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EXPERIMENTS ON STORY UNDERSTANDING AND RECALL*

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It is a special honour for me to deliver the Sir Frederick Bartlett Lecture. He was one of the outstanding intellects of psychology, his work was classic, and it established an important tradition. Since publication of his book *Remembering*, psychologists engaged in laboratory studies of human memory have had his example and challenge before them. That challenge was to break away from the constraints of experiments involving learning of artificial material such as nonsense-syllable lists, and to move on to studying memory in more realistic settings, such as the way people remember or reconstruct text, stories or real-world episodes. Bartlett was concerned with the way readers impose a conceptual schemata onto the information they receive, and how the schema guides later reconstruction of the story. His ideas in this respect have proven seminal but frustratingly difficult to tie down. Those of us who work on people's ability to recall text have built upon the basic intuitions which Bartlett expressed about reconstructive memory. This paper—which is about how people understand and remember simple stories—is a further attempt to analyze and clarify a few of Bartlett's ideas of schema-application and reconstructive memory.

Let us begin with the familiar observation that texts we read differ a tremendous amount in their comprehensibility and in their memorability. In fact, some are so difficult that the only memorable thing about them is how incomprehensible they were. I recall taking a literature course in college where we read James Joyce's *Finnegan's Wake;* although I enjoyed the flow of words and images, I could not remember enough about what I had read in order to discuss it when I went to class the next day. The same is true today if I read experimental-fiction writers such as John Hawkes. The language and imagery is often stunning and beautiful, but I barely remember enough to know where to pick up my reading again in case I lose my bookmark. One might attribute all this to my poor memory. But on the other hand, I find I have very good memory for adventure stories and folktales, for stories like those in *Canterbury Tales*, *The Decameron*, for detective thrillers or simple Western-cowboy stories. Most readers or movie-goers have similar experiences. It is such observations that cause psychologists to become interested in how people understand and remember simple stories.

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A number of very bright people have become interested in this topic in the past few years—linguists, psychologists and computer scientists. My largest intellectual debts on this topic are owed to David Rumelhart (1975), Walter Kintsch (1974), Tuen van Dijk (1975), Roger Schank (1975*a*; Schank *et al.*, 1975), Bob Abelson (1975), and to colleagues at Stanford University. This paper relates some of our current thoughts regarding story understanding and memory. I will also describe some experiments on story recall done by my research group, particularly those planned in collaboration with my student, Perry Thorndyke, and these comprised his Ph.D. dissertation (Thorndyke, 1975; 1976*a*, *b*).

Story understanding and recall is interesting for several reasons. First, the procedures people use to understand and recall stories seem to be very general; they are much like those they use to understand the various happenings around them. And psychologists should be centrally concerned with the way people understand and construct models of the world around them so as to guide their actions and decisions. Thus, stories may provide a small microcosm in which general features of human understanding can be studied. Second, reading stories has strong face-validity as a task humans frequently perform with the goal of remembering. It is not the least bit "artificial". There is the remote hope that one's findings may be of practical significance, either in better designing stories for young children, in teaching elements of story-telling, or in mechanically summarizing texts for a large information-retrieval system—such as a file of all news stories from the *Times* for the past five years.

Stories have a constituent structure

My first point is that simple stories have a very definite "structure"; that is, they have a constant set of abstract constituents such as a setting, characters, a plot, episodes, a resolution, and so on, all of which are put together in a principled way so as to make a coherent whole. The claim here for simple stories is analogous to linguists' claim that, say, sentences have a definite constituent structure described by grammatical rules which tell us the difference between grammatical and ungrammatical sentences. Indeed, for a class of what are called "problem-solving" folktales, there may even be a grammar describing the structure of well-formed stories (see Rumelhart, 1975). By using the grammar, one can generate the possible allowable plot-structures. The hypothesis would say further that texts that radically violate the rules of such a grammar would be incoherent or incomprehensible as stories.

The claim that simple stories have a quite definite structure is hardly controversial: historians of folktales have for the past century conducted research on the premise that a common structure or set of rules underlies thousands of folktales and fables found throughout the world (see Colby, 1973; Propp, 1968). Many folktales had to have a simple structure because they were part of an oral tradition, and were passed from parent to child across many generations. One could think of the process of forgetting as a natural selective pressure which operates across successive re-tellings of a story, forcing the folktale into a simple, memorable

structure. Illogical and incomprehensible elements simply would not survive natural selection as the folktale filtered through the fallible memories of successive generations.

