Recall of Previously Unrecallable Information following a Shift in Perspective

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College undergraduates read a story about two boys playing hooky from school from the perspective of either a burglar or a person interested in buying a home. After recalling the story once, subjects were directed to shift perspectives and then recall the story again. In two experiments, subjects produced on the second recall significantly more information important to the second perspective that had been unimportant to the first. They also recalled less information unimportant to the second perspective which had been important to the first. These data clearly show the operation of retrieval processes independent from encoding processes. An analysis of interview protocols suggested that the instruction to take a new perspective led subjects to invoke a schema that provided implicit cues for different categories of story information.

It has been known since the turn of the century that the important elements of a prose passage are more likely to be learned and remembered than the unimportant elements (Binet & Henri, 1894; Thieman & Brewer, in press). Recent years have seen increasingly precise formulations of the notion of importance in terms of story schemata (Mandler & Johnson, 1977; Rumelhart, 1975), propositional analysis schemes (Kintsch, 1974), and text grammars (Grimes, 1975; Meyer, 1975; Van Dijk, 1972). These systems yield structural descriptions of the content of a text, but they do not pinpoint the mechanisms by which importance has its effect. Possible explanations for the primacy of important text information abound in the literature. However, these explanations are notable for their informality and vagueness, and there has not yet been research that permits a confident choice among competing accounts.

In this paper we will enumerate possible explanations for the primacy of important text information. The explanations are of two classes: those that suppose processes acting at the time of encoding are responsible and those that presume that the effect is due to processes acting later when information is retrieved and used. Next we shall summarize findings from previous research, paying special attention to evidence that would seem to support a distinction between encoding and retrieval. Finally we will report two experiments on possible retrieval mechanisms.

Our treatment will be couched in terms of schema theory. Schemata are abstract knowledge structures whose elements are other schemata, and slots, placeholders, or variables which can take on a restricted range of values (Minsky, 1975; Rumelhart & Ortony, 1977; Schank & Abelson, 1975). A schema is structured in the sense that it indicates typical relationships among component elements. In the simplest case the reader or listener will have a preformed schema adequate to sub-
sume (Ausubel, 1963) a text. The encoded representation of such a text will consist of the subsuming schema in which the slots have been assigned specific values, that is, are instantiated (Anderson, Pichert, Goetz, Schallert, Stevens, & Trollip, 1976) with the particular information in the message. A person will have the subjective sense that a passage has been comprehended when there is a good match between the information presented and the slots in the schema.

A schema at the level required to subsume a text will contain embedded subschemata (Rumelhart & Ortony, 1977). We shall assume that typically the subschemata form a hierarchy, or at least can be represented hierarchically without doing great violence to the interrelationships. The position of a subschema in the hierarchy reflects its importance. The significant text elements are the ones that instantiate slots in high-order subschemata. In this fashion, schema theory provides an immediate gloss on the primacy in recall of important information. The explanation is saved from being circular because, at least for stereotyped genre such as folk tales, children's stories (Rumelhart, 1975), and detective novels (Cawelti, 1976; Mellard, 1972), it is possible to specify in advance the high-level schemata that normally will be brought to bear (Anderson, Spiro, & Anderson, 1977; Brown & Smiley, 1977; Mandler & Johnson, 1977).

Consider next the processes by which importance may influence encoding. Two alternative accounts seem compatible with schema conceptions. The first can be called the “attention-directing” hypothesis. The schema singles out important elements. More attention is devoted to these elements than to less important ones; therefore, they are more likely to be learned.

A second possibility on the encoding side has been termed the “ideational scaffolding” hypothesis (Ausubel, 1963). A schema is bound to contain a slot for an important text element and it could be that the information gets stored precisely because there is a niche for it. Depending upon individual differences among readers, there may not be slots for less important elements. Or, there may be optional slots for unimportant elements, instantiated or not depending on the reader’s motivation and on demand characteristics.

We turn now to the possibility that schemata facilitate information retrieval instead of, or in addition to, information storage. Again there is more than one plausible mechanism. Several investigators (Bower, 1977; Mandler & Johnson, 1977; Pichert & Anderson, 1977) have speculated that a schema might provide a retrieval plan. The idea is that memory search proceeds from the generic knowledge incorporated in the schema to the particular information stored when the text was read. A top-down schema-based search is very likely to give access to structurally important information but cannot turn up information unconnected to the schema. Thus, the latter categories of information are relatively inaccessible.

A second possibility is that schemata guide “output editing.” This would require postulating that a schema contains within itself an index of importance which, in consort with the demand characteristics of the recall situation, causes the person to establish a response criterion. A person may terminate memory search when the criterion is reached. Or, when information occurs to a subject that falls below the criterion, he or she may not write it into the protocol.

A final possible retrieval process is “inferential reconstruction.” (Spiro, 1977). Suppose that a subject was attempting to recall a story about a meal at a fine restaurant (Anderson et al., 1977; Schank & Abelson, 1975). He or she might fail to remember whether a drink was served with dinner, but since there is a slot in his or her schema for a beverage during the meal the subject is led to try to reconstruct this element. If the subject recalls that a beef dish was the entree, red wine becomes a candidate beverage. At this point red wine could be produced as a plausible guess; though after a long retention interval a subject may not be able to distinguish between an element of the text and an element produced (Spiro, 1977). Alternatively, on the other hand, such as red wine, had been seen might be verified against an otherwise inaccessible memory trace. In a primacy of important text information could be explained in terms of reconstruction. The conceptual schema will be biased to structuring important elements.

