Scripts for Typical Crimes and their Effects on Memory for Eyewitness Testimony

VALERIE FISHER HOLST and KATHY PEZDEK
Claremont Graduate School

SUMMARY

The effect of scripts on memory for information presented as eyewitness testimony in a mock criminal trial was tested. In Experiment 1 the nature of people’s scripts for three types of robberies was examined. There was a high rate of agreement in a heterogeneous sample of 247 people regarding the actions that comprise a typical robbery of each type. In Experiment 2 the effects of people’s robbery scripts and the effects of leading questions by the attorney on memory were probed. An audio-recording of a mock trial was presented in which some of the script-relevant actions from Experiment 1 were stated by the eyewitness and some were unstated. One week later a significant number of unstated items were recalled and recognized as having been stated. Further, unstated actions mentioned in ‘misleading’ questions by the attorney were recalled as having been stated by the eyewitness, and cautionary instructions warning of the possible misleading effect of the attorney’s questions did not significantly reduce this misleading effect. Thus, people have scripts in memory for typical robberies, and when such scripts are activated people incorporate into their memory script-relevant information not presented, along with information presented. Moreover, most people do not differentiate between information presented by the eyewitness versus the attorney. These results have practical implications for the way jurors process and remember trial testimony.

When jurors deliberate at the end of a trial, they are required to recall volumes of information presented during the trial, compare their memories with those of the other jurors, and then make a decision based on the facts in the collective memory of the jury. The information processing that occurs during a typical trial, therefore, makes significant demands on memory.

This study examines the effect of scripts on memory for information presented during a mock criminal trial. Schank and Abelson (1977) proposed that our knowledge is organized around hundreds of stereotypic situations composed of routine activities. These stereotypes of situation–action routines have been called ‘scripts’. When we encounter a familiar routine we activate the relevant script in our memory and comprehend the new event by applying the structure and content of the script to the new event. Many studies have demonstrated that scripts are used to comprehend and organize material in memory (Mandler, 1984; Pezdek, Whetstone, Reynolds, Askari, and Dougherty, 1989; Taylor and Crocker, 1981).

Graesser and Clark (1985) have suggested that one function of scripts is to provide the background knowledge that is relevant for generating inferences. When individuals comprehend statements in prose, they construct a cognitive representation.

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that contains the information presented, as well as a large number of inferences. For example, advertisers often imply information rather than make explicit claims about their products. Harris (1977) found that subjects who listened to commercials frequently drew false inferences about the advertised products, even when they were previously given information about the difference between asserted and inferred statements.

While 'script theory' can account for many of the efficiencies in memory and comprehension processes, it also predicts certain patterns of error. Bower, Black, and Turner (1979) tested the notion that when people remember short passages of scripted events they use the underlying script to fill in gaps in actions that were not explicitly presented. As a result, people tend to incorrectly recall (Experiment 3) and recognize (Experiment 4) script-relevant information that was not presented in the text.

Although these intrusion errors that result from activating relevant scripts do not cause a major problem in most everyday memory situations, they can have serious consequences in the case of memory for information presented during a trial. The present study examines several factors that affect memory for eyewitness testimony in a mock criminal trial. If people have scripts for typical crimes, and if they use these scripts to comprehend and remember information presented during a trial, then their memory could erroneously include stereotypic scripted information that was not actually presented during the trial. This is particularly important when the critical element of the crime is assumed to have occurred, such as 'took the money' or 'pulled out a gun'. Also, knowledge of the nature of the scripts that people have for criminal crimes may be valuable both to defence and prosecuting attorneys, as there may be advantages to tailoring one's presentation to either conform to or depart from the underlying script action sequence.

In addition, as reported by Barsalou and Sewell (1985), people tend to reorder the sequence of events presented in an attempt to make it conform to the scripted sequence in memory. If jurors similarly reorder information presented in the eyewitness's testimony, this may alter the impact of factors in mitigation or aggravation. For example, if part of a juror's script for robbery is to 'pull out a gun' before 'threatening the people', although the evidence suggests that the gun was pulled after the robber verbally threatened the people, their memory for the sequence of actions may be altered to conform to their script. The result may be a verdict that is based on armed robbery and aggravated assault rather than just armed robbery.

