

Provided for non-commercial research and education use.
Not for reproduction, distribution or commercial use.



This article appeared in a journal published by Elsevier. The attached copy is furnished to the author for internal non-commercial research and education use, including for instruction at the authors institution and sharing with colleagues.

Other uses, including reproduction and distribution, or selling or licensing copies, or posting to personal, institutional or third party websites are prohibited.

In most cases authors are permitted to post their version of the article (e.g. in Word or Tex form) to their personal website or institutional repository. Authors requiring further information regarding Elsevier's archiving and manuscript policies are encouraged to visit:

<http://www.elsevier.com/copyright>



Contents lists available at ScienceDirect

Journal of Criminal Justice



Examining the “CSI-effect” in the cases of circumstantial evidence and eyewitness testimony: Multivariate and path analyses

Young S. Kim^{a,*}, Gregg Barak^a, Donald E. Shelton^b

^a Department of Criminology, Eastern Michigan University, Ypsilanti, MI 48197, United States

^b Circuit Court Judge, Washtenaw County, Ann Arbor, MI 48104; Adjunct Faculty, Department of Criminology, Eastern Michigan University, Ypsilanti, MI 48197, United States

A B S T R A C T

As part of a larger investigation of the changing nature of juror behavior in the context of technology development, this study examined important questions unanswered by previous studies on the “CSI-effect.” In answering such questions, the present study applied multivariate and path analyses for the first time. The results showed that (a) watching CSI dramas had no independent effect on jurors' verdicts, (b) the exposure to CSI dramas did not interact with individual characteristics, (c) different individual characteristics were significantly associated with different types of evidence, and (d) CSI watching had no direct effect on jurors' decisions, and it had an indirect effect on conviction in the case of circumstantial evidence only as it raised expectations about scientific evidence, but it produced no indirect effect in the case of eyewitness testimony only. Finally, implications of the present study as well as for future research on the “CSI-effect” on jurors are discussed.

© 2009 Elsevier Ltd. All rights reserved.

Introduction

One of the developing issues with respect to the impact of the media on the criminal justice process has been referred to as the “CSI-effect.” Narrowly conceived, this label has referred to an alleged or supposed influence that watching television shows like *CSI: Crime Scene Investigation* has on juror decision-making during the workings of a criminal trial.¹ Broadly conceived, the CSI-effect has referred to those dynamic relationships that exist “between the images of forensics found on *CSI* and what we often think of as the ‘real world’ of forensics, law and criminal justice” (Mopas, 2007, p. 116), or to the ways in which “*CSI* circulates images and proffers cultural meanings that assert the moral authority of the police and science” (Cavender & Deutsch, 2007, p. 68) in relation to “matters as diverse as gender, race, family, work, and of course, crime and policing” (Cavender & Deutsch, 2007, p. 78).

In the narrower scheme of things, many legal practitioners, especially prosecutors, believe that those jurors who are frequently exposed to forensic programs will be more likely to acquit guilty defendants when such scientific evidence is not available than will those jurors not exposed to such programs (Cooley, 2007; Podlas, 2006; Tyler, 2006). Similarly, anecdotal media reports of cases seemingly supporting this speculation have also fueled the debates about the existence of a CSI-effect in the legal and social science communities (Baldas, 2005; Blankstein & Guccione, 2005; Deutsch,

2006). Although several academic attempts have been made to address the CSI-effect, most of these previous efforts were conceptual or theoretical (Cole & Dioso-Villa, 2007; Cooley, 2007; Ghoshray, 2007; Mann, 2006; Tyler, 2006), lacking support from systematic empirical research. Only a limited number of studies had addressed this issue with empirical approaches by utilizing a survey method or mock-jury experiment of college students (Podlas, 2006; Schweitzer & Saks, 2007) or by surveying potential jurors who were called for jury duty (Shelton, Kim, & Barak, 2006). Although there have been some empirical surveys of prosecutors regarding the CSI-effect (Stevens, 2008; Thomas, 2006), these studies did not directly examine the existence of the CSI-effect on jurors.

Despite these initial efforts, previous research needs to be expanded more to address several important questions about the CSI-effect, such as (a) whether or not it may exist in some particular instances for some types of viewers; (b) if it does exist in those instances, whether or not it has an independent effect even after controlling for any individual characteristics; (c) if it has any interaction effects with various individual characteristics; or (d) if it has a direct or indirect effect on jurors' decision-making in reaching a verdict. The shortcomings of previous research in addressing these questions are largely due to the fact that the methodology for examining a CSI-effect had yet to be established and that those initial studies presented findings in a very basic statistical manner. Although some of the conclusions reached from these early empirical studies may be valid, more caution is needed until their findings are verified through more rigorous and systematic examinations. Hence, in order to answer more demanding questions about the CSI-effect, the present study conducted a more thorough examination by utilizing multivariate and path analyses

* Corresponding author. Department of Criminology, Eastern Michigan University, 713-D Pray Harrold, Ypsilanti, MI 48197. Tel.: +1 734 487 7921; fax: +1 734 487 7010. E-mail address: ykim4@emich.edu (Y.S. Kim).

applied to criminal cases involving circumstantial evidence or eye-witness testimony.

The “CSI-effect” as an explanation of juror behavior

The CSI-effect is not only a label that refers to a recent phenomenon of prosecutors' complaints about the acquittal of guilty defendants based on the lack of scientific evidence, but it also provides an explanation or a theory on 'how' and 'why,' regarding the relationship between potential jurors' exposure to the CSI dramas and their decision-making in arriving at a verdict. In order to examine if there exists a CSI-effect on jurors and how it may operate, it is necessary to define what is meant by the CSI-effect as applied to this unique group of lay participants in the criminal adjudication process. While the concept of a so-called “CSI-effect” has gained much attention in legal and popular circles, and more recently in the social scientific community, there is no single, widely accepted, definition of the concept. The CSI-effect has many different meanings, takes, or dimensions (Cooley, 2004; Podlas, 2006) even when it is not broadly or theoretically conceived in terms of the larger changes in science, technology, and culture (Cavender & Deutsch, 2007; Mopas, 2007; Shelton et al., 2006). For example, Podlas (2006, p. 433) identified three different ways to define the CSI-effect: (1) “CSI creates unreasonable expectations on the part of jurors, making it more difficult for prosecutors to obtain conviction,” (2) “CSI raises the stature of scientific evidence to virtual infallibility, thus making scientific evidence impenetrable,” and (3) “CSI's increasing lay interest in forensics and science.” Similarly, Cole and Dioso-Villa (2007) identified six different aspects that could be considered a part of the CSI-effect. These included what they referred to as: (1) the “strong prosecutor's effects” (Cole & Dioso-Villa, 2007, p. 448) or the wrongful acquittals of guilty defendants by jurors, (2) the “weak prosecutor's effects” (p. 448) or the remedial measures used by prosecutors to the jurors, (3) the “defendant's effects” (p. 449) or the increasing public trust in forensic evidence resulting in more convictions, (4) the “producer's effects” (p. 452) or the education of jurors about scientific evidence, (5) the “professor's versions” (p. 452) or the increased interests in forensic science among students, and (6) the “police chief's versions” (p. 453) or the education of criminals. According to Cole and Dioso-Villa (2007), all dimensions described above constitute the CSI-effect because these are the changes or consequences the popular CSI dramas have brought to the criminal justice process and to the public in general.

