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Computer-Animated Displays and the Jury: Facilitative and Prejudicial Effects

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Two experiments assessed the effects of computer-animated displays on mock jurors. In both, participants watched a trial involving a dispute over whether a man who fell to his death had accidentally slipped or jumped in a suicide. They watched a proplaintiff or prodefendant version in which the body landed 5–10 feet or 20–25 feet from the building. Within each condition, the distance testimony was presented orally or with an animated display. When the tape depicted the event in a neutral manner, judgments were more consistent with the physical evidence. But when the plaintiff and defense used the tape to depict their own partisan theories, participants increasingly made judgments that contradicted the physical evidence. Results suggest that computer-animated displays have greater impact than oral testimony. Whether that impact is to facilitate or mislead a jury, however, depends on the nature of the display.

In recent years, increasing numbers of trial attorneys have sought to introduce into trial evidence computer-animated displays that recreate murders, automobile collisions, airline disasters, environmental conditions, medical procedures, complex mechanical systems, and other physical and behavioral events. Based on known data concerning mass, velocity, distance, acceleration, and other physical parameters, events in dispute can be reconstructed or simulated on a computer and then presented via videotape to a jury. In one case, for example, a vehicular manslaughter defendant showed the jury an animated recreation of his accident to prove that he could not have been speeding (*People v. McHugh*, 1984). In a second case, U.S. Justice Department lawyers used computer animation to show that airline pilots had received a visual warning of hazardous weather conditions and could have avoided a crash landing (*Connors v. United States*, 1991). In a third case, the manufacturer of a football helmet used animation to demonstrate that a high-school player's head injury was caused by the way he tackled his opponent, not by a flaw in the design of the helmet (*Brandt v. St. Bernard Parish*, 1992).

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A review of recent case law reveals that courts are currently in a state of flux over the evidentiary status of this developing new technology. Some judges have ruled that computer-animated constructions are admissible as demonstrative evidence, or as a basis for expert testimony, on the ground that they are probative and assist the trier of fact (e.g., *Connors v. United States*, 1991; *Florida v. Pierce*, 1993; *People v. McHugh*, 1984). Yet others have excluded such presentations from evidence on the ground that the risk of confusion or prejudice outweighs their probative value (e.g., *Racz v. Merryman Trucking*, 1994; *Sommervold v. Grevlos*, 1994). Indeed, many legal commentators have expressed concern about the impact of animated reconstructions on the jury (Bulkeley, 1992; Ellenbrogen, 1993; Menard, 1993; Sherman, 1992).

Three independent lines of research offer converging evidence for the hypothesis that computer-animated reconstructions of past events are likely to have a highly persuasive impact on the jury. First, psychological research in nonlegal contexts shows that most people are poor intuitive physicists and do not know various basic laws of motion (Caramazza, McCloskey, & Green, 1981; McCloskey, 1983). For example, many people erroneously believe in the "impetus principle" that an object set in motion acquires its own internal force which keeps that object in motion. Thus, among subjects asked to predict the path of a smooth metal ball rolling through a spiral tube, the majority predicted that the ball would follow a curved path even after it exits the tube (McCloskey & Kuhl, 1983). Many people also harbor the "straight down belief"—the misconception that something dropped from a moving object will fall to the ground in a straight vertical line. Thus, among subjects asked to predict the path of a ball dropped at shoulder height by a walking adult, most incorrectly assumed that the ball would fall straight down rather than in a forward trajectory (McCloskey, Washburn, & Felch, 1983). The point is, with people not being proficient naive physicists, juries may be particularly vulnerable to manipulation by alternative constructions of dynamic physical events.

Second, people are highly influenced by information that is vivid, easy to imagine, and readily available in memory. Research in a legal context has thus shown that mock jurors are more likely to recall and accept testimony when it contains vivid and colorful details (e.g., that the defendant knocked over a bowl of guacamole dip, which splattered all over the white shag carpet; see Bell & Loftus, 1980; Reyes, Thompson, & Bower, 1980; Shedler & Manis, 1986) or when a videotape of a graphic crime scene is shown (Kassin & Garfield, 1991). Similarly, research shows that when people are prompted to imagine the occurrence of specific events (e.g., being arrested, winning a contest)—a process known as mental simulation—the imagined events later seem more plausible and subjectively more likely to occur (Gregory, Cialdini, & Carpenter, 1982).