Given that scripts have already been shown to affect memory for a range of everyday activities including what happens in a restaurant, a doctor's office, a lecture hall, a grocery store, etc. (Bower et al., 1979), why study the effects of scripts on memory for crimes? The major reason is that people have frequent personal experience with the types of activities studied previously, but most people have no personal experience with robbery. The scripts that people develop for what happens, for example, in a restaurant are predicted to result from multiple experiences in restaurants. Although people certainly learn from books, films, and television programmes (e.g., Bandura, Ross, and Ross, 1963) about events that they have no personal experience with, such as being robbed, it is an empirical question whether scripts operate in the same manner for such events as for events personally experienced.

This study also addresses the extent to which jurors may be misled by leading questions from the attorney, and whether specific instructions can minimize this mis-

leading effect. In other words, when listening to the questions asked by attorneys and the answers offered by witnesses, jurors can be confused between what the witness actually said and what was implied in the question asked. Given the question/answer format of the testimony of eyewitnesses in a trial, it is important to know the extent to which jurors remember information in the attorney's questions along with the information in the witness's answer.

In a relevant study, Loftus and Palmer (1974) had subjects view a film of a two-car accident and then complete a questionnaire about what they had seen. There were four versions of one critical question. Some subjects were asked, 'About how fast were the two cars going when they contacted each other?' In the three other versions the words hit, bumped, and smashed were substituted for contacted. The word contacted yielded an average speed estimate of 31 m.p.h., whereas the words hit, bumped, and smashed produced estimates of 34, 38, and 41 m.p.h., respectively. The wording of the post-event question significantly affected memory for the severity of the accident.

Further, subjects in the above study returned one week later and were asked, 'Did you see any broken glass?' Although there was no broken glass in the film, 32 per cent of the subjects who had answered the 'smashed' question a week earlier, but only 14 per cent of those who had answered the 'hit' question, reported having seen broken glass (Loftus and Palmer, 1974). One interpretation of this finding is that the information about the violence of the collision inferred from the first question activated a script for severe automobile accidents. The occurrence of broken glass was then generated by the script and incorporated into the memory of the accident. The script apparently contains the information that more severe car crashes typically involve broken glass.

Post-event information, in addition to altering memory, can also cause people to incorporate discrepant information (Pezdek, 1977, 1980) or completely false information (Loftus, 1975) into memory. Loftus (1975) had subjects view a videotape of an automobile accident, followed by questions designed to introduce false information. Subjects were asked either 'How fast was the white sports car going when it passed the barn while travelling along the country road?' or the same question but without the words 'when it passed the barn'. There was, in fact, no barn in the videotape. When subjects were questioned about the accident a week later, 17 per cent of those who had heard the question mentioning the barn reported seeing a barn in the videotape, compared to only 3 per cent of those who had not heard the barn mentioned. The above two studies demonstrate that a witness's memory for an event can be influenced by the kinds of questions that are asked subsequent to the event, in that information implied by post-event questions can be incorporated into memory.

This study includes two experiments. Experiment 1 examines the nature of the scripts that people have for three variations of the crime of robbery—a convenience store robbery, a bank robbery, and a mugging. Three types of robberies were included to enhance the generalizability of the results of the study; however, no differences were predicted across the robbery types. To establish whether people have similar beliefs about the actions that constitute each type of robbery, subjects were asked to list all of the actions they believe occur in a typical robbery of each of the three types. It was anticipated that across individuals a similar sequence of actions would be mentioned in describing a typical robbery of each type. Scripted, or schemat-
relevant, actions were defined as those actions that were mentioned by at least 25 per cent of the subjects. The scripted actions revealed in Experiment 1 were used to develop the transcripts of the mock trials presented to subjects in Experiment 2.

Experiment 2 examines the effects of people’s robbery scripts and the effects of leading questions by the attorney on memory for a specific robbery presented as a transcript of a mock trial. Each participant listened to an audiotape-recorded transcript of a mock trial in which the prosecutor questions an eyewitness to a robbery. The recordings were made by drama students who read the parts of the prosecuting attorney, defense attorney, judge, and witness.

