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I. INTRODUCTION: THE NATURE OF THE RESEARCH

This article presents the results of three groups of studies designed to assess the response of jurors to videotape trials. The studies of Group I (reported in section II of this article) centered on the videotape of one trial, the case of *Nugent v. Clark*. This tape was used to determine whether the mode of presentation—live or videotape—influenced jurors' verdicts, perceptions of attorney credibility, information retention, and interest and motivation. The tape was also used to compare the effects of split-screen and full-screen videotape viewing, and to assess the effects on juror verdicts resulting from deletion of inadmissible testimony from the trial.

The second group of studies (reported in section III) dealt exclusively with differences in information retention demonstrated by jurors exposed to different modes of trial presentation. The first study of this group compared the information retention exhibited by jurors participating in live trials with that demonstrated by jurors watching videotape trials. The second and third studies compared the effects of black-and-white videotape with the effects of color videotape on juror information retention.

The third group of studies (reported in section IV) examined the effects of videotape on jurors' emotional arousal. The final section of the article summarizes the findings and draws general conclusions from the research.

Three general comments about the studies that follow seem appropriate. First, although a systematic description of the research has been attempted, the use of behavioral science jargon and lengthy excursions into esoteric methodological and statistical issues has been minimized. Where statistical terms are used in the text, brief definitions are given in the footnotes. This article is intended to be readable by and comprehensible to a variety of audiences.

Second, the research reported here focuses on the effects of the videotape medium on individual juror responses *prior to* group deliberation. Unquestionably, many things occur in the jury room to modify and change these initial perceptions and judgments. The importance of such group communication variables is admitted, but the dynamics of jury deliberations are at least partially determined by the perceptions and information that individual jurors carry into the jury room. Accordingly, the research reported here was limited to the question of whether the communications medium per se influences the information processing and decision making of individual jurors. The introduction of numerous group process variables into these studies would have made it impossible to deal unambiguously with this question.

Third, the article frequently states that the results of the studies indicate that the differences between groups being compared are "not statistically significant." Level of statistical significance (p) represents the likelihood that the results occurred by chance, rather than

as a result of some systematic difference between the groups being compared. The level $p < .05$, the standard generally used in social science research, is used as the standard of statistical significance for all the studies reported in this article and indicates a probability of less than 5 percent (1 in 20) that the results of the test occurred by chance alone. Thus, where the article states that differences are not *statistically* significant, it simply means that there is a greater than 5 percent chance that the results occurred by chance alone; it does not mean that there is no *practical* significance to the findings. For example, a p of .10, while not amounting to statistical significance, indicates a 90 percent chance that the differences were produced by some systematic factor. An analogy may be helpful: statistical significance ($p < .05$) can be thought of as proof beyond a reasonable doubt and practical significance ($p < .50$) as proof by a preponderance of the evidence.

II. GROUP I: THE *NUGENT V. CLARK* STUDIES

A. *Background*

The initial research was designed to answer three questions: (1) Do the responses of jurors exposed to a live trial differ from those exposed to a videotape trial? (2) Do the responses of jurors exposed to a split-screen videotape presentation differ from those exposed to a full-screen presentation? (3) Do the responses of jurors exposed to inadmissible testimony differ from those not exposed to such testimony?

1. *Selecting the stimulus trial*¹

To research these questions, it was first necessary to select the stimulus trial. Two criteria guided the selection of the stimulus: maximizing the *realism* of the research environment and maintaining a sizeable degree of *experimental control*.² Based on these criteria, the decision was made to select an actual trial and to recreate it in its entirety. By using a videotape of an entire trial, the researchers could maintain a high degree of realism (at least if the trial were skillfully recreated) and at the same time could edit trial content and structure to control certain extraneous variables that might influence juror response.

¹We are including a detailed description of the preparation for the *Nugent v. Clark* studies since the procedures may be of interest to those wishing to conduct similar experiments. The preparation for the other studies will not be described as fully, since the considerations presented here were much the same as those in the other studies.

²These two criteria were somewhat conflicting. At one end of the continuum, taping of an actual trial seemed to allow for maximum realism, but minimum experimental control. At the other extreme, use of constructed scenarios or vignettes — that is, short segments of testimony — seemed to permit optimal control but to lack realism. After discussing the alternatives with legal professionals and behavioral scientists, both extremes were rejected. Instead, an actual trial was selected and recreated.

Since videotape has thus far been accepted more widely in the civil than in the criminal arena, a civil case was selected. Moreover, a type of case which is frequently tried was chosen so that the findings could be readily generalized. Since they are heard relatively frequently, and since it appeared that problems resulting from low juror interest or initial juror bias could be minimized by focusing on this area of civil litigation, we decided to use an automobile injury case. Three criteria guided selection of a specific case: (1) the length of time required to try the case should not exceed 3 to 4 hours; (2) the merits of the opposing parties' cases should be roughly comparable; and (3) the abilities of the contesting attorneys should be roughly comparable.³ Armed with these criteria, consultants from the University of Michigan Law School assisted in selecting an automobile injury case involving the question of contributory negligence on the part of the plaintiff.⁴

2. *Editing the transcript*

For the most part, the content and structure of the trial transcript were left unchanged. There were, however, three areas where some editorial discretion was exercised. First, the names of all participants in the trial were changed and anglicized, both to protect the identity of the original participants and to avoid any possible juror bias resulting from ethnic names. As a result, the names in the "official" case title became James and Marjorie Nugent and Frank Clark. Second, certain details of the trial were altered to conform with the date of reenactment and to facilitate procurement of visual exhibits. Finally, the dialogue was edited to eliminate some of the testimony objected to by the opposing attorneys in the original trial so as to ensure an equal number of objections by both attorneys.

The edited transcript contained six objections by each attorney, two that were sustained by the judge and four that were overruled. For each attorney, four of the objections concerned substantive matters relating to the introduction of facts or opinions as evidence in the case, and two concerned procedural matters relating to errors in trial procedure. This equalizing procedure made it possible to keep the merits of the two cases and the behavior of the two attorneys relatively comparable and to establish an identical baseline for the

³Obviously, we had no precise measure for equating the merits of the cases, or the skills of the two attorneys; however, we felt a rough measure of comparability could be achieved by relying on the judgment of legal experts. Comparability of the arguments and evidence was particularly important for the phase of the research dealing with stricken testimony, for if the merits of the cases were grossly disparate, the addition or deletion of inadmissible testimony might have little discernible impact on jurors' responses. Similarly, attorney comparability was crucial for obtaining measures of the effects of introducing inadmissible testimony on juror perceptions of attorney credibility.

⁴Most of the decisions having legal implications were made only after consultation with our advisory panel. We would like to thank the members of that panel: Thomas E. Brennan (former Michigan supreme court justice; Dean of the Cooley Law School), Judge James McCrystal, Judge Dale Riker, Professor Edward Stein, Attorney Alan E. Morrill, Attorney Douglas Sweet, Joseph Ebersole of the Federal Judicial Center, and Francis J. Taillefer of the National Center for State Courts.

insertion of additional inadmissible material in the stricken testimony phase of the research.

Working with legal consultants, we constructed six additional instances of substantively objectionable material and included them in the plaintiffs' case.⁵ These six instances of inadmissible material were taped separately from the rest of the trial which made it possible to create differing versions of the trial by splicing in various numbers of such inadmissible material. Thus, in the first two studies (comparing live and videotape trials, and comparing split-screen and full-screen videotape) none of the six instances of objectionable material were included. In the third phase of the research (focusing on the effects of inadmissible testimony), different versions of the videotape containing from zero to six instances of inadmissible material were used.

3. *Preparing the trial*

a. *Casting.* Since a realistic recreation of the trial was essential to the utility of the research, a professional theater and television director was employed to cast and direct the recreated trial. Except for the judge and the bailiff, who were played by Judge Dale Riker and Court Bailiff Lofton Carleton of the 68th District Court of Michigan, all participants in the trial were professional actors and actresses.⁶

Casting of participants was based not only on ability to read lines, but also on age and physical appropriateness for the part. Each participant was given character sketches of the persons to be portrayed. All participants sought to develop their roles as "ordinary" persons—persons who might normally be unsure, hesitant, and somewhat nonfluent in a trial setting—and to avoid the style of television courtroom dramas. For purposes of research control, all participants were required to learn their lines closely in order to avoid ad libis and improvisations. The dialogue in the presentation conformed quite faithfully to the edited transcript.

b. *Equipment.* Before selecting the equipment system used to tape the trial, we reviewed and studied systems presently in use. Based on this review, we formulated a set of objectives believed appropriate to an operational system as well as to the experiment:

1. The videotape material should be rich enough to hold the attention of the viewers.
2. The videotape material should allow all relevant participants to be seen, heard, and identified.
3. The videotaping should be unobtrusive to minimize disruption of the court routine.
4. Fixed cameras should be used to avoid the possibility of editorializing by the cameraman and director.

⁵See note 34 *infra*.

⁶The total cast consisted of two plaintiffs, a defendant, one attorney for the plaintiffs and one for the defendant, four witnesses for the plaintiffs, and two witnesses for the defense.

5. The system should be composed of equipment equal in complexity and cost to the equipment most likely to be used in actual courtroom situations.

The system which best fulfilled these objectives included simultaneous recording of three courtroom perspectives: an establishing perspective showing the entire active area of the courtroom, a perspective showing only the witness and the witness stand, and a perspective showing only the bench and the questioning attorney. The trial was recorded by using a split-screen technique that partitioned the television screen so as to show the three perspectives simultaneously.⁷ The full courtroom shot appeared on the lower half of the screen; the close-up of the witness and the witness stand was located in the upper left quarter; and the upper right quarter of the screen contained a view of the bench and the questioning attorney. This system, besides being technically feasible, would hold the attention of the jurors while allowing them to see, hear, and identify all relevant participants in the courtroom.

Since this system was to some degree experimental, a more conventional alternative system was also used to allow for secondary backup recording and to make possible a comparison of the effects of split-screen and full-screen videotape. This backup system used one camera to record a full-screen shot of the total courtroom, excluding spectator area.

All equipment was off-the-shelf merchandise, roughly equal in complexity and cost to the equipment most likely to be used in actual courtroom situations.⁸ All playback was done on conventional television sets rather than on more expensive studio monitors. The equipment was positioned as unobtrusively as possible given the constraints of the courtroom. All cameras were placed on fixed, unmanned tripods. Audio equipment already permanently installed in the courtroom was used, with the addition of two microphones placed at the litigants' table. All videotape recorders, control monitors, split-screen devices, and audio-mixing equipment were located in the judge's chambers behind the courtroom, and at no time were technical personnel visible to the jury.

B. *Nugent v. Clark Study 1: Live v. Videotape Trials*⁹

1. *Questions examined*

Although we had no single set of theoretical explanations about

⁷Originally it was planned to record the three different perspectives simultaneously using three cameras and three recorders, and play back the recordings on three separate television screens, allowing jurors to attend to different perspectives at different times. Due to technical difficulties in synchronizing the three tapes, this system was replaced with the split-screen approach.

⁸One-half inch monochromatic recorders which conformed to the conventional EIAJ-1 standard were used.

