

# **The Impact of Computer Animation Presented in Civil Versus Criminal Trials**

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## **ABSTRACT**

Computer animation as demonstrative evidence has a growing presence in courtrooms. There is limited research on the impact of these animations on jurors; further, the type of trial the animation is used in has yet to be examined. This study explored the effect of demonstrative animation on decision-making in a criminal vs. civil case. Using the same scenario, mock civil and criminal cases were developed, varying the presence of demonstrative visual evidence. Participants provided a verdict and indicated the role different pieces of evidence played. The presence of animation increased guilty verdicts and was viewed as more important in the criminal case but did not impact verdicts for the plaintiff in the civil case. The animation's differential impact may result from the burden of proof being different for the two trial types.

**Keywords:** courtroom; evidence; jury; perception; testimony; verdict; visualization

## **INTRODUCTION**

With the increase in computer capabilities and the evolution of animation software, computer animations are more elaborate and life-like than ever. In addition, the costs associated with creating such animations and the time needed have been reduced. The advancement in technology has led to increased use of computer animations in a variety of non-entertainment settings, one of which is in the courtrooms. Animated depictions of visual information are used as demonstrative evidence in court, created from the evidence as interpreted by an expert witness (Commonwealth vs. Serge, Pa. 2006; Hinkle v. City of Clarksburg. WV. 1996). Often computer animations are created based on an expert's interpretation of the facts in a case and then used in court as evidence to support their testimony (Feigenson & Dunn, 2003). While

forensic animation can accurately depict events occurring within virtual 3D environments (Noond et al., 2002), it can also have prejudicial effects on the perceived accuracy and value of the expert's testimony (Kassin & Dunn, 1997; Norris, 2013).

Litigators are turning to animations for many reasons, such as improvement in retention and recall of expert testimony and aiding in the visualization of events (Norris, 2013). Visual representations can be used to enhance the verbal descriptions provided by the expert during the trial, helping jurors to visualize the events (Feigenson, 2010). Having visual representations of the narratives presented in the courtroom impacts the juror's perception of truthfulness. The average attention span for jurors is about 7 minutes, and quick visual aids are much more easily

processed than verbal or written descriptions (Noond et al., 2002). The ability to relay information in an animation aids the jury in understanding how events transpire quickly. Also, such visual depictions can influence the persuasiveness of the expert's testimony and ultimately impact decision-making (Kassin & Dunn, 1997; Connel, et al., 2016; Norris, 2014). This means that in addition to information coming to the jury quickly, it can also influence their decisions differently than if no animation was present. Because these visual recreations are considered by the courts to be demonstrative evidence, they can include expert opinions, not just established facts (Commonwealth vs. Serge, Pa. 2006); thus, there is a concern about how they are used by the trier of fact.

Research on animation evidence used in the courtroom is relatively new and not very abundant (Feigenson, 2010). Some articles show that animations have a powerful effect on jurors' perceptions. For example, Norris (2013) notes that animations can swing a verdict, and subtle changes in the visual depiction can lead to significant differences in trial outcomes. In addition, Dunn et al. 2006, found that the impact computer animations had varied by type of scene depicted. In their study, they found that animations had an influence on verdicts in a plane crash scenario but not in a car crash scenario. One possible explanation provided was that the familiarity of the animation depictions might impact its influence. For instance, people are generally more familiar with car crashes so the animation may not influence their decision making. They may be able to visualize the scenario without the assistance of a visual aid. In unfamiliar depictions, animations may be seen as more persuasive as people are unable to rely on personal experience.

Computer animations most often include movement or change of perspective; however, the mere presence of visual evidence can impact perceptions of an expert's testimony. Visual reconstructions such as photographs, 3D printed models, and 3D imaging use were examined to see their impact on juries' decision-making. Compared to photographs and 3D printed models, 3D

imaging had a greater influence on jurors' decision-making (Errickson et al., 2020).

The type of trial the computer animation is being presented in is another factor that could affect how much impact it might have on jurors. Computer animations can be presented in criminal cases (Commonwealth vs. Serge, Pa. 2006) and civil trials (Hinkle v. City of Clarksburg. WV. 1996). While the presence of computer animation has been looked at in both civil (Dunn et al., 2006) and criminal trials (Connel, et al., 2016), little research has been done that directly compares the impact of such evidence in the two different legal contexts. The presence of visual evidence, like computer animation, may have a different effect since the burden of proof in a civil case is less than in a criminal one ("U.S. Code," n.d.).