Frames or schemas for understanding

I think we can use the notion of a schema or a framework to represent our abstract knowledge of simple stories (see Minksy, 1975). I suppose that people in our culture as a result of hearing hundreds of such simple stories have abstracted a common framework or set of inter-related schemata depicting the prototypic story and variations on it. This is concept formation of a rather high-level, and I have no idea how it occurs in detail.

This abstract framework serves two important functions: first, we use it to interpret new stories we hear; second, we use it to guide our construction of a new story or our re-telling of a series of real-life episodes which we believe comprise a story. You can notice your own frameworks in operation if you are asked to compose a perfectly boring little Western-cowboy script, or to compose a script for a standard police or detective program on TV. You would start with a setting, introduce a cast of characters—in particular, the hero—and create some sort of problem. The story then consists of a series of attempts by the hero to solve this problem or subproblems it generates. The exact content would vary across authors but the abstract structure of the stories would be very similar. Very young children, who do not yet know this framework, will, of course, tell fractured stories with various elements missing, unexplained, or out of order.

I think these general frameworks are what adults use when they listen to and understand a story. You can think of the story framework as an abstract concept which you fit onto incoming data, by instantiating certain variables with particular exemplars (see Minsky, 1975). The framework is a set of related categories or slots which are to be filled by particular objects and events in the story. To clarify this notion, consider your framework of a soccer game. You have lots of organized knowledge about the various players, their roles, relations and goals. When you go out to watch an actual game, I suppose that you call up this soccer framework from memory and proceed to instantiate its elements with the actual characters and events you see before you. That framework is the background allowing you to understand the significance of particular events—for example, to understand the differing significances of a player kicking the ball into the goal net from in front of it and in bounds vs. from behind it and out of bounds. The framework helps us distinguish major from minor events in terms of the goals of the players. The framework which helps us understand the events also helps us remember what has happened. Suppose, on the other hand, you had no "soccer frame", no script for interpreting events (e.g., we take an Australian bushman to a professional soccer match); then a game would appear as an incomprehensible jumble. Similarly, if I were to stage a crazy soccer game in which all the standard forms and rules were repeatedly violated in multiple ways, you would not be able to understand what is going on.

Now the general script for a soccer game is known in fair detail by most of us.

It is also claimed that we know the general script for folktales. People who work on story grammars think they can write down the rules that characterize a subset of simple problem-solving stories. You can think of these rules as good guesses about the categories or slots in our story framework, and guesses about the relations among these abstract elements in the story framework. Table I shows a set of rewrite rules proposed by Perry Thorndyke (1975), following upon earlier work by David Rumelhart (1975). These rules are tentative and they probably apply unambiguously only to a small set of stories. The exact details of the story grammar are not important as these will surely be modified as it is extended to describe a greater range of stories. However, the general form of the structural analysis is important and likely to survive.

TABLE I

Grammar rules for simple stories

Rule number			
(1)	Story	→	setting + theme + plot + resolution
(2)	Setting	→	characters + location + time
(3)	Theme	→	(event)* + goal
(4)	Plot	→	episode*
(5)	Episode	→	subgoal + attempt* + outcome
(6)	Attempt	→	{ event* / episode
(7)	Outcome	→	{ event* / state
(8)	Resolution	→	{ event / state
(9)	{ Subgoal / Goal }	→	desired state
(10)	{ Characters / Location / Time }	→	statives

Examining the grammar, we note that the first rule defines a story frame to consist of slots to be filled by a setting, a theme, a plot, and a resolution, these elements usually occurring in that order in the story. In Rule 2 the setting frame consists of slots to be filled by the characters, and, optionally, the location and the time of the story. Rule 10 says these are simple stative (i.e., existence) propositions, as in the classic "Once upon a time in the land of Nod there lived an old king with three lovely daughters". Rule 3 says that the theme of a story is typically just a goal of the main character. For example, the goal may be to rescue the beautiful damsel from the dragon, or to change a frog back into a prince, or to find the murderer. Often, a story begins with some events that create the goal (see Rule 3)—for example, we witness the damsel-kidnapping or the bank robbery that creates the goal for our hero.