⁹The *Nugent v. Clark* study discussed in this section was previously reported in Miller, Bender, Florence & Nicholson, *Real versus Reel: What's the Verdict?*, 24 J. COMMUNICATION, Summer 1974, at 99.

what differences, if any, to expect in juror responses to live and videotape trials, several lines of thinking suggested the possibility that jurors might respond differently to the two presentational modes. Marshall McLuhan has asserted that the medium itself is the primary message in communication transactions.¹⁰ He argues that the medium has a pervasive influence on the ways we process information and develop perceptions of the external world. To be sure, most of his insights concern potential differences between alternative media such as print and television, rather than possible variations between media-mediated and directly experienced events. Still, his ideas are provocative and do suggest that the addition of any intervening medium to a communication transaction might have an impact on the way information is processed and judgments are formed.

At a less abstract level, the complexity of the stimulus field to which jurors are exposed is reduced by the use of videotape. During a live trial, a juror may be attending to the verbal and nonverbal behaviors of the witness, the facial expressions of the judge or defendant, a conversation between one of the attorneys and his client, the murmured remarks of spectators, or a host of other stimuli. Although we attempted to create a taping system that would capture some of this detail and richness, it is apparent that with the use of videotape, reduction in the jurors' fields of vision must occur.

The major problem, however, lies in specifying the *extent* and *direction* of differences, if any, that might occur in juror responses to live and videotape trials. Assuming that the complexity of jurors' stimulus fields is reduced when videotape is used, restriction of the stimulus field should facilitate information retention. From a distraction viewpoint, this conclusion is warranted. The many competing stimuli present in a live trial may divert jurors from the testimony of witnesses, the questions of attorneys, or the rulings of the judge, thus reducing the amount of trial-related information retained. To the extent that this occurs, elimination of some distractions by means of videotape should result in better retention.

However, from a motivational standpoint, the rich milieu of the live trial may be better calculated to hold the interest of jurors. Extensive viewing of a videotape trial may become boring and monotonous, causing jurors' attention to lag. If so, and if interest is necessary for retention of information, the live trial could result in better retention by jurors of trial-related information.

Because of the numerous possible conflicting predictions that might have been generated, this study was made question centered, rather than hypothesis centered. Specifically, the following questions were investigated:

1. Do jurors who view a videotape trial attribute negligence to litigants to a greater or lesser degree than jurors who view a live trial?

¹⁰M. McLuhan, *UNDERSTANDING MEDIA: THE EXTENSIONS OF MAN* (1964).

2. Among jurors finding for the plaintiffs, do jurors who view a videotape trial award a larger or smaller monetary judgment for damages?

3. Do jurors exposed to a videotape trial perceive attorneys as more or less credible than jurors exposed to a live trial?

4. Do jurors exposed to a videotape trial retain more or less trial-related information than jurors exposed to a live trial?

5. Do jurors who view a videotape trial have greater or lesser motivation and interest than jurors who view a live trial?

2. Procedures

a. The live presentation. Fifty-two jurors from the Genesee County Circuit Court (Flint, Michigan) jury panel served as subjects on their final day of jury service. These jurors comprised the entire November jury panel with the exception of those not reporting for jury duty on that particular day and those who were serving on other jury panels.¹¹

On the day of the trial, the jurors were brought into the courtroom and seated in the spectator section facing the hearing area. The judge then explained that the videotape recording cameras in the courtroom were for the purpose of making a record of the trial for possible later appeal or review. The judge further explained that the abnormally large size of the jury was to allow a group of researchers from Michigan State University, who were interested in jury size, to analyze the results of the trial. The jurors were assured that they were the actual determiners of the verdict in the case, and that their decision would be binding on the litigants. Because of the large jury size, the judge explained, *voir dire* would be accomplished by means of a written questionnaire.

After the *voir dire* questionnaires had been completed by the jurors and the attorneys had examined them, four jurors were peremptorily dismissed, a move made to heighten realism. After these preliminaries, the judge started the trial and the taping began. As mentioned earlier, all technical personnel and control equipment were located in the judge's chambers outside the view of the jurors.

The trial proceeded in 50-minute segments through the judge's final instructions to the jury. Recesses were taken after each 50-minute segment. In all, the trial was conducted in a manner as closely conforming to normal trial procedure as possible. Visual exhibits were distributed at the appropriate times. When the trial ended, the jurors went to the jury assembly room, where an experimenter ad-

¹¹The decision to use the large jury size represented a calculated trade-off. Had we restricted ourselves to the typical 12-person jury, it would have been necessary to recreate the live trial four or five times, a procedure prohibited by both time and money constraints. Moreover, variability from trial to trial would have been inevitable, no matter how skilled the performers. Thus we opted for this departure from normal trial procedure. No jurors expressed suspicion about the abnormal jury size, a not surprising fact when one recalls that an actual presiding judge gave the jurors the rationale for it.

ministered the "jury size" questionnaire.

After completing the questionnaire, all jurors were completely debriefed. Very little suspicion about the reality of the trial was expressed either orally during the debriefing session or on the questionnaires. Jurors did not deliberate, since, for purposes of this study, we were interested only in what jurors take to the jury room with them.

b. The videotape presentation. Subjects were 45 jurors from Genesee County who viewed the videotape trial on the last day of their jury service 1 month later. The same research personnel were used, and the two attorneys were again present to conduct an ostensible written voir dire and to observe the trial. The single variation in procedure was that the trial was viewed by jurors on six television monitors placed in the spectator section of the courtroom, rather than being seen live. The judge's preliminary instructions to the jury addressed this difference, explaining the split-screen system and admonishing the jurors that, although the trial would be viewed on television, it was fully as important as any trial they had sat on during their term of jury service. Visual exhibits were distributed at the appropriate times. At the conclusion of closing arguments, the judge entered the courtroom and read instructions to the jury.

As with the live presentation of the trial, jurors were taken to the jury assembly room, where the experimenter administered the "jury size" questionnaire. After completing the questionnaire, all jurors were completely debriefed. Again, little suspicion on the part of the jurors about the reality of the trial was voiced or noted on the questionnaires, and again, jurors did not deliberate.

c. The questionnaire. Three goals guided the construction of the questionnaire: (1) a format which would yield maximum information, (2) a minimally complex set of questions, and (3) a highly structured set of questions. Criterion (1) was clearly necessary to answer the questions posed by the research. Criteria (2) and (3) represented an attempt to obtain data that would be highly reliable, and therefore maximally generalizable to other jurors. Specifically, the questionnaire posed two questions directly: (1) Was the defendant in fact negligent, and if so, was the plaintiff contributorily negligent? (2) If the verdict necessitated monetary awards to the plaintiffs, what was the juror's judgment as to the magnitudes of those awards? Further, the questionnaire was designed to measure juror perception of attorney credibility, juror retention of substantive information, and juror motivation and interest.

Both the negligence and the award questions were derived from the presiding judge's instructions to the jurors. In treating the negligence issue, the verdicts could have been broken down in several ways. We elected to classify them according to the legal criterion of liability. Thus, if a juror found the defendant, Frank Clark, solely negligent, his response was scored as a verdict for the plaintiffs. If a juror found Clark not negligent or found contributory negligence on

the part of the plaintiff, Marjorie Nugent, his response was scored as a verdict for the defense. The jurors who found for the plaintiffs were then asked to specify an award for James Nugent (derivative action) and an award for Marjorie Nugent for pain and suffering. These awards, which could range from nothing to \$3,136 for Mr. Nugent and from nothing to \$42,500 for Mrs. Nugent, were used to determine the mean award for each of the two modes of trial.

The perceived credibility of the attorneys was assessed with a set of 15 seven-interval semantic differential-type scales:¹² five each for the competence, trustworthiness, and dynamism dimensions of credibility. The measure of each dimension of credibility was arrived at by summing across the five relevant scales. Hence, a score of 5 reflected maximally unfavorable perceptions of credibility, while a score of 35 reflected maximally favorable perceptions.

The retention measure consisted of a 40-item examination, made up primarily of multiple-choice and true-false questions, but also containing some unaided, specific recall items. The questions used were selected from a large item pool that had been pretested with another group of subjects and subjected to item analysis. Besides being the most reliable, the items chosen were distributed approximately equally over the duration of the trial.

Finally, the measurement of juror interest and motivation consisted of a set of 11 seven-interval semantic differential-type scales. The mean interest and motivation score was derived by summing across the scales and dividing the total by 11; consequently, a score of 1 represented minimal interest and motivation, while a score of 7 reflected maximum interest and motivation.

3. Results and discussion

a. Negligence verdicts and mean awards. Table 1 contains the breakdown of the negligence verdicts for jurors who viewed the live and the videotape versions of the trial. Analysis of these data revealed no evidence that the mode of presentation significantly influenced jurors' attributions of negligence.¹³ Although jurors found for the

¹²A semantic differential scale is formed by separating a set of bipolar adjectives by a line which is divided into seven intervals. For example:

bad _____ good

The juror's task was to place a check in the interval which best expressed his opinion of each attorney. Such a set of scales was also used in measuring juror interest and motivation.

¹³There were several ways in which the verdict measure could have been analyzed, as reflected by the following table summarizing the frequency of each type of verdict in the live and videotape trials:

Trials	Clark not neg.	Both neg.	Clark neg.	Trials	Clark not neg. Both neg.	Clark neg.
Live	19	12	13	Live	31	13
Tape	14	7	20	Tape	21	20

$$\chi^2 = 3.45; p > .10.$$

$$\chi^2 = 2.55; p > .10.$$

plaintiff somewhat more frequently in the videotape trial (that is, they found the defendant, Frank Clark, solely negligent with greater frequency), these differences do not reach statistical significance.¹⁴

TABLE 1.—*Negligence verdicts and mean awards for Mr. & Mrs. Nugent by jurors in the live and videotape trials*

	For plaintiffs	For defendant	Mean award Mr. Nugent	Mean award Mrs. Nugent
Live trial	13	31	\$2,761	\$20,538
Videotape trial	20	21	\$2,660	\$17,975

The mean awards for both Mr. and Mrs. Nugent are also found in Table 1. In neither instance did the mode of presentation significantly affect the amount of award given by jurors who found for the plaintiffs.¹⁵ While there is a difference of approximately \$3,000 in the amount awarded Mrs. Nugent by jurors in the live and videotape trial, that difference is more than offset by the substantial variability of awards given by jurors in each trial.¹⁶

Trials	Clark not neg.	Clark neg. Both neg.	Trials	Clark not neg.	Clark neg.
Live	19	25	Live	19	13
Tape	14	27	Tape	14	20
$\chi^2 = .398; p > .50.$			$\chi^2 = 2.18; p > .10.$		

For all four analyses, the obtained chi squares are not statistically significant.

¹⁴ $\chi^2 = 2.55; p > .10.$

The chi square (χ^2) test compares the observed frequencies of an event with the expected frequencies to determine the probability that the former depart from the latter. χ^2 is a *nonparametric* statistic; *i.e.*, it is used for discrete, noncontinuous measures that do not meet the assumption of interval scaling. Thus, as usually employed in courtroom trials, verdict is a dichotomous, discrete measure. Jurors may find either "guilty" or "not guilty," but they do not ordinarily scale guilt according to some continuous measure (although the monetary award measure is continuous and does provide an opportunity for the juror to fix the degree of "guilt" in a damage suit).

¹⁵ The comparison of the two trials yielded small values: $t < 1$ for both Mr. and Mrs. Nugent's awards.

The t test is a statistic for determining the probability that the means of two samples were drawn from the same population. If the magnitude of the difference between the two means is significant at the specified level of significance (the .05 level in all cases herein), the researcher infers that the two means are not from the same population (*i.e.*, he rejects the null hypothesis—see note 20 *infra*); if the difference between the two means is not statistically significant, he accepts the null hypothesis (or more precisely, does not reject it). Unlike χ^2 , the t test is a *parametric* statistic; *i.e.*, it is used only for continuous measures that are assumed to be intervally scaled.

