

Real and Demonstrative Evidence: From State of the Art to Cutting Edgeⁱ

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I. Introduction

Melvin Belli is regarded as the “Father of Demonstrative Evidence.” He began his legal career representing convicts on death row at San Quentin at the request of the Catholic Chaplain at the famous prison. His use of demonstrative evidence began when he defended a prisoner on a charge of murder occurring in prison. His defense was self defense. To prove it, Belli subpoenaed the confiscated weapons taken from prisoners over the years at the prison. He had them marked as exhibits by dumping the entire box of weapons on the clerk’s desk to be marked as an exhibit. It was a successful defense.

In his first personal injury lawsuit, Mel Belli represented an injured cable car gripman. Over defense attorneys’ objections, Belli brought a large model of a cable car intersection and the gearbox and chain involved in the accident to court to demonstrate to the jurors exactly what happened.

A second case involved a young mother whose leg was severed by a trolley in San Francisco. After a jury awarded her \$65,000 the opposing lawyers appealed the verdict, claiming the amount was excessive. Belli appeared in court with a long and slender box, which attracted the attention of the judge, jury, and opposing counsel. All of them were thinking the same thing: did he really have the severed leg of his client, Mrs. Jeffers?

In the final moments of his concluding argument Belli unwrapped the box, revealing his client’s artificial leg. After delivering the final lines of his speech describing the unfeeling limb of his client, he placed the leg in a juror’s lap.

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Since that time, the use of real and demonstrative evidence has become common place in the courtroom, but attorneys use and knowledge of the effectiveness of such evidence varies widely. Moreover, cognitive science has demonstrated the effectiveness of real and demonstrative evidence in allowing jurors to see, touch, and feel the reality of what a plaintiff or other party has experienced. It takes the issues of the case and makes them real and believable allowing the jury to place themselves into the situation and circumvents the natural skepticism jurors have of the claims made by the parties.

It now seems obvious that demonstrative exhibits can illuminate and give meaning where a juror might otherwise have trouble grasping a concept.¹ For example, the difference between simply describing working of the human heart as opposed to holding up a working model and showing how the various parts function is dramatic.² Lawyer use demonstrative evidence not only to simplify and clarify meaning, but because they believe that it makes presentations more memorable.³

In the past decade, scientific research has largely confirmed the effectiveness of demonstrative evidence.⁴ For example, a recent study shows that the use of PowerPoint is more effective than not using PowerPoint or a similar visual presentation.⁵ Moreover, the very use of technology itself, independent of the underlying information presented, may increase jurors' esteem of lawyers, leading to a more likely favorable verdict.⁶

Yet while the research is finally catching up with our use of real and demonstrative evidence, technology continues to change, making effective use of demonstrative evidence a moving target for trial attorneys. Until recently, demonstrative evidence meant mounting a photo or displaying an x-ray.⁷ Today the field includes photo enlargements, diagrams, graphic charts, custom medical diagrams, models, computer generated animations, video presentations, power point presentations and anything else a trial attorney can dream up (assuming the judge allows it).⁸

And the expectations of jurors in our technology driven society continue to increase.⁹ "From the moment they wake up until they go to sleep, jurors are immersed in a steady stream of graphics displayed on television, movie screens, billboards, magazines, and even cell phones."¹⁰ Not only are potential jurors immersed in this increasingly media-intensive culture, many people create the graphics themselves.¹¹ "With a digital camera or video recorder to capture the graphics and the software to edit them, the ability to create graphical media is now within reach of an ever-

¹ W. Mark Lanier, *Communicating Without Speaking*, West Texas General Practice Symposium, March 3, 2006, Lubbock, USA, at C-2.

² Lanier, *supra* note 1, at C-2.

³ Lanier, *supra* note 1, at C-2.

⁴ *Infra*, Section II.

⁵ *Infra*, Section II (b).

⁶ *Id.*

⁷ Gary B. Pillersdorf, *Nuts and Bolts: Demonstrative Evidence in Automobile and Premises Cases*, Association of Trial Lawyers of America (July, 2003) Ann.2003 ATLA-CLE 2233, at 1.

⁸ Pillersdorf, *supra* note 7, at 1.

⁹ Cliff Atkinson, *Using Graphics to Persuade: Three Steps to Clarity and Focus*, Association of Trial Lawyers of America (February, 2006), at 1.

¹⁰ *Id.*

¹¹ *Id.*

wider population.”¹² Media-savvy jurors will expect a legal case to be presented using graphics too.¹³

Effective use of demonstrative exhibits is much more than tacking a “visual aid” onto a trial presentation.¹⁴ The strategy of preparing a visual trial presentation must be incorporated at an early stage of litigation.¹⁵ From e-discovery to storyboarding, this means that the art and science of real and demonstrative evidence deeply influences the trial preparation of the effective trial attorney.¹⁶

Attorneys would be well advised to apply a unified approach to integrating all media used during a trial.¹⁷ This unified approach begins with an understanding of the empirical evidence of the way the mind processes the information presented through the use of demonstrative evidence.¹⁸ For example, an understanding of the need for tailoring a presentation with the limitations of human short-term memory applies across the board, whether one is using PowerPoint, flip charts, document projectors, or other tools.¹⁹ Applying a scientifically grounded approach across all materials ensures coherence of the story and the focus of the jury’s attention.²⁰

The many forms of real and demonstrative evidence and their use at trial have been written about extensively; Part I of this Article contains a survey of those well-established uses. Part II is a detailed discussion of the scientific evidence regarding the effectiveness and use of visual and demonstrative evidence, both generally, and at trial. Part III integrates this scientific background with specific techniques the practicing trial attorney may use to leverage this science to achieve trial success. Finally, Part IV addresses evidentiary foundation and admissibility concerns these techniques may raise.

a. Definitions of Real and Demonstrative Evidence

Black’s Law Dictionary defines demonstrative evidence as

That evidence addressed directly to the senses without intervention of testimony. Real (“thing”) evidence such as the gun in a trial of homicide or the contract itself in the trial of a contract case.

Evidence apart from the testimony of witnesses concerning the thing. Such evidence may include maps, diagrams, photographs, models, charts, medical illustrations, X-rays.²¹

More broadly, demonstrative evidence is something that demonstrates a point, as opposed to

¹² *Id.*

¹³ *Id.*

¹⁴ Atkinson, *supra* note 9, at 11.

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ *Id.*

²¹ BLACK’S LAW DICTIONARY 432 (6th ed. 1990).

simply testifying with words about a point.²² “Real” evidence, by contrast, consists of objects and things—the promissory note, the canceled check, the voluminous contract, the defective helmet, the negligently designed crib, and the remains of the defective tire—and documentary evidence consists of records, memos, and the like.²³ Demonstrative evidence is prepared evidence, usually in graphic form, that illustrates, correlates, supplements, and emphasizes facts or circumstances.²⁴ For example, storyboards, chronologies of events, and “time lines” are among the simplest and most effective forms of demonstrative exhibits.²⁵ Attorneys rely on these devices to present relevant evidence persuasively in difficult cases.²⁶

Missouri courts frequently blur the distinction between real and demonstrative evidence and admit evidence which may not actually have played any role if it looks like an object which might have played such a role.²⁷

Sometimes exhibits themselves may not actually be admitted but are used only for “demonstrative purposes” to illustrate contemporaneous testimony or explain scientific principles.²⁸ Thus the jury does not have these exhibits in the jury room for consideration during their deliberations. This is a major limitation on exhibits used only for illustrative purposes.²⁹ Ideally, substantive demonstrative evidence should be prepared to be admissible.³⁰

b. Examples of Real and Demonstrative Evidence

Real and demonstrative evidence may take myriad forms, limited only by the imagination of the lawyer and the discretion of the court. Such evidence could be any of the following:

- Pictures in a PowerPoint presentation,
- Pictures on an overhead projector,
- A water balloon,
- A jar of poison,

²² Lanier, *supra* note 1, at C-2.

²³ Linda Atkinson, *Demonstrative Evidence that Works*, at C-2.

²⁴ *Id.*

²⁵ *Id.*

²⁶ *Id.*

²⁷ See, e.g., *State v. Roller*, 31 S.W.3d 152, 158–59 (Mo. Ct. App. S.D. 2000) (where defendant claimed shooting was accident, guns found in his home were relevant to show his level of skill in handling firearms and his ability to avoid mishaps); *State v. Edwards*, 31 S.W.3d 73, 80–82 (Mo. Ct. App. W.D. 2000) (no error in admitting two knives found by police when home previously occupied by defendant, and victim was searched shortly after victim was knifed. “[W]hile neither knife was shown to have been the one used to stab the victim, both were found at the scene of the crime shortly after it occurred. One had blood on it, and the other was in the sink in water, and the detectives reasonably could have thought it might have been used to commit the crime”); *State v. Strughold*, 973 S.W.2d 876, 886 (Mo. Ct. App. E.D. 1998) (printouts of graphic images found on defendant’s home computer); *State v. Carter*, 691 S.W.2d 417, 419 (Mo. Ct. App. S.D. 1985) (sweater admissible where witness testified that “it ‘looks like the shirt he had on, it’s made like it, looks like it, same color.’”); see also *State v. Thresher*, 350 S.W.2d 1, 7–8 (Mo. 1961) (stick which defendant identified and said “looks like” the stick with which he hit the victim was admissible “to illustrate the type and kind of weapon used.”)

²⁸ Atkinson, *supra* note 23, at C-2.

²⁹ *Id.*

³⁰ *Id.*

- A saw,
- A grinding machine,
- A spoon with salt, or
- A book or set of books.³¹

At a basic level, there are two tasks in deploying real and demonstrative evidence: the creative process of selecting the evidence, and the technical process of presenting it at trial.³² Effective preparation requires rehearsal, as well as brainstorming ways that use of demonstrative evidence could fail. “[D]on’t ask O.J. Simpson to try on a glove unless you know it will fit!”³³ Obviously, it is critical to ensure that the judge will allow the evidence.³⁴ We address some of the most commonly used categories of real and demonstrative evidence and techniques for their use.

i. Photographs

Lawyers place great weight upon the old adage that “a picture is worth a thousand words.”³⁵ Indeed, a blowup of a photograph or document that is otherwise admissible is perhaps the simplest and most common form of demonstrative evidence.³⁶ Blowups are so common in part because of their perceived effectiveness.³⁷ For example, in a case in which 1,000 pages of medical records have been admitted, enlarging one or two of those pages serves to focus the jury’s attention on that part of the record most significant to the claims.³⁸

Blowups are easy to use because once the underlying documents are admitted, the court is likely to also admit the enlargements.³⁹ Once medical records have been authenticated and admitted into evidence, portions of the record may be published to the jury.⁴⁰ Enlargements are frequently kept on display during the testimony, in the hopes that they will thereby embed their information into the minds of the jurors.⁴¹

Photographs are particularly common in cases where a client’s injuries are visually apparent.⁴² Depictions that make use of before and after comparisons are especially appealing but may be difficult to implement because they require that photographs be taken early, since scars and wounds fade over time.⁴³

Particularly graphic images are often prepared in both color and black and white, as some

³¹ Lanier, *supra* note 1, at C-3.

³² *Id.*

³³ *Id.*

³⁴ See *Infra*, Section IV.

³⁵ Kathleen Flynn Peterson, *Enhanced Persuasion: Effective Use of Demonstrative Evidence at Trial*, *ADVOCATE* (Jan. 2010), at 2.

³⁶ Stephen F. Malouf, *Using Pictures to Develop Your Case Theme*, American Trial Lawyers’ Association Annual Seminar During Jazz Fest: Litigating Auto Collision Cases (April 2005), at 7.

³⁷ Malouf, *supra* note 36, at 7.

³⁸ *Id.* at 7-8.

³⁹ *Id.* at 8.

⁴⁰ Peterson, *supra* note 35, at 2.

⁴¹ *Id.*

⁴² *Id.*

⁴³ *Id.*

courts have ruled graphic color photographs to be overly prejudicial.⁴⁴ Poor quality photographs are both prima facie less effective and potentially inadmissible.⁴⁵ Counsel will therefore often choose to have photographs professionally taken.⁴⁶ Poster-size enlargements are evidently more effective than small snapshots.⁴⁷

X-rays and other medical imaging are also used to present graphical information to the jury regarding a client's injuries. Some attorneys believe that X-ray positives rather than X-ray negatives such as X-rays are easier for juries to relate to. Such X-rays turn the white areas on the X-ray into black areas, making for example, the bones look solid and any orthopedic hardware clearly distinguishable.⁴⁸

"The Digital Imaging and Communications in Medicine (DICOM) format for distributing and viewing medical images such as radiology films is now the gold standard for how to receive and display radiology images."⁴⁹ The cost for obtaining the plaintiff's imaging studies in DICOM format from a hospital or facility is minimal, and the ability to manipulate and display the data is enhanced.⁵⁰

Photographs of witnesses may prove particularly useful. A wise attorney will attempt to obtain a photograph of every witness in the case. These pictures may be used to emphasize a visual theme or to link the witness's testimony to a photograph throughout the case.⁵¹

For example, a photograph of an expert who has previously testified may be displayed during cross-examination of another witness who is discussing the expert's opinions. The slide might also display excerpts or a summary of the expert opinion that is being discussed.⁵² "The visual reinforces the earlier oral presentation, and the photo reminds the jurors whose opinion it is."⁵³ By including a summary or excerpt on the slide, the jury is presented with the expert's findings one more time.⁵⁴

When no other photograph of a witness exists, but a video deposition has been taken, stills shot of the witness can be extracted from the video.⁵⁵ A forethoughtful attorney could bring a camera to each deposition and photograph the witness there.⁵⁶ A photograph from the deposition is particularly useful because the witness will be in the same clothing and setting as any deposition video.⁵⁷ There will consequently be a strong link in the juror's mind between the photograph each

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ Peterson, *supra* note 35, at 2.

⁴⁷ *Id.*

⁴⁸ *Id.*, at 3.

⁴⁹ Mark D. Clore, *Thinking Backwards for Computer Presentations, How to Prepare and Present Strategically*, Association of Trial Lawyers of America (January, 2010), at 8.

⁵⁰ Clore, *supra* note 49, at 8.

⁵¹ Zoe Littlepage, *Keep Jurors Awake with Powerful Visuals*, 43-OCT TRIAL 32, at 4.

⁵² Littlepage, *supra* note 51, at 3.

⁵³ *Id.*, at 3-4.

⁵⁴ *Id.*, at 4.

