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Examining the “CSI-effect” in the Cases of Circumstantial Evidence and Eyewitness  
Testimony: Multivariate and Path Analyses.

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## ABSTRACT

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.

## INTRODUCTION

One of the developing issues in terms of media impact 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* have on juror decision-making during the workings of a criminal trial.<sup>1</sup> Broadly conceived, the “CSI-effect” has referred to those dynamic relationships that exist “between the images of forensics found on” programs like “*CSI* and what we often think of as the ‘real world’ of forensics, law and criminal justice” (Mopas, 2007: 116), or to the ways in which “*CSI* circulates images and proffers cultural meanings that assert the moral authority of the police and science” in relation to “matters as diverse as gender, race, family, work, and of course, crime and policing” (Cavender and Deutsch, 2007: 68, 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 (Podlas, 2006; Tyler, 2006, Cooley, 2007). 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 and 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 and Dioso-Villa, 2007; Cooley, 2007;

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<sup>1</sup> The Nielsen ratings for the 2007-08-television season through February 24 ranked the original *CSI* as 6<sup>th</sup> in popularity with 17,000,000 viewers and *CSI: Miami* as 12<sup>th</sup> 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.

Ghoshray, 2007; Mann, 2006; Tyler, 2006), lacking support from systematic empirical research. Only a limited number of studies have addressed this issue with more systematic empirical approaches by utilizing a survey method or mock-jury experiment of college students (Podlas, 2006; Schweitzer and Saks, 2007) or by surveying potential jurors who were called for jury duty (Shelton, Kim, and Barak, 2006).<sup>2</sup>

Despite these initial efforts, previous research need to be expanded to address several important questions regarding a potential “CSI-effect”, such as: (a) whether or not it may exist in some instances for some 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 individual characteristics, or (d) if it has a direct or indirect effect on jurors’ decision-making. 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 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”, we conducted a more thorough examination by utilizing multivariate and path analyses applied to criminal cases involving circumstantial evidence or eyewitness testimony.

#### THE “CSI-EFFECT” AS AN EXPLANATION OF JUROR BEHAVIOR

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<sup>2</sup> Although there are 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”. Rather, they mostly measured the effects of CSI on prosecutors, not on jurors.

The “CSI-effect” is not only a label that reflects 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 courts. 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 criminal adjudication. 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 universal 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 and Deutsch, 2007; Mopas, 2007; Shelton et al, 2006). For example, Podlas (2006: 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 claims that could be considered a part of the “CSI-effect”. These included what they referred to as: (1) the “strong prosecutor’s effects” or the wrongful acquittals of guilty defendants by jurors, (2) the “weak prosecutor’s effects” or the remedial measures used by prosecutors to the jurors, (3) the “defendant’s effects” or the increasing public trust in forensic evidence resulting in more convictions, (4) the “producer’s effects” or the education of jurors about scientific

evidence, (5) the “professor’s versions” or the increased interests in forensic science among students, and (6) the “police chief’s versions 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 brought to the criminal justice process and the public in general.

If one incorporates these wider dimensions, then a “CSI-effect” does indeed exist. It is not difficult to see 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 that “cool” forensics world. However, the key in the debate about the “CSI-effect” on jurors should be about whether or not CSI like programming raises jurors’ expectation about scientific evidence and 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 terminology or the “anti-prosecution CSI-effect” to use the terminology of Podlas (2006). Accordingly, for the purposes of this examination, we have narrowly defined the “CSI-effect” as the effect that those CSI dramas have on the decision-making of jurors (Tyler, 2006).

While 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), Cooley (2004), Tyler (2006) and others have suggested that the effect 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. However, 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 overestimation of the value of the scientific evidence in the first place (Cavender and 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 pro-prosecution as to be anti-prosecution.

Even without the possibility of contradictory outcomes, when applying a narrow definition that focuses on jurors’ behavior, confusions about the existence of the “CSI-effect” may still be produced. For example, what if the exposure to CSI dramas does generally raise jurors’ expectations, regard for, or value of scientific evidence, yet does not affect their judgments or verdicts in trial? In other words, could such a limited effect of CSI dramas on jurors’ thinking, constitute neither a pro nor anti-prosecution effect, but rather a more “informed juror effect,” making jurors better able to evaluate the merits of all types of evidence, scientific and non-scientific?

#### PREVIOUS EMPIRICAL RESEARCH ON THE ““CSI-EFFECT””

As stated above, there have been only a limited number of efforts to empirically address the issue of the “CSI-effect” by applying some existing methodologies such as survey and mock-jury experiments. Podlas (2004) 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 (2004) found that about 86% 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" reasons for their verdict. Podlas concluded that there was no "CSI-effect" against prosecutors.