The third empirical basis for the hypothesis that computer-animated displays are persuasive in the courtroom specifically concerns the mental mechanics of juror decision making. According to Pennington and Hastie's (1986) Story Model, jurors actively organize the various strands of evidence and arguments and then use common sense to construct a plausible narrative account, or story, of the events in dispute. Consistent with this model, Pennington and Hastie (1992) found that mock jurors were more likely to favor conviction or acquittal—and to do so with greater

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confidence—when the evidence was presented in a temporal order that made either the guilty or innocent story easier to construct. This finding suggests that computer-animated displays, compared to oral testimony, may have a powerful effect on jurors by bringing to life a particular visual and dynamic image of the event.

To summarize, research on intuitive physics, vividness effects in persuasion, and the story model of juror decision making, lead us to hypothesize that computer-animated displays have a strong persuasive impact on the jury. It is important to realize, however, that this impact may be facilitative or prejudicial, depending on the objectivity of the representation—that is, depending on whether it depicts an event based solely on physical facts not in dispute, or whether it adds controvertible elements of theory and speculation.

Two mock jury experiments assessed the possible effects of computer-animated displays in the courtroom. In both studies, participants watched a videotaped mock trial in which the plaintiff—a woman whose husband had died from a fall off an eight-story building—sued her insurance company for refusing to honor her husband's life insurance policy. The plaintiff argued that the decedent's death was an accident (i.e., he slipped and fell while working), while the defendant argued that his death was a suicide (i.e., he ran and jumped from the site). As explained through the testimony of an expert witness, the distance of the body from the building was the most logical, if not critical, item of physical evidence (i.e., greater distance was more consistent with a run-and-jump theory rather than with a slip-and-fall scenario). The first experiment tested the *facilitation hypothesis* that computer-animated displays can increase judgment accuracy for physical-behavioral events. A second experiment then tested the *prejudice hypothesis*, that animated presentations can be used to mislead or bias a jury.

EXPERIMENT 1

Method

Participants and Design

Forty-eight undergraduates (20 male, 28 female) were recruited from an introductory neuroscience class and paid $5.50 to take part in this study. Participants were randomly assigned to one of the four cells produced by a 2 (proplaintiff vs. prodefendant) × 2 (animated display vs. control) factorial design. They were tested in small groups ranging in size from two to six.

Procedure

Upon entering a laboratory courtroom furnished with a judge's bench, witness stand, and jury box, participants were instructed that they would watch a videotaped re-creation of a civil trial, after which they would be asked a series of questions. They were told that to keep the trial presentation short, we had the lawyers summarize the evidence and arguments. The trial was shown on a 19-in. color monitor

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stationed on the judge's bench. Afterward, all participants were given a questionnaire to fill out. They were then paid, debriefed, and thanked for their participation.

The Stimulus Trial

The videotaped mock trial was based on an actual case in which the plaintiff was Sarah Welkin, a woman whose husband died from a fall off an eight-story construction site, and the defendant was the Burgoine Insurance Company, which would not honor her husband's life insurance policy. The plaintiff argued that Welkin's death was an on-the-job accident, as he slipped and fell from a beam while working. In support of this theory, the plaintiff's attorney summarized the testimonies of Sarah Welkin, who said that her husband cared deeply about his family and was on the verge of realizing a life-long ambition; a clinical psychologist who believed that Welkin was not at risk for suicide; a co-worker who heard him scream in horror as he fell to his death; and a suicide expert who concluded from the physical evidence that Welkin had accidentally fallen.

In contrast, the defendant argued that Welkin leaped to his death, an act of suicide that absolves the company from paying his beneficiary. To support this claim, the defendant summarized the testimonies of a close friend of Welkin's who said that he was devastated by news that his wife was pregnant with another man's child; an old college friend, who recalled that Welkin used to suffer from occasional bouts of depression; a psychologist who noted that Welkin's father had committed suicide, a variable that increases the family risk; and a suicide expert who concluded from the physical evidence that Welkin had jumped to his death.