The plot in Rule 4 is the action-line itself, a series of episodes. Rule 5 says that each episode has a subgoal, one or more attempts, and an outcome. The subgoal is something that is instrumental to achieving the main goal—for example, our hero wants to find a horse to ride to the dragon's cave, or our detective wants to find witnesses to the crime. The attempt itself (in Rule 6) is the action or event—the hero asks the king for a horse, or the detective interviews a witness. The outcome in Rule 7 is often the achievement of some new state—for example, the hero comes in possession of a horse or the detective acquires a clue provided by an eye-witness. After a series of such episodes, an outcome occurs which matches the goal of the main character, ending the plot and ushering in the final resolution. The resolution in Rule 8 may either be an event—for instance, after the hero rescues the damsel from the dragon, he returns her to her father, the king, who marries them and they live happily ever after—or the resolution may be an evaluation or "moral" to the fable. Events are not defined in the grammar but they are action-based scenarios with the basic case-frame slots of actors, recipients, instruments, source, or goal (see, e.g., Schank, 1975*b*).

This framework allows for embedding subgoals within goals since Rule 5 writes an episode as an attempt while Rule 6 may rewrite an attempt as another episode. Thus the hero may want to carry out some action but he can't do that until he has set up certain conditions by doing other things—the hero can't slay the dragon until he transports himself to the cave, so he sets up a subgoal to get there, which sets up the subgoal of finding a horse, and so on. Rules 5 and 6 allow hierarchical embedding of subgoals. The relation between goals and outcomes in this hierarchy is usually that of enablement: the action at one level has an outcome which enables the action at the next higher level to achieve its goal. For instance, transporting the hero to the dragon's cave enables his action of slaying the dragon. For those familiar with computer simulation models, this is very reminiscent of the subgoal hierarchy generated by the General Problem Solver model of Newell and Simon (1972) when that program is attempting to solve a problem.

A story having this multiply embedded character is the "Old Farmer and his Stubborn Animals". We have adapted it from Rumelhart (1975).

Old Farmer normal story

(1) There was once an old farmer (2) who owned a very stubborn donkey. (3) One evening the farmer was trying to put his donkey into its shed. (4) First, the farmer pulled the donkey, (5) but the donkey wouldn't move. (6) Then the farmer pushed the donkey, (7) but still the donkey wouldn't move. (8) Finally, the farmer asked his dog (9) to bark loudly at the donkey (10) and thereby frighten him into the shed. (11) But the dog refused. (12) So then, the farmer asked his cat (13) to scratch the dog (14) so the dog would bark loudly (15) and thereby frighten the donkey into the shed. (16) But the cat replied, "I would gladly scratch the dog (17) if only you would get me some milk". (18) So the farmer went to his cow (19) and asked for some milk (20) to give to the cat. (21) But the cow replied, (22) "I would gladly give you some milk (23) if only you would give me some hay". (24) Thus, the farmer went to the haystack (25) and got some hay. (26) As soon as he gave the hay to the cow, (27) the cow gave the farmer some milk. (28) Then the farmer went to the cat (29) and gave the milk to the cat. (30) As soon as the cat got the milk, (31), it began to scratch the dog. (32) As soon as the cat scratched the dog, (33) the dog

began to bark loudly. (34) The barking so frightened the donkey (35) that it jumped immediately into its shed.

Reading this, you notice how a series of subgoals are being recursively generated and stacked up on one another, to a level about four deep; and then the main character just knocks them over like dominoes in order to achieve his final goal. The Farmer story has what we call a very tightly-knit goal structure.

Experiment on violating goal-structure rules

One of the first experiments that we planned and Thorndyke ran was to delete certain critical components of the goal-structure in the Farmer story. If we remove the over-riding goal and re-order the events so that the subject cannot detect the implicit goal hierarchy of the original story, we get the text entitled "narrative-no theme".