The current study looked at the impact of computer animation as demonstrative evidence on jurors' decision-making in criminal compared to civil trials. The presentation of computer animation was compared to computer-generated still images of the event and the expert's testimony without any accompanying visual evidence. It was hypothesized that the presence of the animation would impact juror decision-making regarding guilt/defendant's responsibility and be viewed differently than other evidence presented during the trial.

## METHODS

### Participants

Email invitations to participate were sent to 384 undergraduates in psychology courses at a northwestern Pennsylvania university and offered extra credit for their participation. A total of 264 surveys were received; however, 42 participants failed one or more manipulation checks, resulting in 222 completed surveys which is a 58% participation rate. Of these remaining participants, 174 (78.4%) self-identified females, 206 (92.8%) indicated they were between 18 and 23, and 56 (25.2%) indicated that they had heard about the use of animations in courtrooms. Also, 31 (14%) participants had previously been called to jury duty, 2 (0.9%) of whom served.

## Materials

A mock trial scenario was constructed based on a computer animation produced by Courtroom Animation (2018). The scenario consisted of a vehicular accident, where an SUV, pulling out of a parking lot, hits and runs over a bicyclist. After reaching out to Courtroom Animation and receiving permission, the animation was shortened to the section with the vehicular accident, and screenshots of the accident were produced to be used as still images. Based on the scenario, six written vignettes were created where the type of trial (civil vs. criminal) and type of visual evidence (animation, still images, and no visual evidence) was varied (i.e., a 2 x 3 between groups design). In all the vignettes, an expert testified about the SUV driver's ability to avoid the bicyclist, supporting the prosecution or plaintiff's position; the expert's testimony was supplemented with the presence of demonstrative visual evidence depending on the condition. In the visual evidence conditions, the visual evidence (animation or still images) was presented after the expert testimony. In the no visual evidence condition, just the expert's testimony was present.

The type of trial differed between a criminal case, where the driver was charged with reckless driving that resulted in severe injury, or a civil case, where the victim of the same accident was suing for monetary damages. Participants were informed of the specific details regarding the decision of guilt or not guilty in criminal scenarios and siding for the plaintiff or defendant in civil scenarios. A set of questions was then generated for participants to respond to after they read the scenario. First questions were designed to make sure that participants had both read and understood the scenario and viewed any visual evidence presented. Then a question asked participants to make a decision regarding the guilt/ responsibility of the defendant and the certainty of their decision. In addition, questions were developed to assess, on a seven-point scale, how much impact the various pieces of evidence presented during the trial, including statements from the victim and the defendant, the expert's testimony, and any visual evidence, had on the participants' decisions.

## Procedure

Participants were sent an email invitation inviting them to participate in our study. The email included a link to an anonymous online survey. Participants were asked to review and agree to the informed consent. Upon agreeing to the informed consent, participants were randomly assigned to read one of six case scenarios. The participants saw either an animation of events, or images of the events, or they only read a description of what had transpired. The participants only interact with one of the vignettes from either the civil or criminal scenarios. After reading the scenario (and viewing the animation or images as required), participants were then asked questions to assess if they read the case and understood the scenarios. They then respond to questions regarding their views on the evidence used and its importance in their decision-making. Once completing these questions, participants were asked to provide non-identifying demographic information and were then taken to a separate page to provide any needed information for obtaining extra credit.

## RESULTS

Participant's verdicts in the criminal case (Figure 1) were impacted by the presence of visual demonstrative evidence ( $X^2(2) = 8.545, p = .014$ ) with a medium effect size ( $f = .275$ ). In the direct comparisons of the impact of the three types of demonstrative evidence on the verdict, the difference between No Visual Evidence and the Computer Animation was significant ( $X^2(1) = 8.224, p = .004, f = .343$ ); however, the difference between No Visual Evidence and Image was not-significant ( $X^2(1) = 3.563, p = .059$ ), nor between Image and Computer Animation (Figure 1). Participants' verdicts in the Civil case did not significantly differ based on the presence of demonstrative visual evidence (Figure 2).