If one incorporates these wider dimensions, then a CSI-effect does indeed exist. It is not difficult to witness how CSI-type programs intersecting with other developments in contemporary technology and popular culture have been influential in shaping the broader contours of the criminal justice process and even helping to produce an audience desire to be a part of the forensics world. As Cooley (2004), Tyler (2006), and others have suggested, however, the effect of the CSI dramas on jurors' verdict in courts could be mixed or contradictory. For example, it is possible that jurors' frequent exposure to the CSI dramas may raise their expectations about scientific evidence unreasonably high, resulting in more acquittals of defendants when no scientific evidence is available or necessary to be presented by prosecutors than when such evidence is presented. At the same time, it is also plausible that frequent exposure to the CSI dramas with high-tech forensic techniques could lead jurors to unrealistic levels of trust about scientific evidence or to an over-estimation of the value of the scientific evidence in the first place (Cavender & Deutsch, 2007), resulting in higher conviction rates even when the scientific evidence could be invalid or less-relevant (Cooley, 2004; Podlas, 2006; Tyler, 2006). In other words, if the CSI-effect does exist, then it is possible that the effect could be just as likely to be prosecution as to be anti-prosecution.

Since most law practitioners, especially prosecutors, believe that the CSI-effect exerts its power or pressure against the interests of prosecutors by raising jurors' expectations about scientific evidence to

convict defendants (Marquis, 2007), however, the key in the debate about the CSI-effect on jurors has been about whether or not CSI-like programming actually raises jurors' expectation about scientific evidence and whether it leads jurors to acquit guilty defendants due to a lack of scientific evidence—the “strong prosecutor's effect” to use Cole and Dioso-Villa's (2007) terminology or the “anti-prosecution CSI-effect” to use the terminology of Podlas (2006). Accordingly, for the purposes of this examination, the present study narrowly defined the CSI-effect as the effect that those CSI dramas have on the decision-making of jurors.

Previous empirical research on the CSI-effect

As stated above, there have been only a limited number of efforts to empirically examine the issue of the CSI-effect by applying some existing methodologies such as survey and mock-jury experiments. Podlas (2006) conducted research to examine the CSI-effect by surveying 306 university students on their viewing habits of the CSI dramas, and asking them to make a verdict on a hypothetical rape scenario and to provide reasons for their verdicts. The rape scenario was constructed to capture jurors' decision-making on whether or not the actual sexual act was ‘consensual or forced.’ Whether or not the sexual act happened was not a matter of jurors' interest. Therefore, the scenario did not provide any information about scientific evidence. Podlas (2006) found that about 86 percent of the respondents found the defendant “not guilty,” meaning that the sexual act was consensual, and that there was no statistically significant difference between CSI viewers and non-viewers. She also found that both CSI viewers and non-viewers provided similar number of “CSI-marked” (Podlas, 2006, p. 459) reasons for their verdict. Podlas concluded that there was no CSI-effect against prosecutors.

Schweitzer and Saks (2007) also conducted a study using college students. They presented a brief transcript of a criminal trial to forty-eight university students, and asked them to rate their perceptions about the trial and the forensic evidence. Also, they measured participants' watching patterns of “forensic-science themed programs and general crime-themed programs” (Schweitzer & Saks, 2007, p. 362). Schweitzer and Saks found that CSI-viewers were more skeptical of the forensic evidence that was inappropriate or inconclusive and were less likely to convict the defendant than non-CSI viewers (18 percent versus 29 percent). In other words, viewers of CSI were more discerning of scientific evidence than non-viewers were. Thus, it may suggest that non-CSI viewers are more likely than CSI viewers to convict when presented with ambiguous forensics based on a less informed view of scientific evidence in relation to these contemporary forensic practices.

Shelton et al. (2006) conducted a survey to examine the CSI-effect with actual jurors who had been summoned for jury duty. They measured jurors' TV watching patterns including the CSI dramas, and expectation about the scientific evidence and willingness to convict the defendants in various crime cases. The researchers classified the respondents who watched CSI dramas at least on occasion as “CSI-watchers,” and those who never watched or almost never watched as “non-CSI watchers” (Shelton et al., 2006, p. 347), and compared various outcomes between the two groups. Shelton et al. found no significant difference between CSI-watchers and non-CSI watchers in their willingness to convict defendants in most crime cases presented, concluding that no CSI-effect exists on jurors. Instead, they suggested more generally that a “tech effect” running throughout society raises jurors' expectation about scientific evidence rather than the mere exposure to CSI-like programming (Shelton et al., 2006).

The present study

Although the previous empirical studies described above provided initial contributions to the literature of the CSI-effect, findings and

implications of those studies were inconclusive due to the limitations imposed by the methodology they used. The shortcomings of the previous research on the CSI-effect included the following: first, the use of a small number of college students as a sample (Podlas, 2006; Schweitzer & Saks, 2007) significantly limited their ability to generalize the findings. The actual jurors consist of people with many different personal characteristics in terms of age, occupation, education, life experience, and so on. In short, the use of college students to study the CSI-effect, combined with a small sample size, may not reflect the real world. Second, the use of student jurors' decisions involving only one type of crime scenario (i.e., rape in Podlas's study) to determine the existence or not of the CSI-effect on a diversity of criminal trial scenarios also limited its ability to generalize the findings. For example, different types of scientific evidence can be collected and utilized with respect to the different type of offenses involved such as murder, assault, rape, burglary, and so on. Thus, jurors could react differently to the scientific evidence presented depending on different type and seriousness of offenses. Third, the previous studies did not address the possibility that the effect of watching CSI dramas on verdict outcomes could vary depending on individual characteristics such as social class, education, gender, race/ethnicity, and political orientation. These limitations in previous studies make it necessary to investigate the effect more thoroughly to expand the understandings of the newly developing phenomenon in criminal justice.

The present study aimed to answer the questions including (a) does the "CSI-effect" exist after controlling for demographic variables or personal characteristics such as age, gender, education, income, and political orientation? (b) do CSI watching patterns interact with any of the juror's personal characteristics to produce different verdicts in specific types of cases? (c) do CSI watching patterns affect jurors' decisions in different types of offenses or situations?, and (d) what is the causal process in terms of how exposure to the CSI dramas may affect jurors' decision-making?