Old Farmer narrative-no theme

There was once an old farmer who owned some very stubborn animals. One evening the farmer was taking a walk, when he saw his donkey. The farmer pulled the donkey, but the donkey didn't move. Then he pushed the donkey, but still the donkey didn't move. Then the farmer went to his cow and asked for some milk. But the cow replied, "I would rather have you give me some hay to eat". Then the farmer saw his dog, and he asked him to bark loudly. But the dog refused. Then the farmer went to the haystack and got some hay. When he gave the hay to the cow, the cow gave the farmer some milk. Then the farmer asked his cat to scratch the dog. But the cat replied, "I am thirsty and would be happy if you would get me some milk". So the farmer gave his milk to the cat. As soon as the cat got the milk, it began to scratch the dog. As soon as the cat scratched the dog, the dog began to bark loudly. The barking so frightened the donkey that it jumped immediately into its shed, which the farmer had built at the time he had purchased the donkey.

The propositions here correspond rather closely to those of the original story—they even preserve many local causal and temporal relations—yet the text as a whole seems like a series of unrelated episodes involving the main character but without any over-riding goal tying the episodes together. The expectation, of course, is that subjects would be poorer at understanding and recalling this second passage.

Two other text conditions were included in the experiment: one is just like the narrative text above except the overall goal of the farmer was inserted as a statement at the end of the passage—that is, replace the final clause with the clause "which is what the farmer had been trying to get the donkey to do from the beginning". The question is whether providing such a goal at the end of the text will enable the subject to go back over and partially reorganize and make sense of the unrelated events he has just read. Finally, a fourth group read a totally random arrangement of the original story. This random control provides a baseline measure of how memorable specific sentences are considered as unrelated statements.

So four different groups of eight college students read these four passages at their natural pace, instructed only to rate their text for its comprehensibility on a 10-point scale. They had no idea they would have to recall it later. All read it

within 90 s. They then engaged in another, unrelated learning task for 40 min, then were unexpectedly asked to recall the Farmer passage. Recall was scored according to the gist of propositions that appeared in some form in recall. These clauses are marked in the first Farmer text shown above.

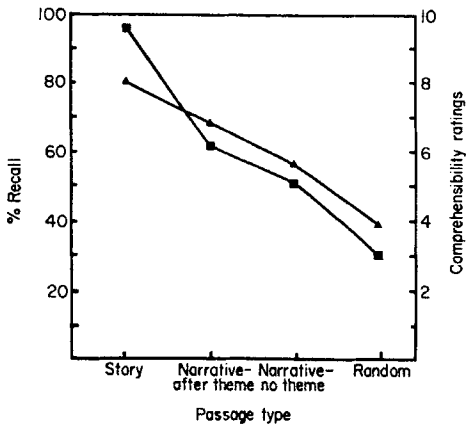

FIGURE 1. Recall (▲) and comprehensibility (■) ratings related to amount of plot-structure in the text.

The results of this initial experiment are shown in Figure 1. This shows recall and comprehensibility ratings for the four types of texts. The texts are ordered along the horizontal axis according to the amount of goal structure they provide. As anticipated, the more tightly knit the goal structure of the text, the more coherent and comprehensible it was judged to be, and the better it was recalled later.

Let us consider why a coherent story is remembered better than the narration of a series of unrelated events. Several factors probably contribute to the difference.

First, the coherent story is more easily comprehended during learning because it fits the story frame so well that the reader's predictions about events are being consistently confirmed. That is, ease of understanding an event depends upon its predictability given the context.

Second, the abstract story framework provides a restrictive set of retrieval cues which the person can generate to prompt his recall of the several components and episodes. You can think of this advantage as much like that produced by providing a free-recall subject with the names of the categories represented on the word list he is recalling. Subjects who studied the unrelated episodes of the narrative tend to show all-or-none forgetting of entire episodes much like a free-recall subject may fail to retrieve a whole category of words from his study list. In contrast, the story-frame provides a set of cues that prevent this complete loss from occurring for subjects who read the coherent story.