Three versions of the transcripts for each of the three types of robberies were prepared—a neutral version, a leading question version, and a leading question plus instructions version. Each transcript followed the script information established in Experiment 1 except that some scripted actions were explicitly stated by the eyewitness and others were deliberately unstated by the eyewitness. In the neutral version of each transcript, a target set of scripted actions was not mentioned in the mock trial. Further, the attorneys did not ask any leading questions of the eyewitness regarding this information. In the leading question version the target set of scripted actions was not mentioned by the eyewitness in the transcript, but the attorneys asked questions or made remarks that mentioned these unstated actions.

Participants in the leading question plus instructions version heard the same information as in the leading question version, but in addition they received instructions prior to hearing the testimony, about the potential distorting influence of leading questions on memory. Instructions to offset the misleading effect of attorneys’ questions were included to test the effectiveness of the jury instructions that some judges offer along these lines. Kaplan and Schersching (1980), for example, identified several types of bias that affect the judgements of juries, and suggested that biases may be reduced by instructing jurors and judges to ignore their predispositions and attend only to the evidence. However, this may be difficult for jurors in a trial situation where witnesses, defense, and prosecution, seem to be presenting conflicting evidence. As information becomes more complex, jurors may increasingly rely on their scripts to aid them in retaining the information presented.

In several studies it has been reported that warning people about the possible effects of misleading information can produce some resistance to the suggestive effect of such information (e.g. Christiaansen and Ochalek, 1983; Greene, Flynn, and Loftus, 1982). However, in these previous studies a methodology was used that involved having people view a slide sequence followed by a possibly suggestive narrative and then a test on memory for the slides. The misleading information was always presented in the narrative which followed the slide sequence as a separate event in the experimental session. In the present study the potentially misleading information was presented in the attorney’s question which immediately preceded the to-be-remembered information in the witness’s answer. Because the potentially misleading information was perceived before the true information in the witness’s answer, it is predicted to have a stronger influence on memory than if it followed.

On the basis of these procedural differences between the present study and the earlier-cited studies, in the present study no memory differences were expected between the leading question and leading question plus instructions conditions. It is predicted that people retain explicitly stated information along with the unstated information activated by the relevant script, such that the two types of information are indiscernible in memory. Consistent with this prediction, Harris (1977) and Harris, Teske, and Ginn (1975) reported that subjects generally recall implications as facts even when specifically given prior instructions not to.

In this study, one week after hearing the mock trial, participants were asked to complete a free-recall test and then a recognition test. The recognition test included three types of items—stated (scripted actions presented in the witness’s testimony), unstated (scripted actions not presented in the witness’s testimony), and filler items (non-scripted but plausible actions not presented in the testimony).

The primary issue in this study is whether, in remembering a reported sequence of actions, individuals retain script-relevant information that was not stated in addition to script-relevant information that was stated. If subjects rely on their underlying scripts regarding robberies in remembering the witness’s testimony in the present study, then a significant number of unstated items will be recalled, and the recognition accuracy will be lower for unstated items than for filler items. No significant differences in recall or recognition of stated items are predicted among the three versions.

Second, it is predicted that subjects will incorporate script-relevant information presented in the attorney’s questions into their memory for the witness’s testimony. As a result, it is predicted that recall will be significantly higher and recognition accuracy significantly lower for unstated items in the leading question version than in the neutral version, with no difference in the recall or recognition of stated items between these two versions. Finally, as instructions do not appear to influence people’s ability to distinguish implications from facts, recall and recognition rates for both stated and unstated items are predicted to be similar in the leading question and leading question plus instructions version of each transcript.

EXPERIMENT 1

In Experiment 1 the content of people’s scripts for three variations of the crime of robbery was examined. Two hundred and forty-seven participants were asked to identify the actions that constitute a typical instance of either a convenience store robbery, a bank robbery, or a mugging. The data gathered in Experiment 1 were then used to generate materials for Experiment 2.