Schweitzer and Saks (2007) also conducted a study that used college students. They presented a brief transcript of a criminal trial to 48 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 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% vs. 29%). 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, Kim, and Barak (2006) conducted a survey to examine the CSI effect with actual jurors who were summoned for their 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 case scenarios. The researchers classified the respondents who watched CSI dramas at least on occasion as “CSI-viewers”, and those who never watched or almost never watched as “non-CSI viewers”, and compared various outcomes between the two groups. Shelton, Kim, and Barak (2006) found no significant difference between CSI-viewers and non-viewers in their willingness to convict defendants in most scenarios, 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, Kim, and Barak, 2006).

#### THE PRESENT STUDY

Although the previous empirical studies described above provided significant initial contributions to the literature of the “CSI-effect”, it is necessary to investigate the effect more thoroughly to expand our understandings of the newly developing phenomenon in the criminal justice. The present study aims 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 so on? (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?

Previous studies on juror decision making have examined the effects of jurors' individual characteristics on verdict (Hastie, Penrod, and Pennington, 1983; Diamond, Saks, and Landsman, 1998; Mills and Bohannon, 1980; Moran and Comfort, 1982; Hart and Saks, 1999). Some studies reported a relatively minor influence of demographic characteristics on verdicts (e.g., Hastie, Penrod, and Pennington reported that less than 2% 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. For example, 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% of variance in verdicts can be explained.

Although there are variations in terms of effect sizes reported in these previous studies, the examination of the effects of jurors' demographic variables on their verdicts has been a continued interest of research on jury decision-making. When the evidence is very strong and decisive, the evidence determines jurors' verdicts. According to the "liberation hypothesis" developed by Kalven and Zeisel (1966), however, jurors liberate themselves from the constraints imposed by law and feel free to use their own values or beliefs in making verdicts when the evidence is weak or contradictory. 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. In addition, given the fact that jurors' verdicts in criminal cases should be based solely on the legal factors rather than on juror's

demographic 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.

In spite of its importance, lack of inclusion of demographic variables in the examination of the “CSI-effect” in the previous studies may limit our understandings of the questions listed above. Therefore, the present study expands the previous empirical studies by examining multivariate relationships and by analyzing the causal process of the “CSI-effect.” The present study marks 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 consists 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 selects 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 sample consists of 54.9% males and 43.4% females (1.7% missing data), and of 82.2% Whites and 12.6% non-whites (5.2% missing data).

### *Dependent Variables*

The present study utilizes two dependent variables - the willingness of each juror to convict the defendant without any scientific evidence based only on (a) circumstantial evidence or (b) eyewitness testimony, in the case scenarios for 3 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 are 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 we actually see or hear and may directly prove a fact. Eyewitness testimony is considered direct evidence that may prove causation without inference. However, there has been significant controversy about the accuracy of the eyewitness testimony (Brigham and Bothwell, 1983; Charman and Wells, 2008; Migueles and Garcia-Bajos, 2007; Wells and Loftus, 1984). Therefore, we believed that it is necessary to see how jurors react in two different situations, based on their CSI dramas watching habits when scientific evidence is not available. Although jurors are instructed to consider both direct evidence and circumstantial evidence to prove if a defendant is guilty or not, they could place different weight on those two types of evidence. For this reason, we decide to analyze the “CSI-effect” separately for the circumstantial and eyewitness

testimony to examine how juror's exposure to the 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 is 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 eyewitness testimony only case, the 'circumstantial evidence' in the statement is substituted by 'the testimony of an eyewitness and other witnesses'. For the different types of offenses, the same statement is 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 is measured on a 5-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 generate the same outcome. Therefore, the scores within each situation are 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 is .829 and .762, respectively.

### *Independent Variables*

Exposure to CSI dramas, the main independent variable of the present study, is measured with a question: "how often do you watch *CSI* (or *CSI: Miami* or *CSI: New York*)?" Jurors respond to this question on a 5-point scale (1: Never, 2: Almost never, 3: On

occasion, 4:Often; and 5:Regularly). This is a part of the questions that measure jurors' exposure to various law-, crime-, and criminal justice-related TV programs.

Juror's expectation about whether they will receive 'scientific evidence of some kind', another main independent variable, in seven different types of offenses is measured on a 3-point scale (1:No, 2:Unsure, and 3:Yes). In order to develop an index to determine general level of expectation, all the scores are added. Higher scores indicate high expectations about scientific evidence to be presented by prosecutor. The Alpha coefficient is .839.