Based on the facts of the case, the plaintiff and defense lawyers, both of whom were played by adult male actors, presented opening statements, summaries of witness testimony, and closing arguments. The presentation concluded with instructions from the judge (also played by an adult male actor) on the applicable law and standard of proof. The entire trial presentation lasted for approximately 30 min.

The physical evidence and the presence/absence of an animated tape were independently varied, yielding four videotaped versions of the trial. Across physical evidence conditions, the location of the body in relation to the building was never in dispute. The experts for the two sides, however, drew opposite conclusions from that evidence. In the *proplaintiff* condition, Welkin's body was said to have landed 5–10 feet from the base of the building, a distance that is short enough to plausibly accommodate the plaintiff's slip-and-fall argument. In this version of the case, Dr. Kenneth Taylor—the plaintiff's suicide reconstruction expert—testified that a body falling straight down can be expected to land 5–10 feet from the building, whereas the momentum produced by a jump would have resulted in a greater distance. Anticipating the subsequent testimony of Dr. Jonathan Fisher, the defendant's expert, Taylor noted that although wind resistance could alter the trajectory of a falling object and cause it to land closer than it normally would, the wind on the day in question was not strong enough to account for the location of Welkin's body. Taylor concluded that "the only way a person's body could land as close as it did, 5–10 feet from the building, is if that person had accidentally slipped and fallen from the eighth floor."

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In the *prodefendant* condition, the body was found 20–25-feet from the building, an item of physical evidence that clearly favored the defendant's run-and-jump scenario. In this version of the case, Dr. Fisher, the defense expert on the physics of falling objects, testified that a body falling straight down can be expected to land only 5–10 feet from the base of the structure, and that only the momentum produced by a jump can explain the added distance of the body from the building. Responding to testimony from Dr. Taylor, the plaintiff's expert, Fisher said that although wind resistance could cause a falling object to land further from a building than it normally would, the wind that day was not sufficient to account for Welkin's ground location. Fisher thus concluded that "the only reasonable way a person's body could land as far as it did, 20–25-feet from the building, is if that person had taken a running jump off the edge of the eighth floor."

Within the aforementioned conditions, the critical evidence was presented orally or with the aid of a videotaped animated display. In a *no-animation control* group, the critical distance evidence was presented within the testimony of the expert witness for the plaintiff or defense, as described above. In the *animated-display* condition, these oral presentations were supplemented by an animation tape custom-made for us by a company that specializes in creating computerized displays for use in litigation. In both the proplaintiff and prodefendant versions, the tape depicted an eight-story skeletal structure against a black background. Welkin was portrayed as a faceless stick figure dropping from a beam on the eighth floor. On the ground below, straight red lines were spaced at 5 foot intervals to mark distances from the base of the building. In the proplaintiff version, the body landed face down between the 5- and 10-foot lines; in the prodefendant version, it landed face down between the 20- and 25-foot markers. The animated sequence was thus introduced by the plaintiff or defense lawyer, as follows: "We used computer animation to recreate what we think actually happened. The tape you will see represents our theory of this event." The taped sequence, which lasted for 10 seconds, was then played three times with the following voice-over by the presenting attorney: (1) "Here you can see the distance the body landed from the base of the building"; (2) "Take another look"; and (3) "One final time."

Dependent Measures

Individually and without deliberation, participants in all groups completed a two-page questionnaire in which they were first asked to render a verdict for the plaintiff or defense and to rate their confidence in that verdict on a 10-point scale (1 = *not at all*, 10 = *very confident*). Recognizing the possibility that our participants might favor the plaintiff even while accepting the insurance company's claim that Welkin had taken his own life, we next asked participants to judge whether Welkin's death was an accident or a suicide and rate their confidence in that judgment as well on a 10-point scale.