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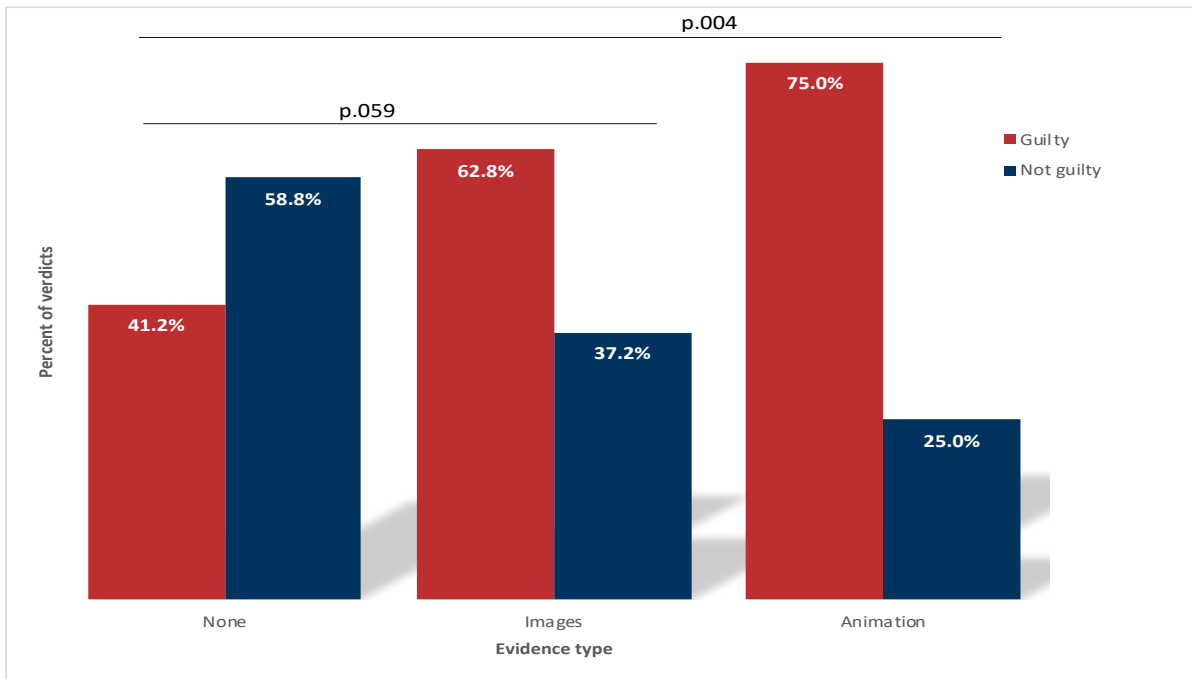


Figure 1. Verdict (guilty vs. not guilty) in the criminal case by the presence of demonstrative visual evidence