¹⁶ Variability of awards among jurors in the same trial proved to be a persistent problem when dealing with the award data. To use common statistical tests, it is desirable that the data cluster around some central point of the distribution. Thus, if a mean award was \$20,000, the majority of jurors should group into a range of \$18,000–\$22,000, a few others in the ranges \$15,000–\$18,000 and \$22,000–\$25,000, and very few into the categories of less than \$15,000 or more than \$28,000. Unfortunately, the awards of the jurors did not fall into this pattern: many jurors awarded the plaintiff nothing, while many others gave extremely high awards. Relatively few awards fell in the

b. Juror perception of attorney credibility. Juror perceptions of credibility were uniformly high for both attorneys and did not differ significantly between the two trials. Table 2 contains the mean competence, trustworthiness, and dynamism ratings for Mr. Simmons, the plaintiffs' attorney, and Mr. Albright, the attorney for the defense. The ratings each of the attorneys received from the live trial and the videotape trial jurors were compared and found statistically insignificant. Thus, the mode of presentation did not influence juror perceptions of credibility of either attorney.

TABLE 2.—*Ratings of credibility for the contesting attorneys by jurors in the live and videotape trials*

	Plaintiffs' attorney		
	Competence	Trust	Dynamism
Live Trial	28.22	26.16	26.96
Videotape Trial.	27.02	26.18	25.91
<i>t</i> -value.	1.11	< 1	< 1
	Defendant's attorney		
	Competence	Trust	Dynamism
Live Trial	29.16	26.65	28.41
Videotape Trial.	28.17	26.67	27.67
<i>t</i> -value.	< 1	< 1	< 1

The absence of differences in ratings of attorney credibility for the live and videotape trials could be reassurance for lawyers who fear a loss in their courtroom effectiveness with the adoption of videotape. However, such an interpretation must be offered cautiously. The courtroom communication skills of both attorneys probably exceeded those of the typical trial lawyer. Both were actors with considerable experience in the television and film media. Whether this same degree of relative effectiveness holds for attorneys with limited exposure to videotape remains a question for future research.

c. Juror information retention. The jurors' retention of trial-related information was not significantly influenced by the medium of presentation. Of a possible score of 40, the mean retention score for jurors in the live trial was 31.1, while the score for jurors in the videotape trial was 29.8. The difference is not statistically significant.¹⁷ The question of juror information retention was explored further in subsequent research not related to the *Nugent v. Clark* case, and the somewhat contradictory results of that research are presented in section III of this article.

middle. In subsequent analyses, we hope to develop procedures for dealing more sensitively with data that are distributed in this fashion.

¹⁷*t* = 1.37.

d. Juror interest and motivation. Juror interest and motivation did not vary significantly as a result of watching a live or videotape trial, suggesting that there is nothing inherently less interesting or motivating about watching a videotape trial rather than the live counterpart. The mean rating of interest and motivation for jurors in the live trial was 4.51, while the mean for jurors in the videotape trial was 4.24.¹⁸ The difference is not statistically significant. The question of juror emotional arousal, as it relates to juror interest and motivation, was the subject of a further study which is presented in section IV of this article.

4. Conclusions from Study 1

On the basis of the results of this study and the impressions gleaned while conducting the research, we find that the videotape trial format does not produce detrimental effects on juror responses. When compared to their counterparts who heard a live trial, jurors who viewed the videotape trial arrived at similar judgments about negligence and amount of award, had similar perceptions of the contesting attorneys, retained as much of the trial-related information, and reported similar levels of interest and motivation toward the task of serving as jurors. Moreover, numerous jurors expressed enthusiasm for the potential of videotape as a courtroom communication medium and indicated that in litigation of their own, they would prefer a videotape trial to a live trial. Such a preference is consistent with that expressed by the majority of jurors in several prior videotape trials.¹⁹

The hazards of basing our inferences on our failures to reject the null hypothesis are recognized.²⁰ Consequently, we grant an inability to specify an exact level of significance for our results. However, the study stimuli and instruments were carefully constructed, and identical procedures of administration were employed for both trials. Moreover, the believability and realism of the methodology bolsters confidence in the findings. Unlike most previous research, the present research used actual jurors who viewed a complete trial in a courtroom setting. That these jurors responded similarly in the videotape and live trials bodes well for the comparability of the two modes of presentation.

C. Nugent v. Clark Study 2: Split-Screen v. Full-Screen Videotape Presentations

As previously indicated, two taping systems were used to record *Nugent v. Clark*, a split-screen system and a full-screen system. Per-

¹⁸*t* = 1.12.

¹⁹TIME, Dec. 17, 1973, at 83-84.

²⁰The null hypothesis is the statistical hypothesis of no difference (*e.g.*, mean of population₁ = mean of population₂) and serves as the basis for all statistical tests. The researcher starts with a statistical model based on the assumption of no differences (or equally probable events) and then checks the probability that his observations conform to his model.

haps the greatest difference between the two systems lies in the amount of detail that can be captured by the cameras. Although the single camera, full-screen system has the advantage of providing jurors with a realistic shot of the entire trial area, the technical limitations of relatively low-cost equipment prevent the screening of close-up views of trial participants, particularly when panning and zooming are prohibited. Thus, while the full-screen shot affords jurors a broader perspective of the proceedings, absent zooming, the shot does not permit them to pick up many subtle nuances in facial expression and gesture.

By contrast, the triple camera, split-screen system allows the juror to study the idiosyncratic responses of trial participants in greater detail. The two camera shots that comprise the upper half of the screen—that is, the shot of the witness in the upper left quarter and of the questioning attorney and the bench in the upper right quarter—provide much more detailed shots of the participants because the cameras are focused tightly on those portions of the trial area. The greatest potential disadvantage of the split-screen system is its lack of realism; unlike the full-screen system, which communicates a single shot of a familiar setting, the split-screen system relies upon technology to create a more visible, yet more “unnatural” product.

How are these differences likely to affect juror responses? Again, it is possible to make plausible arguments for at least two opposing effects. On the one hand, the greater detail of the split-screen system might provide more information for jurors, thereby allowing them to make finer discriminations in their perceptions of trial participants or to assimilate more trial-related information. On the other hand, the contrived nature of the split-screen system might be distracting, causing jurors’ attention to focus on the novelty of the technology. To the extent that this might happen, one would expect assimilation of trial-related information to suffer.

1. Questions examined

Due to uncertainties as to which line of argument would prove most fruitful, we decided, as in Study 1, to pose questions rather than to test hypotheses. The questions investigated paralleled those of Study 1:

1. Do jurors who view a full-screen trial attribute negligence to litigants to a greater or lesser degree than jurors who view a split-screen trial?

2. Among jurors finding for the plaintiff, do jurors who view a full-screen trial award larger or smaller monetary judgments than jurors who view a split-screen trial?

3. Do jurors who view a full-screen trial perceive attorneys as more or less credible than jurors who view a split-screen trial?

4. Do jurors who view a full-screen trial retain more or less trial-related information than jurors who view a split-screen trial?

5. Do jurors who view a full-screen trial have more or less motivation and interest than jurors who view a split-screen trial?

2. Procedures

The subjects for this study were 57 adult members of a Catholic church group whose demographic characteristics (e.g., age, occupation, educational level) were, aside from the obvious bias in religious affiliation, similar to those of a typical jury panel.²¹ Each subject was randomly assigned to view either the full-screen or the split-screen videotape of *Nugent v. Clark*. They were told that they would be viewing a reenacted trial and that they were to assume the role of jurors. It was further explained that the purpose of the study was to assess both the effects of using videotape in courtroom trials and the effects of jury size on the responses of individual jurors. The importance of entering into the role of a juror was stressed.

After the instructions had been given, subjects in the full-screen group saw the single camera videotape of *Nugent v. Clark*, while those in the split-screen group saw the triple camera tape of the same trial. Two monitors were employed in each of the experimental rooms. As in the earlier study, the trial was shown in 50-minute segments, with the subjects taking a 10-minute break between each segment. Subjects within each group were cautioned not to visit about the trial during breaks, and there was no opportunity for conversation between subjects assigned to different presentations. After the trial was completed, all subjects filled out the same questionnaire used in Study 1.

3. Results and discussion

a. Negligence verdicts and mean awards. Table 3 contains the breakdown of the negligence verdicts by jurors who viewed the split-screen and full-screen versions of the trial.²² Analysis of the data revealed no evidence that the mode of presentation significantly influenced jurors' attributions of negligence. Although jurors found

²¹Constraints concerning the availability of a courtroom and of actually impaneled jurors led to our decision to conduct the study outside the courtroom setting. Two large social rooms, well separated within a church, were used for the study.

²²As in Study 1, there were several ways in which the verdict measure could have been analyzed, as shown by the following table which summarizes the frequency of each type of verdict for the subjects in the full-screen and split-screen conditions:

Screen	Clark neg.	Both neg.	Clark not neg.	Screen	Clark neg. Both neg.	Clark not neg.
Split	11	8	4	Split	19	4
Full	15	5	11	Full	20	11
$\chi^2 = 3.46; p > .10.$				$\chi^2 = 2.17; p > .10.$		
Screen	Clark neg.	Clark not neg. Both neg.	Screen	Clark neg.	Clark not neg.	
Split	11	12	Split	11	4	
Full	15	16	Full	15	11	
$\chi^2 < 1; p > .90.$			$\chi^2 < 1; p > .30.$			

None of the four chi squares for the various ways of splitting the verdict was significant at the required .05 level.

for the plaintiff somewhat more frequently in the full-screen version, these differences do not approach statistical significance.²³

TABLE 3.—*Negligence verdicts and mean awards for Mr. & Mrs. Nugent by jurors in the split-screen and full-screen presentations*

	Mean Award					
	For Plaintiff	For Defendant	A Mr. Nugent	B Mr. Nugent	A Mrs. Nugent	B Mrs. Nugent
Split-screen	11	12	\$3,137	\$1,569	\$21,200	\$10,000
Full-screen	15	16	\$2,919	\$1,459	\$19,308	\$ 8,097

Table 3 also indicates the mean awards for Mr. and Mrs. Nugent. The data for the amount of award were analyzed in two ways. First, only those full-screen and split-screen jurors who stipulated an award for Mr. and Mrs. Nugent were compared (designated "A" in Table 3). Second, the mean awards for all jurors in the full-screen and split-screen presentations, including those jurors who did not stipulate an award were compared (designated "B" in Table 3). In every case, the comparison of the means showed no statistical significance.²⁴ Thus, there is no evidence that the type of presentation to which jurors were exposed affected the amount of the award granted. Although the mean award is consistently somewhat higher in the split-screen presentation, the variance in the amount of award within each presentation is so high that this difference is readily attributable to chance fluctuations.²⁵

b. Juror perception of attorney credibility. The study indicated that the type of presentation may have influenced the jurors' perceptions of attorney credibility. However, the evidence is less than overwhelming since the difference is statistically significant for only one attorney. The plaintiffs' attorney, Mr. Simmons, received a mean credibility rating of 5.19 in the split-screen presentation and a mean rating of 4.81 in the full-screen presentation. Thus, Mr. Simmons was rated more credible by those jurors who saw him on the split-screen system.²⁶ By contrast, the mean credibility ratings for the other attorney, Mr. Albright, were 5.47 in the split-screen and 5.12 in the full-screen presentation. This difference approaches but does not reach statistical significance.²⁷

It had been assumed that the greater detail provided by the split-screen might result in more favorable perceptions of the attorneys. Although admittedly speculative, there is a possible explanation for

²³ $\chi^2 < 1; p > .90$.