To examine the self-reported impact of the animated display on verdicts, and to test the hypothesis that it might overwhelm other evidence, we listed eight key items of evidence taken from the trial (Welkin's mental and emotional state; the distance of the body from the building; the position in which the body was found; the scream

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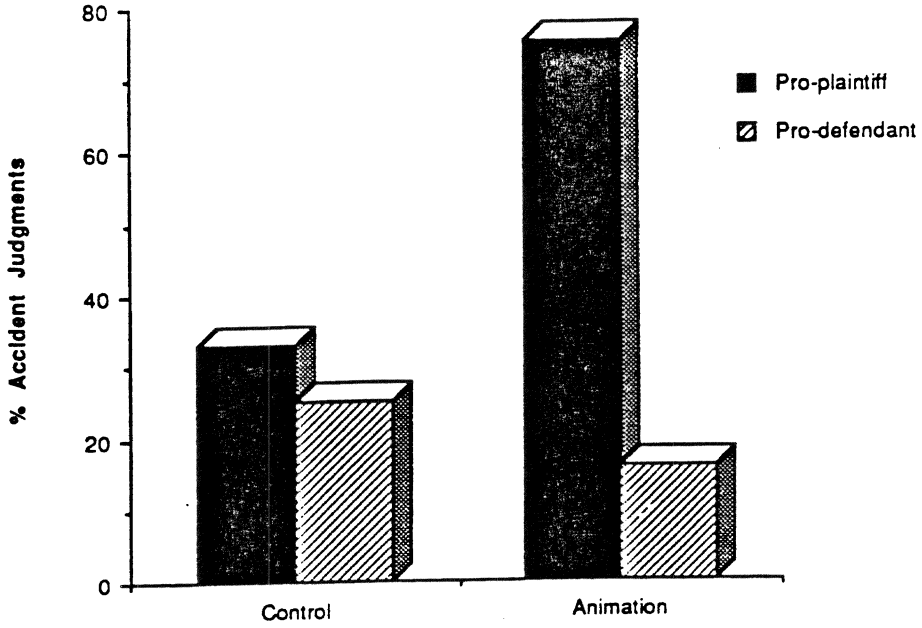

Fig. 1. Percentage of subjects in Experiment 1 who judged the death an accident rather than a suicide.

heard by the foreman; Welkin's marriage, family, and home life; his goal of owning a business; the fact that Welkin's father had committed suicide) and asked participants to rate the importance of each item to their verdicts. In the animation condition, a ninth item was also included in the questionnaire: the computer-generated reconstruction of Welkin's death. All ratings were made on 10-point scales.

Results

As a test of the hypothesis that computer-animated displays can facilitate decision making, we predicted that participants would discriminate more between the proplaintiff and prodefendant versions of the case when the key physical evidence is illustrated in an animated display than when it is presented solely through oral testimony.

On participants' judgments of the event, the results clearly supported this hypothesis. In the control condition, 33% of the participants judged the death an accident in the proplaintiff version of the case, compared to 25% in the prodefendant group—a difference that was in the expected direction but was not significant. In the animated-display condition, however, 75% saw the death as accidental in the proplaintiff version compared to only 16% in the prodefendant version of the case—a difference that was statistically significant, χ^2 (1, N = 24) = 6.04, $p < .02$. These results are illustrated in Figure 1.

To obtain a more sensitive measure and to test for both main effects and the two-way interaction, a scalar variable was created by combining each participant's

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judgments and confidence ratings. Positive confidence values were assigned to perceptions of the death as an accident, whereas negative values were assigned to the perception of suicide. Scores could thus range from -10 (maximum confidence in a suicide judgment) to +10 (maximum confidence in an accident judgment). On this measure, a 2 × 2 ANOVA yielded a main effect for physical distance, with participants more likely to see the death as an accident in the proplaintiff condition than in the prodefense condition (M's = +.42 and -4.46, respectively), F (1, 44) = 8.90, $p < .005$. This main effect was qualified by a significant two-way interaction, F (1, 44) = 5.87, $p < .02$. Further analyses indicated that distance affected judgments of the event in the animated-display condition (M's = 3.42 & -5.42 in the proplaintiff and prodefense conditions, respectively; $p < .001$ via Newman-Keuls test), but not in the control groups (M's = -2.58 and -3.50 in the proplaintiff and prodefense conditions, $p > .50$).