Method

Participants

The participants were 247 students enrolled in six introductory psychology classes at San Bernardino Valley Community College. Seventy-three students in two classes generated the convenience store robbery script; 85 students in two classes generated the bank robbery script; and 89 students in two classes generated the mugging script. The sample was a heterogeneous one. Across all groups the mean age of the students was 26, with 66 per cent females and 34 per cent males. The racial composition was Caucasian (49 per cent), Hispanic (25 per cent), Black (18 per cent), Asian (6 per cent), and others (2 per cent). In addition, 51 per cent had been called for jury duty at least once.
Procedure
Students participated as part of a lecture session in six different classes. They received a sheet of paper with appropriate instructions for one of three types of crimes. For example, participants who generated the script norms for the bank robbery received the following instructions:

Please write a list of actions describing a typical act of robbery. We are interested in what you think are the most common or typical actions that occur in a robbery. Start your list with the first step of the robbery and end the list with the last step. Include about 20 actions and put them in the order you think they would occur. To get you started, assume that the robbery takes place in a bank. Please write your list on this sheet.

The instructions are identical to those used by Bower et al. (1979) except for the reference to the particular criminal event. Subjects were given 12 minutes to complete their list.

Results
Two independent raters coded the data for each of the three versions of robbery by first identifying actions listed by at least two subjects and then tallying frequencies for these actions. Actions that served similar functions but were worded in terms of different details were combined into one action category for the purpose of collecting the script norms. For example, 'get in getaway car' (41 per cent), 'drive away in a normal manner' (31 per cent), and 'drive away as fast as possible' (15 per cent) were combined and listed in the same category, 'drive away in getaway car'.

Using the criterion of Bower et al. (1979), scripted actions for each crime were defined as actions mentioned by at least 25 per cent of the subjects who described that crime. The list of scripted actions for each crime is presented in Tables 1, 2, and 3, with the percentage of participants who mentioned each action indicated. These are listed in the chronological order in which they were most commonly mentioned. As can be seen in these tables, there was a high rate of agreement in the heterogeneous sample of 247 people, confirming the notion that people hold common views about the actions that comprise a typical robbery of each type. At least 25 per cent of the people mentioned the 12 actions in the convenience store robbery, 17 actions in the bank robbery, and 13 actions in the mugging, most of these actions mentioned by at least 50 per cent of the participants.

Viewed another way, if there was maximum diversity among the scripts of the participants, then most actions would be mentioned by very few people. For each type of robbery the ratio of the number of unique mentions (items mentioned by only one person) relative to the total number of actions mentioned was calculated. These ratios were 18/846 (2.1 per cent) for the convenience store robbery, 42/1399 (3.0 per cent) for the bank robbery, and 44/1026 (4.3 per cent) for the mugging. As can be seen, few of the actions generated were unique, and most were common to a significant number of the participants. Together these data confirm the high rate of agreement among subjects for the actions that comprise each type of robbery.

One of the issues in the present study is whether scripts operate in the same manner for events that people have knowledge of but little or no personal experience with; that is, being robbed. Participants in Experiment 1 were asked where they thought...
their scripts for robbery originated. As predicted, most had no personal experience with robbery. Averaged across the three types of robberies, the most frequently

| Table 3. Empirical script norms and percentage levels for mugging. Experiment 1 (n=89) |
|-----------------------------------|-----------------------------------|
| Action                            | Percentage of subjects mentioning action |
| Make a plant (−)*                 | 85                                |
| Act/dress casually (S)            | 34                                |
| Look around (S)                   | 74                                |
| Select a victim (−)               | 76                                |
| Wait for an opportunity to mug (U)| 60                                |
| Approach the victim (S)           | 89                                |
| Flash weapon (U)                  | 32                                |
| Threaten victim (S)               | 37                                |
| Demand money/valuables (S)        | 32                                |
| Use force (U)                     | 95                                |
| Take money/valuables (U)          | 85                                |
| Leave the scene (S)               | 99                                |
| Count/spend stolen goods (−)      | 43                                |

*Notation indicates items from Experiment 1 that were selected to be stated (S), unstated (U), or not included (−) in Experiment 2

mentioned sources of information were television shows (50 per cent) and the news media (23 per cent). Sixteen per cent of the participants reported movies and only 12 per cent mentioned personal experience as the source of their knowledge about robbery. Of the 28 people who cited personal experience as the primary source of their knowledge about robbery, seven had witnessed a robbery or mugging, five knew a victim of a mugging, six were victims of a robbery or mugging themselves, four worked in law enforcement, four knew a robber, and two had been the perpetrator of a mugging.