⁵⁵ *Id.*

⁵⁶ *Id.*

⁵⁷ Littlepage, *supra* note 51, at 4.

time it is displayed and the testimony the attorney wishes to emphasize.⁵⁸

ii. Medical Illustrations and Models

An easy way to present complex medical issues is to create visual images of the effects of the disease or injury-and then consistently use those visuals throughout the trial.⁵⁹ Images for virtually every ailment, disease, and injury are available online. Color photos can be scanned from medical textbooks for use at trial.⁶⁰

Attorneys can enhance the drama of physician testimony by having the doctor come off the stand to work with medical illustrations or models.⁶¹ For example, one might instruct the doctor to mark medical models with an erasable pen, showing the jury the location of the plaintiff's injuries.⁶² The attorney can then seek to have the models admitted as evidence, allowing the jury to examine them closely during deliberations.⁶³

Custom-made illustrations of the client's injury are expensive, but if they effectively illustrate the problem, they may be worth the cost.⁶⁴ Not every medical, scientific or other illustration, symbol, or animation needs to be custom drawn or created for a given case.⁶⁵ Often they can be found free of copyright reservation, or otherwise available for business, personal, and education uses.⁶⁶

iii. Day-In-The-Life Video

There is a common misconception among attorneys that, most of the time, day-in-the-life films are too expensive to produce.⁶⁷ In the age of smartphones, it is relatively easy to create a day-in-the-life presentation that consists of both photographs and video.⁶⁸ "Even one great shot of your client-after surgery, in the hospital, or struggling with physical therapy or routine tasks-can replace an hour of testimony about damages."⁶⁹

From the case's inception, the attorney should insist that the client document all injuries and photograph or videotape every stage of the treatment and progress.⁷⁰ Incorporating these visuals into the trial presentation can show the reality of the damages in a dramatic fashion.⁷¹

The video will typically concentrate on hygiene, travel, and other daily tasks that cannot

⁵⁸ *Id.*

⁵⁹ *Id.*

⁶⁰ *Id.*

⁶¹ Gary B. Pillersdorf, *Sweet Visuals to Sway Jurors*, TRIAL, Vol. 6, No. 34 (Jun. 2007), at 5.

⁶² Pillersdorf, *supra* note 53, at 5.

⁶³ *Id.*

⁶⁴ *Id.*

⁶⁵ Clore, *supra* note 49, at 5.

⁶⁶ *Id.*

⁶⁷ Littlepage, *supra* note 51, at 4.

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ *Id.*, at 5.

⁷¹ *Id.*

be replicated in the courtroom, or it may be considered cumulative with other evidence and inadmissible.⁷² In any case, long videos may lose their impact.⁷³ The video should be tastefully done, including taking care not to overly embarrass the client or the jury.⁷⁴

iv. Functional Capacity Evaluations

Likewise, pain management or rehabilitation programs may be brought to life in the courtroom by videotaping a typical session with the client used in court with the therapist to narrate.⁷⁵ They are often used to show how difficult the road is in getting back to doing the simplest tasks.⁷⁶

v. Pain Medications or Drugs

The attorney may re-create the volume of large doses of prescription or even non-prescription drugs by using dummy pills or candy and pouring them into a clear container.⁷⁷ “For example, if the plaintiff four Tylenols per day plus two sleeping pills is 6 x 364” or 2, 190 pills per year.⁷⁸ This demonstration could be used in conjunction with evidence of the medication’s negative side effects.⁷⁹ The argument could be made that the simple necessity of taking pills so frequently is harmful to a plaintiff’s quality of life.⁸⁰

vi. Models and Out of Court Experiments

Another commonly used category of demonstrative evidence consists of models, charts, and out-of- court experiments.⁸¹ For example, the attorney might videotape an experiment such as a crash test and offer the videotape into evidence.⁸² Other possibilities include building a model of the scene of an automobile accident or creation an animation of blood flow for a medical negligence action.⁸³

Out-of- court experiments are generally admissible if there is a substantial similarity between conditions existing at the time of the event at issue and the conditions existing at the time of the experiment.⁸⁴ Even when there is dissimilarity in the conditions, admission of the experiment is within the trial court’s discretion if the differences are minor or subject to explanation.⁸⁵

⁷² Linda Miller Atkinson, *Drive Home Your Message: Effective Evidence for Auto Cases*, Association of Trial Lawyers of America (January, 2005) Winter2005 ATLA-CLE 267, at 8.

⁷³ *Id.*

⁷⁴ *Id.* at 8.

⁷⁵ *Id.* at 9.

⁷⁶ *Id.* at 8.

⁷⁷ *Id.*

⁷⁸ Atkinson, *supra* note 72, at 8.

⁷⁹ *Id.*

⁸⁰ *Id.*

⁸¹ Malouf, *supra* note 36, at 7-8

⁸² *Id.*

⁸³ *Id.*

⁸⁴ See Section IV, *infra*.

⁸⁵ *Id.*, Malouf, *supra* note 36, at 7-8

Toys or models of the vehicles can be used to make comparisons with the damage photos, or vehicle handling characteristics.⁸⁶ Models of the client's face that can be peeled back to show underlying injuries are very expensive but may be worthwhile.⁸⁷

Creation of an admissible scale model is a multi-step process. A scaled diagram of the area prepared by a qualified person is the first step.⁸⁸ The diagram could include measurements of the distances from landmarks like light poles or street signs, as well as the location of crosswalks and all traffic control devices.⁸⁹ Testimony of the person who created the scaled diagram can then provide the foundation for admission of a scaled magnetic model of the accident scene, including cars or other relevant objects.⁹⁰ This magnetic accident board can be used as a visualization tool for other evidence the witnesses discuss.⁹¹

Some attorneys believe that using a model can be critical to the trial presentation.⁹² "Phrases like 'the accident happened in the middle of the intersection' take on new life when the plaintiff can place the model cars at the point of impact and describe distances and relevant features like crosswalks and parking lanes."⁹³

Effective use of a scale diagram can turn the outcome of a trial into a math problem.⁹⁴ The plaintiff, if well prepared, can demonstrate to the jury why the numbers mean he or she was not at fault.⁹⁵ The use of the magnetic scale diagram is used as a method for humanizing the client.⁹⁶ The attorney may have the witness get off the stand and use the magnetic accident board or another map blowup to show jurors the route he or she took the day of the accident.⁹⁷ As with the other techniques mentioned herein, the most effective attorneys will take care that the witness has an opportunity to practice before trial.⁹⁸

The witness may testify how fast he or she was going just before the crash to help demonstrate the timing of the accident.⁹⁹

For example, if the plaintiff was traveling at 20 mph, ask the court to take judicial notice of the fact that a mile is 5,280 feet, and, therefore, the plaintiff claims he or she was traveling about 30 feet per second. Using the distance grid, you can easily show where your client was two seconds before the crash.¹⁰⁰

⁸⁶ Atkinson, *supra* note 72, at 9.

⁸⁷ *Id.*

⁸⁸ Pillersdorf, *supra* note 53, at 4.

⁸⁹ *Id.*

⁹⁰ *Id.*

⁹¹ *Id.*

⁹² *Id.* at 5.

⁹³ Pillersdorf, *supra* note 53, at 5.

⁹⁴ *Id.* at 6.

⁹⁵ *Id.*

⁹⁶ *Id.*

⁹⁷ *Id.*

⁹⁸ *See Infra*, Section III(d).

⁹⁹ Pillersdorf, *supra* note 53, at 6.

¹⁰⁰ *Id.*

The use of the magnetic diagram is just one way that models can be used. Another technique that is frequently used is the use of medical models, such as skeletons.¹⁰¹ As with other medical models, the flexible moving parts can engage jurors with tactile learning styles.¹⁰²

vii. Maps or Aerial Photographs

Topographical maps and aerial maps are useful in setting the scene for the jury, and are particularly suited for showing visibility and assured clear distance.¹⁰³ If a police officer testifies, an enlarged street map of the area where the accident occurred can also aid the jury in following the officer's presentation.¹⁰⁴

Maps with elevations and curve gradients, are typically available from any county or municipal governments.¹⁰⁵ They may also be available online. A police officer can establish the foundation for the map by testifying to the general schematic correctness of the diagrams.¹⁰⁶ He or she can corroborate the location of traffic signs and lights.¹⁰⁷ If necessary, an employee from the department of transportation, or whoever provides the records, can also provide the necessary foundation.¹⁰⁸

Aerial photos may serve the same function as maps, and will also show recognizable landmarks.¹⁰⁹ Most localities hire companies to routinely take these photos for surveys, and the companies usually will sell them for a modest price.¹¹⁰ Aerial photographs are also available online from Google Earth or other sources.

viii. Computerized Models, Animations, Or Graphs

The most recent addition to the canon of demonstrative evidence techniques is computer animation.¹¹¹ In sum, computer-generated animation recreates an accident, event or medical process or procedure, and allows the jury to see what happened.¹¹² Typically, the animation is played from a computer and displayed on a screen.¹¹³

To goal of using animation is to assist the judge and jury in retaining key concepts, as well as to ensure that important facts are not left to the imagination. "Without animation, jurors listening to an oral presentation may create their own differing versions of the process or event.... [W]ith animation, all the jurors see the exact same event at the same time and to some degree become

¹⁰¹ Peterson, *supra* note 35, at 2.

¹⁰² *Id.*

¹⁰³ Atkinson, *supra* note 72, at 6.

¹⁰⁴ Pillersdorf, *supra* note 53, at 2.

¹⁰⁵ *Id.*

¹⁰⁶ *Id.*

¹⁰⁷ *Id.*, at 4.

¹⁰⁸ *Id.*

¹⁰⁹ Pillersdorf, *supra* note 53, at 4.

¹¹⁰ *Id.*

¹¹¹ Peterson, *supra* note 35, at 3.

¹¹² *Id.*

¹¹³ *Id.*

witnesses.”¹¹⁴

Animation provides a unique technique to allow the jurors to see processes as they develop step by step.¹¹⁵ It is an intuitively appealing option for explaining spatial relationships and complex time processes.¹¹⁶ For example, computer animation could show how prudence would have prevented an intersectional collision, or that the defendant’s version of the events is inherently contradictory.¹¹⁷

Not every “reconstruction” needs to be done on the computer. Tried and true methods, such as re-creating significant distances in the courtroom with a roll of paper or tape that provides a visual reference for length or height, are still available.¹¹⁸ Some courtrooms already have distances measured from the bench to the back of the courtroom and this may be available to use.¹¹⁹

Attorneys can create something like a reconstruction with simple video by taking a recording of the route of the defense vehicle with a camera behind the wheel where the driver was positioned, in order to, for example, reveal the blind spots.¹²⁰ Similar footage could be used outside along the alleged route to show handling characteristics, causation, and the foreseeable pedestrian victim.¹²¹ Alternatively, this video can form the foundation for the computer animation.¹²²

ix. Audio Recreations

In cases where a client has lost the ability to see or hear, an audio recreation may be used to convey the gravity of the condition. If the client has gone blind, the attorney can create a video of a significant event in the client’s life, like a child’s birthday party.¹²³ The audio can be played while the screen is blank to show how the plaintiff experienced it.¹²⁴ In a deafness case the process would be reversed, with the video running without any audio.¹²⁵

Other sounds can be relevant: 911 calls or news clips of the accident would certainly be fair game. “Have you ever been in an intensive care unit? The beeps, electronic graphs, and whirs or whooshes of a ventilator are a sensory bombardment with the seriousness of the condition.”¹²⁶ These sound effects can be reconstructed as an audio recreation and used as demonstrative exhibits.¹²⁷

x. Performance Reviews or “Report Cards”

¹¹⁴ *Id.*

¹¹⁵ *Id.*

¹¹⁶ Peterson, *supra* note 35, at 3.

¹¹⁷ Atkinson, *supra* note 72, at 9.

¹¹⁸ *Id.* at 7.

¹¹⁹ *Id.*

¹²⁰ *Id.*

¹²¹ *Id.*

¹²² Atkinson, *supra* note 72, at 7.

¹²³ *Id.* at 8.

¹²⁴ *Id.*

¹²⁵ *Id.*

¹²⁶ *Id.*

¹²⁷ Atkinson, *supra* note 72, at 8.

Driver manuals, company guidelines, and even the federal regulations set out written guidelines for what should be done under certain circumstances.¹²⁸ The corporate representative's deposition can be used to establish the foundation for creating a "report card" based on these written guidelines.¹²⁹ The "report card" can then be used to show the jury that the company failed to live up to required standards.¹³⁰

xi. Hardware: Tools, Parts, Medical Devices

A physical item that is a central to the facts of the case is a form of real evidence.¹³¹ For example, the attorney may want to let a juror feel the heft of a damaged trailer hitch.¹³² Providing the black box and photographs of how the box is located in the truck can provide a frame of reference for the credibility of black box evidence.¹³³ The chisel and hammer used during a laminectomy can provide jurors with a visceral understanding of the gravity of the surgery.¹³⁴ Showing the jurors the physical pulse oximeter can demonstrate, for example, how easy it would have been to monitor oxygen saturation.¹³⁵ Fixation devices or metal fixtures can be used in conjunction with x-rays that show them in place.¹³⁶

Medical devices and other pieces of real evidence may be used live at trial with expert witnesses.¹³⁷ This technique can bring to life dull or esoteric medical words, and turn these ideas into concrete things the jurors can see and touch. "Intramedullary rod," for example, is simply a medical term until a doctor shows the jurors the device and "explains how this ominous-looking piece of metal is inserted into a canal that has been drilled into a broken bone."¹³⁸ Similarly, fixation screws make a visceral impression when jurors can see them and are told this is the object that had to be put in the client's body as a result of the injury.¹³⁹

This kind of evidence can be used creatively, if the judge will allow it. If the patient lost 500 ccs of blood, an expert witness could bring in a 500-cc bag of saline and pour it into a container so jurors can see just how much blood the plaintiff lost.¹⁴⁰

xii. Diagrams, Side-By-Side Charts, Or Other Summaries

As with other forms of demonstrative evidence, with charts, graphs, and visual aids, the possibilities are endless. The principle behind the use of charts and graphs is to simplify information in a way that assists in the ultimate goal persuading the jury. Visual aids can

¹²⁸ *Id.*

¹²⁹ *Id.*, at 6.

¹³⁰ *Id.*

¹³¹ *Id.*

¹³² *Id.*

¹³³ Atkinson, *supra* note 72, at 6.

¹³⁴ *Id.*

¹³⁵ *Id.*

¹³⁶ Atkinson, *supra* note 72, at 6.

¹³⁷ Pillersdorf, *supra* note 53, at 5.

¹³⁸ *Id.*, at 5-6.

¹³⁹ *Id.*, at 6.