The examination of the effects of jurors' demographic variables on their verdicts has been a continued interest of research on jury decision-making in general. Previous studies produced somewhat different findings in terms of the effect size that jurors' demographic characteristics have on their verdicts (Diamond, Saks, & Landsman, 1998; Hastie, Penrod, & Pennington, 1983; Mills & Bohannon, 1980; Moran & Comfort, 1982; Wissler, Hart, & Saks, 1999). Some studies reported a relatively minor influence of demographic characteristics on verdicts. For example, Hastie et al. (1983) reported that less than 2 percent of variance in verdicts can be explained by juror's demographic characteristics such as education, political orientation, occupation, age, gender, and prior jury service. On the other hand, other studies reported a relatively larger proportion of variance explained by such demographic variables. Mills and Bohannon (1980) and Moran and Comfort (1982) reported that juror's demographic characteristics have significant relationship with their verdicts on several criminal cases and that more than 10 percent of variance in verdicts can be explained.

In spite of its importance, lack of inclusion of jurors' demographic variables in the examination of the CSI-effect in the previous studies may limit the understandings of the questions listed above. When the evidence is very strong and decisive, the evidence itself may determine jurors' verdicts. When the evidence is weak or contradictory, however, jurors liberate themselves from the constraints imposed by law and feel free to use their own values or beliefs in making verdicts. It is known as 'liberation hypothesis' (Kalven & Zeisel, 1966). It suggests that demographic characteristics of jurors as well as defendants—such as race, gender, age, education, social class, political orientation, and so on—can influence their decision-making when the evidence is not overwhelming. Given the principle that jurors' verdict in criminal cases should be based solely on the legal factors rather than on juror's personal factors, examination of even a

small effect of demographic variables is worthwhile. In addition, the claimed "CSI-effect" on verdicts is a new phenomenon and should be scrutinized with the inclusion of other factors that influence decision making in the analysis to see how watching CSI dramas might interact with other individual characteristics.

Therefore, the present study expanded the previous empirical studies by examining multivariate relationships and by analyzing the causal process of the CSI-effect. The present study marked the first multivariate/path analysis approach to the topic of the CSI-effect, and its findings will provide some insightful specificity on the possibilities of a direct or indirect CSI-effect with respect to circumstantial evidence and eyewitness testimony, especially in those cases without the presence of any scientific evidence.

Methods

Sample

The sample of the present study consisted of 1,027 actual jurors who were summoned for their jury duty in Washtenaw County court, Michigan. Washtenaw County is located in southeast Michigan with a population size of about 340,000. The county court selected the jurors randomly from the lists of persons who have a driver's license or alternative state identification card. Before they were assigned (or not) to an actual trial, the prospective jurors waiting in the courthouse were asked to fill out a questionnaire for the present study. The prospective jurors were instructed that participation was voluntary and anonymous, and that participation in the study would have absolutely no effect on their potential selection as a juror in any case. The sample consisted of 54.9 percent males and 43.4 percent females (with 1.7 percent missing data), and of 82.2 percent White and 12.6 percent non-White (with 5.2 percent missing data). The comparison of the sample of the present study with the population of Washtenaw County indicated that the sample was representative of the county.

Dependent variables

The present study utilized two dependent variables—the willingness of each juror to convict the defendant without any scientific evidence based only on (a) circumstantial evidence and (b) eyewitness testimony, in the case scenarios for three different types of offenses (murder or attempted murder, a physical assault of any kind, and any criminal case). The concepts of circumstantial and eyewitness evidence in these variables were based on the legal notion that evidence can be classified into 'direct' or 'circumstantial' evidence. Circumstantial, or indirect, evidence is evidence that normally or reasonably leads to other facts and requires judges' or jury's interpretation and inference about the causation. Direct evidence is evidence about what one actually sees or hears and may directly prove a fact. Eyewitness testimony is considered direct evidence that may prove causation without inference, although there has been significant controversy about the accuracy of the eyewitness testimony (Brigham & Bothwell, 1983; Charman & Wells, 2008; Migueles & Garcia-Bajos, 2007; Wells & Loftus, 1984). Jurors are instructed to consider both direct evidence and circumstantial evidence to decide if a defendant is guilty or not, but they could place different weight on those two types of evidence. For this reason, the present study decided to analyze the CSI-effect separately for the circumstantial and eyewitness testimony to examine how juror exposure to CSI dramas plays differently in making their verdicts when any other direct evidence is not available.

The hypothetical murder (or attempt) case involving only circumstantial evidence was described as "a case charging the defendant with murder or attempted murder, [where] the prosecutor presents circumstantial evidence but does not present any scientific evidence." For the eyewitness testimony only case, the 'circumstantial evidence' in the statement was substituted by 'the testimony of an eyewitness

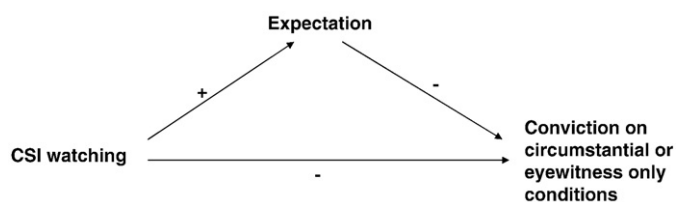


Fig. 1. Conceptual causal process of the CSI effect.

and other witnesses.’ For the different types of offenses, the same statement was presented to the jurors by replacing the ‘murder (or attempt)’ with ‘physical assault of any kind and any criminal case,’ respectively. Jurors’ willingness to convict defendants was measured on a five-point scale for each of three circumstantial and eyewitness testimony only scenarios (1 = I would find the defendant not guilty, 2 = I would probably find the defendant not guilty, 3 = I am not sure what I would do, 4 = I would probably find the defendant guilty, 5 = I would find the defendant guilty). Separate analyses for each offense type generated the same outcome. Therefore, the scores within each situation were added to make an index for jurors’ willingness to convict defendants in the circumstantial evidence only situation or eyewitness testimony only situation in general. The reliability coefficient for each situation was .829 and .762, respectively.

Independent variables

Exposure to CSI dramas, the main independent variable of the present study, was measured with a question: “how often do you watch CSI (or CSI: Miami or CSI: New York)?” Jurors responded to this question on a five-point scale (1 = never, 2 = almost never, 3 = on occasion, 4 = often, and 5 = regularly). This was a part of the questions that measured jurors’ exposure to various law-, crime-, and criminal justice-related TV programs.

Juror expectations about whether they will receive ‘scientific evidence of some kind,’ another main independent variable, was measured on a three-point scale (1 = no, 2 = unsure, and 3 = yes). In order to develop an index to determine general level of expectation, all the scores were added. Higher scores indicated high expectations about scientific evidence to be presented by prosecutor. The alpha coefficient was .839.