EXPERIMENT 2

The findings of Experiment 1, along with the recently reported findings of List (1986) regarding people’s scripts for shoplifting, confirm that there is a high degree of similarity in the scripts that people have for the sequence of actions that comprise a convenience store robbery, a bank robbery, and a mugging. Experiment 2 examined the effects of people’s robbery scripts and the effects of leading questions by the attorney on memory for a specific robbery presented as a transcript of a mock trial.

Method

Participants and design

The participants were 231 students in 12 different psychology classes at San Bernardino Valley Community College and Chaffey Community College. Each of 12 classes was assigned to one condition in the 3×3 factorial design defined by between-subjects factors of transcript version (neutral, leading question, or leading question plus instructions) and type of robbery (convenience store robbery, bank robbery, or mugging). In order that approximately equal numbers of people participate in each of the nine conditions, additional classes were recruited such that, for three conditions, two smaller classes rather than one larger class were included.

The mean age of the participants was 23 with 67 per cent females and 33 per cent males. The racial composition was Caucasian (57 per cent), Hispanic (17 per cent), Black (13 per cent), Asian (8 per cent) and others (5 per cent). In addition, 37 per cent had been called for jury duty at least once.

Materials and procedure

Nine facsimile transcripts of a mock trial were prepared; three versions for each of the three types of robbery. The transcripts consisted of a prosecuting attorney questioning an eyewitness to a robbery. The eyewitness was the cashier at the convenience store, the teller at the bank, or the woman who was mugged. The eyewitness answered questions about the suspect’s activities before and during the robbery. Objections from the defence counsel and rulings by the judge were interspersed to make the proceedings appear similar to what jurors would hear during a real trial. These interspersed remarks were taken from the transcript of a real robbery trial. Each transcript was recorded on audiotape by four college theatre majors who read the parts of the district attorney, public defender, judge, and eyewitness.

The mock trial transcripts lasted an average of six minutes on the audio tape. The trial was in question-and-answer format and followed the sequence of events established in Experiment 1. From the set of scripted actions generated in Experiment 1, four actions for each type of robbery were selected to be unstated by the eyewitness in the transcript and the remaining scripted actions were stated by the eyewitness. The exception was that some actions generated in Experiment 1 could not be conveyed through the eyewitness’s testimony. These items were not included in the transcript. The items from Experiment 1 that were selected to be stated, unstated, or not included in the transcripts in Experiment 2 are indicated in Tables 1, 2, and 3. The remaining content of each transcript filled in background information about, for example, the setting of the robbery and the appearance of the robber. The mean percentage of subjects in Experiment 1 who mentioned the items selected to be stated (M = 50.5 per cent) and unstated (M = 47.3 per cent) in Experiment 2 did not significantly differ. Nor did these means differ for each of the three types of robberies separately. Thus, the items selected to be stated and unstated in Experiment 2 were equally likely to be included in people’s scripts for each type of robbery.

Three versions of each transcript were prepared—a neutral version, a leading question version, and a leading question plus instructions version. Each transcript followed the scripted information established in Experiment 1 except that some scripted actions were explicitly stated and others were unstated. In the neutral version of each transcript a target set of four scripted actions was not mentioned in the transcript by the attorney or the eyewitness; these were the unstated actions. In the leading question version the district attorney asked the eyewitness questions or made remarks that were intentionally misleading with regard to the target set of four unstated actions; however, the eyewitness did not include the unstated actions in her testimony. The leading question plus instructions version contained the same

Because classes but not individuals were randomly assigned to conditions in this study, there is some need to provide evidence that the classes were comparable in terms of memory ability. This evidence is found in the result that recall and recognition of stated items did not significantly differ as a function of transcript version, although the critical difference in recall and recognition of unstated items did occur.
information as the leading question version, but subjects in this condition received instructions prior to the presentation advising them of the distorting effects of leading questions on memory. These instructions were the following:

You are going to make your decision of guilt or innocence based on the evidence presented in this trial. You should keep in mind that the evidence you are required to consider consists of information presented in the answers of the witness and not in the questions posed by attorneys. Therefore it is important to separate out which information is actually presented by the witness and which information is implied by the attorneys. This is important because leading questions presented by attorneys have been found to have a distorting influence on memory.