¹⁴⁰ *Id.*

accomplish this goal in a number of ways. One very common method is to use timelines, addressed separately *infra*. Charts can also be used to show the spatial relationship between complex facts, while highlighting relevant information with bold and vivid colors.¹⁴¹ There are many ways visual aids can be used to bring the facts together to make emphatic points.¹⁴²

For example, a comparative or summary chart can show a list of prudent or required procedures as established in depositions and manuals.¹⁴³ The chart can be juxtaposed with evidence regarding the conduct that actually occurred, to make the comparison between duty and breach immediately apparent to the jury. This helps to establish the relationship of details to the theory of the whole case.¹⁴⁴

Charts might also be used by the plaintiff during the testimony of the defendant's medical expert, in order to highlight the plaintiff's pain and suffering.¹⁴⁵ The defense medical expert's findings can be listed in a table beside one summarizing the findings of the plaintiff's medical expert, in order to minimize the matters on which the experts disagree.¹⁴⁶ Alternatively, the disparity in opinions can be highlighted, in order to show that all the expert testimony represents opinions, rather than facts.¹⁴⁷

A chart summarizing the doctor's findings can also be used to cast doubt on the validity of the expert's opinions. A clever attorney can ask questions during cross examination that lead the expert witness to concede that certain assumptions underlie some or all of the witness's conclusions.¹⁴⁸ The chart can serve of a visual reminder to the jury that each of the statements rest on some other proposition.

One interesting technique is to use charts with checkboxes for "Yes" or "No" answers with witnesses. A form can be created with very specific questions that require a yes or no answer.¹⁴⁹ The witness can be asked to answer and check the answer, and sign the paper.¹⁵⁰ Then, the signed statement can be used later during argument.¹⁵¹

Attorney Linda Miller Atkinson provides the following example of the use of this technique in a negligent entrustment case.¹⁵²

Testimony of Milt Gregory (Safety Director)

(1) K Trucking believes that a driver's past driving record is

¹⁴¹ Peterson, *supra* note 35, at 2.

¹⁴² Atkinson, *supra* note 72, at 7.

¹⁴³ *Id.*

¹⁴⁴ *Id.*

¹⁴⁵ Pillersdorf, *supra* note 53, at 7.

¹⁴⁶ *Id.*

¹⁴⁷ *Id.*

¹⁴⁸ *Id.*

¹⁴⁹ Atkinson, *supra* note 72, at 8.

¹⁵⁰ *Id.*

¹⁵¹ *Id.*

¹⁵² *Id.*

“Indicative of future driving performance”?

Yes No

(2) K Trucking acknowledges a duty to train all of its drivers on safe driving practices?

Yes No

(3) K Trucking allowed this driver to continue to drive after seven violations, seven accidents, and a suspended license for point violations over a period of four years?

Yes No

(4) K Trucking provided no safe driver training or remedial driver training to this driver?

Yes No ¹⁵³

Another technique, commonly used, is to create a handwritten chart reproducing the jury verdict form.¹⁵⁴ The attorney can go through each item and explain how to answer (with the answers tailored to the client’s interest, of course.) Similarly, the attorney may wish to display to the jury a chart quantifying pain and suffering. Each element of the client’s injury along with suggested damages amounts that seem reasonable for each could be shown. Gary B. Pillersdorf provides the following example:¹⁵⁵

- | | |
|--|-------------------------|
| 1. getting hit by car hard enough to break a large bone: | \$ _____ |
| 2. waiting on a cold, dirty street for an ambulance: | \$ _____ |
| 3. having the bone reset and put in a cast: | \$ _____ |
| 4. limping for the rest of your life: | \$ _____ ¹⁵⁶ |

The appropriate chart for a given case will depend on the unique facts and legal issues. The goal is to draw together key principles, equations, facts, data in testimony and show their relationship and relevance to the case.¹⁵⁷

Sometimes the best visual aid is simply an enlargement of the key document in the case with the most important few words highlighted.¹⁵⁸ One way to draw this language to the jury’s attention is to actually do the highlighting there as they are watching. Similarly, the attorney can work with an enlarged diagram of a car accident intersection, drawing on it in different colors to

¹⁵³ Atkinson, supra note 72, at 8.

¹⁵⁴ Pillersdorf, supra note 53, at 6.

¹⁵⁵ *Id.*

¹⁵⁶ *Id.*

¹⁵⁷ Atkinson, supra note 72, at 9.

¹⁵⁸ Littlepage, supra note 51, at 2.

illustrate the differences in the testimony.¹⁵⁹

These techniques can be also be used for very simple exhibits, such as an expert's curriculum vitae.¹⁶⁰ In the internet age, bountiful helpful illustrations and photographs are available online.¹⁶¹ Attorneys often reinforce visual themes throughout the trial using related images in much the same way that they link verbally expressed ideas thematically.¹⁶²

xiii. Timelines and Calendars

One specific subset of the categories of charts and graphs includes timelines and calendars. For example, a timeline can be used to create the impression that a collision is inevitable.¹⁶³ A calendar marked to show the chronology of events can illustrate contradictions in a witness's version of events.¹⁶⁴

Calendars and timelines are particularly suited for representing a plaintiff's pain and suffering.¹⁶⁵ A calendar for the year before the accident and the year after can be marked by a witness to show the days that the plaintiff missed work.¹⁶⁶ Alternatively, the calendar could show the days the plaintiff engaged in athletic hobbies or other activities potentially affected by the incident at issue in litigation.¹⁶⁷ If he or she has been hospitalized, the attorney may use a blowup of the medication administration chart or record the days the plaintiff had to take medication. Evidence that the plaintiff had to take pain medication daily serve as a "diary of discomfort."¹⁶⁸ "The idea is to create a color-coded calendar that shows how the accident disrupted [the plaintiff's] life."¹⁶⁹

Timelines, like other visual aids, must be simple and not look too busy, complex, or confusing.¹⁷⁰ As with other forms of real or demonstrative evidence, a foundation must be laid.¹⁷¹ Timelines can be a creative way to integrate evidence based on a variety of sources.

xiv. Overlays and Transparencies

Many of the above described techniques can be used with overlays or transparencies. In the case of physical charts, graphs and photographs, these overlays can take the form of old-school transparency film. In the case of computer-driven vehicle for presentation of photographs, maps, graphs, or charts, using, for example, PowerPoint presentations, overlays take a digital form.

¹⁵⁹ *Id.*, at 3.

¹⁶⁰ *Id.*

¹⁶¹ *Id.*

¹⁶² *Id.*

¹⁶³ Atkinson, *supra* note 72, at 6.

¹⁶⁴ *Id.*

¹⁶⁵ Pillersdorf, *supra* note 53, at 6.

¹⁶⁶ *Id.*

¹⁶⁷ *Id.*

¹⁶⁸ *Id.*, at 5.

¹⁶⁹ *Id.*, at 6.

¹⁷⁰ Atkinson, *supra* note 72, at 6.

¹⁷¹ *See infra*, Section IV.

Transparencies are particularly appropriate for showing forgeries or spoliation of evidence. For example, different versions of logbooks with potentially altered contents present and absent can be shown by taking transparencies, then laying them over each other on the overhead projector.¹⁷² A similar effect can be achieved by assembling digital images and displaying them on a screen. This can provide a potentially more dramatic effect than a side by side comparison.¹⁷³

xv. Media Sources

While it may not come immediately to mind for many attorneys, media often covers events which may be relevant to a case, and this coverage may provide a useful source of demonstrative evidence.¹⁷⁴ “Newspaper, online news, and television coverage of collisions, weather conditions, police investigations, and rescue operations make riveting exhibits at trial, as do the transcripts of 911 calls reporting wrecks.”¹⁷⁵ Given the time-sensitive nature of these materials, they should be gathered as early as possible in the case, so they can be preserved for later use at trial.¹⁷⁶

xvi. Web Pages, Advertising Slogans, Or Billboard Campaigns

In many cases, knowledge of injury mechanisms, claims of agency, misrepresentations of safety, or misrepresentations regarding the degree of control may be among the issues at trial.¹⁷⁷ The internet presence, advertising slogans, billboard campaigns, or other public statements of a party may be used as party admissions on contested issues.¹⁷⁸

In a malpractice case, a hospital’s website claimed that it offered “a caring team of professionals—surgeons, anesthesiologists, nurses—to provide optimal care” but “when the patient was bleeding out and needed immediate care, no one would answer the page.”¹⁷⁹ Similarly, in a trucking case, the “shipper who employed the defendant posted billboards near airports that echoed their [website’s] claim, ‘We make the fastest delivery anywhere.’”¹⁸⁰ This can be powerfully juxtaposed with evidence or argument that the driver was in a hurry or overworked.

Unlike traditional media reports that may be ephemeral, and therefore difficult to preserve, anything broadcast on the internet is likely available effectively forever.¹⁸¹ Various services regularly create archive databases of the internet, and several of these archives are publicly accessible.¹⁸² Examples can be found at web.archive.org and www.archive.org.¹⁸³

xvii. Videotaped Depositions

¹⁷² Atkinson, *supra* note 72, at 7.

¹⁷³ *Id.*

¹⁷⁴ *Id.*, at 5.

¹⁷⁵ *Id.*

¹⁷⁶ *Id.*

¹⁷⁷ Atkinson, *supra* note 72, at 8.

¹⁷⁸ *Id.*

¹⁷⁹ *Id.*

¹⁸⁰ *Id.*

¹⁸¹ Clore, *supra* note 49, at 5.

¹⁸² *Id.*

¹⁸³ *Id.*

The use of videotaped deposition testimony at trial depends on jurisdiction and whether the case is in state or federal court.¹⁸⁴ But if a deponent is a critical witness and the video will likely be played at trial, the attorney may consider filming the deposition testimony using two (or more) cameras.¹⁸⁵ This can augment the information that can be provided to the jury by showing the reactions of people in the room, any evidence or documents used during the deposition, or any other aspect of the deposition proceedings that might be used for dramatic effect.¹⁸⁶ The second camera can be used to take multiple different shots, including the lawyer asking the question, visual aids, or the exhibit being discussed.¹⁸⁷ Additional cameras can create a realistic, more interactive presentation style.¹⁸⁸ The presentation with multiple cameras to the jury can more closely resemble live deposition testimony, with both the lawyer and the witness appearing on screen.¹⁸⁹

In some jurisdictions, one camera focusing on the witness is required, but use of split-screen technology, with the other camera view played alongside the view of the witness's face, is permissible.¹⁹⁰ As a practical matter, it may be advisable to obtain a pretrial order permitting the additional camera(s) or the use of split-screen technology at trial.¹⁹¹ This can forestall any objection made on the eve of trial to this mode of presentation.¹⁹²

xviii. In-Person Visits

One of the earliest forms of demonstrative evidence, not often considered in this high-tech era, is the “view,” or the in-person visit to a location relevant to the case.¹⁹³ Of course, as with all the other forms of demonstrative evidence discussed herein, the “view” is subject to the discretion of the trial court.¹⁹⁴

This technique presents a visceral, concrete representation of facts or circumstances that might otherwise be abstract or remote in a juror's mind.¹⁹⁵ It also may serve as a teaching tool regarding specialized knowledge that may be critical to rendering a just verdict, but is completely outside the juror's experience. For example, a jury's trip to view an allegedly defective grain bin may teach about the requirements for safely engineering such a bin that a juror without a farming background might be at a loss to understand otherwise.¹⁹⁶

xix. The Attorney's Body

¹⁸⁴ Compare Mo. Sup. Ct. R. 57.07 (“Depositions may be used in court for any purpose”) with Fed. R. Civ. P. 32 (“...a deposition may be used against a party on these conditions...”).

¹⁸⁵ Mo. Sup. Ct. R. 57.03(c)(4) specifically allows for use of more than one camera.

¹⁸⁶ Littlepage, *supra* note 51, at 3.

¹⁸⁷ *Id.*

¹⁸⁸ *See infra*, Section III, regarding the psychological effect of the appearance attorney sophistication.

¹⁸⁹ Littlepage, *supra* note 51, at 3.

¹⁹⁰ *Id.*

¹⁹¹ *Id.*

¹⁹² *Id.*

¹⁹³ Atkinson, *supra* note 23, at C-2.

¹⁹⁴ In person visits without court approval constitute juror misconduct. *See* Travis v. Stone, 66 S.W.3d 1, 5 (Mo. banc 2002).

¹⁹⁵ Atkinson, *supra* note 23, at C-2.

¹⁹⁶ *Id.*

The attorney's own body can be used as a demonstrative tool.¹⁹⁷ An instructive example of the use of this technique comes from Attorney Pillersdorf: in describing a spine injury, an attorney might use her hands to articulate the structures of the vertebrae, and instruct jurors to visualize the disks that separate them as jelly doughnuts.¹⁹⁸ Jurors can easily relate to the analogy of a jelly donut being crushed, "oozing its jelly (nucleus) onto your tie (nerves) and ruining the outfit (life)."¹⁹⁹

This particular analogy could be extended, to frame the conversation throughout trial, and potentially even rebut counter-arguments.²⁰⁰ For example, in response to evidence or argument regarding a plaintiff's potential preexisting condition, the attorney could analogize that "even a slightly stale doughnut can be squashed."²⁰¹

xx. In-Court Demeanor

While not technically or legally part of the definition of real or demonstrative evidence, the appearance and demeanor of the attorneys and witnesses are part of the visual trial presentation. The seating of your client and his or her dress and demeanor are all factors that the jury will take into consideration.²⁰² "The most dreadful scar will lose its repulsiveness if the jury is allowed to gaze on it for the entire trial."²⁰³ Thus if the client has a scar or other deformity, the attorney may want to keep it hidden until it can be unveiled for dramatic effect.²⁰⁴

Jurors will inevitably be interested in what the plaintiff is wearing and will check the lawyer for shined shoes.²⁰⁵ They also will scrutinize the lawyers for signs of disorganization or untruthfulness. Lawyers should therefore inform the client that the jury is watching every move, even in common hallways and elevators.²⁰⁶

c. Cost Considerations in Selecting Real and Demonstrative Exhibits

The foregoing is not an exhaustive list of the possibilities in the use of demonstrative evidence at trial, and yet choosing amongst even these options is a daunting task. The basic principle is to use whatever you need to get your point across.²⁰⁷ But how? The next section of this Article discusses the empirical evidence regarding how to best use demonstrative evidence. Trial attorneys will need to weigh this empirical evidence regarding the benefits of each potential strategy against their respective costs.

¹⁹⁷ Pillersdorf, *supra* note 53, at 2.

¹⁹⁸ *Id.*

¹⁹⁹ *Id.*

²⁰⁰ *Id.*

²⁰¹ *Id.*

²⁰² Pillersdorf, *supra* note 7, at 3.