At least three lines of evidence distinguish between encoding. First, there is the research of Luchman (1971) and others on substantial facilitation when a context is furnished prior to difficult passages. Bransford and Johnson went on to show that a context is helpful when presented after subjects have begun the task. Bransford and Johnson pointed out that the context helps when presented after subjects have begun the task. Nevertheless, it is difficult to conclusion that schemata play a role.

Two findings seem to implicate work after a passage has been investigated (cf. Bartlett, 1932-1975) have found that the importations increase with the retention interval. This finding can be taken as evidence for increasing reliance on ential reconstruction. If one assumes that correct and incorrect produced by the same process (the finding also gives indication that the lines argued above, to tive interpretation of the fact that primacy of important text information, it is possible that logic is independent of what a subject is to be able to discriminate elements actually in the text elaborations, so he suppresses time passes, the discrimination order to make and, as a result, appear more often.
Depending upon individual differences, readers, there may not be slots for less important elements. Or, there may be optional unimportant elements, instantiated only depending on the reader's motivation and personal characteristics.

We return now to the possibility that a facilitation information retrieval process, or in addition to, information again there is more than one plausible mechanism. Several investigators (Bower, H. A., & Johnson, 1977; Pickert & others, 1977) have speculated that a memory schema might provide a retrieval plan. The memory search proceeds from the knowledge incorporated in the schema to particular information stored when the schema is read. A top-down schema: based very likely to give access to structurally important information but cannot turn information unconnected to the schema.

Yet another category of information is inaccessible.

And possibility is that schemata guide editing. This would require posulating a schema contains within itself an importance which, in concert with the characteristics of the recall situation, the person to establish a response. A person may terminate memory when the criterion is reached. Or, when nothing occurs to a subject that falls below the criterion, he or she may not write it into the memory. A possible retrieval process is “inference reconstruction” (Spiro, 1977). Suppose a subject was attempting to recall a story read at a fine restaurant (Anderson et al., 1975). He or she may try to remember whether a drink was at dinner, but since there is a fact in the schema for a beverage during the story, the subject is led to try to reconstruct: this is the subject recalls that a beef dish was eaten, red wine becomes a candidate. At this point red wine could be the most plausible guess; though after a long interval a subject may not be able to distinguish between an element that was in the text and an element produced by inference (Spiro, 1977). Alternatively, once a candidate such as red wine, had been generated, it might be verified against an otherwise weak or inaccessible memory trace. In any event, the primacy of important text information in recall could be explained in terms of inferential reconstruction. The conceptual machinery of the schema will be biased toward reconstructing important elements.

At least three lines of evidence bear on a distinction between encoding and retrieval. First, there is the research of Dooley and Lachman (1971) and others demonstrating substantial facilitation when a schema-evoking context is furnished prior to difficult-to-understand passages. Bransford and Johnson (1973) went on to show that a context is not very helpful when presented after such a passage. The Bransford and Johnson materials were unlike normal text, deliberately written so that interpretations of expressions were obscure. Nevertheless, it is difficult to escape the conclusion that schemata play a role in encoding.

Two findings seem to implicate processes at work after a passage has been read. Several investigators (cf. Bartlett, 1932; Frederiksen, 1975) have found that the frequency of importations increases with the length of the retention interval. This finding can be taken as evidence for increasing reliance upon inferential reconstruction. If one additionally assumes that correct and incorrect elements are produced by the same process (Spiro, 1977), the finding also gives indirect support, along the lines argued above, to a reconstructive interpretation of the facts about the primacy of important text information. However, it is possible that importations reflect inferences made when a passage was read (Freyer, 1977). Shortly after reading a subject may be able to discriminate between elements actually in the text and his own elaborations, so he suppresses the latter. As time passes, the discrimination becomes harder to make and, as a result, importations appear more often.

The best available evidence for an independent retrieval mechanism is the repeated finding that important elements continue to appear in recall protocols after a retention interval, whereas the appearance of unimportant elements declines sharply (cf. Bower, 1976; Newman, 1939). In research that was the immediate precursor of the present studies (Pickert & Anderson, 1977), college students read stories from either of two directed perspectives or from no directed perspective. One passage was about two boys playing hooky from school. They go to one of the boys' homes because his mother is never there on Thursdays. The family is well to-do. They have a fine old home, set back from the road, with attractive grounds. Since it is old it has some defects—a leaky roof, a damp and musty basement. Because the family has considerable wealth, they have a lot of valuable possessions—ten-speed bikes, a color TV set, a rare coin collection. Different groups rated the importance of the elements in the story from one of three points of view: the viewpoint of a burglar, the viewpoint of a prospective home buyer, or no directed perspective. Obviously a leaky roof is important to a home buyer but unimportant to a burglar. The reverse is true of a color TV set or coin collection. The average intercorrelation of rated idea unit importance across three perspectives on each of two stories was .11.

Next, independent groups of subjects read the stories taking the various perspectives. The previously obtained ratings of idea unit importance were strongly related to immediate recall. This was true just of ratings obtained under the perspective the subject was directed to take, not other possible but nonoperative perspectives. Also significant was the effect of importance from the operative perspective on 1-week recall. The measure was recall of elements after 1 week given recall of the same elements shortly after reading. Thus, importance was demonstrated to have independent effects on delayed recall.