²⁴ $t < 1$.

²⁵ See note 16 *supra*.

²⁶ A comparison of these means yields a statistically significant t of 2.23.

²⁷ $t = 1.75; p < .10$.

the fact that this effect was more pronounced for Simmons than for Albright. Informal observation of the two attorneys indicated that Mr. Simmons' greatest strength was his expressive nonverbal behavior and his skillful use of props such as his glasses. Mr. Albright, on the other hand, relied more heavily on vocal delivery and persuasive voice inflection. Obviously, Mr. Simmons' nonverbal talent could be observed more easily on the split-screen while the vocal abilities of Mr. Albright would be readily recognized in either presentation. Hence, the credibility of a trial lawyer may be enhanced more by the split-screen system than by an inexpensive full-screen system.²⁸

c. Juror information retention. This study provided no evidence that the type of presentation affected jurors' retention of trial-related information. Jurors in both conditions had relatively high mean retention scores: of a possible score of 39, the mean for jurors in the split-screen presentation was 30.70, while the mean for the jurors in the full-screen presentation was 31.03. The difference is statistically insignificant.²⁹ Thus, there is no reason to expect that one system or the other is superior in terms of juror retention of trial-related information.

d. Juror interest and motivation. There is no clear evidence that the two modes of presentation resulted in differing degrees of juror interest and motivation. The mean rating of juror interest and motivation was 5.31 in the split-screen presentation and 4.94 in the full-screen presentation. The difference approaches but does not attain statistical significance.³⁰ Thus, while there is a trend toward higher self-report ratings of interest and motivation in the split-screen presentation, one cannot conclude that jurors viewing that presentation were more motivated or found the task more interesting than jurors viewing the full-screen presentation.³¹

4. Conclusions from Study 2

Save for perceptions of attorney credibility, the two taping systems do not appear to produce differing juror responses. There are, as in Study 1, some admitted problems in failing to reject the null hypothesis.³² Specifically, a significance level for the findings of no differences cannot be specified. Many possible sources of error may have contributed to the failure to observe differences between

²⁸If the single-screen shot could be magnified by means of an expensive projection system, this difference might be eliminated. Moreover, we have no data to indicate if the converse is also true, *i.e.*, whether a relatively unskilled attorney would profit from the loss of detail that occurs with the full-screen system.

²⁹ $t < 1$.

³⁰ $t = 1.52$; $p < .10$.

³¹The maximum possible rating of interest and motivation was 7.00. Consequently, jurors in both conditions reported that their interest and motivation were well above the midpoint (4.00) of the scale. This fact suggests that neither group found the task of viewing a videotape trial unmotivating or uninteresting, which bodes well for the use of either system in actual trial situations.

³²See note 20 *supra*.

the groups of jurors: errors associated with the questionnaire, errors resulting from the administration of the trials by the researchers, and errors stemming from characteristics of the subjects themselves. However, the instruments were carefully developed and the administration of the study was maintained as constant as possible in both presentations.

D. Studies 3 & 4: The Effects of the Deletion of Inadmissible Testimony

Proponents of the use of videotape in jury trials have argued that an advantage of videotape is that legally inadmissible testimony may be edited from recorded videotape before jurors are exposed to such testimony. These proponents claim that, because of this ability to edit, trial time can be reduced, judges can be afforded the opportunity to research questions of admissibility thoroughly before ruling on them, and inadmissible evidence can be suppressed so as not to taint a jury's verdict. The present study tested the validity of only the last asserted advantage.³³

Some rather involved hypothesizing, based on both legal wisdom and behavioral research, is possible with regard to this issue. A party may be benefited by improper questioning or by inadmissible testimony. This possibility, it seems, has encouraged some attorneys to knowingly introduce to the jury inadmissible evidence. In moderation, this technique may work to the advantage of an attorney's case. However, when inadmissible material is frequently inserted into a trial, the total effect might be quite different. To the extent jurors think of a trial as a highly rule-governed procedure, they may consider it unethical for an attorney to violate the rules. When courtroom rules are extensively violated by an attorney, then one or both of two contingencies might be predicted. The rule-breaking attorney might be perceived by jurors as having knowingly and intentionally broken the rules, in which case the attorney would be perceived as less trustworthy. Jurors may react unfavorably to the client of such an attorney. Alternatively, the rule-breaking attorney might be perceived by the jurors as ignorant of the rules of trial procedure and thus generally less competent. Jurors may feel some measure of sympathy for the client of such an attorney and react more favorably toward the client's case.

1. Questions examined

Since the preceding hypothetical analysis involves a number of complex, competing relationships, no experimental hypotheses were tested. Rather, two exploratory studies aimed at breaking ground in the area of inquiry outlined above were conducted. Each of these

³³Our research did not address the first two proposed advantages; each of them must simply be analyzed in terms of whether the time saved and convenience achieved outweighs the added costs of videotaping trials.

studies was designed to address the following questions:

1. Are there differences in attribution of negligence among jurors exposed to differing amounts of inadmissible testimony in a trial?
2. Among jurors finding for the plaintiff, are there differences in the amounts of award among those jurors who have been exposed to differing amounts of inadmissible testimony?
3. Are there differences in perceptions of attorney credibility among jurors who have been exposed to differing amounts of inadmissible testimony?

2. *Procedures: Study 3*

One hundred and twenty jurors serving on the Wayne County Circuit Court (Detroit, Michigan) panel, who voluntarily returned for "further jury service" during the week following the end of their term of regular jury service, were instructed that they would serve as jurors in change-of-venue trials. They were further told that a representative from Michigan State University would be administering a questionnaire on jury size to them subsequent to the trial and prior to their deliberation. The jurors were then randomly assigned to one of seven experimental trials, each trial using a split-screen tape of *Nugent v. Clark* containing from zero to six instances of inadmissible testimony.³⁴ At the conclusion of the videotape presentation, each group completed the "jury size" questionnaire. The questionnaire was essentially the same as that used in Studies 1 and 2, with the addition of five questions whose answers referred to inadmissible portions of the trial.³⁵

³⁴See text accompanying note 5 *supra*.

The six instances of inadmissible materials introduced in the trial transcript can be summarized as follows:

1. Plaintiffs' attorney questions the defendant, Frank Clark, about a prior arrest for drunken driving.
2. Plaintiffs' attorney questions the defendant, Frank Clark, about his ownership of a motorcycle.
3. Plaintiffs' attorney questions the defendant, Frank Clark, concerning alleged brake repairs on his auto following the accident.
4. As a result of questioning by plaintiffs' attorney, the investigating officer testifies that there was damage on Frank Clark's car from a previous accident.
5. As a result of questioning by plaintiffs' attorney, the attending physician expresses the opinion that Marjorie Nugent's life was probably shortened by the accident.
6. As a result of questioning by her attorney, plaintiff Marjorie Nugent testifies that because of their excellent driving records, she and her husband have safe driver insurance rates.

Two criteria were used to prepare the inadmissible materials: first, they should lend themselves to believable, "natural" insertions into the transcript; and second, the psychological impact of each instance on the jurors should be roughly comparable. The first criterion was much easier to satisfy than the second. At present, we know of no foolproof way of assuring that each instance of inadmissible material will have an equal behavioral impact on jurors. In arriving at our choices, we were guided by the advice of legal consultants and by some pretesting of the items on students and colleagues. Still, we seriously doubt that each instance is equally potent.

³⁵No jurors expressed suspicion of the procedures used in the study; in fact, a number of them expressed a desire to move on to group deliberation so as to reach a verdict. As in the previous studies, no group deliberation occurred.

3. Results and discussion: Study 3

a. *Negligence verdicts and mean awards.* Table 4 summarizes the verdicts for the plaintiff, Marjorie Nugent, or the defendant in each of the seven versions of the tape containing differing amounts of inadmissible testimony introduced by the plaintiff.³⁶ The data indicate a generally higher proportion of verdicts for the plaintiff, but this does not significantly vary as the amount of inadmissible testimony introduced to the jurors varies.³⁷

TABLE 4.—*Summary of the verdict responses for jurors in the seven presentations of inadmissible testimony, and mean amount of award*

Amount of inadmissible testimony	Verdict responses		Mean award
	For plaintiff	For defendant	
0	9	6	\$22,500
1	15	5	17,200
2	5	4	21,940
3	9	9	17,055
4	13	7	18,461
5	11	9	14,863
6	10	5	21,000

Also shown in Table 4 are the mean awards made by the jurors viewing the seven differing trials. To test for differences in the

³⁶There were again several ways of analyzing the verdict measure, as shown by the following table:

Number of deletions	Clark neg. Both neg.	Clark not neg.	Number of deletions	Clark neg.	Both neg.	Clark not neg.
0	13	2	0	10	3	2
1	20	0	1	11	9	0
2	17	3	2	13	4	3
3	12	6	3	9	3	6
4	7	2	4	5	2	2
5	16	4	5	15	1	4
6	14	1	6	9	5	1
$\chi^2 = 9.52; p > .20.$			$\chi^2 = 17.54; p > .20.$			
Number of deletions	Clark neg.	Clark not neg.	Number of deletions	Clark neg.	Both neg. Clark not neg.	
0	10	2	0	10	5	
1	11	0	1	11	9	
2	13	3	2	13	7	
3	9	6	3	9	9	
4	5	2	4	5	4	
5	15	4	5	15	5	
6	9	1	6	9	6	
$\chi^2 = 7.50; p > .30.$			$\chi^2 = 3.25; p > .80.$			

³⁷ $\chi^2 = 3.25; p > .80.$

amount awarded to Marjorie Nugent, a simple analysis of variance of award among the seven groups of jurors was performed. Only the awards made by jurors who had found the defendant negligent and the plaintiff not negligent were considered in this analysis. That is, since no other jurors *could* legally have made awards, only those who found the defendant solely negligent were considered. The analysis yielded no statistically significant differences in amount of award attributable to the amount of inadmissible testimony included in the trial.³⁸

b. Juror perception of attorney credibility. To test for the effects of the inclusion of inadmissible testimony on the credibility of attorneys, sets of scales previously found to be highly reliable indicants of perceived trustworthiness and competence were analyzed for both attorneys.³⁹ Since the plaintiffs' attorney was responsible for introducing the additional inadmissible materials, some change might have been expected over the seven different presentations. Yet a simple analysis of variance of trustworthiness scores of plaintiffs' attorney yielded no statistically significant differences among the seven different presentations of inadmissible testimony.⁴⁰ Similarly, a simple analysis of variance of competence ratings of plaintiffs' attorney among the seven presentations produced no statistically significant differences.⁴¹ Likewise, the jurors' ratings of the defense attorney's credibility did not vary as a result of the varying amounts of inadmissible testimony in the seven versions of the trial.⁴²

4. Conclusions from Study 3

The study uncovered none of the effects of inadmissible testimony predicted. No statistically significant differences in attribution of negligence resulted from experimentally varying the amounts of inadmissible material in the trial. Similarly, no statistically significant differences were found in the amount of money awarded to the plaintiff or in the jurors' perception of attorney credibility. However, these results are preliminary only, for the findings of no differences may be attributable to one or more of three factors. First, the in-

³⁸ $F < 1$.