A third factor promoting better recall of the coherent story is that the redundancy or interconnectedness of the text components is much greater for the coherent story than for the narration of unrelated events. A given episode in the goal hierarchy of the coherent story becomes connected in memory to the superordinate actions and goals which it enables and to the subordinate actions and outcomes upon which it depends. The events in the normal Farmer story tend also to be logically related in pairs, so that a subgoal-plus-attempt that is frustrated becomes logically paired off to a later outcome which enables that attempt to achieve its desired subgoal; for instance, the cat's refusal to scratch the dog is later reversed by giving the cat some milk to do this. Of course, over-riding this local causation is the higher-order goal which ties all the events together, namely, the intention of the farmer to get the donkey in the shed. We can expect that any event inserted into the story which is not on that main-line, goal-directed action chain will be forgotten, discarded as inessential and irrelevant. In contrast to this strong causal chain linking events in coherent stories, the narrative-no theme text appears to be a series of disjointed, arbitrary events related only by their temporal order of mention.

Looking at the structural diagrams of the tightly-knit, coherent story versus the rambling narrative (see Figure 2 later for an example), the salient difference is that the poor narrative has a shallow but broad structure (i.e., a temporal conjunction of episodes at the same level), whereas the coherent story has a narrow but "deep" subgoal hierarchy with action-enablement or causal links from one level to the next.

Notice in Figure 1 that recall of the narrative version was improved if a statement about the farmer's goal was inserted at the end. We suppose this is because these subjects partially reorganized and rearranged the events of the narrative in memory so as to now interpret them as the farmer's attempts to get his donkey into the shed. (We know it was not because subjects re-read the text after the final goal-statement; the same effect occurred in an experiment where they simply listened to the narrative.) This reorganization of the text in memory was reflected in the way these subjects recalled. About 75% of them moved the goal statement from the end of the text to near the initial position during their recall—that is, to the beginning place where the theme of a story typically occurs. This order-error occurred despite their being asked for exact reproduction of the text. In contrast to this 75% intrusion, none of the subjects in the "narrative-no theme" condition intruded an overall theme or goal anywhere in their recall protocols. So, this is strong evidence that people reorganize a narrative according to a theme given to them, and that their telling of the reorganized narrative moves the top goal into its normal initial position. We shall see evidence of this reorganization again, in the data depicted later in Figure 3.

Hierarchical ordering of propositions within a story

Let us consider another interesting aspect of story recall data. A story grammar like that in Table I assigns a hierarchical description to the propositions of a story. We suppose that the higher up in the hierarchy a given proposition is, the more

salient it is, the easier it is to identify, the more central or important it is to the story, the more attention the person will pay to it and the more likely it is to be remembered.

As an example, consider the Circle Island story as rewritten by Thorndyke (1975).

Circle Island

(1) Circle Island is located in the middle of the Atlantic Ocean, (2) north of Ronald Island. (3) The main occupations on the island are farming and ranching. (4) Circle Island has good soil, (5) but few rivers and (6) hence a shortage of water. (7) The island is run democratically. (8) All issues are decided by a majority vote of the islanders. (9) The governing body is a senate, (10) whose job is to carry out the will of the majority. (11) Recently, an island scientist discovered a cheap method (12) of converting salt water into fresh water. (13) As a result, the island farmers wanted (14) to build a canal across the island, (15) so that they could use water from the canal (16) to cultivate the island's central region. (17) Therefore, the farmers formed a pro-canal association (18) and persuaded a few senators (19) to join. (20) The pro-canal association brought the construction idea to a vote. (21) All the islanders voted. (22) The majority voted in favour of construction. (23) The senate, however, decided that (24) the farmers' proposed canal was ecologically unsound. (25) The senators agreed (26) to build a smaller canal (27) that was 2 feet wide and 1 foot deep. (28) After starting construction on the smaller canal, (29) the islanders discovered that (30) no water would flow into it. (31) Thus the project was abandoned. (32) The farmers were angry (33) because of the failure of the canal project. (34) Civil War appeared inevitable.

Propositions one through 10 supply setting information; propositions 13–16 give the theme or goal of the farmers, and lines 17 through 27 relate a series of action episodes. Proposition 31 describes the frustration of the top goal, and 32 through 34 give the resolution of the plot.

That's the surface structure of the story. Figure 2 shows the hierarchical description assigned to the Circle Island story by the text grammar. Numbers in this figure refer to numbered propositions in the Circle Island story above.