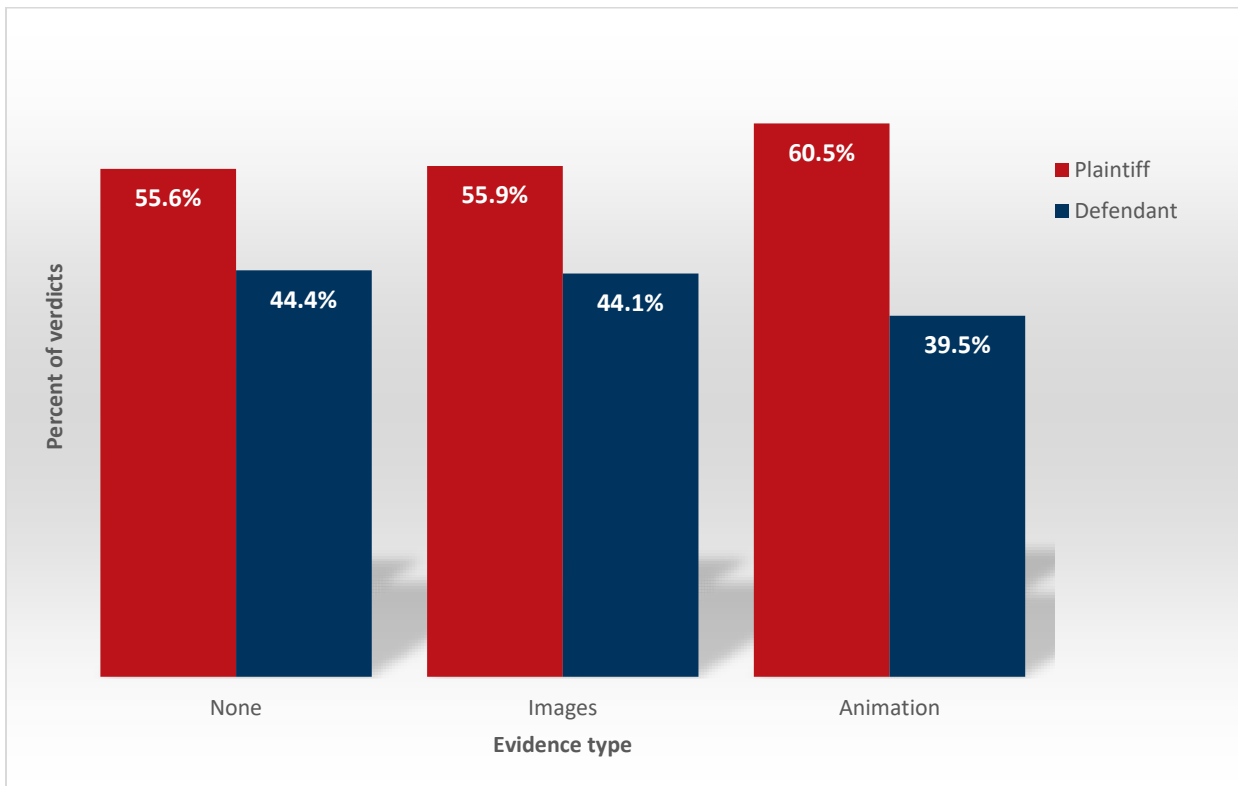


Figure 2. Verdict in the civil case (Plaintiff vs. Defendant) by the presence of demonstrative visual evidence

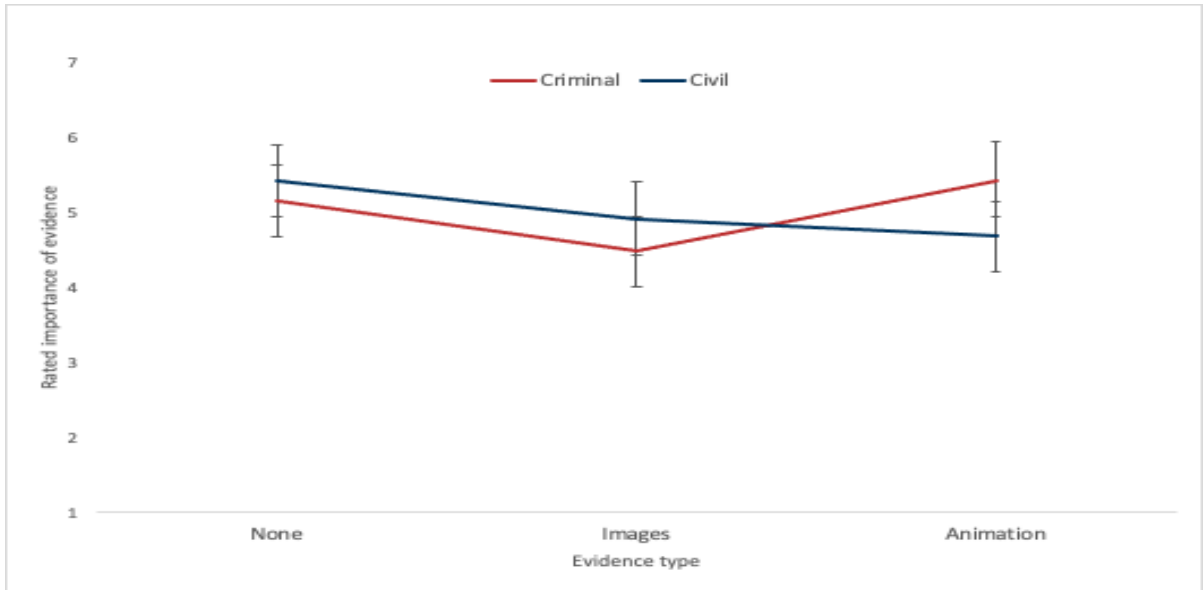


Figure 3. Importance of expert demonstrative evidence by civil vs. criminal trial type (error bars +/- 2SEM)