The F test is similar to the t test (see note 15 *supra*) except that it is generally used to determine whether the means of several samples (three or more) were drawn from the same population. When more than two conditions are being compared, the standard procedure is to compare all of them with an F test (analysis of variance), and if the overall F is statistically significant, to make all of the possible two sample comparisons using a two-sample statistic such as t . Like t , F is a parametric statistic.

³⁹The scales used were the credibility scales of Berlo, Lemert, and Mertz and the authoritative and character scales of McCroskey. The former are seven-interval differential scales; the latter, six-interval Likert items. The persons developing the scales found them to be reliable through rigorous pretesting. See Berlo, Lemert, & Mertz, *Dimensions for Evaluating the Acceptability of Message Sources*, 33 PUB. OPINION Q. 563 (1969-70).

⁴⁰ $F < 1$.

⁴¹ $F = 1.61$.

⁴² $F = 1.39$ for trustworthiness; $F < 1$ for competence.

admissible testimony may have had too small an effect in relation to the length of the trial.⁴³ The plaintiffs' attorney's rule-breaking behavior may never have reached the point where it worked against him. Indeed, the attorney's behavior may never have reached the point at which it began to help him and his client. Second, the inadmissible testimony may have been neither supportive enough of plaintiffs' case nor damning enough for defendant's case to have had an appreciable effect on verdict, award, or attorney credibility. Third, the large amount of money asked for by the plaintiff very likely suppressed any differences in juror response caused by the varying amounts of inadmissible testimony in the seven versions of the trial. When a large amount of money is asked for, there is a tendency for jurors to choose a round number near one of the extremes of allowable awards. And this tendency may have been accentuated by the small sample size in the present study.⁴⁴ Also, although a rough pretest of the effect of the inadmissible materials was performed using a sample of students, there is no indication that the six instances were comparable in effect.

5. *Modified replication: Study 4*

Study 4 represents an attempt to mitigate some of the problems encountered in Study 3. Specifically, a problem may have arisen in Study 3 because of the attempt to detect very subtle differences. Study 3 depended on single-item differences in inadmissible materials to produce variations in juror response. The experimental use of seven different trial presentations relied heavily on the possibility that one additional item of inadmissible evidence, or one less item, would exercise a measurable impact on juror behavior. Study 4 sought to discover whether the insertion of three additional items of inadmissible material would affect juror response. Study 4 used three of the seven presentations employed in Study 3: the version of the trial containing none of the six additional items of inadmissible material, the version containing three of these items, and the version containing all six. The questions investigated were identical to those in Study 3.

6. *Procedures: Study 4*

Because of limitations in the availability of a courtroom setting and actually impaneled jurors, 144 undergraduate students at Michigan State University role-played jurors in this study. Potential subjects responded to advertisements requesting paid assistance in a legal research project, and those who agreed to participate were randomly assigned to one of the three presentations.

⁴³Sue, Smith, and Caldwell have reported research which indicates that the inclusion of only *one* instance of inadmissible testimony can have an effect on juror verdict *when a summary of only one page* is provided the subjects. Sue, Smith, & Caldwell, *Effects of Inadmissible Evidence on the Decisions of Simulated Jurors: A Moral Dilemma*, 3 J. APPLIED SOC. PSYCH. 345 (1973).

⁴⁴See Table 4 in text *supra*.

Subjects were told that they would be viewing an actual videotape trial and that their task was to role-play a conscientious juror. They were instructed to assume that their verdict would be binding on the plaintiffs and the defendant. Following the presentation of the trial, the subjects completed the same questionnaire used in Study 3.

7. *Results and discussion: Study 4*

a. *Negligence verdicts and mean awards.* Once again, there was no indication that the amount of inadmissible material affected juror attribution of negligence. Table 5 summarizes the frequency of verdicts for the plaintiff and the defendant in the 0-item, 3-item, and 6-item presentations.⁴⁵ More jurors found for the defendant, but the frequency with which this occurred did not vary significantly according to the amount of inadmissible material.⁴⁶

TABLE 5.—*Summary of the verdict responses for jurors in the three presentations of inadmissible testimony, and mean amount of award*

Amount of inadmissible testimony	Verdict responses		Mean award
	For plaintiff	For defendant	
0	15	26	\$15,528
3	20	30	17,806
6	24	29	14,964

The mean awards in the various presentations are also given in Table 5. Again the data reveal no compelling evidence that the amount of inadmissible testimony introduced in the trial influenced the awards of jurors finding in favor of the plaintiff. The changes in the size of the mean award are consistent with our expectations: as

⁴⁵The various possibilities for analyzing the verdict measure are reflected in the following table:

Instances of inadmissible testimony	Both neg.	Clark not neg.	Clark neg.	Instances of inadmissible testimony	Clark not neg.	Clark neg. Both neg.
0	16	10	15	0	10	31
3	15	15	20	3	15	35
6	12	17	24	6	17	36
$\chi^2 = 3.03; p > .50.$				$\chi^2 < 1; p > .80.$		
Instances of inadmissible testimony	Clark not neg. Both neg.	Clark neg.	Instances of inadmissible testimony	Clark not neg.	Clark neg.	
0	26	15	0	10	15	
3	30	20	3	15	20	
6	29	24	6	17	24	
$\chi^2 < 1; p > .80.$			$\chi^2 < 1; p > .70.$			

⁴⁶ $\chi^2 = 1; p > .80.$

the jurors are exposed to inadmissible materials, the size of plaintiffs' award increases; but with the introduction of additional inadmissible materials, the size of the award decreases. However, the variation in size of awards is not statistically significant.⁴⁷

b. Juror perception of attorney credibility. There is no evidence that juror perception of the credibility of plaintiffs' attorney, Mr. Simmons, varied between the three trials of Study 4. This suggests that his introduction of inadmissible materials did not have a deleterious effect on his courtroom image. Specifically, the mean ratings of Simmons' credibility were as follows: 0-item presentation, 4.71; 3-item presentation, 5.01; and 6-item presentation, 4.70. These means correspond with the pattern observed on amount of award: Simmons' credibility increased when he introduced three items of inadmissible testimony but declined when he increased the input to six items. However, the variation is not statistically significant.⁴⁸ The mean credibility ratings of defendant's attorney, Mr. Albright, are somewhat more stable than those of Simmons: 5.32 in the 0-item presentation; 5.21 in the 3-item presentation; and 5.42 in the 6-item presentation.⁴⁹

8. Conclusions from Study 4

While there are some encouraging patterns in the findings of Study 4, none of the comparisons proved statistically significant. Since the sample sizes used were larger than those of Study 3, we have greater confidence that something other than sample size contributed to the lack of differences. As mentioned above, it may be that the stimulus was not sufficiently powerful: perhaps the three presentations used in Study 4 did not contain enough inadmissible material, given the total trial length. Then, too, the great difference within juror groups in the amount of awards given to the plaintiff reduced the likelihood of finding statistically significant differences among the three groups. Perhaps if the award requested by the plaintiff were reduced,⁵⁰ we could generate a distribution of awards more amenable to comparison.

III. GROUP II: THE INFORMATION RETENTION STUDIES

The second group of studies dealt with the possible impact of videotape testimony on juror retention of trial-related information. Concern with information retention stems from the judicial value or premise that verdicts should be based on the facts and evidence of the case, not on extraneous factors. If jurors viewing videotape trials retain either more or less information than jurors viewing live trials, this fact would have important implications for the use of videotape

⁴⁷ $F < 1$.

⁴⁸ $F = 1.70$.

⁴⁹The analysis of variance of these ratings produced an F of < 1 .

⁵⁰In the trial, the requested award for Mrs. Nugent was \$42,500.

in the courtroom. Thus, three related studies addressed two questions:

1. Are there differences in the amounts or patterns of trial-related information retained by jurors exposed to live testimony and jurors exposed to videotape testimony?

2. Are there differences in the amount or pattern of trial-related information retained by jurors exposed to black-and-white videotape testimony and jurors exposed to color videotape testimony?

In regard to the amount of information retained by jurors, a reasonable argument can be made that either the live or the videotape presentation is more effective. As mentioned above, use of videotape reduces the stimulus field of jurors, thus "screening out" many potentially distracting features of the live courtroom environment. Such a reduction of competing stimuli might enhance the jurors' ability to concentrate on the important informational aspects of testimony. Conversely, the rich stimulus provided by the live trial may best ensure a high level of juror interest. Televised testimony may be perceived as uninteresting, or even boring, causing jurors' attention to lag and resulting in reduced levels of information retention.

In examining patterns of juror information retention, at least two considerations are relevant. Research by Miller and Campbell indicates that if people are interested in a presentation they will remember the last portion of the message to a greater extent than the first.⁵¹ On the other hand, given an uninteresting presentation, recall will be better for the first part than the last, presumably because listeners "tune out" as the message proceeds. This mechanism might be at work when testimony is presented to jurors in live and videotape presentations. Specifically, if one presentation results in more personal involvement and interest for jurors than the other, one would expect the jurors viewing the more involving presentation to better remember the most recent information.

There are also grounds for assuming that jurors who view black-and-white videotape and color videotape testimony may differ in their patterns of information retention. Prior research provides evidence that viewers exposed to black-and-white television programs exhibit information processing patterns different from the patterns of viewers exposed to color television programs.⁵² Color presentations appear to result in greater retention of peripheral, tangential information, whereas black-and-white seems to produce better retention of central concepts and important information. To the extent that these differences hold for jurors viewing testimony, they would

⁵¹Miller & Campbell, *Recency and Primacy in Persuasion as a Function of the timing and Speeches and Measurement*, 59 J. ABNORMAL & SOC. PSYCH. 1 (1959).

⁵²Kumata, *Two Studies in Classroom Teaching by Television, in THE IMPACT OF EDUCATIONAL TELEVISION* 151 (W. Schramm ed. 1960); N. Katzman & J. Nyenhuis, *Color versus Black and White Effects on Learning, Opinion, and Attention*, 1971 (unpublished manuscript, Dept. of Communication, Mich. St. U.).

constitute relevant data to help guide the selection of taping systems for use in the courtroom.

Thus, the three studies reported below first attempted to assess the overall retention of trial-related information by jurors exposed to live, black-and-white videotape, and color videotape testimony. Then, assuming that overall information retention scores might be similar for the three types of presentations, the studies also sought to determine whether there were differences in patterns of information retention among jurors exposed to the various formats.

A. Study 1: Retention of Trial-Related Information by Jurors Viewing Live, Black-and-White, and Color Testimony.

1. Procedures

Thirty-one jurors from the 65th District Court in Flint, Michigan, were told by the presiding judge that they were viewing an actual trial. To justify the large jury, jurors were told that the parties involved had agreed to participate in a jury size study. They were also told that the litigants had agreed the trial could be halted from time to time in order that questionnaires could be administered.

The jurors viewed a live reenactment of the opening 2 hours of a trial involving a will contest. The reenactment was videotaped in the courtroom, the jurors having been told that the videotape was being used to keep a record of the trial. After the reenactment, the jurors were excused for lunch. When they returned, a questionnaire designed to measure retention of information from the second hour of the trial was administered. The second hour, consisting of the testimony of only one witness, was chosen to avoid the confusing effects on test results stemming from the varying delivery styles and credibility levels of two or more witnesses. While the jurors were filling out the questionnaire, they harbored the impression that the trial would resume when they were done. When they finished the questionnaire, they were debriefed and dismissed.