The present study also utilizes several demographic variables and personal characteristics as independent variables, as the justifications of its importance are described earlier. Jurors' demographic variables include age, gender, race, and other personal characteristics include education level, income level, neighborhood crime problems, and political view. Age is measured as a continuous variable ranging from 18 to 81. Gender is a dummy variable with female as a reference group (Female: 0, Male:1). In the original survey, different races/ethnicities were measured. However, the present study uses a dummy variable with whites as a reference group (White:0, Non-white:1). This re-categorization of the race is necessary because most of the jurors in the present study are whites (about 82%). Juror's education level is measured with a 4-point scale (1: Less than high school ~ 4: Post college education). Income is also measured with a 4-point scale (1: Less than 30,000 ~ 4: Over 100,000). A 5-point scale is used to measure perceptions of the crime problem in the juror's neighborhood (1: Not serious at all ~ 5: Very serious) and the political view of jurors (1:Very liberal ~ 5:Very conservative).

## Analytic Techniques

The present study employs multivariate and path analyses. Multivariate regressions are 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 develops 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, is regressed only on jurors’ demographic and personal characteristics including age, gender, race, education, income, neighborhood characteristics, and political view. This model is used to examine how each juror’s decision is associated with his/her demographic and personal characteristics. The second model (Model 2) adds 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) includes interaction terms between jurors’ exposure to CSI dramas and each of their individual characteristics.

The present study uses 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 (Tyler, 2006; Cooley, 2007, Podlas, 2006). The present study conceptualizes the causal process in which exposure to the CSI dramas

influences jurors' verdicts through their increased expectations about scientific evidence as illustrated in Figure 1.

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Figure 1 about here

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The present study utilizes several multivariate regressions to generate path coefficients among variables. First, jurors' verdicts are regressed on all variables simultaneously including jurors' expectations, exposure to the CSI dramas, and individual characteristics. Second, jurors' expectations are regressed on exposure to the CSI dramas and their individual characteristics. Finally, exposure to the CSI dramas is regressed on individual characteristics.

## RESULTS

### Multivariate Analysis

The results from multivariate analyses in the circumstantial evidence only situation are presented in Table 1. Three individual characteristics show significant effects on jurors' willingness to convict defendants based only on circumstantial evidence when prosecutors present no scientific evidence. Non-white jurors are more willing to convict defendants ( $p < .05$ ) in this situation. Education level of jurors is negatively associated with their willingness to convict defendants ( $p < .05$ ). Jurors with lower education levels show higher willingness to convict defendants than jurors with higher education levels. Not surprisingly, jurors from higher crime neighborhoods are 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 are added, the effect of age becomes significant ( $p < .05$ ). Older age is related to higher willingness to convict defendants based only on circumstantial evidence. However, the significant effect of race in Model 1 loses its significance, and the effect of education becomes marginal ( $p < .10$ ). As far as the “CSI-effect” is concerned, the Model 2 fails to generate a significant effect of the exposure to the CSI dramas on conviction, controlling for other variables. However, jurors’ expectations about scientific evidence have significant independent effect ( $p < .001$ ) above and beyond the effects of the exposure to the CSI dramas and of other individual characteristics. The Model 3 shows that there is no significant interaction effect between exposure to the CSI dramas and individual characteristics on jurors’ likely verdicts (See Table 1).

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Table 1 about here

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In the eyewitness testimony only situation in Table 2, jurors’ age and gender have significant effects on their willingness to convict defendants (Model 1). Older jurors are significantly more willing to convict defendants ( $p < .01$ ) without any scientific evidence when the prosecutors presented eyewitness testimony. Males are more likely than females to convict defendants with eyewitness testimony only ( $p < .001$ ). When exposure to the CSI dramas and expectations about scientific evidence are included in the equation (Model 2), effects of age and gender still remain significant. In addition, jurors’ political views show a marginally significant effect ( $p < .10$ ), indicating that more conservative jurors are slightly more willing to convict defendants based on eyewitness testimony. Like the findings from

circumstantial evidence situations, exposure to the CSI dramas has no significant effect on jurors' decisions, and it does 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 becomes much weaker and marginally significant ( $p < .10$ ), controlling for other variables. This finding suggests that jurors consider eyewitness testimony as important as any scientific evidence in convicting defendants. (See Table 2).

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Table 2 about here

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It is important to note that the models of multivariate analyses employed in the present study produce a smaller proportion of variances explained by the variables included. Proportions of the variance explained in the models range from 2.4% to 5.4%. This result suggests that jurors' decision making, at least in the cases presented by the present study, is mostly based on legal factors such as the strength of evidence, and is only minimally influenced by extra-legal factors such as personal characteristics or exposure to CSI dramas.