The presence of computer animation was seen as more important in the criminal trial (Figure 3). In contrast, the expert testimony and the images were viewed as more important in the civil trials ( $F(2,209) = 3.30, p = .04, \eta_p^2 = .03$ ). No other significant differences were

found in participants' feelings about understanding the case, accuracy of the representations, or how realistic they felt the demonstrative evidence was based on evidence type.

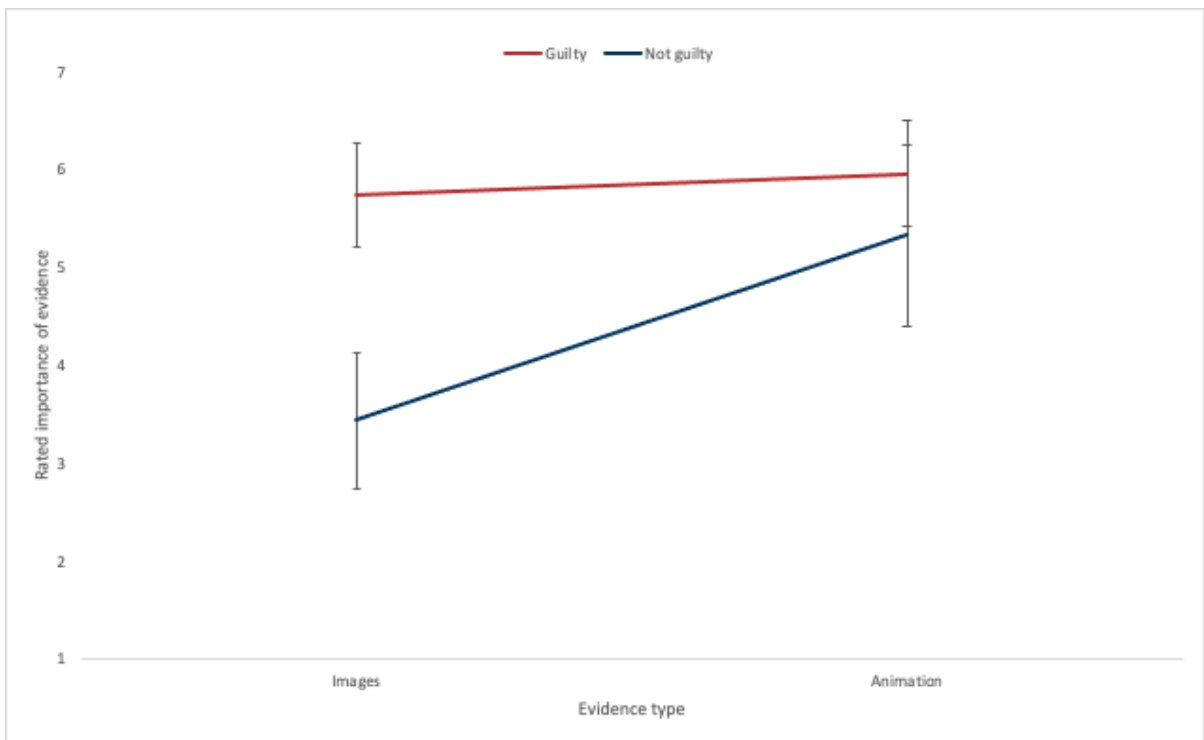


Figure 4. Importance of visual evidence in the criminal case (guilty vs. not guilty) in reaching a decision (error bars +/- 2SEM)

When asked directly how important the visual evidence was coming to their verdict in the criminal case, the animation was seen as being more important ( $M = 5.65$ ,  $SE = .267$ ) than the images ( $M = 4.59$ ,  $SE = 2.19$ ) ( $F(1,75) = 7.36$ ,  $p = .008$ ,  $h_p^2 = .089$ ). In comparing participants' ratings of the importance of all the evidence presented in the case, the type of visual representations (image and animation) in the criminal case varied based on the verdict, a significant interaction was found ( $F(1,75) = 5.89$ ,  $p = .02$ ,  $h_p^2 = .073$ ). Participants who voted not guilty found the animation more important than they did images (Figure 4), whereas there was no difference in importance based on evidence type for those voting guilty. No significant differences were found in the importance of the type of visual evidence in the civil case.