The fact that importance has effects on delayed recall independent of those on immedi-
ATE RECALL SEEMS ON ITS FACE TO REQUIRE A RETRIEVAL EXPLANATION, FOR ANY INFLUENCE ON WHAT IS ENCODED SHOULD SHOW UP IMMEDIATELY, OR SO THE ARGUMENT GOES. AMONG THE POSSIBLE RETRIEVAL MECHANISMS DISCUSSED IN THE FOREGOING, THE RETRIEVAL PLAN NOTION PROVIDES AN ESPECIALLY APPEALING INTERPRETATION. ALL BUT THE SIMPLEST STORIES CONTAIN SECONDARY THEMES AND INCIDENTAL HAPPENINGS. NORMALLY THESE ARE PERFECTLY COMPREHENSIBLE, SO IT IS REASONABLE TO SUPPOSE THAT THEY ARE ENCODED. HOWEVER, IF MEMORY SEARCH STARTS WITH THE GENERIC KNOWLEDGE IN A SCHEMA THERE WILL BE LOW PROBABILITY OF ACCESSING INFORMATION THAT DOES NOT CONNECT WITH THIS SCHEMA. FOR INSTANCE, THERE PRESUMABLY ARE NO POINTERS IN A BURGLARY SCHEMA TO DEFECTS IN A HOUSE SUCH AS A MUSTY BASEMENT: HENCE, EVEN IF IT HAD BEEN STORED, THIS INFORMATION COULD NOT BE RETRIEVED VIA A TOP-DOWN SEARCH THROUGH A BURGLARY SCHEMA.

THE FOREGOING ACCOUNT IS INCOMPLETE IN THAT IT STILL FAILS TO EXPLAIN WHY INFORMATION UNRELATED TO THE DOMINANT SCHEMA BECOMES LESS ACCESSIBLE AS TIME PASSES. AN AUXILIARY ASSUMPTION IS REQUIRED, NAMELY, THAT SHORTLY AFTER READING THERE ARE OTHER ROUTES, NOT MEDIATED BY THE SCHEMA, TO INFORMATION UNRELATED TO THAT SCHEMA: AND FURTHER, THAT OVER TIME THESE ALTERNATIVE ROUTES BECOME INCREASINGLY PROBLEMATIC. THIS IS NOT AN UNREASONABLE ASSUMPTION. THERE COULD BE SOME MEMORY FOR SURFACE ASPECTS OF THE MESSAGE IMMEDIATELY AFTER READING, SUCH AS CONTINUOUSLY PRESENTED INFORMATION. TO ILLUSTRATE, A SUBJECT MENTALLY CANVASING A HOUSE FOR LOOT UNDER THE AEGIS OF A BURGLARY SCHEMA MIGHT REMEMBER A VALUABLE OBJECT ASSERTED TO BE IN THE BASEMENT. THIS IN TURN COULD BE A SUITABLE CUE, JUST AFTER READING BUT NOT LATER, THAT THE NEXT ASSERTION WAS THAT THE BASEMENT WAS DAMP AND MUSTY.

WE HAVE TRIED TO CONSTRUCT A PLAUSIBLE RETRIEVAL EXPLANATION FOR THE FACT THAT MORE UNIMPORTANT THAN IMPORTANT TEXT ELEMENTS DROP OUT OF RETRIEVAL PROTOCOLS OVER A RETENTION INTERVAL. HOWEVER, THERE IS A STORAGE OR ENCODING EXPLANATION THAT SOME WILL THINK EQUALLY PLAUSIBLE. A TRADITIONAL INTERPRETATION WOULD BE THAT IMPORTANT ELEMENTS TEND TO BE OVERLEARNED AND, THEREFORE, HAVE ENOUGH STRENGTH TO APPEAR AT EITHER IMMEDIATE OR DELAYED RECALL, WHEREAS A LARGER PROPORTION OF THE LESS WELL-LEARNED UNIMPORTANT ELEMENTS FALL ABOVE THRESHOLD WHEN RECALL IS ATTEMPTED SHORTLY AFTER READING BUT BELOW THRESHOLD LATER.

TO SUMMARIZE, EVERY ESTABLISHED FACT ABOUT PROSE RECALL CAN BE GIVEN AN ENCODING INTERPRETATION. WHILE SOME FINDINGS CAN ALSO BE EXPLAINED IN RETRIEVAL TERMS, NONE IN THE PREVIOUS LITERATURE DEMANDS SUCH AN EXPLANATION. ON THE OTHER HAND, THE FINDING THAT A MEANINGFUL CONTEXT FACILITATES RECALL WHEN PRESENTED BEFORE, BUT NOT AFTER, AN AMBIGUOUS PASSAGE DOES SEEM TO DEMAND AN ENCODING EXPLANATION.

