.07	0.05	0.93

Note: Fingerprint analysis and weak evidence were used as the reference groups for comparison.

* $p < 0.05$.

To test for differences between fingerprint analysis and eyewitness evidence, we conducted a second hierarchical regression using fingerprint evidence as the reference group (see Table 3). Similar to the previous regression, we entered the dummy-coded variables for eyewitness and DNA evidence, evidence strength, and perceived realism in the first step. There was a significant main effect of eyewitness testimony ($b = -1.19$, $p = 0.001$, $OR = 0.31$), such that jurors presented with fingerprint evidence were over three times as likely to render a guilty verdict than jurors presented with eyewitness testimony. Like the first regression, the two and three-way interactions between the variables were added in the second and third steps, respectively. The second step revealed a significant interaction between eyewitness evidence and evidence strength ($b = 2.21$, $p = 0.01$, $OR = 9.15$), although no other two or three-way interactions were significant.

To probe the significant interaction, two additional *post hoc* logistic regressions were conducted on the fingerprint and eyewitness conditions respectively, using evidence strength as the single predictor. The first of these indicated that evidence strength had no significant effect on verdicts for jurors presented with fingerprint analysis ($b = 0.04$, $p = 0.92$, $OR = 1.04$). In comparison, evidence strength was a significant predictor of jurors' verdicts when the prosecution presented eyewitness testimony ($b = 2.37$, $p < 0.001$, $OR = 10.74$). Jurors were nearly 11 times more likely to convict when exposed to strong as compared to weak eyewitness testimony. A third regression was conducted to examine whether jurors were sensitive to differences in strong and weak DNA evidence. Results of this regression indicated that evidence strength had no significant effect on verdicts for participants presented with DNA evidence ($b = 0.80$, $p = 0.06$, $OR = 2.21$).

Finally, we predicted that there would be a relationship between scores on the Perceived Realism scale and attitudes toward eyewitness testimony, fingerprint analysis, and DNA evidence (hypothesis 3). Correlation analyses were conducted between Busselle's (2001) Perceived Realism scale and the Eyewitness Attitudes scale, DNA Attitudes scale, and Fingerprint Attitudes scale. Results of correlation analyses using Pearson's Product-Moment Correlation (r) revealed significant relationships between perceived realism and eyewitness attitudes ($r = 0.35$, $p < 0.001$), DNA attitudes ($r = 0.30$, $p < 0.001$), and fingerprint analysis attitudes ($r = 0.34$, $p < 0.01$). These values suggest a weak to moderate (Cohen, 1988) positive linear relationship between perceived realism and attitudes regarding each of the three evidence types presented in this study.

7. Discussion

The purpose of this study was to understand the potential role of perceived realism of crime drama television in the so called “CSI-effect”. Because jurors show a strong preference for DNA evidence (Lieberman et al., 2008; Maeder et al., 2016), we also tested whether any emergent CSI-effect would be driven by expectations about DNA specifically, relative to fingerprint evidence and eyewitness testimony. Our results regarding the influence of DNA evidence on juror verdicts were somewhat inconsistent with previous research. Although jurors presented with DNA were more likely to convict the defendant compared to those in the eyewitness condition, there was no significant difference in verdicts between the fingerprint and DNA evidence conditions. In comparison, Lieberman et al. (2008) found DNA evidence led to more convictions compared to hair fiber, fingerprint, and eyewitness testimony evidence. A possible explanation for the null difference between DNA and fingerprint evidence may relate to the fact that the fingerprint expert testified in a scientific manner. For example, the fingerprint expert went into great detail regarding the process by which fingerprints are retrieved and entered into an Automated Identification System. It is possible that participants evaluated the evidence using availability heuristics (Tversky & Kahneman, 1973), relying on what they previously knew about scientific evidence from past experiences. They may have inferred that the complex scientific language was an indicator of the quality of the evidence given previous associations between scientific language and objectivity.

Participants may have also judged the evidence based on their desire for cognitive activity (Petty & Cacioppo, 1986). According to the Elaboration Likelihood Model, jurors’ evaluation of evidence is moderated by their individual Need for Cognition (NC; Cacioppo & Petty, 1982; Devine, 2012). Researchers posit that those high in NC will systematically assess the evidence, while jurors with low NC will evaluate evidence using a peripheral approach, relying primarily on mental shortcuts and heuristics. Evaluation using a peripheral approach would likely lead participants to quickly assign a high probative value to the fingerprint evidence because of its similarity to other scientific language they have heard before. Though fingerprint analysis and DNA evidence yielded a statistically equivalent number of guilty verdicts, future studies should evaluate NC in an attempt to determine how jurors are evaluating evidence. The language of the testimony could also explain why differences between strong and weak forms of fingerprint evidence were not found. The weak fingerprint analysis condition manipulated the credentials and competency of the expert, but the explanation of the fingerprint analysis collection and analysis process remained the same. It is possible that jurors deemed the scientific nature of the collection process to outweigh the poor credentials of the expert giving the testimony. We additionally observed no difference in verdicts between strong and weak DNA evidence, consistent with Lieberman et al.’s (2008) research but contrary to work recently published by Maeder et al. (2016). Future studies should be conducted that continue to examine whether jurors are sensitive to differences between strong and weak DNA evidence, as it is currently unclear.