So listen carefully to what is actually stated by the witness in this trial.

Prior to the presentation of the mock trial, participants were instructed to imagine that they were jurors in a criminal trial while they carefully listened to the recording to follow. Participants in the leading question plus instructions condition heard additional instructions at this point. After the presentation, participants were asked to perform an irrelevant memory task superflously related to the presentation. This test consisted of several short-answer questions on the previously heard material but not relevant to the study. This step was included to give the impression that the study was completed.

One week after hearing the transcript of the mock trial, participants completed a free-recall test and a recognition test. In the recall test, participants were asked to recall as many actions as they could from the witness’s testimony. They were given a blank sheet of paper and five minutes to complete this task. The recognition test contained 12 statements relevant to the robbery transcript heard by each participant—four stated scripted actions, four unstated scripted actions, and four filler items. Filler items were non-scripted actions that were plausible but were not heard; for example, ‘The mugger had alcohol on his breath’. Filler items were included to test if the intrusions and distortions in memory were specifically based on underlying scripts rather than being more general memory flaws. For each recognition test item, participants first responded ‘yes’ or ‘no’ as to whether that action was true based on the witness’s testimony, and then they rated their recognition confidence on a scale from 1 (completely guessing) to 5 (absolutely certain).

Results

The free-recall and recognition data were analysed separately. The significance level for all analyses was \( p < .05 \).

Free-recall

The free-recall data were coded according to the percentage of stated and unstated scripted items recalled by each participant. These data, along with standard deviations, are reported in Table 4 as a function of type of robbery and transcript version. The recall data are reported as percentages, because although the maximum number of unstated items recalled for each type of crime was four, the number of stated items included in the transcripts of the three types of robberies varied.

If subjects rely on their underlying scripts regarding robberies in remembering the witness’s testimony in the present study, then a significant percentage of unstated items will be recalled. This prediction was confirmed, as the mean percentage of unstated items recalled (.20) was significantly greater than the correct response of zero, \( t(230) = 16.65 \). The 95 per cent confidence interval for this mean was .18-.23. One might argue that the number of unstated items recalled (.81) should be compared with the number of script-relevant or even script-irrelevant intrusion errors. The number of script-relevant (.38) and script-irrelevant (.25) intrusion errors were well outside of the 95 per cent confidence intervals for the number of unstated items recalled (.71-.90).

As a stronger test of the above prediction, the mean percentage of unstated items recalled in the neutral condition (only .15) was compared with the correct response of zero. This comparison also tests if the recall of unstated material resulted from intrusions from script-relevant information in memory or from information included in the leading questions. This difference was also significant, \( t(171) = 3.56 \). The 95 per cent confidence interval for this mean was .13-.17. Thus, the recall of unstated material resulted from intrusions from script-relevant information in memory and not only from information in the leading questions.

The second prediction regarding the recall data was that participants would recall a significantly higher percentage of unstated items in the leading question version than in the neutral version, with no difference in the recall of stated items between the leading question version and the leading question plus instructions version. A 3 (type of robbery) \( \times 3 \) (transcript version) analysis of variance yielded a significant main effect of transcript version on recall of unstated items, \( F(2,228) = 6.52, MSe = 322 \). Neither the main effect of robbery type nor the interaction of robbery type by transcript version were significant. Participants who heard the neutral version recalled significantly fewer unstated items (15.0 per cent) than those who heard the leading question version (25.8 per cent), \( t(228) = 3.61 \), but recall of unstated items did not differ between this latter condition and the leading question plus instructions version (20.4 per cent). In other words, people in the leading question condition recalled an average of one out of the four scripted actions that were not actually presented by the witness. This finding is consistent with the hypothesis that participants incorporated script-relevant information that was presented in the attorney’s
questions into their memory for the witness's testimony. The instructions warning them of the potential distorting influence of the attorney's questions did not significantly reduce the misleading effect. However, the finding that the percentage of untrusted items recalled in the leading questions plus instructions condition (20.4 per cent) was less than that in the leading questions condition (25.8 per cent) and not significantly greater than in the neutral condition (15.0 per cent) does suggest that the instructions may have served a weak although non-significant role in mitigating the effect of leading questions.