The text propositions occur in this story at four different levels. So the centrality hypothesis predicts that a proposition like no. 34 ("Civil War appeared

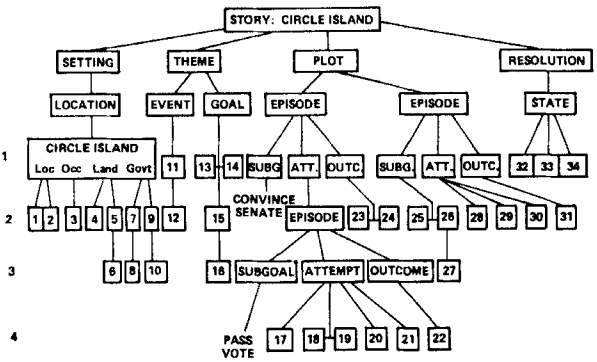

FIGURE 2. Hierarchical structure assigned by the grammar to propositions in the Circle Island story. Numbers in boxes refer to propositions of the text.

inevitable"), which is high in the hierarchy, will be much more salient and much better recalled than a proposition like no. 21 ("All the islanders voted on the construction issue"), which is at a lower level.

To gather data on this issue, Thorndyke ran another experiment using the same four text conditions as before (story, narrative-no theme, narrative-after theme, and random) along with a fifth text condition, the descriptive text. This was a list of "existence" propositions stating the content of the text as one might describe a static painting, without causal or even temporal connections between the actions. These five variants were written for both the Farmer text and the Circle Island text, and each subject studied both texts. Learning was by the intentional method and a verbatim recall was requested within a minute after each story was read.

The results on recall and comprehensibility ratings fully confirmed those of the earlier study, with the descriptive passage falling between the narrative-no theme and random variants of the text. Of greater interest is the way recall of a proposition varied according to its level in the hierarchy of the normal, coherent story.

The results for the Circle Island story are shown in Figure 3; results for the

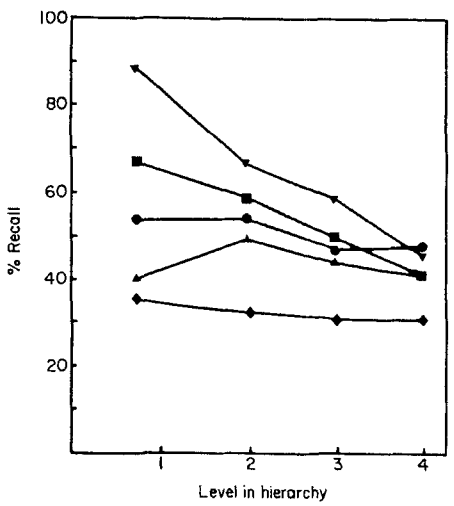

FIGURE 3. Percentage recall of propositions according to their hierarchical level in the normal story, for the separate kinds of texts. Story (▼); after-theme (■); no-theme (●); description (▲); random passages (◆).

Farmer story were similar. The first important result is that for the coherent story version, recall is best for propositions at higher-levels of the hierarchy ("lower numbers" in depth) and it declines across lower levels. That is, propositions corresponding to the top-level constituents of the story as analyzed by the grammar are better recalled. On the other hand, the flatness of the controls—the random, no-theme and description curves—indicates that in the absence of a plot the propositions at levels 1–4 of the story do not differ in their inherent memorability. The difference is induced onto them by the insertion of a plot structure in the goal-directed story.

It is interesting to note in Figure 3 that the narrative-after theme text, which gives subjects just a last second's glance at the top-level goal, produces a sloping recall function, with events that are structurally salient in the disguised story being selected for recall from the disjointed narrative.

So, to summarize briefly here, the story grammar identified those propositions which are structurally significant to the plot insofar as they tend to be recalled well, whereas structurally insignificant elements at the bottom of the hierarchy are poorly recalled.

Another way to validate the story grammar's ability to pick out the salient parts of a text is to ask a group of students to read the story and have them rate each proposition for its "importance" to the overall plot. Two of my students, Justine Owens and John Black, recently collected such "importance ratings" for propositions from the Farmer and Circle Island stories. Subjects used essentially a "magnitude estimation" response scale, so medians were taken. Table II shows the average of the median importance ratings assigned to propositions at the several levels of the story hierarchy. Lower levels of the Farmer story are grouped to keep reasonable sample sizes. The trend is unmistakable; propositions that the grammar assigns to the top level of the hierarchy are rated as more structurally important or central to the gist of the story.