THE PURPOSE OF THE EXPERIMENTS DESCRIBED IN THIS PAPER WAS TO ATTEMPT TO PROVIDE INCONTESTABLE GROUNDS FOR THE OPERATION IN PROSE RECALL OF RETRIEVAL MECHANISMS DISTINCT FROM STORAGE MECHANISMS. EARLIER, REASONING WITHIN A SCHEMA FRAMEWORK, WE ARGUED THAT PEOPLE MAY STORE INFORMATION WHEN READING A TEXT WHICH THEY FAIL TO PRODUCE WHEN RECALLING THAT TEXT. THE THEORY ALSO PREDICTS THAT IF PEOPLE ARE CAUSED TO CHANGE SCHEMATA AFTER READING A PASSAGE THEN THEY WILL RECALL ADDITIONAL INFORMATION, SPECIFICALLY INFORMATION IMPORTANT TO THE NEW SCHEMA BUT UNIMPORTANT TO THE SCHEMA OPERATIVE WHEN THE PASSAGE WAS READ. THERE ARE THREE SOMEWHAT DIFFERENT FORMULATIONS WITHIN SCHEMA THEORY OF WHY THIS SHOULD HAPPEN. THE FIRST IS THE RETRIEVAL PLAN HYPOTHESIS, ACCORDING TO WHICH THE NEW SCHEMA WILL PROVIDE IMPLICIT CUES FOR DIFFERENT CATEGORIES OF TEXT INFORMATION. THE SECOND IS THE OUTPUT EDITING HYPOTHESIS: UNDER THE AEGIS OF A CHANGED SCHEMA DIFFERENT CATEGORIES OF TEXT INFORMATION WILL FALL ABOVE A RESPONSE CRITERION. THE THIRD IS THE INFERENCEAL RECONSTRUCTION HYPOTHESIS: A NEW SCHEMA WILL FURNISH A DIFFERENT SYSTEM OF CONCEPTS FOR RECONSTRUCTING IMPORTANT BUT UNAVAILABLE INFORMATION.

SUBJECTS DIRECTED TO TAKE EITHER A BURGLAR OR A HOMEBUYER PERSPECTIVE ARE DESCRIBED EARLIER ABOUT TWO BOYS FROM SCHOOL. EVERYONE ATTEMPTED THE STORY TWICE. HALF OF THE SUBJECTS TO TAKE A NEW PERSPECTIVE (FROM HOME BUYER OR VICE VERSA) BEFORE ATTEMPTING. IF THESE SUBJECTS WERE TO ADDITIONAL INFORMATION IMPORTS A PERSPECTIVE THIS WOULD BE UNEXPECTED FOR A RETRIEVAL PROCESS. WE, AT LEAST, UNABLE TO THINK OF AN EXPLANATION THAT WOULD ACCOUNT FOR THIS RESULT SOLELY IN TERMS OF ENCODING.

EXPERIMENT 1

METHOD

SUBJECTS. THIRTY-NINE INTRODUCTORY PSYCHOLOGY STUDENTS PARTICIPATED IN THIS EXPERIMENT IN ORDER TO OBTAIN EXPERIENCE WITH METHOD.

MATERIALS. THE EXPERIMENT NARRATIVE ABOUT TWO BOYS AT THEIR HOUSE WHILE THE SCHOOL. IT CONTAINED A NUMBER OF IDEAS, INCLUDING THE STORY IN 72 IDEA UNITS WHICH PREVIOUSLY FOR THEIR RELATIVE IMPORTANCE TO A PROSPECTIVE HOMEOWNERS.

DESIGN AND PROCEDURE. SUBJECTS WERE RANDOMLY DISEGREGATED INTO GROUPS OF THREE TO EIGHT, SO THAT THE STUDY CONSIDERED ABOUT EIGHT IDEAS. WHERE THE IDEAS IN THE STORY WERE RANDOMLY ASSIGNED TO THE IDEAS IN THE BOOKLET, THEY READ INSTRUMENTS USED. THE BURGLAR OR HOMEOWNER WERE THEN GIVEN 2 MINUTES NEXT, 12 MINUTES WERE ALLOWED TO WRITE IN THE RANGE FRENCH, EKSTROM, & PRIOR. THE FIRST 48 ITEMS WERE SCORED ITEMS AND 48 ITEMS AND NO SUBJECTS FOR 12-MINUTE PERIOD.

AFTER THE VOCABULARY
RECALL AFTER A PERSPECTIVE SHIFT

In the present study, a perspective shift in memory was induced by having subjects read a story from a homebuyer or burglar perspective. A traditional interpretation would be that important elements tend to be learned and, therefore, have enough to appear at either immediate or delayed recall, whereas a larger proportion of less well-learned unimportant elements is below threshold when recall is attempted after reading but below threshold later. Summarize, every established fact about recall can be given an encoding interpretation. While some findings can also be analyzed in retrieval terms, none of the usual literature demands such an explanation. On the other hand, the finding that a useful context facilitates recall when read before, but not after, an ambiguous context, does seem to demand an encoding interpretation.

The purpose of the experiments described here was to attempt to provide incontestable evidence for the operation of prose recall on schema mechanisms distinct from storage mechanisms. Earlier, reasoning within a framework, we argued that people read information in a text, they fail to produce when recalling that text, theory also predicts that if people are to change schemata after reading then, when they will recall additional information, specifically information important to a new schema but unimportant to the operative when the passage was read.

We three somewhat different forms of schema theory of why this is so. The first is the retrieval plan, according to which the new will provide implicit cues for different types of text information. The second is the editing hypothesis: Under the aegis of schema different categories of information will fail above a response threshold. The third is the inferential reconception hypothesis: A new schema will differ from the system of concepts for organizing important but unavailable information and is directed to take either a burglar or homebuyer perspective read the story described earlier about two boys playing hookey from school. Everyone attempted to recall the story... Half of the subjects were directed to take a new perspective (from burglar to home buyer or vice versa) before the second attempt. If these subjects were to recall additional information important to the new perspective this would be unequivocal evidence for a retrieval process. We, at least, have been unable to think of an explanation for such a result solely in terms of encoding mechanisms.