²⁰³ *Id.*

²⁰⁴ *Id.*

²⁰⁵ *Id.*

²⁰⁶ *Id.*

²⁰⁷ Mike Rogers, *Practice Makes Perfect Visual Presentations*, TRIAL, Vol 45, No. 6 (Jun. 2009), at 5.

In determining cost, the attorney should consider economy, simplicity and practicality.²⁰⁸ The attorney's fiduciary duty to the client requires the use of "the most economical form for that particular case, considering complexity of issues and amount in controversy, as well as a form appropriate to the underlying point to be proven."²⁰⁹

Simplicity of the trial strategy must be considered within the issues presented by the case and within the capabilities of the court's facilities.²¹⁰ More complex demonstrative evidence may not necessarily be more effective, but it is likely to be more expensive. For example, "in a complex contract case involving failure to develop prototypes, where feasibility is the issue, computer animation may be the simplest effective form; in the construction site fall case where fall prevention is the issue, a simple sketch showing rigged nets may be the simplest effective form."²¹¹

Cost-benefit analysis falls by the wayside if there are genuine concerns regarding the practicality of any given demonstrative evidence strategy.²¹² "The most sophisticated computer reenactment is useless if the trial lawyer lacks familiarity with the equipment, or the courthouse lacks equipment or facilities to show it appropriately to the jury."²¹³

Using visual aids during a trial is not risk-free. You could overuse them, use something that your adversary turns against you, fumble with machines that do not work, use models that break as you are using them, and many other pitfalls. These are some of the reasons why visual aids must be carefully thought out and effectively produced. If your planning eliminates the negative aspects, the overall effectiveness of using visual aids could be tremendous.²¹⁴

Common sense dictates that the basic approach involves a use of a combination of media presentations to communicate effectively with the jury, incorporating tactile, audio and visual elements to reach jurors who may respond particularly to each of these media.²¹⁵ A case presentation that includes, for example, boards, handouts, models, and computer presentations, can give the jury "a multisensory explanation of the case."²¹⁶ A presentation incorporating multiple channels of communication also assists in creating the impression that the attorney is competent and diligent.²¹⁷

II. Research on Demonstrative Evidence's Impact on Trial Outcomes

Despite the centuries-long history of the jury trial the use of demonstrative evidence therein, and the libraries worth of books devoted to trial practice and presentation, until very recently, there had been few experimental studies of the effects of visual and multimedia evidence

²⁰⁸ Atkinson, *supra* note 23, at C-10.

²⁰⁹ *Id.*

²¹⁰ *Id.*

²¹¹ *Id.*

²¹² Atkinson, *supra* note 23, at C-11.

²¹³ *Id.*

²¹⁴ James Rasicot, *WINNING TRIALS* (2014).

²¹⁵ Rogers, *supra* note 208, at 5.

²¹⁶ Rogers, *supra* note 208, at 5.

²¹⁷ *Id.*

in legal settings.²¹⁸

There has long been, however, a body of general psychological research which suggests that visual evidence can enhance juror's understanding of the evidence and therefore legal judgment.²¹⁹ For instance, visual displays can enhance attention and recall, which logically should improve juror's ultimate judgments.²²⁰ Similarly, incorporating visual aids into a presentation can enhance the audience's level of engagement, which would presumably motivate jurors to decide more accurately.²²¹

Nonetheless, studies attempting to directly measure the success of practical applications in trial practice of these psychological principles have met with mixed results.²²² One study of a mock jury did show that visual aids improved the mock jurors' memory of key evidence.²²³ "Other studies, however, have shown mixed effects on recall or none."²²⁴ Several studies have concluded that visual evidence may actually be detrimental to effective decision-making because it "elicit[s] undue emotional responses, cognitive or perceptual biases, or reliance on peripheral cues."²²⁵

Several studies show an effect of using demonstrative evidence on jury outcomes but only in specific scenarios. Computer animations sometimes appear to enhance the ability of jurors to visualize and thus to understand key events.²²⁶ But animations tend to affect judgments only in cases with specialized facts about which jurors might be likely to be unfamiliar.²²⁷ Another study found that visual aids improved understanding of scientific evidence only for those with a visual learning preference.²²⁸

The studies that have been conducted are inherently limited.²²⁹ Sometimes, case materials may be so simple that jurors can easily understand them regardless of the method of presentation.²³⁰ Study authors may not be as creative as attorneys in making full use of demonstrative exhibits, nor may they have the same motivation to ensure the persuasive quality of the test exhibits.²³¹ Moreover, in the real world, it is often the case that no matter the quality of the presentation, the case is lost on bad facts, not the strength of advocacy.²³² Attorneys know to settle those cases early; cases that go to trial are the well-balanced ones. Study authors may not always present a balanced scenario to mock jurors, confounding the results.²³³

²¹⁸ Neal Ferguson, *Visual Evidence*, 17 PSYCHONOMIC BULLETIN & REVIEW 149, 149 (2010).

²¹⁹ Edward Jones & Richard Nisbett, *THE ACTOR AND THE OBSERVER: DIVERGENT PERCEPTIONS OF THE CAUSES OF BEHAVIOR* (1971).

²²⁰ *Id.*

²²¹ *Id.*

²²² Ferguson, *supra* note 219, at 149.

²²³ *Id.* at 151.

²²⁴ *Id.*; John Houston et. al, *Computer Animation in Mock Juries' Decision Making*, 76 PSYCH. REP. 987 (1995).

²²⁵ Ferguson, *supra* note 219, at 151.

²²⁶ *Id.*

²²⁷ *Id.*

²²⁸ *Id.*

²²⁹ Ferguson, *supra* note 219, at 150.

²³⁰ *Id.*

²³¹ *Id.*

²³² *Id.*

²³³ Ferguson, *supra* note 219, at 150.

But amidst the flawed methodologies and mixed results, some patterns are starting to emerge from the research that attorneys can leverage to great effect in their trial practices. For example, the use of crime scene or autopsy photos on has a clear tendency to produce guilty verdicts in criminal cases.²³⁴ Computer animations are most effective when the subject matter is generally unfamiliar to participants, such as a complicated scientific principle.²³⁵ “A further pattern that may be emerging is that visual evidence seems likeliest to affect ultimate judgments when only one side uses that evidence.”²³⁶

There is a great deal more study to do.²³⁷ Further research can also address newer and increasingly common forms of courtroom visual displays.²³⁸ But so far, our intuition that demonstrative evidence is an effective tool for communicating with the jury, is largely confirmed.

a. Research on Learning and Cognition Generally

i. Visual Learning and Dual Coding

Dual-coding theory is a psychological theory, first propounded in the early 1970s, that posits that the brain has two channels for encoding information: verbal associations and visual imagery. This theory, while not universally accepted by psychologists, is very influential in the educational psychology field, and has been extensively studied. Dual-coding theory predicts that visual presentation of evidence “may help people whose learning style inclines toward the visual to understand trial information better.”²³⁹ Thus the charts and diagrams discussed *infra* could, for example, improve jurors’ comprehension of quantitative information, while the computer animations could improve their grasp of dynamic processes.²⁴⁰ Pairing visual aids with oral narration would presumably be the most effective way to leverage the dual-coding theory for success at trial.²⁴¹

However, the simple fact that evidence is presented visually is not enough to take advantage of the research on dual coding. Some research indicates that attempts to present information geared towards both channels at the same time can actually inhibit effective learning.²⁴² For example, in one study

the same information was presented to two groups. One group heard narration and saw the same narrated information presented in text form; while the second group heard the narration but did not see the redundant text. The second group, which heard the narration without the redundant text, experienced a 28 percent increase in

²³⁴ *Id.*

²³⁵ *Id.* at 151.

²³⁶ *Id.*

²³⁷ *Id.*

²³⁸ Neal Feigenson & Christina Spiesel, ON DISPLAY: THE DIGITAL TRANSFORMATION OF LEGAL PERSUASION AND JUDGMENT (2009).

²³⁹ Jones & Nisbett, *supra* note 220.

²⁴⁰ *Id.*

²⁴¹ *Id.*

²⁴² Atkinson, *supra* note 9, at 8.

the ability to remember it, and a 79 percent increase in the ability to apply it.²⁴³

This research suggests that focusing the jury's attention on one mode of presentation at a given time may be most effective. On the other hand, there is research that supports the proposition that optimal learning outcomes result when narration is in sync with animated sequences.²⁴⁴

ii. Active Versus Passive Learning and Human Memory

Presenters sometimes proceed under the assumption the audience will passively absorb the information.²⁴⁵ The approach to demonstrative exhibits that follows from the assumption is to simply present a sequence of visuals.²⁴⁶ The research, however, suggest that learning is an active process.²⁴⁷ This process of committing information to memory operates differently depending on the type of material that is being presented as well as the timeframe in which it is presented. Rather than thinking of jurors as empty vessels to be filled with information, understanding the limitations of memory can inform a more effective trial presentation.²⁴⁸

According to the generally accepted understanding, there are at least three ways human beings encode memories, and each one has different limitations.²⁴⁹ Sensory memory operates in the very short term, and relates to the raw information the eyes, ears and other sensory organs collect from the environment.²⁵⁰ On the other end of the spectrum is long-term memory, which stores both long-term memories as well as the analytical links between memories that forms the fabric of our consciousness.²⁵¹ As far as scientists are aware, there are no practical limits in the amount of information that can be collected as sensory data, nor the amount of information that be retained in the long term.²⁵² The intermediate form of memory is short-term or working memory.²⁵³

Working memory does have limitations in terms of the volume of information that can be stored.²⁵⁴ Various research conducted over the past several decades has concluded that there are small number of "chunks" of memory available for short term storage.²⁵⁵ The most recent research supports the notion that in the short term, humans can only juggle three to four concepts at a time.²⁵⁶

²⁴³ *Id.*

²⁴⁴ Mayer, *supra* note 14, at 96.

²⁴⁵ Atkinson, *supra* note 9, at 3.

²⁴⁶ *Id.*

²⁴⁷ Richard E. Mayer, MULTIMEDIA LEARNING 50 (2001).

²⁴⁸ Atkinson, *supra* note 9, at 3.

²⁴⁹ *Id.*

²⁵⁰ *Id.*

²⁵¹ *Id.*

²⁵² *Id.*

²⁵³ Atkinson, *supra* note 9, at 3.

²⁵⁴ *Id.*

²⁵⁵ George A. Miller, *The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information*, 63 PSYCHOL. Rev. 81-97 (1956).

²⁵⁶ Cliff Atkinson, *The Science of Making Your PowerPoint Memorable: Q&A with Nelson Cowan*, at www.sociablemedia.com/articles_cowan.htm.

This raises an obvious problem for the trial attorney. Trials generally involve a great deal more than three or four concepts. The danger exists, then, that jurors will quickly lose track of the big picture during a long or complex trial.²⁵⁷ The scientific understanding of the limitations of memory provides an explanation for the popularity and perceived effectiveness of narrative storytelling as a mechanism for organizing a trial presentation.²⁵⁸ Stories can organize complex information into a simpler, overarching idea that is easy to remember.²⁵⁹ The effectiveness of all evidence, including visual evidence, will be enhanced if it is organized within a coherent structure that simplifies and unifies the number of concepts jurors are expected to retain.

iii. Cognition: Hindsight Bias, Counterfactual Thinking and Point of View

Witnesses at trial know far more about an incident than the involved parties knew at the time of the occurrence.²⁶⁰ This leads to what is known as “hindsight bias”: seeing a past event as foreseeable even though, at the time, there was no objective reason to predict its occurrence.

Hindsight bias occurs in part because as “outcome information becomes known, it is rapidly integrated and connected with other, related information stored in human memory.”²⁶¹ In hindsight, rationales that are consistent the known outcome (i.e., the occurrence that is the subject of a lawsuit) become linked in the mind to memories about the facts and circumstances.²⁶² “What actually happened becomes a vivid and precise point of reference for what should not have happened and then what could have been done differently for a better outcome.”²⁶³ Foreseeability is obviously a key element in determining liability for negligence. Thus hindsight bias has the potential to alter jury outcomes.²⁶⁴

A number of studies have been conducted that show how hindsight bias can influence the perceived reasonableness of an actor’s conduct.²⁶⁵ The research shows that when participants know a negative outcome actually occurred, they are more likely to assign blame.²⁶⁶ One study demonstrates the power of hindsight bias in the use of visual demonstrative exhibits. That research suggests that in a malpractice case,

jurors who see an X-ray, knowing that the ambiguous spot on it turned out to be the tumor that killed the victim, may be likelier to believe that the defendant radiologist, who of course did not know when he read the X-ray that the spot indicated a tumor, should have seen it that way too.²⁶⁷

²⁵⁷ Atkinson, *supra* note 9, at 3.

²⁵⁸ *Id.*

²⁵⁹ *Id.*

²⁶⁰ Michael Dilich, et. al, *Computer Animation of Traffic Accidents*, International Conference on Road Safety and Simulation, September 14-16, 2011, Indianapolis, USA, at 2.

²⁶¹ *Id.*, at 6.

²⁶² *Id.*, at 5.

²⁶³ *Id.*

²⁶⁴ *Id.*

²⁶⁵ Dilich, *supra* note 261, at 7.

²⁶⁶ *Id.*

²⁶⁷ Ferguson, *supra* note 219, at 151.

Effective attorneys can thus leverage the bias that is naturally created in the human mind to achieve desired outcomes in litigation presentations.

The concept of counterfactual thinking is intertwined with the concept of hindsight bias.²⁶⁸ Counterfactual thinking refers to imagining how the past might have been different.²⁶⁹ Jurors have a natural tendency to wonder what would have happened, if say, the driver in a motor vehicle accident case had braked a bit earlier, or sped up, or slowed down.²⁷⁰ “Psychological research has shown that subtle cues that influence counterfactual thinking also influence causal inference and blame judgments.”²⁷¹

For example, a sports fan might react to a loss with the counterfactual judgment that the team would have won were it not for an injury suffered in the fourth quarter. Without that injury, a victory would have been assured, but with it, the loss was inevitable.²⁷²

Discussing facts in terms of counterfactuals can provide a satisfying “feeling of explanation, clarity, and certainty.”²⁷³

When jurors focus on the actions of particular individual involved in an accident, they tend to imagine how the accident could have been avoided if only that individual had acted differently. Thus, the point of view from which a narrative is presented can bias judgment.²⁷⁴ Research also demonstrates that visual evidence triggers “the perceptual bias of illusory causation, people’s tendency to over attribute causality to an especially salient stimulus.”²⁷⁵ In other words, when the attorney uses visuals to highlight the involvement of one party, jurors may be more likely to assign blame to that party. Counterfactuals that focus attention on a particular person’s actions can therefore be an effective way to enhance the likelihood of blame to that person.²⁷⁶

There is a contrary strand in the research, however. People tend to attribute their own behavior to external or situational causes while attributing the behavior of others to internal, dispositional causes.²⁷⁷ This is known as the “actor-observer” effect. This effect may explain why, in one study, an animation depicting a plane crash from the flight crew’s point of view led mock jurors to attribute less responsibility for the crash to the flight crew.²⁷⁸ The problem is complicated by the presence of more than one individual. One study found that mock jurors who watched a criminal suspect’s videotaped confession in which only the suspect appeared on screen were significantly likelier than those who also saw the interrogator to believe that the confession was

²⁶⁸ Dilich, *supra* note 261, at 12.