TABLE II

Importance ratings for propositions at various levels of the hierarchy for two stories (0–10 *scale*)

Level	Farmer story	Level	Circle Island
1	7·8	1	7·1
2	7·0	2	6·6
3–7	6·9	3	6·9
8–12	5·9	4	5·9
13–16	5·0		

A third possible index of the structural salience of a proposition may be provided by asking people to write out a summary of the story as they can remember it. Summaries should pick up only the most important highlights of a story, deleting, collapsing and compressing others. As you might imagine, a summary generally includes many fewer details than does a verbatim recall. People use a number of rules to summarize information at lower levels of the story hierarchy (Rumelhart, 1975; van Dijk, 1975). One rule, for example, is to delete unsuccessful attempts and report only the final attempt which succeeds. Another prominent rule people apply to summarize a nested series of embedded subgoals is to collapse all the specific actions into an "ultimate outcome achievement" sentence. Thus, people will summarize the long action sequence in the Farmer story by saying "The old farmer did some things which finally got his dog to frighten the donkey into its shed". These summarization rules are interesting objects to study in their own right, but they are not our concern at the moment. Rather,

we are more concerned here with whether propositions high in the structural hierarchy are likely to appear in summaries.

After his subjects had studied then recalled the Farmer and Circle Island stories, Thorndyke asked them to write from memory a summary for each story. To control for memory differences between propositions at the various levels at the time the summary was requested, Thorndyke calculated the probability that a proposition was mentioned in the summary conditional upon its having been recalled earlier. Figure 4 shows how this summarization measure varies according to the level in the hierarchy of the propositions. The more salient the proposition,

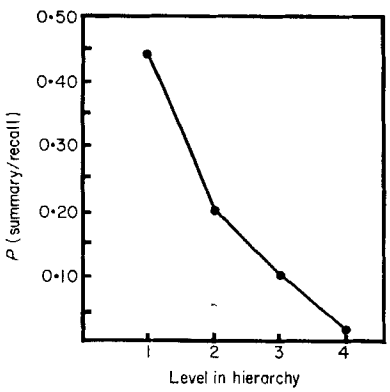

FIGURE 4. Conditional probability that a statement was in the summary given that it was recalled plotted against its level in the hierarchy.

according to the grammar, the more likely it was to be mentioned in the person's summary. This same result was obtained for the Old Farmer story as well. Kintsch and van Dijk (1976) have recently reported a similar finding. Thus, we tentatively conclude that story summaries tend to include information which is high in the structural hierarchy assigned to that story by the grammar. These higher elements are also better recalled in a free recall situation, possibly because they are more closely connected to the implicit retrieval cues provided by the abstract framework for stories and possibly because of subjects' bias to retell a story in terms of these basic constituents, leaving out inessential details.

Forgetting

In terms of our structural diagram of a story, how might we think about forgetting? First, we know that inessential details will be lost—the specifics of names, dates, qualifiers and modifiers are forgotten. These are forgotten first probably because they have low imagery value and are usually overspecified beyond the basic level (see Rosch, Mervis, Gray, Johnson and Boyes-Braem, 1976) needed to tell the gist of the story. That is, the story would remain unchanged if we replaced each detail by its supraordinate or deleted it altogether. Next to be forgotten are "peripheral" episodes that are not on the main-line, goal-directed action sequence.

Being off that main causal line, they usually have only a single, tangential connection to other elements on the main action-line. Essential events in this main line are usually well remembered (unless compressed by summarizing rules) because they are usually causally linked, fitting into our pre-formed schema of "motive-action-outcome (goal)" by which we interpret causal connections between states, actions, and new states (see Abelson, 1975).

The story constituents at the higher levels of the hierarchicial tree are probably better remembered for several reasons. First, they probably receive more attention ("processing") because they fill basic slots of the story frame and may be called to mind several times to relate to other things as a story is read or mulled over, with the net result that these high-level propositions are established in memory at greater strength than are the propositions of lesser importance. This difference should show up even on recognition memory tests. Second, we have suggested that the story framework—the set of basic constituents—serves as a set of abstract retrieval cues to prompt recall of the items of information filling their slots. The lower in the hierarchy a given proposition, the less likely it is to be cued for recall by its chain of parent constituents. We might think of this as an "associative distance" phenomena. This distance hypothesis supposes that the loss is partly one of losing retrieval pathways for lower-order information; this suggests that cueing recall of lower-order events should still produce a large boost in recall even at long retention intervals.