## DISCUSSION

The verdict in the criminal case was influenced by the presence of demonstrative computer animation evidence. The majority of participants who viewed either images or the animation in the criminal case thought the defendant was guilty, compared to the majority voting not guilty when no visual evidence was presented. Animation had the greatest impact on influencing participants' decisions. However, such an impact for visual evidence was not present in the civil case, with no difference between the types of demonstrative evidence and decision-making about the defendant's responsibility.

An explanation for the differential effect of the visual evidence in the two trial types could be that the burden of proof in criminal trials is much higher than that of civil trials. In criminal trials, the standard to judge the defendant is beyond a reasonable doubt. In civil trials, it is the preponderance of the evidence ("U.S. Code," n.d.). The visual evidence, particularly the animation, seemed to influence participants more in determining criminal guilt. With the increased burden of proof, the visualization of the events, even based on opinion, not actual recordings, increased certainty that the driver acted recklessly. Whereas in the civil case, participants in all conditions were more likely to view the driver as having some level of

responsibility. Thus, in a criminal trial, the prejudicial impact of the animation is greater, as it tips the balance of the scales towards the level of beyond a reasonable doubt.

The burden of proof is just one difference between criminal and civil trials. Criminal trials are seen as offenses against the state, whereas civil trials are more often person versus person. Criminal trials often involve a level of malicious intent, while civil trials usually are the result of negligent conduct. Civil trials are more flexible in their decision-making and final sentencing, but criminal trials are almost always left in the hands of the court (Erstad, 2022). In a criminal trial, the high burden of proof and some of these other factors could be what helps a jury to decide if a crime has been committed or not. Likewise, in a civil scenario, the preponderance of the evidence is used to determine what the plaintiff is owed and whether the defendant was a part of the offense that was committed.

Furthermore, criminal trials require clear and convincing evidence for decision-making. While the decision is either guilty or not guilty, civil trials have more variability in determining the defendant's responsibility. Due to this, jurors may examine evidence differently between the two trials, which may result in the differences we found. These differences could impact the decision-making process of jurors in trial scenarios.

The increased influence of animation in criminal trials was also present in the interaction between trial type and evidence type. Those who viewed the animation in the criminal trial viewed it as more important than in the civil case. However, in the criminal case, the impact of the animation was not limited to those voting guilty. Both those voting guilty and not guilty reported that the animation had a larger impact on their ultimate decision and that difference in impact with the still images was greater for those voting not guilty.

The primary limitation of this study was that this was a mock trial scenario and may not accurately reflect jurors' perceptions in real cases. Our case presentation was a summarization of events rather than an actual trial or trial transcript. Another limitation discussed is the type of visual evidence used in

this study. Although the narrative, still images, and computer animation were presented in the most neutral way possible, there could be factors about them that influenced participants' decisions that were not accounted for. Furthermore, the computer animation was a reconstruction of a real event where the court ruled in favor of the cyclist. The results could possibly be skewed in favor of the cyclist as a product of the events rather than the variables introduced in this study.

The technology to create animations may become more advanced, leading to life-like recreations of events based on the interpretation and opinion of an expert witness. This could have multiple effects, such as competing against physical evidence. The content or quality of animation could attract a juror's focus from other pieces of evidence. In the legal system, there is often discussion of who can pay for the best lawyer. In the years to come, as animations become more and more impactful in the courtrooms, the consideration may shift to who can pay for the best forensic animation reconstruction.

Future research should be done on the difference between visual evidence used in a criminal trial versus a civil trial and the impact that it may have on jurors' perception of guilt/defendant's responsibility, as it will certainly influence the decisions made in court.

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