²⁶⁹ *Id.* at 11.

²⁷⁰ *Id.*

²⁷¹ *Id.*

²⁷² *Id.*, at 12.

²⁷³ Dilich, *supra* note 261, at 12.

²⁷⁴ *Id.*

²⁷⁵ Ferguson, *supra* note 219, at 151; *citing* Ratcliff, et. al., *Camera Perspective Bias in Videotaped Confessions: Experimental Evidence of its Perceptual Bias*, 12 J. EXPERIMENTAL PSYCH: APPLIED 197, 197 (2006).

²⁷⁶ Dilich, *supra* note 261, at 12.

²⁷⁷ Ferguson, *supra* note 219, at 151.

²⁷⁸ Houston, *supra* note 225 at 987.

voluntary and that the suspect was guilty.²⁷⁹

b. Research on the Impact of Demonstrative Evidence

Our intuition, and many trial experts, suggest that using demonstrative exhibits, especially slick-looking charts and computer animations, “may convey to the jury technical superiority” over opposing counsel.²⁸⁰ Jurors might subconsciously respect or admire the skill or preparedness of the lawyer (or expert witness) who makes effective use of demonstrative exhibits, and substitute this feeling for a considered judgment regarding the substance of the information presented.²⁸¹

The research supports this intuition. Jurors are inclined to assume information presented in multiple media formats is truthful, independent of its merits.²⁸² Similarly, if the attorneys abandon their digital technology at some point in the trial, the subtext that is conveyed to the jury is that the attorneys may not be competent, and thus lead them to suspect the reliability of the attorney’s version of events.²⁸³

One study showed that mock jurors who watched an animation of a slip-and-fall accident believed the “expert witness whose testimony the animation illustrated to be more credible than did those who saw still slides or no visuals.”²⁸⁴ As is addressed below, several studies show the use of PowerPoint slides increases juror’s estimation of the attorney’s preparedness and persuasiveness, particularly when the other attorney does not use PowerPoint.²⁸⁵ Those findings also extend to better jury outcomes when the lawyer uses PowerPoint.²⁸⁶

Mock jurors may have no idea that their decision-making processes are influenced by these biases.²⁸⁷ Therefore, focus groups, while an important trial planning tool are not, by themselves, sufficient in order to develop a demonstrative evidence strategy.²⁸⁸ Focus groups, as with other trial techniques, should be consistent with a sound scientific understanding of the principles of persuasion.

i. Research regarding use of photographic and videographic evidence

Research strongly supports the conclusion that photographic evidence produces a concrete effect on ultimate judgments, perhaps more so than the research in other areas of demonstrative evidence.²⁸⁹ One study found that when participants see photographs of an accident victim, they render significantly higher damage awards (though this had no effect on their liability

²⁷⁹ Ferguson, *supra* note 219, at 151.

²⁸⁰ Clore, *supra* note 49, at 14.

²⁸¹ Richard E. Petty & Duane T. Wegener, *The Elaboration Likelihood Model: Current Status And Controversies in DUAL-PROCESS THEORIES IN SOC. PSYCH* (1999).

²⁸² Ferguson, *supra* note 219, at 151.

²⁸³ Clore, *supra* note 49, at 14.

²⁸⁴ Ferguson, *supra* note 219, at 151.

²⁸⁵ Feigenson & Spiesel, *supra* note 239.

²⁸⁶ Feigenson & Spiesel, *supra* note 239.

²⁸⁷ Ferguson, *supra* note 219, at 151.

²⁸⁸ *Id.*

²⁸⁹ *Id.* at 149.

determination).²⁹⁰ By contrast, another study did find a correlation between gruesome photos of a plaintiff's injuries and liability determinations.²⁹¹ In criminal cases, showing photographs of the victim, whether color, black and white, graphic or tame, universally increased the likelihood of a guilty verdict.²⁹²

Intuitively, these kinds of effects should apply to video evidence as well. The findings regarding videographic evidence, however, are less clear-cut. A number of studies have found no difference in outcome when deposition testimony is presented via video instead of live.²⁹³ One study did show that using a video reenactment of a child's drowning correlated with assigned less of the responsibility for the accident to the plaintiff.²⁹⁴ It was not clear, however, whether it was the emotional impact of the drowning reenactment that caused this effect, or simply the credibility effect discussed above.

ii. Research Regarding the Effectiveness of Computer Animations

The research on the effectiveness of computer animations in producing favorable jury outcomes has been somewhat mixed. Some studies have shown effects on judgments of liability or responsibility or damage awards, and some have not.²⁹⁵ Mock jurors in one study displayed a greater degree of hindsight bias when they saw computer animations rather than diagrams of the scene accompanied by text.²⁹⁶

The effects of computer animations (and perhaps demonstrative evidence in general) on hindsight bias sometimes differ depending on whether the party involved with the litigated occurrence is "active" or "reactive."²⁹⁷ For example, in an auto accident case involving a head-on collision, the "active" driver is the one who moves into the opposing lane of traffic, while the "reactive" driver is the one who then takes evasive action. One study found that computer animation increases hindsight bias and makes blame judgments more punitive toward the reactive driver, but that this effect does not occur with respect to the active driver.²⁹⁸ In other words, reactive drivers were blamed more when the case information was presented using computer animation.²⁹⁹

When opposing counsel makes use of computer animations, attorneys may seek to combat the hindsight bias effect created by the animation by seeking to "debias" the jurors.³⁰⁰ Studies show that one potential way to achieve this effect is to present computer animations that represent alternative explanations to the one propounded by opposing counsel's animation.³⁰¹ By using the

²⁹⁰ *Id.*

²⁹¹ *Id.*, at 150.

²⁹² Ferguson, *supra* note 219, at 149-150.

²⁹³ *Id.* at 150.

²⁹⁴ *Id.*, at 152.

²⁹⁵ *Id.* at 150.

²⁹⁶ Neal Roese, et. al, *The Propensity Effect: When Foresight Trumps Hindsight*, 17 PSYCH. SCI. 305 (2006).

²⁹⁷ Dilich, *supra* note 261, at 1.

²⁹⁸ *Id.*

²⁹⁹ *Id.*, at 10.

³⁰⁰ *Id.*, at 14.

³⁰¹ *Id.*

animations to illuminate alternative explanations, the hope is that “jurors do not become fixated on a single explanation, which is known to worsen hindsight bias.”³⁰²

Another possible way to avoid the disparate effect of computer animations on active and reactive drivers is to use an aerial view.³⁰³ While this may be a more neutral way of presenting information, it does not completely eliminate hindsight bias.³⁰⁴

iii. Research regarding the effectiveness of PowerPoint presentations.

“There are certainly reasons to expect that augmenting the spoken word with PowerPoint slides would improve lawyers’ ability to communicate with and persuade their audiences.”³⁰⁵ As noted above, dual process theories would support the notion that accompanying written text and images along with verbal communication would improve the jurors’ retention of information and ultimately their decision-making process.³⁰⁶ PowerPoint is also presumably an example of the effect discussed above: that jurors may infer from the lawyer’s preparedness that the lawyer’s arguments must be strong.³⁰⁷

Microsoft PowerPoint software has been available since 1990.³⁰⁸ As of 2012, a presenter somewhere in the world displayed a PowerPoint presentation 350 times per second.³⁰⁹ Yet there were no published controlled experimental studies of the effects of PowerPoint in legal settings prior to 2013.³¹⁰ Two unpublished studies of the effects of PowerPoint on legal decisionmaking to that date yielded mixed results: in one, the plaintiffs’ use of PowerPoint slides increased the defendant’s judged responsibility in a civil case; in the other, text slides summarizing expert testimony had no effect on judgments of guilt.³¹¹ These early mixed results may be due in part to the fact that it is difficult to measure the effect of PowerPoint presentations generally as opposed to the presenter’s skill at using the software effectively.³¹²

One ambitious study conducted in 2013 by Jaihyun Park and Neal Feigenson attempted to settle the question of whether there is a causal link between use of PowerPoint and positive juror decisionmaking outcomes.³¹³ The study also “sought to discover whether any effects of PowerPoint on liability judgments occur through central processing (e.g., by increasing memory for and understanding of case-relevant information) or through peripheral processing (e.g., by acting as a cue to argument strength).”³¹⁴ The study also attempted to address concerns of prior research that did not distinguish between the use of the technique and skill at using the

³⁰² Dilich, *supra* note 261, at 14.

³⁰³ *Id.*

³⁰⁴ *Id.*

³⁰⁵ Jaihyun Park and Neal Feigenson, *Effects of a Visual Technology on Mock Juror Decision Making*, 27 APP. COG. PSYCH 235, 235 (2013).

³⁰⁶ *Id.*

³⁰⁷ *Id.*, *citing* Petty & Wegener, 1999.

³⁰⁸ Microsoft PowerPoint, WIKIPEDIA (last accessed May 6, 2015).

³⁰⁹ Bob Parks, *Death to PowerPoint!*, BLOOMBERG BUSINESSWEEK, businessweek.com, retrieved 6 September 2012.

³¹⁰ Park & Feigenson, *supra* note 306, at 235.

³¹¹ Ferguson, *supra* note 219, at 150.

³¹² Park & Feigenson, *supra* note 306, at 236.

³¹³ *Id.*

³¹⁴ *Id.*

technique.³¹⁵ It included graphs and charts of statistical evidence “while avoiding the sorts of ‘bells and whistles’ that, according to the literature on educational uses of PowerPoint, might arouse participants’ attention but distract them from substantively processing message content.”³¹⁶

The study did find that “[w]hen lawyers illustrated key portions of their oral presentations with PowerPoint slides, jurors rendered liability judgments that were more favorable to those lawyers’ clients.”³¹⁷ The study authors concluded that this effect was caused by “both central processing (i.e., increased recall of case information) and peripheral processing (i.e., more favorable perceptions of the attorney using the slides or less favorable perceptions of the opposing attorney).”³¹⁸ In other words, when the lawyers used PowerPoint, the jurors both thought better of the lawyers, and also understood the information better, both leading to good results.³¹⁹ The study also confirmed the effect of asymmetrical use of PowerPoint.³²⁰ “PowerPoint’s impact was greatest when its use was unequal.”³²¹

III. Visual Exhibit Basics

The research largely confirms trial attorneys’ experiences and intuitions about the basics of how visual exhibits should be used. Organize presentation in story form so jurors do not have to remember discrete facts, but just have to remember the story—from your client’s perspective. Use photos and videos where they are illustrative and appropriate. Using PowerPoint is a must, because opposing counsel will probably use it. The research also confirms our intuitions that attorneys should not get too carried away with demonstrative evidence. Poorly used, it is of little benefit. Abandoning technology mid-trial risks losing the jury’s trust.

While technologies like PowerPoint have little downside, use of computer animations can be more risky. If the research is to be believed, reactive actors are blamed more when animations are used. If the lawyer represents the plaintiff in an automobile collision case where the defendant swerved into oncoming traffic, the plaintiff’s use of a computer animation to illustrate the plaintiff’s point of view might backfire. Jurors would tend to think about what the plaintiff could have done to avoid the accident. That hindsight bias potentially could overwhelm any dramatic value of presenting the plaintiff’s point of view during the incident.

The research does provide some concrete recommendations. For example, given the inherent limitations of human memory, special care should be taken during long trials to organize information in a way that can be crystallized into three or four big ideas. Themes should be used as a teaching tool, to reinforce ideas that have worked their way out of working memory but not quite into long-term memory. The use of demonstrative evidence techniques should fall within this rubric. For example, segmental animations, rather than long and complete ones, may be used throughout trial, then joined together at argument to complete the scene and story.³²²

³¹⁵ *Id.*

³¹⁶ *Id.*

³¹⁷ Park & Feigenson, *supra* note 306, at 239.

³¹⁸ *Id.*

³¹⁹ *Id.* at 244.

³²⁰ *Id.*

³²¹ *Id.* at 235.

³²² Clore, *supra* note 49, at 14.

Yet in large part, the research leaves unanswered the question of how to implement real and demonstrative evidence in the most persuasive way. And while the research can clear away wrong-headed thinking about cognition, and perhaps reveal unseen mistakes, the frontier of investigation regarding the exact nature of the most effective visual trial practice remains unexplored. The best information remains the anecdotal advice of the trial masters.

Studies such as the Park and Feigenson study discussed at length above attempt to evade the “skill of the presenter” factor by using middle-of-the-road presentations – charts, graphs, but not too flashy. Some aspects of the persuasive power of trial presentation may resist reduction to a formula. The skill of relating to an audience and expressively communicating could be understood as an art form. But this art can be taught, in a way that pays due heed to the scientific pointers and pitfalls, much in the same way that the art of music can be improved and tempered by an understanding of the mathematical relationship between tonal frequencies.

Cliff Atkinson, the author of the book *BEYOND BULLET POINTS*, and consultant to Mark Lanier in the first Vioxx trial, provides a story of the power of the skill of the presenter in visual presentation. “[A]ccording to the news reporters who were there, the way presentation visuals were used in the opening statements of *Ernst v. Merck* [by the plaintiffs]³²³ were ‘frighteningly powerful’³²⁴ and presented a ‘stark choice’³²⁵ to jurors in contrast to the defendant’s approach.³²⁶ By contrast, the jurors reported that the defendant Merck’s presentation “sailed right over their heads. ‘Whenever Merck was up there, it was like wah, wah, wah,’ said juror John Ostrom, imitating the sounds Charlie Brown’s teacher makes in the television cartoon. ‘We didn’t know what the heck they were talking about.’”³²⁷

One thread that runs through the advice of experienced litigators is the importance of using visual evidence to relate to jurors’ personal experiences.³²⁸ This line of thinking puts aside the science about persuasion because it assumes that to a certain extent, persuasion is fundamentally impossible. “The only reality that counts in trial is what your jurors already believe.”³²⁹ Thus the approach is to “start by learning how your jurors think and let their thinking guide you.”³³⁰ Central to this approach is conducting focus group research in the local where the juror pools are assembled.³³¹ The visual strategy is then tailored around reasoning that the mock jurors themselves provide.³³²

Experienced attorneys understand without the need for any scientific evidence showing a piece of visual evidence can lead jurors to make assumptions about what occurred.³³³ Some of

³²³ No. 19961-BH02 (Dist. Ct. Brazoria Cty., Tex., filed May 24, 2002).