The results also supported the facilitation hypothesis on the all important measure of verdicts (judgments and verdicts were highly correlated, $r = .87$, $p < .001$). In the control condition, 42% of participants favored the plaintiff in the proplaintiff version of the case compared to 25% in the prodefendant group, a difference that was in the predicted direction but not significant. In the animated-display condition, however, 75% of participants voted for the plaintiff in the proplaintiff version compared to only 8% in the prodefendant condition, a difference that was highly significant, χ^2 (1, N = 24) = 8.40, $p < .005$.

As with the judgment data, a verdict scale was created by assigning positive confidence values to verdicts for the plaintiff and negative values to verdicts for the defense. Scores could thus range from -10 to +10. A 2 × 2 ANOVA on this measure revealed a significant main effect such that participants were more likely to favor the plaintiff in the proplaintiff condition than in the prodefendant condition (M's = 1.5 and -5.09, respectively), F (1, 44) = 12.10, $p < .002$. More importantly, a significant interaction, F (1,44) = 5.62, $p < .05$, indicated that physical distance influenced verdicts in the animation condition (M's = 3.33 and -6.50 in the proplaintiff and prodefendant conditions, respectively; $p < .001$ via Newman-Keuls) but not in the control groups (M's = -1.83 and -3.67 in the proplaintiff and prodefendant conditions, respectively; $p < .50$).

The results on the self-reported impact of the animated tape and other items of evidence were clear. In order of importance, the various items of evidence were rated as follows on a 1-10 point scale: Welkin's mental and emotional state (M = 7.13), his family, marriage, and home life (M = 6.90), the body's distance from the building (M = 6.58), the fact that Welkin's father had committed suicide (M = 6.27), the scream heard by the foreman (M = 5.73), the body's face-down position (M = 5.15), and Welkin's lifetime goal of owning his own business (M = 4.50). It is worth noting that there was no support for the fear that computer-animated displays would overwhelm jurors. Specifically, participants in the two animation groups rated the tape as having little impact relative to other items of evidence (M = 4.17; the combined mean for all other items was 5.69). There were also no significant main effects or interactions involving animation on evidence ratings. That is, exposure to the animated sequence did not lead participants to view Welkin's mental and emotional state, marriage, distance from the building, or other factors, as less important.

One significant effect was obtained, however, on ratings of the importance of physical distance. Interestingly, participants saw the body's location from the build-

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ing as more important in the prodefendant version of the case than in the proplaintiff condition (M's = 7.41 and 5.75, respectively), F (1, 44) = 5.02, $p < .05$. Apparently, they felt that the long 20–25-foot distance was compatible with only a run-and-jump interpretation of the event, whereas the shorter 5–10-foot distance could accommodate either interpretation. The two-way interaction was not significant, as this effect was the same in both the animation and control conditions.

EXPERIMENT 2

The results of Experiment 1 clearly supported the hypothesis that a computer-animated reconstruction can facilitate decision making by increasing the extent to which jurors render verdicts consistent with the physical evidence. The distinction between the proplaintiff and prodefendant versions was thus more pronounced in the animated-display condition than in the control groups. In addition, exposure to the computer-animated display did not lead participants to attach less self-reported importance to the other evidence.

The animated tape used in the first experiment illustrated the body's fall to the ground based solely on physical facts not in dispute (i.e., the height of the drop and the manipulated location of the body on the ground). However, a number of courts have been reluctant to admit animated reconstructions into evidence for fear that they can also be used to depict theory and speculation. In the absence of an empirical basis for this concern, a second mock jury experiment was designed to test the prejudice hypothesis—that animated reconstructions that depict a partisan theory have the power to mislead or bias a jury.

Participants watched a proplaintiff (5–10-foot) or prodefendant (20–25-foot) version of the civil case used in the first study. Within each condition, they saw either a suggestive plaintiff's sequence of the event in which a man was shown losing his balance and falling to the ground, a suggestive defense sequence in which the figure ran and leaped to his death, or no animated display. As in the first experiment, participants indicated their perceptions of the event, rendered individual verdicts, and answered other case-related questions.