The videotape of the reenactment was shown in color and black-and-white respectively to two other groups of thirty-one 68th District jurors. The judge appeared in the courtroom prior to the videotape showings and instructed the jurors that they were viewing a videotape of a trial where both parties had agreed to accept the judgment of the jury who viewed the videotape. The jury size cover story was again used. The same questionnaire given to the jury exposed to the live trial was administered under the same conditions to the jurors in the videotape group.

In constructing the questionnaire, the hour-long testimony was divided into four, 13-minute parts. Equal numbers of questions were asked from each part so that the pattern of retention could be ascertained for equal time periods. We compared retention from corresponding 13-minute sections across live, black-and-white, and color presentations and performed analyses on retention in each

mode of presentation to determine whether retention differed for the three modes across the four time intervals.

2. Results and discussion

Table 6 summarizes the mean retention scores across the four, 13-minute time intervals for jurors in the live, black-and-white, and color presentations. For all three presentations, retention of trial-related information was highest for the first 13 minutes and declined significantly throughout the presentation.⁵³ If Miller and Campbell's reasoning about order effects is correct, this finding suggests that most jurors found the trial relatively uninteresting.

TABLE 6.—Mean scores for retention of trial-related information by jurors viewing the three modes of presentation⁵⁴

	Mean retention				
	Interval 1	Interval 2	Interval 3	Interval 4	Intervals 1-4
Live	9.8	8.3	7.7	7.6	8.3
Black-and-white	9.4	9.2	7.8	8.0	8.6
Color	9.0	8.6	8.5	7.8	8.5

The most important finding, however, was that information retention declined significantly⁵⁵ over time in all modes of presentation. As the mean retention scores in Table 6 indicate, a more rapid decline in retention occurred for jurors who viewed the testimony live. Jurors in the two videotape presentations retained more information from later segments of the testimony, with the retention somewhat better for those who viewed the testimony in black-and-white. Overall, then, it appears that as the amount of viewing time increases, videotape testimony results in greater retention of trial-related information, suggesting that videotape may better hold jurors' attention.

While the information retention patterns differ among the three modes of presentation, the absolute differences in mean retention scores are not large. This fact might lead some to contend that the differences, although statistically significant, are not great enough to exert any appreciable impact on the trial process. Two considerations are relevant when evaluating this argument. First, the study examined retention of trial-related information for only a single hour of testimony. To the extent that the observed differences in retention persist over longer time periods, the cumulative effect of a videotape presentation on juror knowledge could be considerable for a lengthy trial. Second, the fact that such small mean differences in retention scores produced statistically significant results indicates

⁵³ $p < .05$.

⁵⁴Each number represents the average number of questions for each 13-minute interval answered correctly (the mean retention score) by the jury.

⁵⁵ $p < .05$.

that the effect was remarkably consistent for the jurors in a given presentation.⁵⁶

B. Study 2: Retention of Trial-Related Information by Jurors Viewing Black-and-White Videotape and Color Videotape Testimony

Given the higher levels of juror information retention observed for the videotape presentation in Study 1, a second study was conducted to examine with greater specificity whether there are differences in retention of trial-related information between jurors exposed to a black-and-white presentation and jurors exposed to a color presentation.

1. Procedures

In addition to varying the mode of presentation, we also manipulated the delivery characteristics of the witness giving the testimony. This was done to determine if juror response to the black-and-white and color presentations is influenced by the characteristics of a particular witness. We reasoned that a strong witness—one who appears assertive, attentive, and unhesitant—might profit most from the color format, that jurors might retain a great deal of the information presented by such a witness and perceive him as highly credible. By contrast, a weak witness—one who appears uncertain, inattentive, and fumbling—might appear particularly inept in color and might be somewhat more effective in black-and-white. Finally, a third tape, labeled “modal personality” was made of a third party reading testimony into the record.

The stimulus used was a videotape recording of a deposition concerning an industrial accident. A professional actor played the witness roles, and two actual attorneys took the attorney roles. The participants were seated at a small table and the camera shot was fixed, except that at the beginning of the deposition the camera moved in upon the participants and at the end moved away from them.

The manipulation of witness type was achieved by requiring the same actor to play three different roles. In the strong witness role, he was assertive, attentive, and unhesitant when giving testimony. In the weak witness role, he exhibited verbal and nonverbal cues to suggest that he was uncertain, fumbling, inattentive, and hesitant. In the modal personality role, the actor merely read the testimony in an unemotional, businesslike manner.⁵⁷ The testimony was identical in each presentation.

⁵⁶If the within-presentation variance in juror retention scores had been at all marked, between-presentation differences of the magnitude obtained would not have reached the required level of significance.

⁵⁷The validity of the witness manipulation was pretested by showing 12-minute excerpts to a group of 26 students, who were then asked to rank the tapes according to how strong, assertive, and confident the witness appeared to be.

Two hundred and nine paid volunteers from the Lansing-East Lansing area served as role-playing jurors in this study.⁵⁸ Each juror was randomly assigned to one of the study's six experimental presentations. Once the jurors were seated, a brief introduction was delivered.⁵⁹ The jurors then viewed the appropriate version of the videotape deposition. As previously indicated, each group of jurors saw the testimony of one witness type—strong, weak, or modal—either in color or black-and-white.⁶⁰

After the jurors viewed the tape, they filled out a questionnaire designed to measure their degree of information retention and their perceptions of the credibility of the witness. Fifty-nine multiple-choice items were used to index information retention, and seven-interval, semantic differential-type scales were employed to assess witness credibility.⁶¹ Upon completing the questionnaire, the jurors were briefed on the purpose of the study, thanked, and dismissed.

2. Results and discussion

a. *Juror information retention.* Table 7 summarizes the mean information retention scores for jurors in each of the six groups. Obviously, the mode of presentation did not influence retention. Scores for jurors in the black-and-white and color presentations were quite similar, and any differences between scores did not approach statistical significance.⁶² Analysis did reveal, however, a statistically significant effect for witness type.⁶³ Subsequent comparisons indicated

⁵⁸In some of the studies reported above we used actual jurors who were led to believe that they were participating in a real trial. In the present study and the ones following we used persons who were asked to play the role of jurors. Although we believe our results have validity and generalizability, we grant that the role-playing task is not psychologically identical to actual jury service.

⁵⁹The introduction stated:

Tonight you are going to view a videotape of an actual deposition taken for a lawsuit involving a construction mishap. The deposition is being taken in a court reporter's office, and the witness, Robert Montague, is being questioned by Edward R. Olsen, the attorney for the plaintiff. Also present is the attorney for the defendant, Robert R. Anthony. Tonight we are going to ask you to role-play jurors; that is, we want you to watch this videotape just as if you were going to render an actual verdict based on the testimony. Since we want to duplicate actual courtroom procedure as closely as possible, we want to ask that you do not take any notes, and that you do not talk to anyone at any time about the testimony during the course of the experiment. After you have viewed the testimony, you will fill out a questionnaire concerning what you have seen. When you are finished, if you would like to remain we would be happy to explain what we have been doing in the experiment.

For the modal condition the second sentence was replaced by:

The deposition is being read into the court record. The witness, Robert Montague, is absent because of illness so his testimony is being read by the court reporter. The questions are being asked by Edward R. Olsen, attorney for the plaintiff.

⁶⁰Since the three witness versions were originally taped in color, it was possible to show the identical tapes in black-and-white by "washing out" the color on the monitors, thereby ensuring that each version was exactly comparable for both presentational modes.

⁶¹For an explanation of the instruments measuring credibility, see note 39 *supra*.

⁶² $F < 1$.

⁶³ $F = 4.88; p < .05$.

that jurors who viewed the strong and weak witnesses retained significantly more information than jurors who viewed the modal witness, but there was no significant difference in retention between the former two groups.

TABLE 7.—*Mean information retention scores for jurors in the six groups*⁶⁴

Type of witness	Mode of presentation	
	Black-and-white	Color
Strong	47.61	46.33
Modal	44.58	43.94
Weak	47.55	47.09

b. Juror perception of witness credibility. Table 8 contains the mean ratings of perceived witness credibility given by jurors in the six experimental groups. The strong witness was perceived as significantly more credible than either the modal or weak witnesses, while the modal witness was perceived as significantly more credible than the weak.⁶⁵

TABLE 8.—*Mean ratings of perceived witness credibility for jurors in the six groups*⁶⁶

Type of witness	Mode of presentation	
	Black-and-white	Color
Strong	69.42	70.18
Modal	67.03	62.03
Weak	59.76	62.03

In addition, a significant interaction between mode of presentation and witness type was observed.⁶⁷ Examination of the pattern of mean credibility ratings revealed the fact that both the strong and the weak witnesses were perceived as more credible in color, while the modal personality was perceived as more credible in black-and-white.

3. Conclusions from Study 2

In this study the mode of presentation did not appear to have any marked effects upon subsequent information retention. This lack of difference is somewhat surprising, since, as indicated above, prior researchers have reported differences in information retention result-

⁶⁴Each number represents the average number of questions answered correctly by the jurors in each group out of a possible 59 questions.

⁶⁵Analysis of variance yielded a significant result based on witness type consistent with the manipulation employed in the study. $F = 16.56$; $p < .05$.

⁶⁶For an explanation of the credibility scales employed, see note 39 *supra*.

⁶⁷ $F = 3.04$; $p < .05$.

ing from exposure to color and black-and-white formats.⁶⁸ But unlike most previous research, the present study dealt only with information which might be termed central. Perhaps information types must be more finely distinguished before the differences produced by color and black-and-white videotape can be isolated.

A second surprising finding is a decrease in credibility for the modal witness in the color as opposed to the black-and-white presentation. To the extent that color provides a richer and more detailed picture of the testimony, the lack of excitement generated by the modal presentation may be accentuated to a greater degree in the color mode, whereas the black-and-white presentation may dampen this effect.

Overall, certain problems that arose in this study made it difficult for us to interpret the findings with much confidence. First, an ambiguity existed with respect to evaluating the credibility of the modal witness, for the jurors did not know whether to rate the original unseen witness or the person reading the deposition. Second, the role-playing jurors who participated in this study were primarily college students. Thus, their mean education level was higher and their mean age lower than a representative sample of actual jurors. Finally, perhaps because of the well-educated sample, retention of information was quite high across all experimental conditions, producing a ceiling effect that may have blurred actual differences in retention among jurors in the six groups. Consequently, a third study aimed at eliminating or at least alleviating these procedural problems was conducted.

C. Study 3: Retention of Trial-Related Information by Jurors Viewing Black-and-White Videotape and Color Videotape Testimony—A Modified Replication.

1. Procedures

The procedures used in Study 3 were identical to those employed in Study 2 save for three modifications. The difficulty of the retention items was increased to reduce the ceiling effect encountered in Study 2. Because of the ambiguity associated with rating his credibility, the modal witness was dropped from Study 3. This decision seemed reasonable, given the greater concern for the effects of mode of presentation on the perceived credibility of the strong and the weak witnesses. By establishing contacts with a number of adult groups in the Lansing-East Lansing area, a more representative sample of role-playing jurors was gathered.

2. Results and discussion

a. Juror information retention. Table 9 summarizes the mean retention scores for jurors in each of the four experimental groups

⁶⁸See note 52 accompanying text *supra*.

used in Study 3. Of particular interest is the fact that retention scores for both witness types were higher in the black-and-white than in the color presentation. The variance is statistically significant,⁶⁹ indicating that regardless of the type of witness, jurors viewing the black-and-white deposition retained more information than jurors who viewed the color testimony.