³²⁴ Roger Parloff, *Stark Choices at the First Vioxx Trial*, *FORTUNE* (July 15, 2005).

³²⁵ Alex Berenson, *Contrary Tales of Vioxx Role in Texan’s Death*, *N.Y. Times*, July 15, 2005.

³²⁶ Atkinson, *supra* note 9, at 2.

³²⁷ Atkinson, *supra* note 9, at 2.

³²⁸ Rodney Jew & Martin Q. Peterson, *Visual Persuasion*, American Trial Lawyers’ Association, at H-1.

³²⁹ Jew & Peterson, *supra* note 329, at H-1.

³³⁰ *Id.*

³³¹ *Id.*, at H-2.

³³² *Id.*

³³³ *Id.*, at H-7.

their conclusions will certainly be biased by their past life experiences.³³⁴ For example, a juror who believes, on principle, that Americans should buy American cars, may have a bias against a plaintiff who drove a Japanese car.³³⁵ In one experiment, “just getting a glimpse of the defendant’s car—a Porsche—which appeared in photographs of the accident scene, gave jurors all the information they needed to categorize the defendant as wealthy.”³³⁶ Their conclusion was that “the defendant had adequate resources with which to fully compensate the plaintiff for damages.”³³⁷ Focus groups can uncover these effects, as in this example, “a test exhibit that replaced the Porsche with a Volkswagen yielded a very different response on damages.”³³⁸

One key to tailoring a presentation to the biases and proclivities of jurors is to understand that there is a fundamental difference between a lawyer’s perspective and the average juror’s perspective.³³⁹ “Jurors are neither interested in foundation, relevancy, or probative value, nor working to understand legal, technical, or medical jargon.”³⁴⁰ Rather, jurors have their own motivations, which may be to do a good job, or simply to go home as soon as possible.³⁴¹ Either way, jurors are likely to want efficiency.³⁴² Effective presentations do not spend time on irrelevant evidence.³⁴³ And this lines up with the research discussed *supra* regarding the limitations of human memory: shorter presentations are easier to remember.

One way lawyers try to bridge the gap between what the science can tell us and achieving the goal of a stunning trial presentation is to employ trial consultants. Such consultants can assist in understanding and developing the jurors’ perspective from which to develop a persuasive story. Similarly, graphic designers can bridge the gap between a “legally sound and juror-friendly visual story.”³⁴⁴ Trial consultants and graphic designers can work together to “make oral testimony visually come alive in the form of a memorable story.”³⁴⁵

But understanding the juror’s perspective does not necessarily require hiring expert assistance. “Jurors are reasonable people” and so they expect explanations that are reasonable.³⁴⁶ That is the essence behind the intuition that demonstrative exhibits are effective: visual aids can explain a story in such a way that the jury believes it is reasonable.³⁴⁷ This in part because we relate to the notion that jurors are more likely to accept that which they can hear and see.³⁴⁸ But it also because jurors share the basic principles of logic that underlie legal analysis.³⁴⁹ Thus the

³³⁴ Jew & Peterson, *supra* note 329, at H-7.

³³⁵ *Id.*

³³⁶ *Id.*

³³⁷ *Id.*

³³⁸ *Id.*

³³⁹ Amy Pardieck, *State-Of-The Heart Technology, Not State-Of-The Art: Innovative Trial Tools to Show Causation and Damages*, Americal Trial Lawyers’ Association, at 3.

³⁴⁰ *Id.*

³⁴¹ *Id.*

³⁴² *Id.*

³⁴³ *Id.*

³⁴⁴ Pardieck, *supra* note 340, at 3.

³⁴⁵ *Id.*

³⁴⁶ Michael P. Koskoff, *Damages: Making the Invisible Obvious*, at 2.

³⁴⁷ *Id.*

³⁴⁸ *Id.*

³⁴⁹ *Id.*, at 3.

effective attorney should be able to reduce the use of demonstrative evidence “to a logical sequence: this is the test; ‘this is how it works; and Exhibit A shows the results.’”³⁵⁰

As a practical matter, the planning of the use of demonstrative evidence based on sound scientific principles begins at the outset of trial preparation. The earlier the attorney starts preparing, the better.³⁵¹ Brainstorm ideas about the visual trial and fit them within the cognitive principles outlined herein even before drafting a complaint.³⁵² Some lawyers suggest drafting jury instructions before drafting a complaint.³⁵³ The instructions can be crafted to echo verbal and nonverbal themes the attorney anticipates presenting throughout the trial.³⁵⁴ The jury instructions themselves could be ultimately be included in PowerPoint slides.³⁵⁵

Each aspect of trial presentation can be influenced by the attorney’s scientific approach to visual evidence. For example, as discovery is received, it should be digitized with an eye toward displaying it in the courtroom.³⁵⁶ Though it has become routine to use optical character recognition (OCR) software to convert scanned documents that contain typewritten text into a computer-readable format, this step also assists in preparing the case for a visual presentation.³⁵⁷ Organizing the OCR’d documents, including an electronic Bates stamp on every page, makes it possible to refer to the Bates stamp number during depositions and pleadings throughout the litigation process.³⁵⁸

Later, you can synchronize the video clip of the deposition with the relevant document page. When you’re in front of the jury, you can zoom in on the Bates stamp and then on the relevant portion of the document, showing the jurors that they are seeing the same document that the witness saw.³⁵⁹

Having documents in an electronic format also assists in assembling a chronology.³⁶⁰ A variety of software applications are available for document management and the creation of demonstrative exhibits, but those are beyond the scope of this Article. However, by incorporating electronic evidence early, attorneys may streamline and automate the process of converting the case information into demonstrative exhibits.³⁶¹

Given the general effectiveness of multimedia presentations, attorneys would be well advised to take video depositions whenever possible.³⁶² This insures that potentially compelling

³⁵⁰ *Id.*

³⁵¹ Rogers, *supra* note 208, at 1.

³⁵² Atkinson, *supra* note 9, at 2.

³⁵³ Richard H. Friedman and Patrick A. Malone, *RULES OF THE ROAD: A PLAINTIFF LAWYER’S GUIDE TO PROVING LIABILITY* (2010).

³⁵⁴ Rogers, *supra* note 208, at 1.

³⁵⁵ *Id.*, at 2.

³⁵⁶ *Id.*

³⁵⁷ *Id.*

³⁵⁸ *Id.*

³⁵⁹ Rogers, *supra* note 208, at 2.

³⁶⁰ *Id.*

³⁶¹ For a discussion of the mechanics of this process, and several available software tools, see Rogers, *supra* note 208, at 2.

³⁶² *Id.*, at 3.

visual and auditory evidence about demeanor evidence is preserved.³⁶³ For example, the witness may continually look to the opposing lawyer for visual prompts or unspoken advice.³⁶⁴ The attorney should ensure that the video deposition is synchronized with the transcript.³⁶⁵ That will ensure that video clips from the depositions can be easily integrated into the trial presentation.³⁶⁶ If the witness in a video deposition discusses an exhibit for an extended period of time, it may be a good practice to have the witness display the exhibit to the videographer every five minutes or so.³⁶⁷ “That way, you can synchronize the video playback to display the document or exhibit on the screen while the witness testifies about it.”³⁶⁸

Once discovery is complete, many effective lawyers suggest proceeding to a “storyboard” stage, where words and images are assembled in a narrative fashion, organized in a way that divides the information into cognitively manageable chunks.³⁶⁹ Given the research showing that presenting smaller chunks of information leads to better learning outcomes, the storyboard should contain no more than one idea per storyboard frame.³⁷⁰

The storyboard stage is useful in planning timing of demonstrative evidence.³⁷¹ The research outlined above, particularly the Park and Feigenson study, does show differences in outcome based on timing, but those differences have not been fully investigated. The findings regarding working memory also influence timing considerations. Timing is addressed in Section III (c), *infra*.

As a matter of tactics, the principles outlined here can be applicable to the evidence brought by the other side. Once the evidence is admitted, no party owns it. “Under those conditions, the defendant’s stuff becomes fair game.”³⁷² “The photo of the scene, the 3-D model of the machine, and the police report of domestic violence can all become persuasive evidence of the plaintiff’s claims.”³⁷³

a. The Importance of Story Structure

As noted above, it is important to begin planning the trial presentation, including demonstrative evidence, from the outset of the case. If the attorney starts the planning process the moment he or she sits down to prepare a computer presentation for mediation or trial, there will be no way to sort through the litany of illustrations, diagrams, photographs, video or other recordings, animation, charts, graphs, slides, and so on, as well as physical evidence that might be in the case file.³⁷⁴

³⁶³ *Id.*.

³⁶⁴ *Id.*

³⁶⁵ *Id.*

³⁶⁶ Rogers, *supra* note 208, at 3.

³⁶⁷ *Id.*

³⁶⁸ *Id.*

³⁶⁹ Atkinson, *supra* note 9, at 3.

³⁷⁰ *Id.*, at 8.

³⁷¹ Mary Alexander, *Shock and Awe Using Demonstrative Evidence*, American Trial Lawyers’ Association, at 3.

³⁷² Atkinson, *supra* note 72, at 5.

³⁷³ *Id.*

³⁷⁴ Clore, *supra* note 49, at 2.

Developing compelling demonstratives requires first knowing the story of the case.³⁷⁵ Without a deep knowledge of the facts, clear storytelling is impossible.³⁷⁶ Effective storytelling is enhanced by passion and emotional investment. “How can you expect the audience to invest themselves if you are not completely investing your own emotional energy into the telling of the story in action?”³⁷⁷ This investment feeds back into the scientific findings that jurors’ verdicts are influenced by their opinions of the lawyer. A lawyer who is invested in the case, whether technologically or emotionally, is more likely to win.

One of the primary cognitive advantages to the use of narrative structure is the way storytelling enables the attorney to develop themes that are reiterated throughout the trial presentation.³⁷⁸ Some lawyers understand to term “theme” to refer to the “moral core” of a case, while others understand the term to refer more generally to any unifying idea that is a recurrent element in the trial presentation.³⁷⁹ Either way, a theme is an effective way to combat the limits of juror memory and understanding, linking together and simplifying ideas.

Real and demonstrative evidence is uniquely suited for developing trial presentation in narrative format. Use of demonstrative exhibits often provides an opportunity to present mini-drama, or stories within the overarching story structure.³⁸⁰ More generally, these evidentiary techniques are simply additional tools that can be used to highlight salient aspects of a story.³⁸¹

b. The Importance of Comparison and Contrast

Comparing and contrasting is one of the most fundamental and intuitive ways that real and demonstrative exhibits are used. And as the research discussed *infra* suggests, this mechanism produces measurable results on jury decisionmaking. Comparisons are most effective when unified with the attorney’s overarching narrative structure, and presented in a visual language tailored to the jurors’ predilections and biases.³⁸² “Comparisons may point to testimony conflicts, choices presented to and made by defendants, consequences of actions, or other facts supporting your themes.”³⁸³

For example,

[t]o show the devastating effects of a plaintiff’s face and head injury, you might (as we have done) show pre- and post-injury photos of the plaintiff’s face (in side-by-side frontal views).³⁸⁴ To thematically link these images (and drive home the

³⁷⁵ S. Rafe Foreman, *Making The Courtroom Your Stage By Inspired Imagination*, Missouri Bar CLE Advanced Trial College (October 28-29, 2011), at 3.

³⁷⁶ *Id.*

³⁷⁷ *Id.*

³⁷⁸ Malouf, *supra* note 36, at 1.

³⁷⁹ *Id.*

³⁸⁰ Lanier, *supra* note 1, at C-2.

³⁸¹ Rogers, *supra* note 208, at 4.

³⁸² Jew & Peterson, *supra* note 329, at H-6.

³⁸³ *Id.*

³⁸⁴ *Id.*

reason for their contrasting appearance), you may place between them an image that digitally reconstructs the extensive injury to the plaintiff's skull.³⁸⁵

Charts and graphs are another effective means of leverage the comparison effect in trial practice. For example, a pie chart could be used to “contrast the total cost of a truck (equaling the entire ‘pie’) with the minor component cost of a safety feature that the truck manufacturer failed to add (clearly shown to be a small sliver of that pie).”³⁸⁶

Timelines can also be used to highlight comparisons. Two color-coded parallel timelines showing the actions of the plaintiff and defendant over time can be used to compare their conduct. For example, this technique could highlight neglect to duties during a relevant time, or communications during a period that is critical to the case.³⁸⁷ In each of these applications, layout, color, and graphical elements can be used to make the salient comparison “pop out” from the rest.³⁸⁸ Red boxes or highlighting can be used to draw attention to the matter to be compared. The use of high-contrast colors can assist in ensuring that the comparison is clearly visible to jurors.³⁸⁹

As with other techniques, it is important not to go overboard using bright colors or other graphics to highlight a comparison. “Although it may be tempting to add ‘cool’ and razzle-dazzle graphics...it turns out that they can actually harm the ability of an audience to understand the information you are trying to communicate.”³⁹⁰ More colors and graphics means the jurors have more information to process in short-term memory.³⁹¹ Thus comparisons (and all the techniques discussed herein) should be simple enough that they do not risk directing “the attention of the jurors to the screen, instead of to you and the meaning of the [exhibit].”³⁹²

“Keeping the short-term memory of the jurors clear of distraction will help them, and you, to focus on the clarity of your story.”³⁹³ Typically, a simple graphical style is most effective.³⁹⁴ Simplicity also assists in the effort to unify demonstrative exhibits with a story and theme.³⁹⁵

c. The Importance of Order of Proof, Point of View, and Areas of Focus

As set forth *supra*, it is clear that point of view plays an important role in causal judgment of jurors.³⁹⁶ Some of the research indicates that jurors are more likely to blame an individual if they see the incident from that individual's perspective, while other research suggest that the actor-observer effect makes jurors more sympathetic to the person from whose perspective they perceive an incident. However, one thing is clear: people ascribe greater responsibility to those who

³⁸⁵ *Id.*

³⁸⁶ *Id.*

³⁸⁷ Jew & Peterson, *supra* note 329, at H-7.