Method

Eighty-nine introductory psychology students (39 male, 50 female) participated in exchange for extra course credit. Tested in small groups, they were randomly assigned to one of six cells produced by a 2 (proplaintiff, prodefendant) × 3 (plaintiff-presented fall, defendant-presented jump, no-animation control) factorial design.

The procedure was the same as in the first experiment, as participants watched a 30-minute videotaped summary of *Welkin v. Burgoine Insurance Company*. The materials were identical to those previously employed, except for 15-second animation sequences edited into the proplaintiff and prodefendant versions of the trial. In this study, the plaintiff presented an animated sequence with voice-over in which the figure slips, waves his arms, loses his balance, and falls to the ground. In contrast, the defense showed a sequence in which the same figure takes a running

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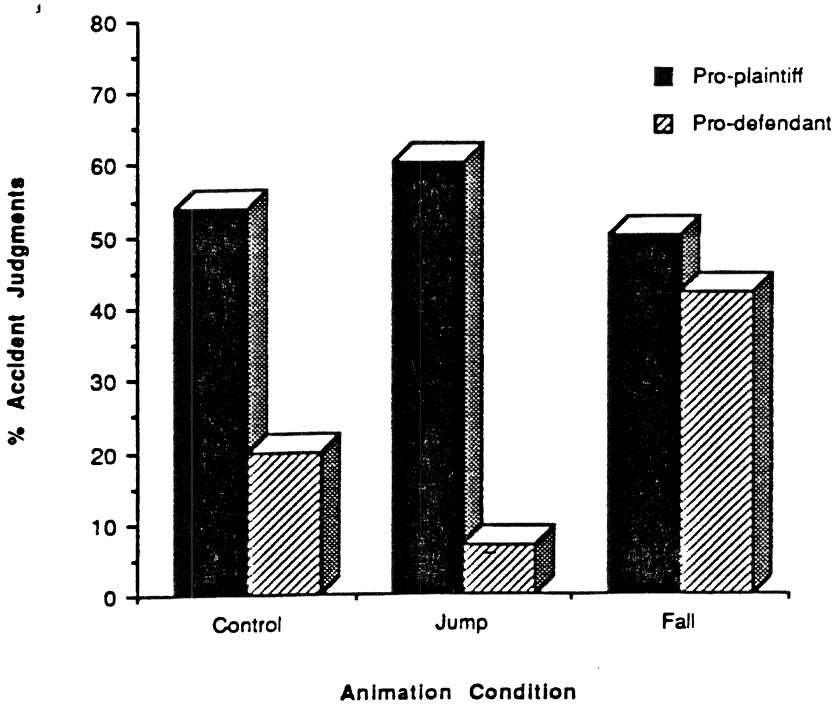

Fig. 2. Percentage of subjects in Experiment 2 who judged the death an accident rather than a suicide.

jump and then leaps off the edge of the building. In the two cases, the body lands 5–10 feet in the proplaintiff condition or 20–25 feet in the prodefendant condition. In the no-animation control groups, distance information was orally presented without the accompanying animation.

Results

Overall, 39% of the participants saw the death as accidental, whereas 61% thought it was a suicide. Across conditions, these judgments were significantly affected by distance. Participants were more likely to judge the fall an accident when the body landed 5–10 feet rather than 20–25 feet from the base of the building (56% compared to 23%, respectively), χ^2 (1, N = 89) = 3.98, p <.05. More importantly, pairwise comparisons indicated that this judgment was significantly affected by distance in the control group, χ^2 (1, N = 31) = 4.29, p < .05, and in the animated-jump condition, χ^2 (1, N = 29) = 8.96, p < .01, but not in the animated-fall condition, χ^2 (1, N = 29) = .29, p > .50. These results are shown in Figure 2.