TABLE 9.—*Mean retention scores for jurors in the four conditions*

Type of witness	Mode of presentation	
	Black-and-white	Color
Strong	39.72	34.59
Weak	36.17	33.31

In addition, jurors who viewed the strong witness retained significantly more information than their counterparts who viewed the weak witness.⁷⁰ This difference in retention is comparable for both color and black-and-white presentations, although it is somewhat more pronounced in the black-and-white presentation.

b. Juror perception of witness credibility. Table 10 contains the mean ratings of perceived witness credibility given by jurors in the four groups. Consistent with the manipulation used in the study, the strong witness was perceived as more credible than the weak witness.⁷¹ More important is the fact that the color presentation produced significantly higher ratings of perceived witness credibility than did black-and-white, with the difference especially apparent for the strong witness. Thus, it appears that use of color videotape enhances the credibility of both witness types but that a strong witness benefits proportionately more from its use.

TABLE 10.—*Mean ratings of perceived witness credibility for jurors in the four groups*⁷²

Type of witness	Mode of presentation	
	Black-and-white	Color
Strong	67.66	75.10
Weak	63.80	64.63

The most interesting and potentially important finding is that jurors remember more of the trial-related information when it is presented in black-and-white.⁷³ There are at least two possible ex-

⁶⁹ $F = 6.55; p < .05.$

⁷⁰ $F = 6.58; p < .05.$

⁷¹ $F = 9.19; p < .05.$

⁷²For an explanation of the credibility scales used, see note 39 *supra*.

⁷³In this respect Study 3 differs from Study 2, which yielded no statistically significant differences in perceived witness credibility.

planations for this outcome. First, color videotape provides a richer visual stimulus field, and as suggested earlier, the added stimuli may distract jurors from the testimony. Second, when compared to black-and-white, color videotape is more realistic: it more closely approximates the visual perspective of jurors participating in a live trial. Perhaps this greater realism places fewer cognitive demands on jurors, culminating in a state of reduced stimulation that could explain the lower amount of information retention. The study on juror emotional arousal reported in section IV of this article lends support to this interpretation.

Even though information retention was lower for the color presentation, ratings of perceived witness credibility were higher. This finding suggests that an important portion of the information which jurors use in making credibility judgments is nonverbal. If so, much of this information might not be received from black-and-white videotape, perhaps because, as in the case of flushed skin, such information cannot be conveyed by a noncolor medium, or because, contrary to what was posited above, jurors do not attend as closely to the less interesting black-and-white visual display, thus missing the nonverbal signals upon which credibility judgments are at least partially based.

To some extent, the findings of Study 3 pose a perplexing and paradoxical problem. Apparently, the black-and-white mode results in better retention of trial-related information, while the color mode produces higher ratings of perceived witness credibility.

IV. THE EMOTIONAL AROUSAL STUDIES

A. *Issues Examined*

The third group of studies explored the possibility that black-and-white and color videotape presentations may influence juror emotional response to testimony.⁷⁴ Also, it was assumed that measures of emotional arousal permit inferences about other aspects of juror behavior such as level of attention or degree of sympathy for, or antagonism toward, a particular witness.

⁷⁴Early research on the effects of color versus monochromatic presentation has yielded mixed results. Two studies, Kanner & Rosenstein, *Television in Army Training: Color vs. Black and White* (pts. 1-2), 8 AUDIO VISUAL COMMUNICATION REV. 243 (1960), 9 AUDIO VISUAL COMMUNICATION REV. 44 (1961); and Vandermeer, *Color vs. Black and White in Instructional Films*, 2 AUDIO VISUAL COMMUNICATION REV. 121 (1954), revealed no significant differences between the amount of information retained by students who viewed a color stimulus and those who viewed a black-and-white presentation. More recently, such studies as Katzman, *Violence and Color Television: What Children of Different Ages Learn*, 1971 (unpublished manuscript, Dept. of Communication, Mich. St. U.); and Katzman & Nyenhuis, *Color versus Black and White Effects on Learning, Opinion, and Attention*, 1971 (unpublished manuscript, Dept. of Communication, Mich. St. U.) have explained the varied effects of monochromatic versus color presentations by distinguishing between retention of central and peripheral information. Both studies found that viewers of color presentations had better recall of peripheral information; viewers of black-and-white presentations recalled more central information.

The emotional responses of jurors to testimony could be related to their information processing and their verdicts in several ways. In a personal injury case where a witness describes the pain and anguish experienced, jurors would probably feel sympathy for the victim. If they later find for the plaintiff in the case, this sympathy could manifest itself in terms of a greater monetary award. If an attorney is particularly vicious during cross-examination, a juror might be aroused to anger, which could also affect the verdict.

The emotional arousal of jurors may also be related to their level of attention. Jurors who are aroused should tend to be alert. In a series of studies conducted for the Air Force, Johnson found the emotional arousal of electronic equipment operators to be good measures of their alertness and overall efficiency.⁷⁵ Also, two separate studies found that arousal decreased over time as their subjects became fatigued.⁷⁶ Emotional arousal may also be related to juror information retention. Behnke found that information which resulted in emotional arousal in subjects was better retained than less arousing information.⁷⁷ One possible explanation for this relationship is that highly interesting material is more likely to be retained than less interesting material, while information of interest is also more likely to result in greater emotional arousal.

The present study was designed to test for possible differences between color and black-and-white videotape formats on the emotional arousal of viewers. The study examined the possibility that the format may affect arousal level regardless of the interest value or emotional content of the testimony itself. We also examined what appeared to be a more reasonable hypothesis: only in response to testimony which results in high arousal will differences in the format be manifested in the arousal level of jurors. In other words, jurors might respond similarly to relatively dull testimony regardless of the format but respond differentially if the testimony were interesting or emotional. Though a difference between color and black-and-white formats on emotional arousal was anticipated, we made no prediction about which of the two formats would cause greater arousal. Since color offers the potential for greater richness and variety of color, it might be anticipated that arousal would be higher during a color presentation. However, the work of many portrait photographers attests to the potentially high emotional impact of black-and-white photographs compared with their color counterparts.

⁷⁵G. Johnson, *Application of Skin Resistance in Psychophysical Studies*, USAF-WADC TECH. REP. 59-688 (1959).

⁷⁶Farmer & Chambers, *Concerning the Use of Psycho-galvanic Reflex in Psychological Experiments*, 15 BRITISH J. PSYCH. 237 (1925); Schlosberg & Stanley, *A Simple Test of the Normality of Twenty-Four Distributions of Electrical Skin Conductance*, 117 SCIENCE 35 (1953).

⁷⁷R. Behnke, *An Exploratory Study of the Relationship between Galvanic Skin Response and Information-Gain*, 1966 (unpublished dissertation, Dept. of Speech Communication, U. of Kan.).

B. Procedures

1. Measurement

The easiest way to assess the emotional responses of jurors to testimony is to ask them about their feelings. However, the nature of the courtroom situation militates against this kind of self-report measure providing a valid assessment of differences in emotional response. For example, in personal injury cases jurors are explicitly told that their sympathies for an accident victim should not affect their decisions about the case. Jurors would therefore probably be very reluctant to report truthfully that they had felt sympathetic. Also, jurors come into the courtroom with many perceptions about how jurors are *supposed* to behave and respond. Self-report answers are influenced by such predispositions, and since the predispositions are relatively constant regardless of whether jurors are exposed to a color or black-and-white presentation, it is not likely that differences in the emotional responses of jurors could be detected by self-reports. Consequently, an alternative method of assessing emotional response was needed.

At least one theory of emotion suggests that for individuals to *experience* emotion, two components are necessary.⁷⁸ The first component of emotional arousal is *physiological* arousal. This arousal is identical regardless of whether the specific emotion experienced is anger, fear, or sympathy. What differentiates these emotional states phenomenologically is the labeling component. Individuals observe the characteristics of a situation and label their arousal according to how they think they should be responding emotionally. According to this view of human emotion, physiological arousal provides an indicant of the magnitude, but not the kind of emotion an individual is experiencing.

The most common measure of physiological arousal in psychophysiological research, and the one chosen for the present study, is the Galvanic Skin Response (GSR).⁷⁹ To supplement the GSR measurement, the jurors filled out, immediately after seeing the

⁷⁸Schachter, *The Interaction of Cognitive and Physiological Determinants of Emotional State*, in 1 *ADVANCES IN EXPERIMENTAL SOCIAL PSYCHOLOGY* 49 (L. Berkowitz ed. 1964).

⁷⁹As individuals become aroused, small amounts of sweat are secreted which increases the electrical conductivity of the skin. In GSR measurement, two small electrodes are attached to the lower palm of the person's hand, and the physiological responses are electronically amplified and recorded on a polygraph. Psychophysicists generally believe the GSR to be the most sensitive and accurate measure of arousal.

The specific machine used in this study was a two-channel Beckman-type R. S. dynograph, with the paper speed set at one millimeter per second. The amplifying settings were adjusted to fit individual response levels and were adjusted during measurement if the response level changed dramatically. The setting during this study was usually 1.0 micromho per centimeter, which is a standard GSR measuring unit. For jurors who displayed low GSR, the machine was adjusted to 0.5 micromho per centimeter. A very responsive juror would have the machine adjusted at about 2.0 micromhos per centimeter. The operator wrote the adjustment on the record next to the response and the data coder then took differences in the machine sensitivity settings into account when transforming the raw records into numbers.

stimulus videotape, questionnaires which measured five categories of variables. Semantic differential-type scales were used to measure the credibility of the two witnesses used,⁸⁰ and information retention was measured with 20 multiple-choice and fill-in-the-blank type questions. Semantic differentials were also used for the jurors to report their emotional state at particular points in the testimony. Jurors were also asked to indicate the amount of award they would give the plaintiff if she won the case. Therefore, in addition to examining differences in physiological arousal resulting from the format of the testimony, the written questionnaire made it possible to examine the effects of the format on witness credibility, information retention, monetary award, and self-reports of emotional response.

2. Subjects

The role-playing jurors were 114 Michigan residents drawn from two separate populations. Twenty-six jurors were members of the Holt, Michigan, Lions Club, and 88 were students enrolled at Michigan State University. A number of jurors from the total group, however, demonstrated a peculiar characteristic. Some persons fail to show GSR response at a measurable level. Such persons cannot respond differently; consequently, they would not provide a good test of the differences between color and black-and-white formats. Twenty jurors fell into this category and they came about equally from both experimental conditions. GSR data from these jurors were therefore discarded.⁸¹ Data from 14 jurors were discarded because of procedural errors during the experiment, such as electrodes coming loose. GSR physiological arousal data were thus obtained from 80 jurors. Questionnaire data from all 114 jurors were used to examine ratings of perceived witness credibility, information retention, and size of award.

3. Stimulus

Two color videotapes, each with two witnesses giving testimony in a personal injury case, were prepared. Both of the witnesses were professional actors, and the words which they used in each tape were identical,⁸² but on one tape the testimony was given in a very straightforward and nonemotional way. On the other tape, the testimony was presented emotionally—one witness became angry and the other became sad.

The stimuli were videotaped in a courtroom in East Lansing, Michigan, and the tape was designed to appear as realistic as possible so it could be presented to the jurors as an excerpt from an actual

⁸⁰For an explanation of the instrument's measuring credibility, see note 39 *supra*.