³⁸⁸ Atkinson, *supra* note 9, at 9.

³⁸⁹ *Id.*

³⁹⁰ *Id.*

³⁹¹ *Id.*, at 10.

³⁹² *Id.*

³⁹³ Atkinson, *supra* note 9, at 10.

³⁹⁴ *Id.*

³⁹⁵ *Id.*

³⁹⁶ Dilich, *supra* note 261, at 13.

dominate a visual scene.³⁹⁷ Thus, using a computer animation from the defendant's perspective is risky for a plaintiff, as it may actually make the jurors more sympathetic to the defendant.

Nonetheless, plaintiffs' attorneys can make use of the science regarding point of view by focusing on the actions of the defendant while not necessarily presenting information from the defendant's point of view. This leverages the fact that "whichever person or object assumes visual prominence tends to be seen as playing a greater causal role in the situation at hand" without risking invoking the actor-observer effect.³⁹⁸

Thus, "skillful manipulation of point-of-view may be used to influence judgments of blame."³⁹⁹ A computer animation prepared by the plaintiff could be from a neutral or aerial perspective, but place the driver's vehicle in the central field of view, or zooms in on that vehicle during the crash, resulting in "exaggerated perceptions of causal responsibility on the part of viewers."⁴⁰⁰

There is no consensus among trial attorneys regarding matters of timing. "Some lawyers like to 'wow' the jury in opening statement with certain aids...."⁴⁰¹ Starting strong is supported by the research showing that use of what jurors might see as sophisticated techniques serves as a peripheral clue or heuristic for the competence and reliability of the attorney. Other attorneys believe the best use of demonstrative exhibits is to "save them for closing argument to persuade the jury."⁴⁰² This approach is also supported by research on the limitations of short term memory.

Timelines of events may be useful in opening and throughout trial to overcome memory limitations and assist the jury in organization the information that is less cognitively demanding.⁴⁰³ Some kinds of demonstrative evidence are particularly suited for use during specific parts of the trial. "Medical illustrations may be best used with the medical expert on the stand, while a Day-in-the-Life video may be best with a family member or life care planner."⁴⁰⁴

Some attorneys believe that "it is best to show demonstratives and visuals first and written exhibits second" because demonstratives tell the story that gives factual exhibits their meaning.⁴⁰⁵ There is some support for the proposition that our brains process visual information first and verbal information second.⁴⁰⁶ However, as noted, *supra*, there is research suggesting that providing context first can aid in understanding. Optimal sequencing may depend on the individual learning styles of the jurors.

It is clear, however, that the topic areas, in whatever sequence, are divided into a

³⁹⁷ *Id.*

³⁹⁸ *Id.*

³⁹⁹ *Id.*

⁴⁰⁰ Dilich, *supra* note 261, at 13.

⁴⁰¹ Alexander, *supra* note 372, at 3.

⁴⁰² *Id.*

⁴⁰³ *Id.*

⁴⁰⁴ *Id.*

⁴⁰⁵ Pardieck, *supra* note 340, at 4.

⁴⁰⁶ Eric Oliver, *PERSUASIVE COMMUNICATION* 320 (2009).

manageable number of general topic areas.⁴⁰⁷ As noted *infra*, these chunks can be organized using storyboards. The storyboards can then inform the order and content of witness examinations. To keep the chunks distinct yet manageable, “it is best to have each expert or major witness cover a few...general topic areas, with a visual aid illustrating each.”⁴⁰⁸

d. Practice Makes Perfect—Making Sure you Perform at Trial

If you fumble and stumble using demonstrative evidence, it loses its impact.⁴⁰⁹ This intuition is supported by the research regarding both central and peripheral processing. If the attorney looks incompetent in an attempt to use demonstrative evidence, this will undermine any peripheral benefit. If the presentation is riddled with technical difficulties, that will also serve as a distraction from its content, undermining central processing.

There is a simple solution: practice with your technology before making any presentation.⁴¹⁰

What’s the difference between a presentation that is a train wreck and one that is masterful? Practice. A well-rehearsed, well-prepared presentation may turn a trial in your client’s favor or secure a substantial settlement, while a failure to practice with presentation technology sets you up for disaster.⁴¹¹

Repetition and practice reliably improve the quality and results of trial presentations in every case.⁴¹² The importance of pre-trial practice with demonstrative exhibits cannot be overstated.⁴¹³ Of course, it is always possible that technology will fail. It is therefore prudent to bring a backup for all technology used in the courtroom.⁴¹⁴

IV. Getting Real and Demonstrative Exhibits Admitted so the Jury Can See Them in Trial and Hopefully Request Them in the Jury Room

None of the above has any value unless the evidence is admissible so it can be used in trial and deliberations.⁴¹⁵ In practice, the use of models, drawings and charts is now almost universally permitted.⁴¹⁶ But admissibility lies within the discretion of the trial court and pitfalls remain.⁴¹⁷

For example, charts and graphs summarizing other evidence may be excluded as cumulative.⁴¹⁸ Some demonstrative evidence may be admissible if for one issue, but not

⁴⁰⁷ Pardieck, *supra* note 340, at 4.

⁴⁰⁸ *Id.*

⁴⁰⁹ Alexander, *supra* note 372, at 3.

⁴¹⁰ Rogers, *supra* note 208, at 5.

⁴¹¹ *Id.* at 6.

⁴¹² *Id.* at 5.

⁴¹³ *Id.*

⁴¹⁴ *Id.*

⁴¹⁵ Atkinson, *supra* note 72, at 9.

⁴¹⁶ Peterson, *supra* note 35, at 1-2.

⁴¹⁷ Atkinson, *supra* note 23, at C-10.

⁴¹⁸ Peterson, *supra* note 35, at 1.

another.⁴¹⁹ “This means the lawyer has to work hard at developing the foundation and providing notice where necessary.”⁴²⁰ Some forms of demonstrative evidence are often excluded because the adversary claims that the ability to cross-examine the witness about the test or demonstration and its validity has been impaired due to its being conducted out of court for litigation but without notice and opportunity to observe.⁴²¹ To avoid this problem, give notice to opposing parties for an opportunity to be present when filming scientific tests or demonstrations that you plan to offer as evidence.⁴²²

In general, attorney will maximize the change that demonstrative exhibits will be admitted by providing notice well in advance to the court and to opposing counsel. Even where the exhibits are not the kind that need to be admitted as substantive evidence (e.g., PowerPoint presentations that accompany closing argument) they should still be included in exhibit lists.⁴²³ “If a demonstrative exhibit is identified early enough to allow opposing counsel to make objections and to prepare any desired counter demonstrative exhibits, courts will be more inclined to allow its use.”⁴²⁴ If the admissibility of a demonstrative exhibit is not settled by the time the case reaches trial, the attorney should prepare a brief and copies of caselaw to submit to the judge.⁴²⁵

The fundamental general considerations in determining admissibility are accuracy, fairness, and helpfulness of the exhibit to the jury.⁴²⁶ As with other evidence, lawyers must establish the foundation and authenticity of demonstrative exhibits, and overcome any objection based on hearsay or prejudice.⁴²⁷

In general, the attorney should follow these steps before a jury may see a demonstrative exhibit:

1. The witness must have reliable evidence of the actual event that will be illustrated.⁴²⁸
2. The witness must testify that the demonstrative is a fair and accurate representation of the thing it is intended to depict.⁴²⁹
3. The exhibit must illustrate, explain, or clarify the authenticating witness’ substantive testimony.⁴³⁰
4. Each witness who uses an illustration must separately state that the exhibit or illustration is accurate from his or her perspective.⁴³¹
5. The exhibit must not be overly prejudicial.⁴³²

⁴¹⁹ Atkinson, *supra* note 23, at C-10.

⁴²⁰ *Id.*

⁴²¹ *Id.*, *citing* 542 F.2d 111 (2d Cir. 1976), cert. denied, 429 U.S. 987 (1976).

⁴²² Atkinson, *supra* note 23, at C-8.

⁴²³ Pardieck, *supra* note 340, at 5.

⁴²⁴ *Id.*

⁴²⁵ Atkinson, *supra* note 72, at 3-4.

⁴²⁶ Malouf, *supra* note 36, at 8.

⁴²⁷ Pardieck, *supra* note 340, at 6.

⁴²⁸ *Id.*

⁴²⁹ *Id.*

⁴³⁰ *Id.*

⁴³¹ *Id.*, at 7.

⁴³² Pardieck, *supra* note 340, at 7.

The trial judge must be satisfied that the demonstrative exhibit will fairly assist the jury in understanding a relevant issue.⁴³³ Once the trial judge is satisfied that the exhibit will assist the jury's understanding of a relevant issue, it may be marked for identification purposes and used during trial without being formally admitted into evidence.⁴³⁴ This means that demonstrative exhibits are considered part of the witness' testimony but do not normally go back to the jury.⁴³⁵

a. Foundation and Admissibility of Demonstrative Evidence in Missouri

Generally speaking, in Missouri, demonstrative evidence which tends to establish any fact in issue or throw light on controversy and aids the jury in arriving at a correct verdict is admissible.⁴³⁶ When demonstrative evidence is offered, an adequate foundation for admission requires authentication that the object offered is the object involved in the controversy and remains in a condition substantially unchanged.⁴³⁷ Admissibility of demonstrative evidence is within the sound discretion of the trial court.⁴³⁸

i. Tangible objects may be admitted into evidence.

A party who seeks to introduce a tangible item must ordinarily authenticate the item by offering sufficient evidence to permit the trial judge to find that the item is, in fact, what it is claimed to be and that it is in substantially the same condition as it was at the time of the incident to which it is claimed to relate. It also must be relevant.⁴³⁹

ii. Photographs and videos may be admitted into evidence.

The party who offers a photo in evidence must show that it is an accurate, faithful representation of the place, person or subject it purports to portray. This authenticity may be established by any witness who is familiar with the subject matter of the photo and is competent to testify from personal observation.⁴⁴⁰

The same general principles which govern the foundation for the admission of photographs apply to the admission of videotapes.⁴⁴¹ The party offering a videotape in evidence must show that it is an accurate and faithful representation of what it purports to show.⁴⁴² Proper authentication of the video requires testimony of the person who was present at for the recording "that the recording equipment was working properly, and that the videotape was a fair and accurate transcription of what transpired."⁴⁴³ Videos may be admitted into evidence for either to re-create

⁴³³ *Id.*

⁴³⁴ *Id.*

⁴³⁵ *Id.*

⁴³⁶ *State v. Weekley*, 621 S.W.2d 256, 261 (Mo. 1981).

⁴³⁷ *Storm v. Ford Motor Co.*, 526 S.W.2d 875, 878 (Mo. App. 1975).

⁴³⁸ *Gleason v. Bendix Commercial Vehicle Sys., LLC*, 452 S.W.3d 158, 181 (Mo.App. W.D. 2014), *reh'g and/or transfer denied* (Nov. 25, 2014), *transfer denied* (Feb. 3, 2015).

⁴³⁹ *State v. Plant*, 694 S.W.2d 751, 753 (Mo.App. E.D. 1985).

⁴⁴⁰ *Wood River Pipeline Co. v. Sommer*, 757 S.W.2d 265, 269 (Mo.App. E.D. 1988).

⁴⁴¹ *Phiropoulos v. Bi-State Dev. Agency*, 908 S.W.2d 712, 714 (Mo.App. E.D. 1995).

⁴⁴² *Id.*

⁴⁴³ *State v. Mueller*, 872 S.W.2d 559, 566 (Mo. Ct. App. E.D. 1994).

events at issue in the litigation, or to illustrate physical properties or scientific principles the average layperson would find difficult to understand and which forms the foundation for an expert's opinion.⁴⁴⁴

iii. Sound recordings may be admitted.

There are seven elements in establishing a proper foundation for the admission of a sound recording into evidence: (1) A showing that the recording device was capable of taking testimony; (2) a showing that the operator of the device was competent; (3) establishment of the authenticity and correctness of the recording; (4) a showing that changes, additions, or deletions have not been made; (5) a showing of the manner of the preservation of the recording; (6) identification of the speakers, and (7) a showing that the testimony elicited was voluntarily made without any kind of inducement.⁴⁴⁵

iv. Diagrams may admitted into evidence.

Maps, diagrams, and charts may, in the discretion of the trial court, be admitted into evidence if they are reasonably accurate and correct, and if they tend to establish a fact in issue or assist the jury in understanding the case.⁴⁴⁶

v. Diagrams may be used with witnesses without admitting them.

Even when not put in evidence, maps, diagrams, and charts may be used with a witness, in opening statement or in argument to illustrate a point based on the evidence, as long as they are not confusing or misleading.⁴⁴⁷ If used only for illustrative purposes, such items should be marked “for identification, but should not actually be received in evidence.”⁴⁴⁸ Other visual displays also may be used, in the discretion of the court, as demonstrative aids.⁴⁴⁹

vi. Models or replicas may be admitted as real evidence or as demonstrative evidence if to scale.

Models may be admitted as either real or demonstrative evidence, depending on the facts in the case.⁴⁵⁰ Demonstrative models are admissible under the same general principles as other demonstrative evidence: namely they must assist in understanding, be accurate, and not too inflammatory.⁴⁵¹ Unlike diagrams or maps, there is some caselaw to suggest that models which are not to scale are not admissible.⁴⁵²

⁴⁴⁴ *Simmons v. Heartland Wood Products, Inc.*, 355 S.W.3d 496, 503 (Mo.App. S.D. 2011).

⁴⁴⁵ *State v. Simmons*, 861 S.W.2d 128, 133 (Mo.App. E.D. 1993).

⁴⁴⁶ *State v. Isa*, 850 S.W.2d 876,891 (Mo. banc 1993); *Brandt v. Csaki*, 937 S.W.2d 268, 276 (Mo.App.1996); *State v. Smith*, 357 S.W.2d 120, 123 (Mo.1962); *Vasseghi v. McNutt*, 811 S.W.2d 453, 456 (Mo.App.1991).

⁴⁴⁷ *State v. Jones*, 749 S.W.2d 356, 363-64 (Mo.banc 1988).

⁴⁴⁸ *Matter of Passman's Estate*, 537 S.W.2d 380, 385-386 (Mo. banc 1976).

⁴⁴⁹ *State v. Snyder*, 748 S.W.2d 781, 784 (Mo.App.1988); *State v. Carson*, 941 S.W.2d 518 (Mo. banc 1997); *Keenoy v. Sears Roebuck & Col.*, 642 S.W.2d 665, 671 (Mo.App.1982).

⁴⁵⁰ *State v. Cofield*, 95 S.W.3d 202, 205 (Mo.App. S.D. 2003).