Recall of the stated items was analysed next. No significant differences were predicted in the recall of stated items among the various conditions. A 3 (type of robbery) × 3 (transcript version) analysis of variance yielded only a significant main effect of type of robbery, $F(2,228) = 15.71$, $MS_e = 483.12$. As the recallability of the stated material was not equated across the three robbery transcripts, this significant effect, although not predicted, is not surprising.

Recognition

There were three types of recognition items—stated actions, untrusted but scripted actions, and filler actions. The mean numbers of correctly recognized items (out of four possible), along with standard deviations, are presented in Table 5 as a function of item type and transcript version. If participants activate their general robbery scripts when processing the witness's testimony in the present case, then it would be expected that script-relevant information that was not stated by the witness would be inaccurately recognized as old. According to this prediction, untrusted items would be recognized significantly less accurately than filler items, but there would be no difference between recognition accuracy for stated and filler items.

### Table 5. Mean number of correctly recognized stated, untrusted, and filler items by transcript version, Experiment 2 ($n=231$)

<table>
<thead>
<tr>
<th>Item type</th>
<th>Neutral</th>
<th>LQ</th>
<th>LQ with instructions</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stated</td>
<td>3.09 (0.87)</td>
<td>3.15 (0.85)</td>
<td>3.14 (0.84)</td>
<td>3.13 (0.85)</td>
</tr>
<tr>
<td>Untrusted</td>
<td>1.58 (0.99)</td>
<td>1.51 (0.78)</td>
<td>1.46 (0.86)</td>
<td>1.52 (0.88)</td>
</tr>
<tr>
<td>Filler</td>
<td>3.08 (1.01)</td>
<td>3.23 (0.89)</td>
<td>3.32 (0.81)</td>
<td>3.21 (0.90)</td>
</tr>
</tbody>
</table>

A 3 (item type) × 3 (transcript version) × 3 (robbery type) analysis of variance was conducted on the recognition data. The main effect of item type was highly significant $F(2,201) = 265.89$, $MS_e = .745$. As predicted, untrusted items ($M = 1.52$) were recognized significantly less accurately than filler items ($M = 3.21$, $t(230) = 20.83$), but there was no difference between the recognition accuracy for filler items and stated items ($M = 3.13$). The absence of a significant interaction of item type and transcript version ($F < 1.0$) indicates that this effect was consistent across the three versions. In particular, as can be seen in the first column of Table 5, the pattern of poor recognition of untrusted compared to stated and filler items was clear in the neutral condition, suggesting that untrusted items are falsely recognized because of intrusions from script-relevant material in memory and not only from information in the leading questions.

The only other significant result from this analysis was the interaction of item type and crime, $F(4,444) = 2.56$, $MS_e = .745$. This interaction resulted from differences in recognition accuracy of filler items, but not stated or untrusted items, among the three types of robbery.

Confidence as well as accuracy measures were collected on the recognition data. The mean confidence ratings for correctly and incorrectly recognized stated, untrusted, and filler items are presented in Table 6. As can be seen in Table 6, whereas participants were significantly more confident in their correct than incorrect responses for stated and filler items, with untrusted items they were significantly more confident in their incorrect decisions that untrusted items had been stated than in their correct decisions that untrusted items had not been stated. This result emphasizes the strength of the effect of script intrusions on memory.

### Table 6. Mean confidence ratings* for correctly and incorrectly recognized stated, untrusted, and filler items, Experiment 2

<table>
<thead>
<tr>
<th>Item type</th>
<th>Correct</th>
<th>Incorrect</th>
<th>$t$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stated ($n = 137$)</td>
<td>4.05 (0.82)</td>
<td>&gt; 3.27 (1.13)</td>
<td>7.31**</td>
</tr>
<tr>
<td>Untrusted ($n = 199$)</td>
<td>3.59 (1.17)</td>
<td>&lt; 3.96 (0.87)</td>
<td>4.03**</td>
</tr>
<tr>
<td>Filler ($n = 104$)</td>
<td>3.59 (0.93)</td>
<td>&gt; 3.15 (1.12)</td>
<td>3.51*</td>
</tr>
</tbody>
</table>

* Five-point scale (1 = guessing; 5 = sure).
Figures in parentheses are standard deviations.