EXPERIMENT I

Method

Subjects. Thirty-nine introductory educational psychology students participated in this experiment in order to fulfill a course requirement.

Materials. The experimental passage was a narrative about what two boys did at one of the boys' homes while they were skipping school. It contained a number of points of interest to a burglar or a real estate prospect. The story was 373 words long and contained 72 idea units which previously had been rated for their relative importance to a burglar and to a prospective homebuyer.

Design and procedure. Subjects were run in groups of three to eight. Subjects were told that the study concerned "how people think about and remember stories... primarily in memory for the ideas in a story." Subjects were randomly assigned envelopes, which contained instructions, the story, and a test booklet. They read instructions assigning them the burglar or homebuyer perspective and were then given 2 minutes to read the passage. Next, 12 minutes were allowed to do 84 items from the Wide Range Vocabulary Test (French, Ekstrom, & Price, 1963). Only the first 48 items were scored. The additional 36 items were employed to keep the retention interval uniform. All subjects finished the first 48 items and no subjects finished all 84 in the 12-minute period.

After the vocabulary test subjects turned to two blank pages and read instructions which emphasized, "Please write down as much of the exact story as you can on these two sheets of paper. If you cannot remember the exact words of any sentence, but you do remember the meaning, write down a sentence or part of a sentence as close to the original as possible. It is extremely important that you write down every bit of the story which you can remember."

When everyone had completed the first recall, 5 minutes were allowed to do six items from the Surface Development Test (French et al., 1963). This test requires subjects to mentally "fold" a two-dimensional figure to match a three-dimensional representation. The task is to match numbered edges on the two-dimensional figure with labeled edges on its three-dimensional representation.

Next, subjects turned to an instruction page which asked them to recall the story a second time. Half did so from the same perspective and half from the other. Subjects in the no-change condition were told the study was being done to determine whether or not people can remember things about a story they thought they had forgotten if they are given a second chance. Their original perspective instructions were then repeated. Subjects in the change-of-perspective condition were told, "This study is being done to determine whether or not people can remember things about a story they thought they had forgotten if they are given a new perspective on that story... Please try to think of the story you read from this new perspective." The new perspective was then described exactly as it has been for those subjects given it originally. Recall instructions were repeated for both groups and the experimenter stressed that "this study is attempting to determine differences in persons' recall from one time to the next so please write down every bit of the story which you can remember."

Following the second recall subjects completed a debriefing questionnaire and were thanked for their cooperation and dismissed.
**Scoring.** Idea units were identified in the protocols which, according to gist criteria, matched any of the 72 idea units. In the earlier study (Pichert & Anderson, 1977), inter-rater reliability was .93. No reliability check was made this time.

**Results.**

*First recall.* Completed first was a $2 \times 2 \times 3$ mixed analysis of variance involving all 72 of the idea units in the story. The between-subjects factors were perspective given prior to the story (Homebuyer, Burglar) and verbal ability (High, Low). Idea unit importance (High, Medium, Low) was a within-subjects factor. Table 1 summarizes performance on the dependent measure, proportion of idea units recalled. A significant effect was found for idea unit importance, $F(2, 70) = 66.47, p < .01$. More than medium and more than high idea units were recalled under both perspectives, replicating our previous finding (Pichert & Anderson, 1977).

The only other significant effect was the interaction between perspective and importance, $F(2, 70) = 19.50, p < .01$. This appeared because importance was more strongly related to recall under the burglar than under the homebuyer perspective, perhaps because college students are relatively less familiar with purchasing real estate.

Some information was important to both perspectives while a good deal was trivial from either point of view. A second analysis involved just those idea units whose rated importance was different from the two perspectives. The mean idea unit ratings obtained in the earlier study were converted to standard scores. Then two clusters of idea units were identified. Placed in the first cluster were 15 units rated about 1.5 standard deviations higher under the burglar perspective than under the homebuyer perspective. This cluster will be called “burglar information.” The complementary procedure was used to define a cluster of 13 idea units of homebuyer information.

Table 2 contains mean proportions of burglar and homebuyer information recalled. An analysis of the first recall data revealed an effect for cluster, $F(1, 35) = 26.31, p < .01$. The burglar information was better recalled than the homebuyer information. More interesting and important was the interaction between perspective and cluster, $F(1, 35) = 16.58, p < .01$, which is graphed in Figure 1. The group that had the burglar perspective recalled more burglar information than the homebuyer group.

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<thead>
<tr>
<th>Perspective</th>
<th>Idea unit importance</th>
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<tr>
<td></td>
<td>High</td>
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<tr>
<td>Homebuyer</td>
<td>.55</td>
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<tr>
<td>Burglar</td>
<td>.66</td>
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<table>
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<tr>
<th>Perspective</th>
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<td>First/second perspective</td>
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<tr>
<th>Information cluster</th>
<th>Burglar</th>
<th>Homebuyer</th>
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<td>First recall</td>
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<tr>
<td>Second recall</td>
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<tr>
<td>Burglar/burglar</td>
<td>.68</td>
<td>.39</td>
</tr>
<tr>
<td>Homebuyer/homebuyer</td>
<td>.70</td>
<td>.58</td>
</tr>
<tr>
<td>Burglar/homebuyer</td>
<td>.54</td>
<td>.56</td>
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**Different between first recall:** Two predictions follow from hypotheses developed in section. First, people who should recall more information from the second perspective than the first. Subjects who changed their perspective gained an additional 7.1% of information. In contrast, subjects who did not changed 2.9% less of information in the second recall. That difference was significant, $p < .01$. Neither the particular 1.00 nor the interaction and whether or not the perspective, $F = 1.12$, helped also was a subsidiary group that shifted the increment in recall group against the null change, which was also 3.07, $p < .01$. 