⁴⁵¹ *State v. Holmes*, 609 S.W.2d 132, 136 (Mo. banc 1980).

⁴⁵² See 23 MO. PRAC., MISSOURI EVIDENCE § 1104:1 (4th ed.).

vii. Summaries are admissible.

Summaries are admissible when they summarize a number of documents that cannot conveniently be examined in court.⁴⁵³ The proponent of admission of a summary of records must show that the records upon which the summary is based are themselves admissible and they are available to the opposing party for inspection.⁴⁵⁴

viii. Medical illustrations are admissible.

Missouri law allows the use of medical illustrations depicting a condition of the plaintiff that assists a jury's understanding of the medical facts, again as long as the illustration is accurate and not too inflammatory.⁴⁵⁵

ix. In-court demonstrations are generally admissible.

Missouri courts generally allow in-court demonstrations when they meet the general criteria for admissibility of demonstrative evidence, namely, that it sheds light on an issue and fairly represents what it is offered to show.⁴⁵⁶ These demonstrations can take the form of in-court displays of injuries or more complicated experiments, some involving jury participation.⁴⁵⁷

Generally, the exhibition of a plaintiff's injury is highly relevant, but displays designed merely to arouse antipathy against the defendant, sympathy for the plaintiff, or where they are irrelevant will be excluded.⁴⁵⁸ Missouri courts have also allowed in-court demonstrations that include juror participation.⁴⁵⁹

x. Out of court experiments are admissible if substantially similar to the occurrence at issue.

In order to admit out of court experiments, the trial judge is required to find that the circumstances of the experiment are substantially similar to those of the accident.⁴⁶⁰ Substantial similarity "is a flexible concept, depending upon what conditions are important to control."⁴⁶¹ Computer simulations and other out of court experiments may be excluded if they are based on variables rather than on basic facts in evidence.⁴⁶²

⁴⁵³ *Ahrens v. Mullenix Corp.*, 793 S.W.2d 534, 540 (Mo.App. E.D. 1990) citing *Benz v. Powell*, 93 S.W.2e 877, 880 (Mo. 1936).

⁴⁵⁴ *Ahrens*, 793 S.W.2d at 540, citing *Union Elec. Co. v. Mansion House Ctr. No. Redev. Co.*, 494 S.W.2d 309, 364 (Mo. 1973).

⁴⁵⁵ *Brandt v. Csaki*, 937 S.U. 2d 268, 276 (MO. App. W.D. 1997).

⁴⁵⁶ *State v. Harrison*, 213 S.W.3d 58, 76 (Mo.App. S.D. 2006).

⁴⁵⁷ See 23 MO. PRAC., Missouri Evidence § 1105:1 (4th ed.).

⁴⁵⁸ *Deveney v. Smith*, 812 S.W.2d 810, 814 (Mo.App. W.D. 1991).

⁴⁵⁹ *Geisel v. Haintl*, 427 S.W.2d 525, 529 (Mo. 1968).

⁴⁶⁰ *Fowler v. S-H-S Motor Sales Corp.*, 560 S.W.2d 350, 356 (Mo. App 1977).

⁴⁶¹ *Gleason v. Bendix Commercial Vehicle Sys., LLC*, 452 S.W.3d 158 (Mo.App. W.D. 2014), *reh'g and/or transfer denied* (Nov. 25, 2014), *transfer denied* (Feb. 3, 2015)

⁴⁶² *Richardson v. State Highway & Transp. Comm'n*, 863 S.W.2d 876, 882 (Mo. banc 1993)

xi. “Views” are permissible in certain circumstances.

It is within the discretion of the trial court whether the jury should be permitted to go outside the courtroom to view relevant evidence which cannot be brought to the courtroom.⁴⁶³ The fact that there were alternative methods for presentation of the evidence does not render a trial court’s decision an abuse of discretion.⁴⁶⁴ As with other forms of demonstrative evidence, the question is whether the evidence is relevant, accurately represents the condition of the evidence at the time of the occurrence, and is not overly prejudicial.⁴⁶⁵

b. Foundation and Admissibility in Federal Court

No federal rule deals specifically with the admissibility of real and demonstrative evidence or makes any distinction between the two.⁴⁶⁶ The definition of “relevant evidence” contained in Rule 401 of the Federal Rules of Evidence is clearly intended to encompass “[c]harts, photographs, views of real estate, murder weapons, and ... other [tangible] items of evidence” offered and admitted as aids to understanding....⁴⁶⁷

The principles in federal the court are largely the same as in Missouri state court: if the evidence aids understanding, is accurate, and is not prejudicial or cumulative, it is admissible.

i. Tangible objects are admissible.

Like Missouri courts, federal courts have admitted almost every imaginable tangible object and allow the display of injured body parts, again, as long as they are in the same condition or are an accurate representations of the object at the time of the occurrence.⁴⁶⁸

ii. Photographs and videos are admissible if not overly prejudicial.

As in Missouri State court, photographs and videos generally are admissible as long as they are relevant, properly authenticated, and not prejudicial or cumulative.⁴⁶⁹ While there is no per se rule against their admissibility, mug shots are generally considered prejudicial and are therefore excluded from evidence.⁴⁷⁰

iii. Sound recording are admissible under certain circumstances.

In federal court, there is a seven part test for the admissibility of sound recordings that is very similar to the Missouri test: (1) That the recording device was capable of taking the conversation now offered in evidence. (2) That the operator of the device was competent to operate the device. (3) That the recording is authentic and correct. (4) That changes, additions or deletions

⁴⁶³ *State v. McAnulty*, 491 S.W.2d 259, 261 (Mo. 1973).

⁴⁶⁴ *Id.*

⁴⁶⁵ *Id.*

⁴⁶⁶ 23 MO. PRAC., MISSOURI EVIDENCE § 1101:2 (4th ed.).

⁴⁶⁷ See FED. R. EVID. 401, Advisory Committee’s Note, 56 F.R.D. 183, 216 (1972).

⁴⁶⁸ 23 Mo. Prac., Missouri Evidence § 1102:4 (4th ed.).

⁴⁶⁹ *United States v. Allen*, 630 F.3d 762, 765 (8th Cir. 2011).

⁴⁷⁰ *Cox v. Wyrick*, 642 F.2d 222, 226-27 (8th Cir. 1981).

have not been made in the recording. (5) That the recording has been preserved in a manner that is shown to the court. (6) That the speakers are identified. (7) That the conversation elicited was made voluntarily and in good faith, without any kind of inducement.⁴⁷¹

iv. Diagrams, maps and charts.

As with other types of demonstrative evidence, admission of maps, charts and diagrams is within the discretion of the trial court. Federal courts generally make a distinction between these visual aids as evidence versus as pedagogical devices.⁴⁷² Visual aids which are actually evidence are admissible, and may be sent back to the jury room.⁴⁷³ Visual aids which are summaries or teaching tools may be used at trial, but not admitted as evidence nor sent back with the jury.⁴⁷⁴

v. Summaries are admissible.

FED. R. EVID. 1006 specifically provides for the admission of summaries.⁴⁷⁵ The summary, chart, or calculation may be admitted to prove “the content of voluminous writings, recordings, or photographs that cannot be conveniently examined in court.”⁴⁷⁶ The proponent must make the originals or duplicates available for examination or copying, or both, by other parties at a reasonable time and place, and the court may order the proponent to produce them in court.⁴⁷⁷ However, these summaries are not evidence, and so should not be sent back to the jury room.⁴⁷⁸ In general however, federal courts have discretion to decide whether exhibits should or should not be sent to the jury.⁴⁷⁹

vi. Computer animations and reconstructions are admissible in certain circumstances.

As in State court, computer animations and reconstructions are only admissible if they are substantially similar to the issue in the case at bar, in addition to being reliable and not overly prejudicial.⁴⁸⁰

vii. “The view” is permissible in certain circumstances.

In Federal Court, as in Missouri State court, whether to permit a “view” is within the discretion of the trial court.⁴⁸¹ The trial court’s decision is “highly discretionary” and therefore unlikely to be disturbed.⁴⁸² Federal courts consider the same familiar factors: whether the out of

⁴⁷¹ *United States v. Oslund*, 453 F.3d 1048, 1054 (8th Cir. 2006)

⁴⁷² *Pierce v. Ramsey Winch Co.*, 753 F.2d 416, 431 (5th Cir. 1985)

⁴⁷³ *Id.*

⁴⁷⁴ *Id.*

⁴⁷⁵ Rule 1006, FED. R. EVID.

⁴⁷⁶ *Id.*

⁴⁷⁷ *Id.*

⁴⁷⁸ *Pierce* 753 F.2d at 431.

⁴⁷⁹ *Leathers v. United States*, 471 F.2d 856, 863 (8th Cir. 1972).

⁴⁸⁰ *Hale v. Firestone Tire & Rubber Co.*, 756 F.2d 1322, 1332 (8th Cir. 1985).

⁴⁸¹ *United States v. Triplett*, 195 F.3d 990, 999 (8th Cir. 1999).

⁴⁸² *Id.*

court visit is relevant, overly prejudicial, whether it would represent accurate information, and whether it would be cumulative with other evidence.⁴⁸³

c. Demonstratives in Opening Statements

Use of demonstratives in opening statements may be particularly effective as it may condition and prepare jurors for the rest of trial presentation.⁴⁸⁴ In most jurisdictions, plaintiffs cannot use traditional demonstrative evidence during opening statement without defense counsel's consent, which is rarely given.⁴⁸⁵ A Federal Judicial Center publication speaks favorably about the effectiveness of using technology in opening, suggesting some support for the practice in federal court.⁴⁸⁶ The practice may be gaining in acceptability, although the limits vary from jurisdiction to jurisdiction.⁴⁸⁷

Nonetheless, if the attorney intends to use demonstrative evidence this intention should be communicated to the judge.⁴⁸⁸ This issue should be raised at the pretrial conference and any potentially troublesome demonstrative exhibit issues should be raised by motion.⁴⁸⁹ Approving demonstrative exhibits ahead of time reduces the risk that showing the evidence to the jury during opening statement will draw an objection and create a disruption.⁴⁹⁰

d. Getting Reenactments Admitted into Evidence

There is a surprising lack of case law dealing with models or animations.⁴⁹¹ Nonetheless, as noted above, the rules applicable to models and animations are roughly the same as those that apply to experiments and other types of demonstrative evidence.⁴⁹² Reenactments and demonstrations have been historically likely to be excluded.⁴⁹³ Going to the expense of creating them is therefore risky.

Computer-generated reenactments are particularly vulnerable to the challenge that they do not represent substantially similar conditions to those of the accident in issue.⁴⁹⁴ Attorneys seeking the admission of computer animations should therefore pay "meticulous attention to every nuance, especially to eliminate any detail that might arguably be argumentative or inflammatory."⁴⁹⁵ Courts also scrutinize computer reenactments closely to exclude them as cumulative.⁴⁹⁶ Attorney must therefore be prepared to argue how the reenactment provides unique assistance to the jury

⁴⁸³ *Id.*

⁴⁸⁴ Pillersdorf, *supra* note 53, at 2.

⁴⁸⁵ *Id.*, at 1.

⁴⁸⁶ See Federal Judicial Center, EFFECTIVE USE OF COURTROOM TECHNOLOGY: A JUDGE'S GUIDE TO PRE-TRIAL AND TRIAL 153- 64 (2001).

⁴⁸⁷ *Id.*

⁴⁸⁸ Pardieck, *supra* note 340, at 6.

⁴⁸⁹ *Id.*

⁴⁹⁰ *Id.*

⁴⁹¹ Malouf, *supra* note 36, at 7-8

⁴⁹² *Id.*

⁴⁹³ Atkinson, *supra* note 23, at C-5.

⁴⁹⁴ *Id.*, at C-6.

⁴⁹⁵ *Id.*

⁴⁹⁶ *Id.*, at C-7.

that no other evidence can afford.

To obtain the greatest chance of admissibility, models, animations, or other analogs, should be created by a qualified expert with the ability to defend their accuracy.⁴⁹⁷

If a machine is to testify against an accused, the courts must, at the very least, be satisfied with all reasonable certainty that both the machine and those who supply its information have performed their functions with utmost accuracy.⁴⁹⁸

Accident reconstruction evidence or reenactments must be substantially similar to the circumstances of the case and they must be scientifically sound.⁴⁹⁹ The proponent of the evidence “must show that the process of putting the data in to the computer avoided error, and that accuracy and reliability of the software and hardware were checked.”⁵⁰⁰

V. CONCLUSION

In our digital age, the potential ways to use demonstrative evidence have never been greater.⁵⁰¹ “Photographs can be electronically stored and redesigned; videos can be manipulated by computer; home movies of the plaintiff can be reproduced as film; surgery can be demonstrated; collapse of the defective ladder can be reproduced by animation; and the single rivet or other defect highlighted.”⁵⁰²

As researchers struggle to keep up with changing technology, understanding the science behind effective use of demonstrative evidence is a moving target for trial attorneys. Nonetheless, recent research, while inherently limited, has provided some concrete guidance. Use of demonstrative evidence can create powerful peripheral effects that bias jurors in favor of attorneys who use these techniques, especially when the other side does not do so. Focusing visually on the party the attorney seeks to blame is effective at enhancing judgments, but presenting evidence from on the party’s point of view may have the opposite result due to the actor-observer effect. Human memory is very limited and demonstrative exhibits should be designed to crystallize key information into three or four major categories. Use of a narrative structure and thematic content can assist in this simplification effort.

This research can inform the trial practitioner’s use of demonstrative exhibits. Nonetheless, given the limitations of the research, the clever lawyer will integrate anecdotal evidence regarding best practices for demonstrative evidence into the trial presentation strategy. At bottom, the demonstrative evidence strategy must comport with the legal requirements for admissibility, and must be polished and professional, to take advantage of these insights.

The use of demonstrative evidence is limited only by the creativity of the lawyer and the

⁴⁹⁷ Malouf, *supra* note 36, at 7-8

⁴⁹⁸ Atkinson, *supra* note 23, at C-4, citing *United States v. De Georgia*, 420 F.2d 889 (9th Cir. 1969).

⁴⁹⁹ Alexander, *supra* note 372, at 1.

⁵⁰⁰ Atkinson, *supra* note 23, at C-4.

⁵⁰¹ *Id.*, at C-10.

⁵⁰² *Id.*

discretion of the courts. Research shows that these tools remain essential parts of the attorney's trial presentation toolkit, and those who do not make use of them are at a severe disadvantage. Ultimately, the more time an attorney spends understanding and developing demonstrative exhibits, the more successful they will be.