The present study also utilized several demographic variables and personal characteristics as independent variables. Jurors’ demographic variables included age, gender, and race; other personal characteristics included education level, income level, neighborhood crime problems, and political view. Age was measured as a continuous variable ranging from eighteen to eighty-one. Gender was a dummy variable with female as a reference group (female = 0, male = 1). In the original survey, different races/ethnicities were measured. The present study, however, used a dummy variable with White as a reference group (White = 0, non-White = 1). This re-categorization of the race was necessary because most of the jurors in the present study were White (about 82 percent). Juror’s education level was measured with a four-point scale (1 = less than high school to 4 = post-college education). Income was also measured with a four-point scale (1 = less than \$30,000 to 4 = over \$100,000). A five-point scale was used to measure perceptions of the crime problem in the juror’s neighborhood (1 = not serious at all to 5 = very serious) and the political view of jurors (1 = very liberal to 5 = very conservative).

Analytic techniques

The present study employed multivariate and path analyses. Multivariate regressions were used to examine (a) whether or not the CSI-effect, if any, exists even after controlling for several demographic and personal characteristics, and (b) if CSI watching

patterns interact with individual juror’s personal characteristics to produce different decisions in court.

In order to examine these questions, the present study developed three multivariate regression models. In the first model (Model 1), each of the dependent variables—jurors’ willingness to convict defendants in a circumstantial evidence situation or an eyewitness testimony condition, was regressed only on jurors’ demographic and personal characteristics including age, gender, race, education, income, neighborhood characteristics, and political view. This model was used to examine how each juror’s decision is associated with his/her demographic and personal characteristics. The second model (Model 2) added a juror’s exposure to CSI dramas and the level of expectation about scientific evidence to the Model 1 to determine if the “CSI-effect” exists above and beyond the effects of individual characteristics. The final model (Model 3) included interaction terms between jurors’ exposure to CSI dramas and each of their individual characteristics.

The present study also used path analyses to determine if exposure to the CSI dramas has any direct and/or indirect impacts on jurors’ willingness to convict the defendant. The definition of the CSI-effect implies clear causal relationships among exposure to CSI dramas, jurors’ expectations, and verdicts (Cooley, 2007; Podlas, 2006; Tyler, 2006). The present study conceptualized the causal process in which exposure to the CSI dramas influences jurors’ verdicts through their increased expectations about scientific evidence as illustrated in Fig. 1.

The present study utilized several stepwise multivariate regressions to generate path coefficients among variables. First, jurors’ verdict was regressed on all variables simultaneously including jurors’ expectations, exposure to the CSI dramas, and individual characteristics. Second, jurors’ expectation was regressed on exposure to the CSI dramas and their individual characteristics. Finally, exposure to the CSI dramas was regressed on individual characteristics.

Results

Multivariate analysis results

The results from multivariate analyses in the circumstantial evidence only situation are presented in Table 1. Three individual characteristics

Table 1
Multivariate analyses for circumstantial evidence

	Model 1		Model 2		Model 3	
	Beta	t	Beta	t	Beta	t
Age	0.053	1.556	0.081	2.322*	-0.022	-0.328
Gender	-0.025	-0.727	-0.046	-1.331	-0.113	-1.677
Race	0.068	2.002*	0.054	1.545	0.091	1.368
Education	-0.07	-1.977*	-0.066	-1.808	-0.067	-0.953
Income	-0.028	-0.767	-0.04	-1.064	-0.064	-0.908
Neighborhood crime	0.071	2.056*	0.088	2.516*	0.191	2.79**
Political view	-0.055	-1.597	-0.032	-0.919	-0.032	-0.49
CSI watching			0.024	0.684	-0.19	-0.714
Expectation			-0.135	-3.82***	-0.133	-3.769***
CSI x age					0.232	1.693
CSI x gender					0.129	1.104
CSI x race					-0.035	-0.509
CSI x education					-0.001	-0.008
CSI x income					0.058	0.459
CSI x neighborhood crime					-0.177	-1.634
CSI x political view					-0.006	-0.042
R-square		0.024**		0.043***		0.054***
df		884		830		830

*p < .05.
**p < .01.
***p < .001.

Table 2
Multivariate analyses for eyewitness testimony

	Model 1		Model 2		Model 3	
	Beta	t	Beta	t	Beta	t
Age	0.096	2.849**	0.102	2.884**	0.1	1.46
Gender	0.108	3.202***	0.096	2.751**	0.006	0.086
Race	-0.04	-1.182	-0.047	-1.333	-0.032	-0.471
Education	-0.011	-0.311	-0.018	-0.498	-0.013	-0.191
Income	-0.004	-0.117	-0.001	-0.035	-0.03	-0.426
Neighborhood crime	0.008	0.232	0.023	0.652	-0.035	-0.5
Political view	0.042	1.219	0.065	1.836	0.083	1.248
CSI watching			0.015	0.441	-0.246	-0.917
Expectation			-0.069	-1.937	-0.068	-1.909
CSI x age					-0.001	-0.011
CSI x gender					0.186	1.579
CSI x race					-0.02	-0.294
CSI x education					-0.002	-0.014
CSI x income					0.069	0.541
CSI x neighborhood crime					0.111	1.013
CSI x political view					-0.039	-0.287
R-square		0.027***		0.032**		0.036*
df		884		829		829

*p < .05.
**p < .01.
***p < .001.

showed significant effects on jurors' willingness to convict defendants based only on circumstantial evidence when prosecutors present no scientific evidence. Non-White jurors were more willing to convict defendants (p < .05) in this situation. Education level of jurors was negatively associated with their willingness to convict defendants (p < .05). Jurors with lower education levels showed higher willingness to convict defendants than jurors with higher education levels. Also, jurors from higher crime neighborhoods were more likely to convict defendants (p < .05) on circumstantial evidence without any scientific evidence.

In Model 2, when exposure to the CSI dramas and expectation about scientific evidence were added, the effect of age became

significant (p < .05). Older age was related to higher willingness to convict defendants based only on circumstantial evidence. The significant effect of race in Model 1 lost its significance, however, and the effect of education became marginal (p < .10). As far as the "CSI-effect" is concerned, Model 2 failed to generate a significant effect of the exposure to the CSI dramas on conviction, controlling for other variables. Jurors' expectations about scientific evidence, however, had a significant independent effect (p < .001) above and beyond the effects of the exposure to the CSI dramas and of other individual characteristics. Model 3 shows that there was no significant interaction effect between exposure to the CSI dramas and individual characteristics on jurors' likely verdicts (see Table 1).

In the eyewitness testimony only situation in Table 2, jurors' age and gender had significant effects on their willingness to convict defendants (Model 1). Older jurors were significantly more willing to convict defendants (p < .01) without any scientific evidence when the prosecutors presented eyewitness testimony. Males were more likely than females to convict defendants with eyewitness testimony only (p < .001). When exposure to the CSI dramas and expectations about scientific evidence were included in the equation (Model 2), effects of age and gender still remained significant. In addition, jurors' political views showed a marginally significant effect (p < .10), indicating that more conservative jurors were slightly more willing to convict defendants based on eyewitness testimony. Like the findings from circumstantial evidence situations, exposure to the CSI dramas had no significant effect on jurors' decisions, and it did not interact with any of their individual characteristics. Compared to the finding in the circumstantial evidence only situation, however, the effect of expectation about the scientific evidence on conviction failed to show a statistical significance (p < .10), controlling for other variables. This finding suggests that jurors may consider eyewitness testimony as important as any scientific evidence in convicting defendants (see Table 2).