![Figure 1](image-url)
The other significant effect was the interaction between perspective and importance, $F(1, 35) = 19.50, p < .01$. This appeared to be more strongly related under the burglar than under the homebuyer perspective, perhaps because conflictants are relatively less familiar with owning real estate.

Information was important to both perspectives while a good deal was trivial from the point of view. A second analysis just those idea units whose rated importance was different from the two perspectives. The mean idea unit rating in the earlier study were converted to standard scores. Then two clusters of idea units were identified. Placed in the first cluster were units rated about 1.5 standard deviations higher under the burglar perspective than the homebuyer perspective. This cluster will be called “burglar information.” A second cluster was comprised of 13 idea units of homebuyer information.

Table 2 contains mean proportions of idea units recalled as a function of perspective. Analysis of the first recall data revealed an interaction, $F(1, 35) = 26.31, p < .01$. Burglar information was better recalled than the homebuyer information. More important information in the interaction perspective and cluster. $F(1, 35) = 7.27, p = .01$, which is graphed in Figure 1. It is also predicted that people who shift perspective will recall less information that is unimportant to the new perspective. In fact, subjects who changed perspective recalled a mean of 7.2% less on the second recall of what was now unimportant information whereas there was no change in the control group which maintained the same perspective. However, this difference was not significant, $F(1, 35) = 2.22, p < .15$. Nor was the decrement in the group that changed perspective significantly different from zero, $t(18) = 2.06, .05 < p < .10$. The increment and decrement in the perspective shift group were the same size, but the latter result was not significant because of the relatively greater variability in the amount of information subjects lost.

Second recall. Considered alone, the data from the second recall are not very interesting. Tests for retrieval effects, much less sensitive than the ones involving first recall—second recall differences already reported, proved to be nonsignificant.

If perspective influences the likelihood that information will be stored, then on the second attempt subjects should have recalled more information important than unimportant to their original perspective. However, the present experiment was not optimally designed to assess encoding benefits, since subjects will have selectively rehearsed more of the information important to the original perspective on the first test. Balancing in the other direction, the experiment had too little power considering the magnitude of the error variance. For what it is worth, on the second attempt more information important to the original perspective was recalled than information unimportant to that perspective, an advantage that was not significant, $t(35) = 1.99, .05 < p < .10$.

**Table 2**

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Homebuyer</th>
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<tr>
<td>First recall</td>
<td>Second recall</td>
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**Experiment II**

Experiment II was completed to determine whether the findings of Experiment I could be replicated and to obtain a set of introspective reports on encoding and retrieval processes.
Method

Subjects. The subjects were 16 undergraduates enrolled in an educational psychology class who participated to meet a course requirement.

Materials, design, and procedure. Half the subjects began with the burglar perspective and half with the homebuyer perspective. Every subject changed perspectives before attempting to recall the passage for the second time; in other words, this study did not include a same-perspective control group.

Loosely structured interviews were conducted after the second recall. The interviewer had a list of questions to ask, but freely departed from this list to probe ambiguous statements or follow up on interesting leads. Eight subjects were interviewed individually and eight in pairs. The protocols were tape recorded and then typewritten transcripts were prepared. An informal content analysis of the transcripts was completed. In all other respects, the study was the same as the first.

Results

Difference between first and second recall. The recall data are summarized in Table 3. On the second test, subjects recalled 10% more information important to the new perspective which had been unimportant to the perspective operative when the passage was read, t(15) = 3.02, p < .01. They recalled 21% less of the information that became unimportant in the light of the changed perspective, t(15) = 5.36, p < .01. Since there was no same-perspective control group in this experiment, these are tests against the null hypothesis of zero change.

Interview protocols. The tallies reported in this section should be regarded as rough indications of the trends in the data. The interviewer did not always ask a question or ask it in the same way of every subject. Furthermore, subjects, particularly those interviewed in pairs, did not always give direct and responsive answers to questions.

In reply to questions such as “How did the perspective affect your reading?” every one of the twelve subjects asked the question who gave an interpretable answer described the process of directing attention to important elements. Sample responses:

- I spent most of the time looking for different items to be interested in when buying a house. So, I noticed the large size of the yard because I’m one who likes area. And then I noticed the new things the father did to the house—the siding, the plumbing. And then the basement was damp. That’s one thing I wouldn’t like. You know, how the house looked.
- Yeah, I had it [the perspective] in mind all the way through. I kept in mind all the critical things a burglar would be looking for such as getting in and out, the items that it would be easy to move and take from the building itself.
- First, I read it straight through without concentrating on anything and then I whipped through it again and scanned it, and I blocked out everything except the specific things a homeowner would be looking for in order to decide whether to buy the house or not.