#### Path Analysis

In order to examine if exposure to the CSI dramas exerts a direct or indirect effect on convictions, the present study employs a method of path analysis. The findings are presented in Figures 2 and 3. According to Figure 2, exposure to the CSI dramas has no direct effect on jurors' willingness to convict defendants, but it shows a significant indirect

effect through raised expectations. Frequent exposure to CSI dramas raises prospective jurors' expectations about scientific evidence to be presented by prosecutor ( $p<.004$ ) and the raised expectations significantly lower jurors' willingness to convict defendants with circumstantial evidence only ( $p<.001$ ). In the eyewitness testimony situation in Figure 3, however, exposure to the CSI dramas fails to show significant direct and/or indirect effects. Jurors' expectations about scientific evidence have a weak association with their willingness to convict defendants. Exposure to the CSI dramas increases their expectations about scientific evidence, but such increased expectations do 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.

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Figures 2 and 3 about here

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Figures 2 and 3 also show that jurors' expectations about the scientific evidence is 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 suggest that jurors' raised expectations are not solely due to their exposure to the CSI dramas, but due to many different and more generalized factors. Also, a preliminary analysis indicates that those who watch CSI dramas often also watch other law-related news, documentaries, and dramas frequently ( $r=.614$ ,  $p<.01$ ). Therefore, in order to examine whether jurors' rose expectations about scientific evidence are due to exposure

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 conducts additional analyses. In these analyses, exposure to the CSI dramas is replaced with exposure to various related TV programs in general. The original survey measured jurors' exposure to 33 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 is created to reflect the exposure to TV programs in general, except for the CSI dramas. The Alpha coefficient for the index is .925.

The results in the Figures 4 and 5 indicate that exposure to the various related TV programs as a whole produces similar but different effects. Just like exposure to the CSI dramas, exposure to seemingly relevant TV programs in general significantly raises jurors' expectations about scientific evidence ( $p < .01$ ), and such increased expectations significantly lowers 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 has a significant independent (or direct) effect on jurors' willingness to convict in both situations. The more the jurors are exposed to those programs as a whole, the more they are 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 differ significantly

depending only on gender and education, exposure to law-, crime-, and criminal justice-related programs in general is related with all individual variables except for the variable of income.

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Figures 4 and 5 about here

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## SUMMARY AND CONCLUSIONS

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 show that jurors’ individual characteristics play 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, Kim, and Barak (2006). However, a more important factor that determined jurors’ willingness to convict defendants 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 indicate that exposure to the CSI dramas had no direct effect on convictions. However, it did 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 supports the conceptual and theoretical links among jurors' exposure to CSI dramas, their expectation about scientific evidence and the verdict described by Tyler (2006) and Cooley (2007). 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 might have raised expectations about scientific evidence but such raised expectations do not significantly lower the willingness of jurors to convict defendants when the prosecutors present eyewitness testimony, even though they fail to present any scientific evidence. This was not the case in the circumstantial evidence only situation.

Therefore, 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 the existence of 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 in terms of the collection and the use of various kinds of evidence. The obvious conclusion is that they should obtain and present scientific evidence whenever it is reasonably available. 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 (Shelton, 2008; National Institute of Justice, 2006). 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 should try to secure credible eyewitnesses to convince jurors and to increase the probability of convicting the defendant. This implication poses concerns about the principle of the rule of law or due process because 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 and Wells, 2008;

Migueles and 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 and Bothwell, 1983; Garrett, 2008; Wells and Loftus, 1984).

Nevertheless, the present study implies that it is crucial to provide testimony of credible eyewitnesses to the jury especially when scientific evidence is not available for prosecutors to secure a conviction of presumably guilty defendants. On the other hand, when scientific evidence is not available or presented, a good strategy for defense attorneys is to challenge the legitimacy of the circumstantial evidence and to stress the lack of direct evidence to defend their presumably innocent clients.

In addition, findings from the present study revealed that jurors' expectations about scientific evidence are significantly related with their age, race, gender, education, and political views. And, those who watch CSI dramas often also watched various other law-, crime-, and criminal justice-related TV programs frequently. Thus, jurors' expectations about scientific evidence are influenced not only by exposure to the CSI dramas, but also by many individual characteristics and by exposure to other relevant sources and materials.

Therefore, it is not exposure specifically to the CSI dramas alone that influences jurors' decision. Rather, it is their raised expectations regarding scientific evidence presented by prosecutors 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. However, as the science and technology in general developed throughout society, these scientific forms of evidences such as fingerprints, blood tests, ballistics tests, and especially DNA tests, were becoming

more available, more regularly used by prosecutors, and more widely known to the general public. 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 has expanded our 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 is not without limitations. First, it 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 and Morris, 1985; Klein and Creech, 1982; Johnson, 1985; Sommers and 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 utilized 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 suggests no difference depending on the types of offenses, it needs to be investigated further with different samples and with more detailed scenarios.

Finally, due to the limitations of survey method itself in the examination of the “CSI-effect”, future study needs to utilize 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 compliment each other.

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