Path analysis results

In order to examine if exposure to the CSI dramas exerts a direct or indirect effect on verdicts, the present study employed a method of path analysis. The findings are presented in Figs. 2 and 3. According to Fig. 2, exposure to the CSI dramas had no direct effect on jurors'

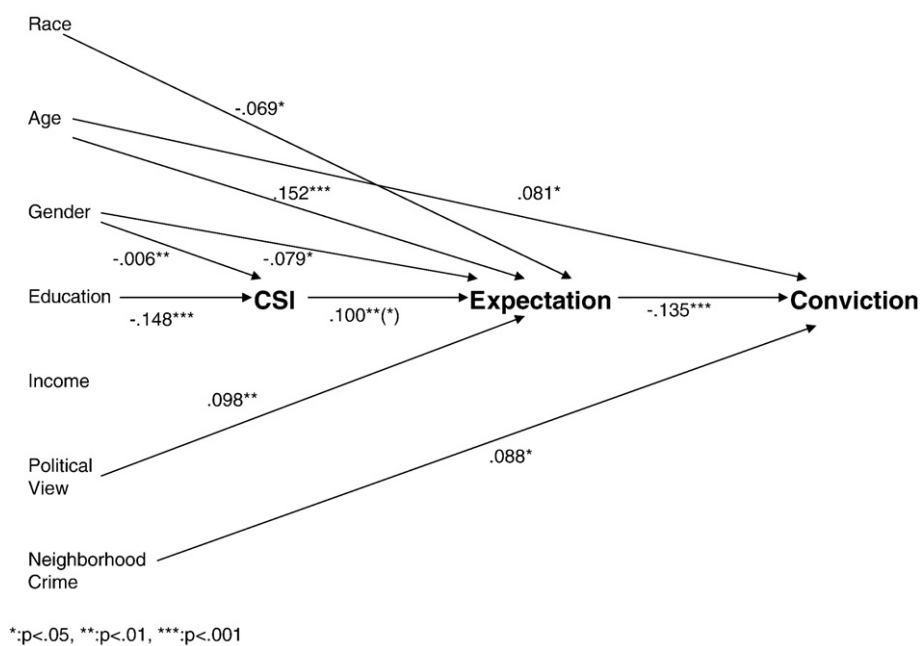


Fig. 2. Conviction based on circumstantial evidence alone (standardized coefficients).

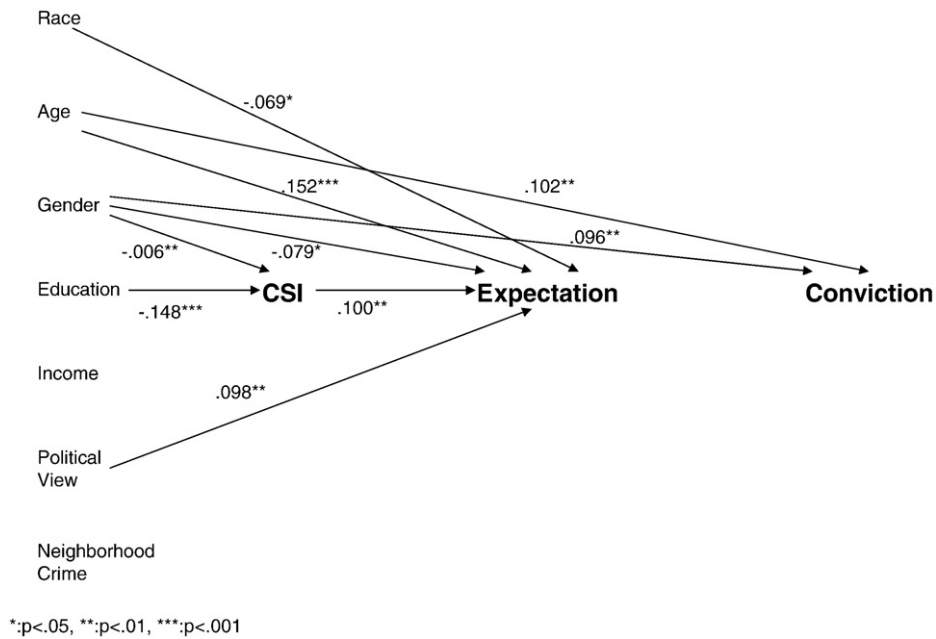


Fig. 3. Conviction based on eyewitness testimony alone (standardized coefficients).

willingness to convict defendants, but it showed a significant indirect effect through raised expectations. Frequent exposure to CSI dramas raised prospective jurors' expectations about scientific evidence to be presented by prosecutor ($p < .004$) and the raised expectations significantly lowered jurors' willingness to convict defendants with circumstantial evidence only ($p < .001$). In the eyewitness testimony situation in Fig. 3, however, exposure to the CSI dramas failed to show significant direct and indirect effects. Jurors' expectations about scientific evidence had a weak association with their willingness to convict defendants. Exposure to CSI dramas increased their expectations about scientific evidence, but such increased expectations did not significantly lower their willingness to convict defendants without any scientific evidence ($p < .10$) when prosecutors presented eyewitness testimony. Again, this finding may imply that jurors do not

believe they need to see any scientific evidence in order to prove the guilt of defendants when they have what they perceive to be credible eyewitnesses.

In addition, Figs. 2 and 3 also showed that jurors' expectations about the scientific evidence was directly influenced by many demographic and personal characteristics such as age, gender, race, and political view, even after controlling for the exposure to the CSI dramas. These findings suggested that jurors' raised expectations were not solely due to their exposure to the CSI dramas, but due to many different and more generalized factors. Also, a preliminary analysis indicated that those who watch CSI dramas often also watched other law-related news, documentaries, and dramas frequently ($r = .614, p < .01$). Therefore, in order to examine whether jurors' expectations about scientific evidence were due to exposure