Table 3  
PROPORTIONS RECALLED OF IDEA UNITS WHOSE IMPORTANCE VARIED AS A FUNCTION OF PERSPECTIVE, EXPERIMENT II

<table>
<thead>
<tr>
<th>Information cluster</th>
<th>First/recall</th>
<th>Second recall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglar</td>
<td>First recall</td>
<td>Second recall</td>
</tr>
<tr>
<td>Homebuyer/burglar</td>
<td>.51</td>
<td>.61</td>
</tr>
<tr>
<td>Burglar/homebuyer</td>
<td>.68</td>
<td>.36</td>
</tr>
</tbody>
</table>

The interviewer attempted to whether subjects suppressed informing questions of the form, “Were you not the first recall?” Of the twelve subjects asked this question and provided nine insisted that they wrote down what they could remember. For instance:

- No, I tried to write everything down, seemed stupid, you know, I generally what I could remember.

Three gave an affirmative answer of them presented a convincing de output editing, as follows:

- Yeah, I remembered a couple of things I didn’t write them down because I didn’t think I didn’t write them down because I didn’t think they were important. It wasn’t why I was looking for. It wasn’t related to the house. The possessions, like the remember weren’t important beer wouldn’t go with the house.

The answer of one of the others said she suppressed information was stored but inaccessible:

- I forgot to say that the house was said and that there was a glass and of living room. [Q: Why didn’t you write the first time?] Well, I forgot to write the first time.

The interviewer went on to probe why they thought they had that (despite the instructions) the information recall just the information recalled in the second perspective.

Subjects were asked to describe the strategies. The interviewer probe for what they thought they had information the second time. They described mental processes considered in the schema as retrieval strategies. They expressly stated that consi
The interviewer attempted to determine whether subjects suppressed information, asking questions of the form, “Were there things you remembered but did not write down on the first recall?” Of the twelve subjects who were asked this question and provided an answer, nine insisted that they wrote down everything they could remember. For instance, one said:

- No, I tried to write everything down, even if it seemed stupid, you know. I generally wrote what I could remember.

Three gave an affirmative answer but only one of them presented a convincing description of output editing, as follows:

- Yeah, I remember a couple of things but I didn’t write them down because I didn’t think they were important. It wasn’t what I was looking for. It wasn’t related to buying a house. The possessions, like the jewels. I remember weren’t important because they wouldn’t go with the house.

The answer of one of the other subjects who suppressed information was uninformative, while the third subject seemed to include in remembered information that which was stored but inaccessible:

- I forgot to say that the house was stone sided and that there was cut glass and china in the living room. [Q: Why didn’t you write it down the first time?] Well, I forgot [subject’s emphasis].

The interviewer was not programmed to inquire about information suppressed when the story was recalled the second time, but a few subjects mentioned doing this. A few more announced while completing the second recall that (despite the instructions) they were going to write just the information relevant to the second perspective.

Subjects were asked to describe their recall strategies. The interviewer probed to determine why they thought they had recalled new information the second time. Seven subjects described mental processes consistent with the notion of the schema as retrieval plan. Subjects were counted among this group only if they expressly stated that considering superordinate categories of information significant in the light of the perspective caused them to recall particular items of information from these categories. For instance, one subject who shifted from the burglar to the homebuyer perspective offered the following reflection:

- I only remembered one other thing, the basement. I had forgotten all about that in the first one. [Q: Why didn’t you remember that the first time?] I don’t know. When I remembered it was when I was upstairs—thinking about the upstairs—in the girl’s bedroom and thinking, was there anything wrong with the rug? Was there anything wrong with the house? And then I remembered the basement was damp.

Two subjects who changed from homebuyer to burglar described the process as follows:

- I just thought of myself as a burglar walking through the house. So I had a different point of view, a different objective point of view for different details. You know, I noticed the door was open and where would I go here, go there, take this, take that, what rooms would I go to and what rooms wouldn’t I go to. Like, you know, who cares about the outside and stuff? You can’t steal a wall or nothing... I remembered [the color TV] in the second one, but not in the first one. I was thinking about things to steal, things you could take and steal. In the den was the money, China, jewelry, other stuff in other places. [Q: Why do you think you remembered the color TV the second time and not the first time?] Because I was thinking of things to steal, I guess.

- You say “OK, I’m a burglar, now what do I want to get out of this house,” and then you write it down... I knew that there were a lot of things, like furs and stuff, that had been described, but I couldn’t remember them because I wasn’t programmed that way the first time... I ended up putting pretty much what I put the first time. I remembered that one of the doors was kept unlocked. I hadn’t remembered that the first time but when it said I was supposed to be a burglar that popped into my head. [Q: Why do you think that popped into your head?] Well, because a burglar would want to know that!

Six other subjects said that the new perspective “jogged” their memories or that when given the new perspective additional infor-
information "popped" into their heads. However, this group was not explicit about the reasons additional information was recallable. Several expressly denied self-knowledge of the process. Sample comments:

- Well, I remembered a couple more items that were of value and I remembered that the door was unlocked or something, so that would help you get in... [Q: Why do you think you remembered these other items?] I don't know. I just remembered it as soon as you said to think of it as a burglar. I don't really know what triggered that.

- Well, a funny thing happened. When he gave me the homebuyer perspective, I remembered the end of the story, you know, about the leak in the roof. The first time through I knew there was an ending, but I couldn't remember what it was. But it just popped into my mind when I thought about the story from the homebuyer perspective.

- I forgot about the glass and stuff, though, but remembered it in the second one for some reason. [Q: Do you know why?] No, I have no idea. All of a sudden it just popped into my head.