⁸¹The data to be discarded were selected by a psychophysiological consultant who had no knowledge of the experimental condition from which the data came.

⁸²A script was written especially for this experiment and was reviewed by an attorney to assure that it conformed to proper trial procedure.

trial. The tapes consisted only of close-up shots of the witnesses—both attorneys were off camera. The emotional version of the testimony was about 17 minutes long, while the nonemotional version was about 16 minutes long.

4. *Data collection*

Each juror signed up for a specific half-hour period to view a version of the tape.⁸³ Jurors were told beforehand only that they would be participating in research using a GSR machine and that the researchers were examining the way people responded to trial testimony. Upon arrival jurors were met by the experimenter⁸⁴ who explained they would be watching a short videotape of actual testimony which occurred in a civil trial in Detroit during the previous year. The electrodes were then attached to the jurors by the experimenter. Jurors sat alone for 10 minutes to become used to the electrodes and to allow their response levels to stabilize. They were then taken into a soundproof room which contained a color television, a chair, and the electrode hookup. After the juror's responses had become stable, which usually required several minutes, either the tape containing the emotional testimony or the tape containing the nonemotional testimony was shown in either color or black-and-white.⁸⁵ After the tape was finished, the juror completed the questionnaire, was thanked and dismissed.

5. *Data coding*⁸⁶

The GSR data sheets were broken into segments of 30 seconds each, resulting in 32 segments for the nonemotional version and 34 segments for the emotional version. Three separate pieces of data were recorded for each segment: the start level, the peak level, and the number of responses. Also, a record was made of the low and high points during the response time of each juror.

⁸³The present study required a more artificial experimental environment than did the previous studies. The subjects watched the stimulus tape alone in a soundproof room. This seclusion was necessary because of the extremely sensitive physiological measures which were used. Even if 12 GSR machines were available and people could have been seated in a courtroom to watch the tapes, the measures obtained would have less validity than those resulting from the present procedures. Such things as a person sneezing could cause the arousal level of all 12 people to go up at a particular point in the testimony. Thus, to an extent, the study involved a trade-off, sacrificing some realism for control.

⁸⁴The same experimenter greeted and briefed each juror. The GSR measure is so sensitive that variations such as different experimenters providing instructions have been shown to sometimes produce significant differences in arousal. See Fisher & Kotses, *Experimenter and Subject Sex Effects in the Skin Conductance Response*, 11 *PSYCHOPHYSIOLOGY* 191 (1974).

⁸⁵In order to eliminate the possibility that the experimenter might treat jurors differently based on their experimental group, he did not become aware of which version of the testimony would be shown the juror until he left the juror in the viewing room and entered a separate room housing the GSR equipment and operator.

⁸⁶To eliminate any possibility of bias on the part of coders, any indication of the juror's group was removed from the GSR data.

To assess the impact of specific parts of the testimony, six items of testimony were identified and the GSR operator noted on the GSR record when each critical statement occurred. Jurors were later asked how they felt emotionally when these specific items of testimony were given. The coders recorded the peak in the 10-second time periods immediately preceding and immediately following the occurrence of each critical statement. This coding procedure thus provided at least 110 separate GSR measures for each juror.

C. Results and discussion

Table 11 provides the mean arousal scores, or GSR readings, summing across all time periods, for jurors in each experimental group. These means reveal a consistent pattern of greater arousal for those jurors who viewed the testimony in black-and-white. This trend is apparent for both the start levels and the peak levels. Moreover, examination and comparison of the individual time frames show consistent differences that are obviously not attributable to chance.

TABLE 11.—Mean arousal scores for all time frames for jurors in the four experimental groups⁸⁷

Type of testimony	Mode of presentation			
	Black-and-white		Color	
	Start	Peak	Start	Peak
Nonemotional.	7.78	8.44	5.94	6.46
Emotional.	8.62	9.41	6.04	6.24

Several possible explanations could account for this finding. The first suggests a distraction effect. The color format may have distracted jurors from paying attention to the arousing content. That no differences were found on information retention argues against this possibility, but the information retention measure was probably far less sensitive than the GSR measure in detecting individual differences.

A second possibility is that black-and-white television is a novelty for many people. The majority of American television programming is in color, and the majority of American homes contain at least one color television set. Jurors may have been more aroused in the black-and-white presentations simply because it was novel for many of them.⁸⁸

A final possibility is that jurors found it more uncomfortable to

⁸⁷Initial differences in the mean arousal levels of jurors in each of the conditions are not taken into account in this table and somewhat reduce the strength of the format-arousal relationship. However, even with initial differences taken into account, the color/black-and-white differences are statistically significant.

⁸⁸Had we asked jurors whether they normally watch color or black-and-white television, data would exist bearing on this possibility; however, we did not.

watch black-and-white than color television. Since black-and-white is further removed from reality, it may be more difficult to relax when watching the less natural black-and-white format. The trends of arousal levels over the entire 16- or 17-minute versions of the tape tend to support this explanation. Prior research indicates that GSR readings show a drop over time.⁸⁹ In the nonemotional color condition this indeed happened.⁹⁰ In the color emotional presentation, jurors' responses fell just slightly.⁹¹ Apparently, the emotional content of the testimony reduced the tendency of jurors to relax. In both the black-and-white conditions, however, the GSR reading went up over time.⁹² If the differences were due to a novelty effect rather than a discomfort effect, the disparity in arousal between black-and-white and color formats should have dissipated over time as the novelty wore off. Clearly the opposite tendency prevailed.

Which of the above explanations best accounts for the differences in arousal has potentially important implications for the adoption of videotape systems by the legal community, and thus further research is required. For instance, if it is novelty that is causing the differences, the novelty would presumably wear off quite quickly. It may be that over a longer time period jurors' arousal levels would be about equal regardless of the format of the presentation. In this case, black-and-white would probably be just as effective as color. On the other hand, if jurors are less comfortable watching black-and-white television or become fatigued more readily because of the higher arousal levels, the differences reported here have quite different implications; namely, color might be the better format for jurors' viewing of trials.

As indicated above, several other measures were also taken. Correlations were calculated between self-reports of emotions at particular points in the testimony and arousal levels at those same points. None of these correlations indicated a systematic relationship, reinforcing the previously expressed concern about the validity of such self-report measures.⁹³

There was a consistent pattern of mildly positive correlations between arousal and information retention. These correlations were, for the most part, not significant. However, the consistency of the pattern suggests that chance is not responsible for these correlations. This relationship was strongest for those who saw the presentation in black-and-white.

The format of the presentation did not affect juror perceptions of witness credibility. The same was true of monetary award and information retention. Particular care should be taken in interpreting this last finding. Every juror was explicitly told to pay close atten-

⁸⁹See note 76 *supra*.

⁹⁰Responses fell .6609 micromhos.

⁹¹Responses fell .0867 micromhos.

⁹²Responses went up .2490 micromhos in the nonemotional version and .5000 in the emotional.

⁹³See text in paragraph preceding note 78 *supra*.

tion to the tape which was, at most, 17 minutes long. Only a limited amount of information could be presented in this time, and it may be that the measures of retention were too crude to pick up subtle differences.

All analyses were performed separately for the Lions Club and student samples. The Lions Club sample was too small to permit us to draw firm conclusions. Nevertheless, in the emotional version of the testimony, the black-and-white format was consistently found to result in higher arousal levels than the color format. No statistically significant difference between the two formats was found for the nonemotional version of the testimony.

Separate analyses were also performed for males and females. Males displayed an arousal level of between one and two micromhos higher than females during most time frames. Still, the basic finding was the same for both groups: black-and-white resulted in consistently greater arousal.

V. GENERAL CONCLUSIONS

Within the confines of the juror responses dealt with in these studies, there is no evidence to indicate that the introduction of videotape presentations has any drastic or deleterious effect on courtroom communication between trial participants and jurors. Hence, there exist no strong grounds for arguing that videotape will exercise a negative impact on juror decision making. The first study of the *Nugent v. Clark* group (Group I) indicated that when compared with their counterparts who participated in a live trial, jurors who view a videotape trial arrived at similar judgments, had similar perceptions of the trial participants, expressed similar levels of interest and motivation, and retained at least as much of the trial-related information. Partially contradictory results were obtained from the first study of the information retention group (Group II), where the data indicated that jurors who watched 1 hour of videotape testimony retained more trial-related information than jurors who watched the same testimony live.

There are at least two possible explanations for this apparent discrepancy, one procedural and one substantive. Procedurally, the number of possible controls and refinements in the instrument used to measure juror retention of information was somewhat greater in the studies of Group II. This is not to deny the care taken in developing the questionnaire used in the Group I study comparing the live and videotape trials, but merely to recognize that the shorter time period (1 hour as opposed to 4 hours) plus the experience gained in earlier research probably resulted in a more precise retention instrument for the comparison of live, color, and black-and-white testimony. To the extent that this is true, the likelihood of detecting differences in retention was increased.

Substantively, of course, it is possible that the relationship be-

tween modes of presentation and amount of information communicated is both complex and nonlinear. In the *Nugent v. Clark* studies, we were dealing with an "information package" that spanned more than 4 hours and a number of witnesses. In the information retention studies of Group II, we were concerned with an hour of testimony by a single witness. Perhaps some combination of factors, such as novelty or interest, confers an initial advantage on videotape testimony, but after a certain period of time the influence of these factors dissipates and information retention levels off and equalizes for the two modes of presentation. Assessment of this possibility awaits future research which manipulates time intervals over a larger range of values.

The second *Nugent v. Clark* study indicated that split-screen and full-screen videotape presentations are equally effective for use in presenting evidence in court. Save for perceptions of attorney credibility, which differed because of the differing modes of presentation used by the two attorneys, the two taping systems do not appear to produce different effects on juror responses.

Although the third *Nugent v. Clark* study indicated that there is no significant influence on juror response caused by the inclusion or deletion of inadmissible testimony, we still suspect that such an effect does exist. Several possible reasons for the failure to obtain significant results in that study have been suggested and those problems may be overcome in future research.

Probably the most intriguing finding of any of the studies reported herein was presented in the second and third information retention studies (Group II) and in the emotional arousal studies (Group III). The finding indicates that jurors not only retain more trial-related information when the presentation is in black-and-white rather than color, but they are also more emotionally aroused by a black-and-white presentation. While speculative explanations for this finding have been offered, further research is needed to evaluate these competing interpretations. One practical observation does, however, seem in order: none of the research suggests that anything is lost in juror information retention or juror emotional involvement by using black-and-white taping systems, rather than their more expensive color counterparts.

It was noted rather consistently that the color format enhances the credibility of witnesses, particularly witnesses with strong presentational skills. This feature of the color medium is potentially a mixed blessing for the legal system. On the positive side, it may be that the added peripheral information acquired from color permits jurors to spot dishonest witnesses more readily.⁹⁴ On the negative side, however, our results indicate that color may maximally enhance the impact of a skilled presentation of information. Stated differently, two witnesses presenting identical testimony exert a differing

⁹⁴We are presently conducting a study designed to assess this possibility.

impact on jurors because of differences in their presentational skills. Naturally, this is bound to be true to some extent for any medium, be it live testimony, black-and-white videotape testimony, or testimony taped in color. But to the extent that a color presentation heightens this effect, it perhaps places a greater premium on variables that should not be central to the decision making process of jurors. A color presentation may magnify the importance of *image* at the expense of information.