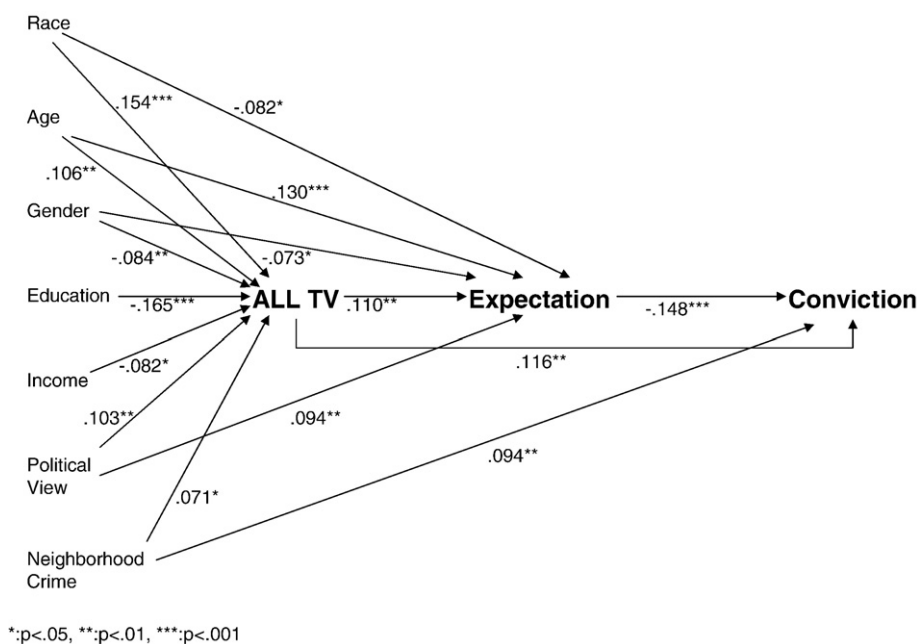


Fig. 4. Conviction based on circumstantial evidence alone (standardized coefficients).

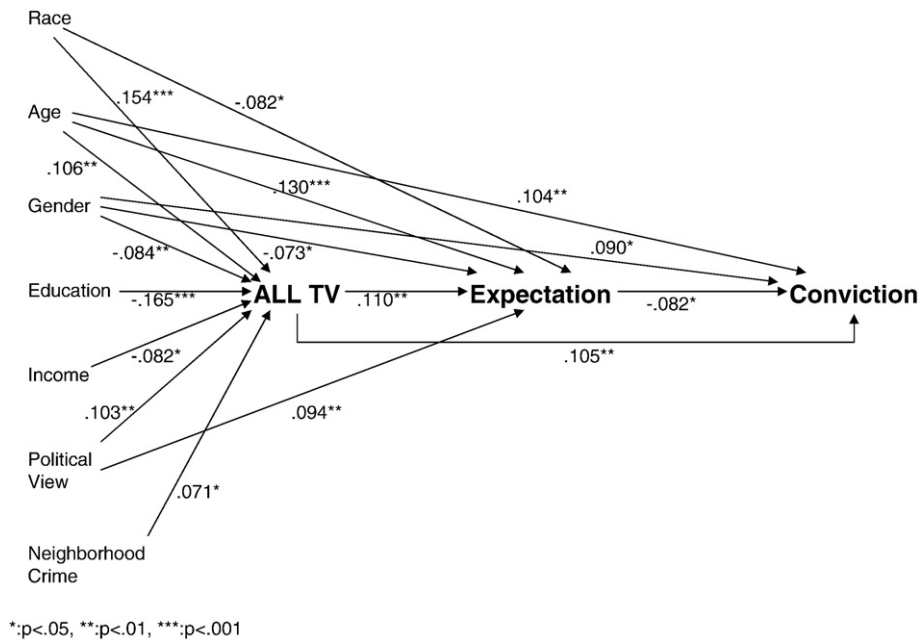


Fig. 5. Conviction based on eyewitness testimony alone (standardized coefficients).

specifically to the CSI dramas only or due to their general exposure to various law-, crime-, and criminal justice-related TV programs, the present study also conducted additional analyses. In these analyses, exposure to the CSI dramas was replaced with exposure to various related TV programs in general. The original survey measured jurors' exposure to thirty-three programs in six different categories including "general news magazine," "crime news shows," "forensic dramas," "forensic documentaries," "general crime documentaries," and "general crime or courtroom dramas." An index was created to reflect the exposure to TV programs in general, except for the CSI dramas. The alpha coefficient for the index was .925.

The results in Figs. 4 and 5 indicated that exposure to the various related TV programs as a whole produced similar but different effects. Just like exposure to the CSI dramas, exposure to seemingly relevant TV programs in general significantly raised jurors' expectations about scientific evidence ($p < .01$), and such increased expectations significantly lowered the willingness to convict defendants in the circumstantial evidence only situation ($p < .001$) and somewhat weakly in the eyewitness testimony only situation ($p < .05$). Unlike the CSI dramas, however, exposure to various law-, crime-, and criminal justice-related programs as a whole had a significant independent (or direct) effect on jurors' willingness to convict in both situations. The more the jurors were exposed to those programs as a whole, the more they were willing to convict defendants without any scientific evidence ($p < .01$), even after controlling for expectations about scientific evidence and various individual characteristics. Such different effects between the CSI dramas only and criminal justice-related programs as a whole on jurors' decisions may be due to the fact that many of the other related TV programs approach the cases from the sympathetic perspective of the victims. Also, while exposure to the CSI dramas differed significantly depending only on gender and education, exposure to law-, crime-, and criminal justice-related programs in general was related with all individual variables except for the variable of income.

Summary and discussion

The present study aimed to answer many important questions regarding the alleged phenomenon of the CSI-effect on juror decision-making across various criminal cases. It employed multivariate and

path analyses in order to better inform, validate, and qualify the conclusion from previous studies.

The results from multivariate analyses showed that jurors' individual characteristics played out differently depending on the types of evidence presented. In the situation involving circumstantial evidence only, jurors' race, education level, and neighborhood crime problem were significantly associated with their willingness to convict defendants, while age and gender were significantly associated with their willingness to convict in the situation involving eyewitness testimony alone. As far as the CSI-effect is concerned, exposure to the CSI dramas had no significant effect on those situations involving either circumstantial evidence only or eyewitness testimony only. This finding was consistent with findings of Shelton et al. (2006). A more important factor that determined jurors' willingness to convict defendants, however, was their expectations about scientific evidence. Jurors' expectations had a strong negative effect on their willingness to convict defendants in the circumstantial evidence only situation, but it had no significant effect in the eyewitness testimony only situation.

The path analyses indicated that exposure to the CSI dramas had no direct effect on convictions. It did, however, have a strong indirect effect through raised expectations about scientific evidence in the circumstantial evidence only situation. Those who were exposed to the CSI dramas frequently had higher expectations about scientific evidence to be presented by the prosecutors, and their increased expectations lowered the willingness to convict defendants without scientific evidence of any kind. This finding supported the conceptual and theoretical links among jurors' exposure to CSI dramas, their expectation about scientific evidence, and the verdict described by Cooley (2007) and Tyler (2006). It suggests that jurors who were exposed frequently to the CSI dramas do lower the value of circumstantial evidence. This finding was contradictory to the observation by Ghoshray (2007) who argued that frequent exposure to the CSI dramas does not lower the 'probative value' of the circumstantial evidence.