Furthermore, eyewitness testimony resulted in fewer convictions than both the DNA and fingerprint evidence, consistent with previous research (Lieberman et al., 2008; Maeder et al., 2016; Skolnick & Shaw, 2001). There was also a statistically significant difference between the strong and weak eyewitness testimony conditions. This was not surprising, given that factors influencing jurors’ evaluations of eyewitnesses are well known and supported (Berman & Cutler, 1996; Brewer & Burke, 2002; Wells, Lindsay, & Ferguson, 1979). Interestingly, jurors’ level of perceived realism did not interact with evidence strength for any of the three evidence types.

We also hypothesized that jurors who perceive television to be reflective of real-life would have lower conviction rates when DNA was not present. Contrary to this prediction, jurors with higher perceived realism were more likely to convict the defendant, regardless of the type of evidence being presented, although this effect was small. In comparison, Maeder and Corbett (2015) found no direct or interactive effects of perceived realism on juror verdicts. It might be useful to do a content analysis examining the rate at which crime-dramas feature conviction or punishment of an accused. It is possible that those higher in perceived realism relied on an inordinate number of guilty verdicts

depicted in crime-drama television shows, resulting in more guilty verdicts. Additionally, perceived realism was positively correlated with attitudes towards all three evidence types, consistent with predictions and the results of Maeder and Corbett (2015). Participants who believed crime drama to be accurate portrayals of investigations had more favorable attitudes towards DNA, fingerprint, and eyewitness evidence.

Researchers should continue to study perceived realism as an impactful variable that may be related to jurors' assessments of different evidence types. Though perceived realism may not act directly upon verdict outcomes, past research as well as the current study has shown that it may be indirectly associated with these decisions by shaping attitudes regarding different evidence types (Maeder & Corbett, 2015). It may also be the case that studying the perceived realism of television content in particular is now too narrow of an approach, as today television is only one of many mediums that people interact with on a daily basis. Since cultivation theory's inception in the 70's (Gerbner & Gross, 1976), the manner in which people consume media has dramatically changed. For instance, individuals now have a much greater degree of choice regarding the type of media they consume. Research should thus begin to incorporate people's interaction with not only television, but news media and Internet content as well.

8. Limitations

As with all mock juror studies, this research carries a number of limitations. Our study used a trial transcript, which limits ecological validity. However, a number of researchers have suggested that mode of presentation has little impact on study outcomes (Bornstein, 1999; Pezdek, Avila-Mora, & Sperry, 2010). Furthermore, this study analyzed the responses of individual mock jurors, rather than deliberating juries. Although this may cause further concern for ecological validity, research has shown that a jury's final verdict often matches the majority of individual jurors' pre-deliberation judgments (Devine, Buddenbaum, Houp, Stolle, & Studebaker, 2007; Kalven & Zeisel, 1966). Thus, studying individual juror verdicts still holds great empirical value. Nevertheless, future research examining perceived realism and the CSI-effect should incorporate a jury deliberation component, given that group discussion can exacerbate or attenuate bias (Salerno & Diamond, 2010). Not only would this increase the study's ecological validity, but the deliberation process may elicit CSI-effects that have so far not been observed in individual verdicts. For instance, individuals who believe crime-drama accurately portrays reality may draw upon their incorrect beliefs in deliberation, presenting influential and convincing arguments to the other jurors.

9. Conclusions

In sum, results did not demonstrate a relationship between perceived realism and juror verdicts in a manner that supports the hypothesized CSI-effect. However, this study showed that jurors are more willing to convict a defendant if DNA or fingerprint evidence is presented as compared to eyewitness testimony. We observed that fingerprint evidence is equally compelling to jurors as DNA evidence, which is noteworthy, as scholars have given fingerprint evidence comparatively little attention. We further found that jurors are unable to differentiate between strong and weak forms of DNA and fingerprint evidence, but are much more critical of weak as compared to strong eyewitness testimony. Additionally, this study reveals more about what is known regarding the CSI-effect. Though jurors may be acquiring their knowledge about crime and scientific evidence collection and analysis from television, this study failed to demonstrate that jurors' perceived realism of the crime drama they watch impacts on their expectation that the prosecution brings forth DNA evidence. Investigation into the CSI-effect should continue, as understanding how jurors are influenced by extralegal factors is an important consideration in the process of criminal trials.

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