As in the first experiment, a scalar variable was created by combining judgments and confidence ratings. On this measure, a 2 × 3 ANOVA confirmed that participants were more likely to perceive the death as accidental when the distance was 5–10 feet than when it was 20–25 feet (M's = 3.63 and −.98, respectively), F

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(2, 83) = 12.37, $p < .001$. Although the two-way interaction term was not significant, F (2, 83) = 1.57, $p < .25$, specific comparisons designed to test the effect of distance within each animation condition revealed that although distance was significant in the control groups, t (29) = −2.75, $p < .05$, and in the animated-jump condition, t (27) = −2.96, $p < .01$, it did not affect judgment scores within the animated-fall condition, t (27) = −.95, $p < .50$.

The results followed a similar pattern on the all-important measure of verdicts (as before, judgments and verdicts were highly correlated, $r = .91$, $p < .001$). That is, participants were more likely to vote for the plaintiff in the proplaintiff condition than in the prodefendant condition (54% & 18%, respectively), χ^2 (1, N = 89) = 4.04, $p < .05$. A 2 × 3 ANOVA on verdict-confidence scores thus yielded the expected main effect for distance (M's = 2.98 and −.58, respectively), F (1, 83) = 13.24, $p < .001$. As with judgments of the event, the interaction was not significant, F (2, 83) = 1.70, $p < .20$. However, specific comparisons indicated that although distance influenced verdicts in the control condition, t (29) = −2.79, $p < .005$, and in the animated-jump condition, t (27) = −3.17, $p < .01$, the effect was not significant in the animated-fall condition, t (27) = −1.01, $p < .50$. Participants who saw the plaintiff's depiction of the event as a fall continued to vote for the plaintiff even in the 20–25-foot version, in which the physical evidence clearly favored the defense.

As in Experiment 1, exposure to an animated tape did not lead participants to attach less importance to other evidence. Closely paralleling the results of the first study, the various factors were rated as follows, in order of importance, on a 10-point scale: Welkin's mental and emotional state (M = 7.30), Welkin's marriage, family, and home life (M = 7.29), the distance of the body from the building (M = 6.58), the fact that Welkin's father had committed suicide (M = 6.12), the scream heard by the foreman (M = 5.80), Welkin's lifetime goal of owning a business (M = 4.76), and the body's face-down position (M = 4.60). Within the animation groups, the animated display received relatively low ratings (M = 4.05).

As in the first experiment, participants saw distance as more important in the prodefendant condition than in the proplaintiff condition (M's = 7.27 and 5.80, respectively), F (1, 83) = 6.59, $p < .01$. Thus, the 20–25-foot distance was seen as compatible with only a run-and-jump interpretation of the event, whereas the 5–10-foot distance could have resulted from either a jump or a fall. On ratings of the animated display made by all participants except those in the control groups, a 2 (proplaintiff vs. prodefendant) × 2 (animated run vs. jump) ANOVA yielded a significant two-way interaction, F (1, 54) = 5.57, $p < .05$. Interestingly, the tape was rated as more important when it was consistent with the physical evidence (proplaintiff/fall M = 4.36, prodefendant/jump M = 5.43) than when it was inconsistent (proplaintiff/jump M = 3.47, prodefendant/fall M = 3.07).

DISCUSSION

The present research provides the first systematic attempt to examine the effects of computer-animated displays on a jury. Taken together, the two studies indicated that animated depictions of a physical event had a greater impact than

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equivalent oral testimony but that the nature of that impact depended on characteristics of the display. When the sequence accurately represented the event in dispute, it improved judgment accuracy by bringing verdicts more in line with the physical evidence. Thus, participants who saw an animated sequence in which a figure dropped from an eight-story construction site were more likely to see the resulting death as a suicide as opposed to an accident when the body landed 20–25 feet from the base of the building than when the distance was only 5–10 feet. In the no-animation control condition, this effect was in the expected direction, but in the absence of a visual-dynamic display the difference was not significant.