On the other hand, exposure to the CSI dramas produced no significant indirect effect on jurors' willingness to convict defendants in the eyewitness testimony only situation. Lack of direct and indirect effects of exposure to CSI dramas on jurors' willingness to convict defendants suggests that jurors consider eyewitness testimony as

equally or comparably credible to any scientific evidence used to convict defendants. Jurors had raised expectations about scientific evidence, but such raised expectations did not significantly lower the willingness of jurors to convict defendants when the prosecutors present eyewitness testimony, even though they failed to present any scientific evidence. This was not the case in the circumstantial evidence only situation. The difference between the circumstantial evidence only and eyewitness testimony only situations, in regard to the effects of jurors' expectations about scientific evidence on their willingness to convict defendants, suggests that frequent exposure to the CSI dramas and its spinoffs may educate the viewers and the prospective jurors to the potential problems of circumstantial evidence and may force them to consider circumstantial evidence more carefully when they make a verdict without any scientific evidence. Therefore, in short, the CSI-effect is limited to an indirect effect only in circumstantial evidence cases to the extent that exposure to the CSI dramas raises jurors' expectations about scientific evidence.

These findings also have some important implications for police officers, prosecutors, and defense attorneys with respect to the collection and the use of various kinds of evidence. From the police and prosecutor's perspective, the obvious implication is that they should obtain and present scientific evidence whenever it is reasonably available to secure conviction. Law enforcement agencies, however, claim that obtaining the evidence, examining it, and providing expert testimony in court for significantly more cases is not reasonably possible. There are currently huge backlogs in forensic laboratories and significant capacity improvements would need to be made just to keep pace with the already increased demands for forensic analyses (National Institute of Justice, 2006; Shelton, 2008). Additionally, in many real world criminal cases, it is impossible for police officers or prosecutors to collect the type of scientific evidence or perform the types of forensic examinations depicted in some crime show dramas, either because the technology does not exist or because it is only available to national defense agencies. In such cases, police officers and prosecutors need to secure credible eyewitnesses to convince jurors and to increase the probability of convicting the defendant.

From the defense attorney's perspective, however, the above implication poses significant concerns about due process, since it is possible that innocent defendants can be convicted based on eyewitness testimony alone, even though the accuracy of and the motivation for the eyewitness testimony in these types of cases are often questionable (Charman & Wells, 2008; Migueles & Garcia-Bajos, 2007). The dangers of reliance on eyewitness testimony for a criminal conviction have been long identified and pose real risks of convicting an innocent person (Brigham & Bothwell, 1983; Garrett, 2008; Wells & Loftus, 1984). Therefore, when scientific evidence is not available or presented by the prosecutor, it is good strategy for the defense attorney to challenge the legitimacy of the circumstantial evidence, to question the validity of eyewitness testimony, and to stress the lack of scientific evidence.

In addition, findings from the present study revealed that jurors' expectations about scientific evidence were significantly related with their age, race, gender, education, and political views. Also, those who watched CSI dramas often also watched various other law-, crime-, and criminal justice-related TV programs frequently. Thus, jurors' expectations about scientific evidence were influenced not only by exposure to the CSI dramas, but also by many individual characteristics and by exposure to other relevant sources and materials. It was not exposure specifically to the CSI dramas alone that influences juror decisions. Rather, it was their raised expectations regarding scientific evidence based on the knowledge from various sources about science and forensic technology available these days. Many of the forensic technologies available these days were not developed or were not widely recognized by the public in the past, resulting in many convictions with only circumstantial evidence. As the science and technology in general developed throughout society, however, these

scientific forms of evidences such as fingerprints, blood tests, ballistics tests, were becoming more available, more regularly used by prosecutors, and more widely known to the general public. This is especially so with the development of DNA testing and the public's awareness that DNA tests can provide a high level of identification confidence and that it has been used widely not only to prove guilt but also to exonerate persons who were convicted using more traditional forms of evidence. Therefore, the development of science and of new forensic technologies, and the public's awareness of such techniques in general, rather than a CSI-effect per se on juror behavior, influences jurors' decision-making.

Although the present study expanded the understandings about the CSI-effect on jurors, specifically by exploring the effects of individual demographic characteristics and by examining the causal process by which the CSI-effect operates, the present study was not without limitations. First, it had its own external validity limitations and needs to be buttressed by other studies so as to find more representational samples locally and nationally than Washtenaw County, Michigan, which for a variety of reasons may not be typical of a vast number of other juror constituencies. Therefore, an application of the findings from the present study to the U.S. in general needs some further research. Specifically, it is necessary to conduct similar research in other counties, states, or by using nationally representative samples to verify the findings from the present study.

Second, the present study utilized very brief statements to describe each offense type without providing detailed information about the case, the victims, or the offenders. Other studies about jury decision-making had historically revealed that their decisions were influenced not only by both personal characteristics and legal factors, but also by the characteristics of victims and offenders such as gender and race (Farrington & Morris, 1983; Johnson, 1985; Klein & Creech, 1982; Sommers & Ellsworth, 2000). Therefore, future researchers need to develop more detailed scenarios that manipulate and control for those characteristics to examine if exposures to the CSI dramas have any effect on jurors' verdicts when the cases involve different characteristics of victims and offender. This can be done either with survey-based experiment method or with mock-jury experiment in the laboratory setting.

Third, the present study used dependent variables by developing an index with only three offense types for each circumstantial evidence only and eyewitness testimony only situation. The future researchers need to create an index with many different types of offenses. Also, it would be interesting to examine the CSI-effect by using each offense with different severities. Although preliminary analysis of the data in the present study suggested no difference depending on the types of offenses, it needs to be investigated further with different samples and with more detailed scenarios.

Fourth, the present study examined the effects of individual demographic characteristics, such as race, gender, age, education, income, and political orientation, on CSI-drama watching patterns and the verdicts. It would be more informative, however, if future studies examine how jurors' various personality traits and attitudes, such as 'prudence' or 'authoritarianism,' influence their CSI watching patterns, their differentiation between types of evidence, and their verdicts.

Fifth, the present study attempted to examine the CSI-effect by focusing on how the prospective jurors value evidence in the 'circumstantial evidence only' and 'eyewitness testimony only' situations without any scientific evidence. The CSI-effect, however, may manifest in other patterns. For example, it may be that frequent exposure to the CSI dramas may lead jurors to unconditional trust for the scientific evidence, and such unconditional trust may lead jurors to render a conviction even based on irrelevant or less critical scientific evidence. It may also be the case that viewers of CSI programming and its spin-offs 'versus' viewers of *Law and Order* programming and its spin-offs 'versus' viewers who watch both types of programs develop different understandings of evidence or represent different types of viewers.

Therefore, it is necessary for future studies to examine these possibilities by manipulating the relevance and validity of the evidence presented by prosecutors to these viewing groups.

Finally, due to the limitations of the survey method itself in the examination of the “CSI-effect,” future study needs to consider other methodologies such as mock-jury experiments with actual prospective jurors with more realistic experimental settings or interviews with actual jurors after the trials, to compare and to complement each other.