**DISCUSSION**

In the present studies people recalled additional, previously unrecallable information following a shift in perspective. There was a significant increase in recall of information important to the new perspective but unimportant to the one operative when the passage was read. It would appear to be impossible to explain this phenomenon in terms of an encoding process, since the perspective shift occurred after the passage had been read and recalled once. A retrieval process seems to be implicated, therefore.

On the basis of previous research there is good reason to believe that schemata also affect encoding or storage processes but, as already noted, the recall data from the present studies did not permit a sensitive, unconfounded test of possible encoding benefits. The interview protocols, however, clearly suggest that readers selectively attend to elements of a story that are significant in terms of an operative perspective. Appropriately designed experiments would probably show evidence in recall of both encoding and retrieval effects.

One caveat about encoding seems well grounded on the basis of the data in hand. Readers must have developed a richer representation for the story material than could be accounted for solely in terms of the dominant schema brought into play by the perspective instructions. Otherwise there would have been no information in the recesses of the mind which could be recovered when the perspective shifted. Evidently the principle of encoding specificity does not extend in a simple way to prose for, if it did, readers would fail to assimilate ideas irrelevant to the dominant schema. It appears, instead, that at least some "irrelevant" information is encoded, and that this information may become available later if a schema to which it connects is invoked.

Among the retrieval explanations for the increment in recall, subjects' self-reports supported the idea that a high-level schema provides the rememberer with a retrieval plan. Seven subjects described a process that fits this hypothesis. They said that they thought of particular information because the perspective led them to think of the general category subsuming this information. Six other subjects, who displayed less metamemorial awareness, made statements consistent with the retrieval plan hypothesis.

A plausible alternative explanation of the fact that subjects recalled previously unrecallable information is that they edited their output according to shifting criteria of importance. Information remembered during the first recall might have been suppressed because it was unimportant to the perspective operative at that time. By and large, the protocol data were not consistent with this interpretation. Most subjects insisted that on the first recall they wrote down everything they could remember.

The recall data also showed decreased recall of information unimportant to perspective, again a fact consistent with a retrieval plan, an output reconstructive process. Regretfully, the viewer did not systematically provide why information included protocol did not appear in the concourse. Nonetheless, it came out in a couple of cases did not bother to write information unimportant to the story. In other words, they were editing.

Psychologists will have vary enthusiasm for the method of amplifying a process by the simple addition of subjects talk about it. Writing the argument that there is a reason to suppose that when a person works in such and such he is mistaken or lying. Many a person with a perspective provided the framework for searching memory, specifically the generic concerns of a homebuyer allowed them to elicit information relevant to these concepts. Converging evidence should be other techniques. In the meant reports make a prima facie schema as retrieval plan. It is suggested that the opinion in the mediated editing of responses, evidence should be interpreted. People are marvelously versatile processors. If one believes the reports: most of them did not notice their output when recalling the first time. But they might under circumstances. Indeed, some of them did so when recalling the story time in the present studies.

Little has been said about the interpretation in the increment in reporting a perspective shift, for the present data weigh against this interpretation. With the variant of the reconstruction hypothesis which would attribute the plausible fabrications seems
RECALL AFTER A PERSPECTIVE SHIFT

of information unimportant to the second perspective, again a fact consistent with either a retrieval plan, an output editing, or a reconstructive process. Regrettably, the interviewer did not systematically press subjects to explain why information included in the first protocol did not appear in the second. Nonetheless, it came out in a couple of cases that persons did not bother to write down information unimportant to the second perspective; in other words, they were editing their output.

Psychologists will have varying degrees of enthusiasm for the method of attempting to illuminate a process by the simple expedient of having subjects talk about it. We find compelling the argument that there is no good a priori reason to suppose that when a person tells you his mind worked in such and such a way that he is mistaken or lying. Many subjects told us that a perspective provided them with a plan for searching memory, specifically that considering the generic concerns of a burglar or nonbuyer allowed them to access information relevant to these concerns. Naturally, converging evidence should be sought using other techniques. In the meantime, these self-reports make a prima facie case for the schema as retrieval plan. The self-reports weighed against the notion that the schema mediated editing of responses. However, this evidence should be interpreted conservatively. People are marvelously versatile information processors. If one believes the subjects' self-reports, most of them did not consciously edit their output when recalling the story for the first time. But they might under other circumstances. Indeed, some of them may have done so when recalling the story for the second time in the present studies.

Little has been said about the reconstructive interpretation of the increment in recall following a perspective shift, for the simple reason that the present data weigh neither for nor against this interpretation. We can only say that the variant of the reconstruction hypothesis which would attribute the increment to plausible fabrications seems unreasonable.

Simple guessing is unlikely to have allowed subjects to produce the information that Mother was never home on Thursdays or that the roof leaked.

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Good and Bad Structure
Theme

Conventional paragraph structure by connected, coherent sentences that can be read at a glance and that provide a clear and concise summary of the content. This type of organization is generally recommended for academic writing because it allows readers to quickly grasp the main points and arguments presented.

The organization of connected text, is generally governed by the conventions which evolved over time. These rules presuppose a human information-processing system, and the skilled reader is expected to use these organizational cues to minimize the effects of process. It thus seems obvious that well-organized paragraphs are easier to read and more easily understood. However, there is an apparent theme in the reading of bad paragraph structures procured from immediately integrated, and (1) graspable sentences. These rest on the idea that memory encoding and integration of the written word is thus facilitated by a well-organized structure.

Two levels of text organization and presentation are under study. Very high-level known as schemas, frameworks, or structures, determine the organization of large units of prose.

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