$p < .01$; **$p < .001$.

### GENERAL DISCUSSION

Together, the results of Experiments 1 and 2 provide evidence that people do share common scripts for three different types of robberies, and these scripts affect their memory for eyewitness testimony in a mock trial of a particular robbery. In Experiment 2, participants recalled a significant number of untrusted items as having been stated, and recognition accuracy was lower for untrusted items than for filler items. These findings are consistent with the results of other studies (e.g., Bower et al., 1979) that have examined the effects of scripts on memory for a range of everyday activities that people have frequent personal experience with, and further suggest that personal experience is not necessary for the development of scripts in memory. However, as would be expected, the scripts generated for robberies in Experiment 1 in the present study include fewer actions than do the scripts for the more frequently experienced activities used in other studies in which the same procedure and criteria for inclusion were used.

The effect of scripts on memory for typical crimes is further bolstered by the confidence data obtained in the present study. Participants were significantly more confident in their correct than incorrect responses for stated and filler actions. However, untrusted actions were apparently so real in their memory that they were actually significantly more confident deciding that these actions had been stated than not.
This result is especially compelling given that, in numerous eyewitness studies, mock jurors find confident eyewitnesses significantly more credible than less confident eyewitnesses regardless of the eyewitness’s accuracy (e.g., Lindsay, Wells, and Rumpel, 1981; Wells, Lindsay, and Tousignant, 1980). If this effect generalizes to the credibility ascribed to confident jurors by their fellow jury members, a confident juror may be more likely to persuade the others that a scripted action occurred when in fact it did not.

The above findings regarding the effects of scripts on memory are particularly egregious given that the unstated items that subjects recalled and falsely recognized included, for example, the action ‘pulled out a gun’ in each of the three types of robberies. If, in a real trial, jurors recall that the robber was armed when there was no evidence presented that he was armed, this could affect their decision in the guilt phase regarding whether the offence was robbery or armed robbery, as well as their judgement of the severity of the crime in the sentencing phase.

The second issue addressed was the extent to which people incorporate script-relevant information that was presented in the attorney’s questions into their memory for the eyewitness’s testimony. As predicted, unstated actions were more likely to be recalled in the leading question and the leading question plus instructions versions than in the neutral version. It appears that when the underlying robbery script is activated, participants remember information that is in their script that was not presented, as well as script-relevant information that was presented, but do not distinguish in memory whether the information was presented by the eyewitness or the attorney.

It was also predicted in Experiment 2 that recognition of unstated actions would be more accurate in the neutral condition than in the two leading question conditions. However, recognition accuracy for unstated actions was low ($M = 1.52$ out of four) and did not differ among the three versions of the transcript. There appears to have been a floor effect in recognition accuracy for unstated actions among these three conditions in the present study. It is suggested that the script effect had a sufficiently powerful impact on recognition memory to override the effect of leading questions.

The practical implications of these results regarding misleading information are quite important. These findings suggest that an attorney can ‘plant’ information in the jurors’ memories by including that information in his/her questions, regardless of what answers the eyewitness gives to the questions. Further, this misleading information will be just as real to the jurors as information that was actually stated by the eyewitness.

What can be done about the hazard of attorneys presenting misleading information to jurors through their comments and questions? Following Kaplan and Schersching (1980), one might use these findings to suggest that judges educate juries through cautionary instructions. However, the cautionary instructions used in the present study did not have this desired effect. Participants in the condition in which misleading questions were combined with cautionary instructions also recalled more unstated actions than those who heard the neutral version of the transcript. The effect of misleading questions apparently is not a conscious one that can be remedied. If the effect of misleading questions is to be limited, this can be done only at the source—by placing restrictions on the attorneys when they attempt to introduce misleading information into the jury’s memory.