Conclusion

Despite the limitations described above, the present study served as another stepping point for more systematic empirical examination of the alleged CSI-effect. If the limitations and suggestions listed above are addressed adequately, future studies would provide even more comprehensive and clear understandings about the CSI-effect and its implications for the criminal justice system. Therefore, until there is a more comprehensive understanding of the interactive communicative and social experience process on jurors' decision-making and the alleged “CSI-effect” has been empirically demonstrated, law practitioners and the criminal justice system should not alter their criminal litigation or procedural practices in a hurry based on ‘yet-to-be fully examined’ CSI-effect on juror behavior.

Note

1. The Nielsen ratings for the 2007–08-television season through February 24 ranked the original *CSI* as sixth in popularity with 17,000,000 viewers and *CSI: Miami* as twelfth with 14,230,000 viewers. These statistics suggest that a large proportion of U.S. citizens who will serve as jurors are exposed to the high-tech based fictional *CSI* dramas.

References

- Baldas, T. (2005, May 20). Lawyers report jurors gone wild. *National Law Journal*. Retrieved from <http://www.law.com/jsp/article.jsp?id=11649351186>
- Blankstein, A., & Guccione, J. (2005, March 18). ‘CSI’ effect or just flimsy evidence? The jury is out: The Blake case raises the issue of whether forensic shows influence how much proof is needed. *Los Angeles Times*. Retrieved from <http://pqasb.pqarchiver.com/latimes/.....>, available at 2005 WLNR 233341179.
- Brigham, J. C., & Bothwell, R. K. (1983). The ability of prospective jurors to estimate the accuracy of eyewitness identifications. *Law and Human Behavior*, 7, 19–30.
- Cavender, G., & Deutsch, S. K. (2007). CSI and moral authority: The police and science. *Crime Media Culture*, 3, 67–81.
- Charman, S. D., & Wells, G. L. (2008). Can eyewitness correct for external influences on their line-up identifications?: The actual/counterfactual assessment paradigm. *Journal of Experimental Psychology-Applied*, 14, 5–20.
- Cole, S. A., & Dioso-Villa, R. (2007). Symposium: The ‘CSI-effect’: The true effect of crime scene television on the justice system: CSI and its effects: Media, juries, and the burden of proof. *New England Law Review*, 41, 435–469.
- Cooley, C. M. (2004). Forensic individualization sciences and the capital jury: Are Witherspoon jurors more differential to suspect science than non-Witherspoon jurors? *Southern Illinois University Law Journal*, 28, 273–342.
- Cooley, C. M. (2007). Symposium: The ‘CSI-effect’: The true effect of crime scene television on the justice system: The CSI-effects: Its impact and potential concerns. *New England Law Review*, 41, 471–501.
- Deutsch, L. (2006, January 15). TV distorting jurors expectations? *Seattle Times*. Retrieved from <http://community.seattletimes.nwsources.com/archive/?date=20060115&slug=tvlaw15>, available at 2006 WLNR 836801.
- Diamond, S. S., Saks, M. J., & Landsman, S. (1998). Juror judgments about liability and damages: Sources of variability and ways to increase consistency. *DePaul Law Review*, 48, 301–325.
- Farrington, D. P., & Morris, A. M. (1983). Sex, sentencing, and reconviction. *British Journal of Criminology*, 23, 229–248.
- Garrett, B. L. (2008). Judging innocence. *Columbia Law Review*, 108, 55–142.
- Ghoshray, S. (2007). Symposium: The ‘CSI-effect’: The true effect of crime scene television on the justice system: CSI and its effects: Circumstantial evidence, reasonable doubt, and jury manipulation. *New England Law Review*, 41, 533.
- Hastie, R., Penrod, S., & Pennington, N. (1983). *Inside the jury*. Cambridge, MA: Harvard University Press.
- Johnson, S. L. (1985). Black innocence and the White jury. *University of Michigan Law Review*, 83, 1611–1708.
- Kalven, H., & Zeisel, H. (1966). *The American jury*. Boston: Little Brown.
- Klein, K., & Creech, B. (1982). Race, rape, and bias: Distortion of prior odds and meaning changes. *Basic and Applied Psychology*, 3, 21–33.
- Mann, M. D. (2006). The ‘CSI-effect’: Better jurors through television and science? *Buffalo Public Interest Law Journal*, 24, 157–183.
- Marquis, J. K. (2007). *CSI effect: Does it really exist?* National District Attorney Association publication retrieved from <http://communities.justicetalking.org/blogs/day17/archive/2007/10/16/csi-effect-does-it-really-exist.aspx>
- Miguelles, M., & Garcia-Bajos, E. (2007). Selective retrieval and induced forgetting in eye-witness memory. *Applied Cognitive Psychology*, 21, 1157–1172.
- Mills, C. J., & Bohannon, W. E. (1980). Juror characteristics: To what extent are they related to jury verdicts. *Judicature*, 64, 23–41.
- Mopas, M. (2007). Examining the ‘CSI-effect’ through an ANT lens. *Crime Media Culture*, 3, 110–117.
- Moran, G., & Comfert, J. C. (1982). Scientific jury selection: Sex as a moderator of demographic and personality predictors of impaneled felony jury behavior. *Journal of Personality and Social Psychology*, 43, 1052–1063.
- National Institute of Justice. (2006). *Status and needs of forensic science service providers: A report to Congress*. Retrieved from <http://www.ojp.usdoj.gov/nij/pubs-sum/213420.htm>
- Podlas, K. (2006). The ‘CSI-effect’: Exposing the media myth. *Fordham Intellectual Property, Media and Entertainment Law Journal*, 16, 429–465.
- Schweitzer, N. J., & Saks, M. J. (2007). The ‘CSI-effect’: Popular fiction about forensic science affects the public's expectations about real forensic science. *Jurimetrics*, 47, 357–364.
- Shelton, D. E. (2008). The ‘CSI-effect’: Does it really exist? *National Institute of Justice Journal*, 25, 1–7.
- Shelton, D. E., Kim, Y. S., & Barak, G. (2006). A study of juror expectations and demands concerning scientific evidence: Does the ‘CSI-effect’ exist? *Vanderbilt Journal of Entertainment and Technology Law*, 9, 331–368.
- Sommers, S. R., & Ellsworth, P. C. (2000). Race in the courtroom: Perceptions of guilty and dispositional attributions. *Personality and Social Psychology Bulletin*, 26, 1367–1379.
- Stevens, D. J. (2008). Forensic science, wrongful convictions, and American prosecutor discretion. *Howard Journal of Criminal Justice*, 47, 31–51.
- Thomas, A. P. (2006). The CSI-effect: Fact or fiction. *Yale Law Journal Pocket Part*, 115, 70–72.
- Tyler, T. R. (2006). Viewing CSI and the threshold of guilt: Managing truth and justice in reality and fiction. *Yale Law Journal*, 115, 1050–1084.
- Wells, G. L., & Loftus, E. F. (1984). *Eyewitness testimony: Psychological perspectives*. New York: Cambridge University Press.
- Wissler, R. L., Hart, A. J., & Saks, M. J. (1999). Decision making about general damages: A comparison of jurors, judges, and lawyers. *University of Michigan Law Review*, 98, 1751–1826.