Although animated displays improved the performance of our participants, Experiment 2 tested the prejudice hypothesis—that such presentations can also be used to portray a litigant's theory about the event and mislead jurors in a manner that contradicts physical evidence. In this study, the plaintiff showed an animated sequence of a man who slips and falls, whereas the defense depicted the figure as running and jumping to his death. Results indicated that participants who saw the plaintiff's slip-and-fall tape did not exhibit the usual effect for distance. Rather, a majority of the participants in this condition viewed the death as accidental and voted for the plaintiff even in the prodefendant condition in which the body landed 20–25 feet from the building. This distortion in perceptual judgment is sobering. Intuitively, most people appear to recognize that a weighted object dropped from an eight-story structure would not land that far from the edge without momentum. Through animation, however, a 20–25-foot fall was rendered plausible, thus misleading a sizable number of participants. On the positive side, it is worth noting that the prejudice hypothesis was only partially supported. Whereas the plaintiff's slip-and-fall tape led participants to view the death as accidental and vote for the plaintiff even in the prodefendant condition, the defendant's run-and-jump tape did not similarly increase defendant-suicide verdicts in the proplaintiff condition.

The potential for distortion was evident in the creation of the animated displays used in our studies. The plaintiff's 20–25-foot fall sequence was rendered plausible by depicting the body as falling outward in a parabolic arc. In sharp contrast, pretesting revealed that participants were not similarly misled by a 20–25-foot fall sequence when the figure was shown following a horizontal path off the edge of the building, extending out, and turning downward at a 90-degree angle. Research shows that although some people erroneously assume that impetus would create this path of motion, a majority senses that such a trajectory violates the laws of physics (McCloskey, 1983).

Although computer-animated displays had significant effects in our studies, the results may well *under*estimate their potential impact. There are two bases for speculation in this regard. One is that we used an event that was relatively simple, intuitive to the naive physicist, and easy to imagine. Yet the potential for facilitation may be even greater in cases that involve collisions, mechanical systems, medical procedures, and other complex physical events that the average juror does not understand as a matter of common sense (Caramazza et al., 1981; McCloskey, 1983). Second, participants watched a brief trial and made decisions immediately afterward. Yet vividness effects in oral testimony are typically more pronounced when judgments are delayed rather than immediate (Bell & Loftus, 1985; Reyes et al.,

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1980)—a situation that more closely mirrors the temporal sequence of events in the courtroom.

The present research is limited in two important respects. First, our data do not betray the mechanism by which the animated presentations exerted influence over participants. In Experiment 1, we varied the physical evidence to create proplaintiff and prodefense versions of the case and presented the illustrative tape through the plaintiff and defense experts, respectively (i.e., in the animation condition, the tape was always presented by the party that was supported by the evidence). Thus, although we believe that animation facilitated decision making by giving clarity to the dynamic event, we cannot completely rule out the possibility that the effect could also have resulted from related factors we did not control—such as the use of a visual stationary exhibit, repetition of oral testimony, or added exposure to the presenting attorney.

A second limitation is that we had assessed the impact of animation on individuals who did not deliberate to a verdict. On the one hand, it could be argued that jurors are significantly influenced by the social influences inherent in the processes of voting and deliberation (Davis et al., 1989; Sandys & Dillehay, 1995) and that group discussion would mitigate both the positive and negative effects of animation exhibited by individual jurors (Kerwin & Shaffer, 1994). On the other hand, many researchers have argued jury verdicts are highly predictable by the initial predeliberation opinions of individuals in the group (Kalven & Zeisel, 1966; Kerr, 1981; Stasser & Davis, 1981) and that the effects of biasing material persist despite the processes of deliberation (Carretta & Moreland, 1983; Kaplan & Miller, 1983; Kramer et al., 1990; Padawer-Singer & Barton, 1975). At this point, further research is needed to determine whether juries spend a great deal of time discussing animated displays relative to oral testimony—and whether that discussion increases, decreases, or in some way moderates the impact of this new form of evidence.

In light of the important implications of our findings for questions concerning the evidentiary status of computer-animated displays, more research is needed to evaluate both the facilitative and prejudicial effects on the jury. Ideally, this research would involve the depiction of different types of physical events, vary the timing of the animated presentation in relation to the jury's decision-making, and provide individual jurors an opportunity to deliberate. With the use of computer-animated displays becoming increasingly common, and with serious questions being raised about their impact in court, the policy implications of such future studies may well prove significant.

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