Either of these hypotheses implies that lower ("unimportant") elements of the tree will be forgotten sooner than the upper elements of the tree. We may think of the bottom "leaves" of the tree withering away over the retention interval. The net effect of forgetting, then, should be to make the "levels effect" on recall (see Figure 3) more pronounced over time. As a consequence of forgetting details and lower elements of the structural tree, recall of a story tends to look, progressively more over time, like a summary of that story. This point, that recalls approach a summary, is very reminiscent of Bartlett's notions of progressive "schematization" of a memory over time. It is a point also supported, through with a different story analysis, in recent work on text recall by van Dijk (1975).

So, to summarize my points so far, I have claimed that simple stories have a definite structure, that we use our general knowledge about such stories to comprehend and to remember them, that texts which violate the rules of good story grammar are poorly comprehended and poorly recalled, that propositions of a story can be assigned to different levels in a hierarchical description, that elements high in this hierarchy tend to appear in summaries, they tend to be recalled more often, and are forgotten more slowly, with the consequence that over time recall protocols tend to look progressively more like summaries. So those are the claims made so far.

The content vs. the plot structure of a story

So far, I have mainly been discussing the formal structure of stories—their abstract constituents, their "grammar or syntax"—while giving only passing attention to the actual content (or "semantics") of the stories. The content of a

story refers to its actual cast of characters, their goals, actions, and so on. This distinction between structure and content suggests that one can construct stories that are structurally very similar, while altering their content. So we could retell the Old Farmer story using new characters—for example, it is an Old Zoo-keeper trying to coax a lemur out of his cage, so he appeals for help in turn to an iguana, a gnu, and an aardvark, asking them to do arbitrary actions. Or the plot could be about a Latin American government seeking to solve a national labour strike so it asks the landowners to appeal to the military officers who then force the labour leaders to negotiate.

One of the experiments Thorndyke and I planned demonstrated that recall of a text with a given goal structure was better the greater was the concreteness or imagery value of the characters and the more predictable were the actions the characters perform (see the middle line of Figure 5 later). For instance, the concrete predictable story had a dog that was barking, a cat that was scratching, and a cow that was giving milk. On the other hand, the abstract arbitrary story had a political party that, in order to pass a communication bill, was funding research, a scientist who was testifying before a union board, that then pressured another political party into a coalition with the first party, and so on—all abstract and somewhat unpredictable. As expected, the concrete, predictable story proved to be remembered better, with an advantage of about 17%.

Transfer between stories

This separation of a text into a structure and a content suggests questions regarding transfer of learning between two stories depending on their similarity of structure or similarity of characters. We have done two experiments on this topic. One experiment by Thorndyke (1975, Experiment 3) required subjects to study two successive stories, with the second related in various ways to the first. The four stories used are schematized in Table III. The plot structure was that appropriate either to the Old Farmer story or the Circle Island story, and the

TABLE III

Four stories constructed by instantiating two plot structures with different character-and-action sets

Plot structure	Character set	
	Animals (C_f)	Parties (C_c)
Old Farmer (S_f)	S_fC_f	S_fC_c
Circle Island (S_c)	S_cC_f	S_cC_c

characters were either the barnyard animals or the abstract political parties. A subject would study one of these stories as his first story, and then study a different one for his second story. The second story could have the characters repeated in a new plot (for instance, S_fC_f followed by S_cC_f), or the plot structure repeated with new characters and actions (S_fC_f followed by S_fC_c), or neither plot nor

characters repeated (S_fC_f followed by the unrelated S_cC_c story). All twelve possible ordered pairs of stories were used with four subjects reading each pair.

Incidental learning was used, with the students reading the two stories initially instructed only to rate them for comprehensibility and for imagery value. These ratings are of interest in their own right. Comprehensibility was mainly affected by plot structure, with the Farmer story rated more comprehensible. On the other hand, the imagery rating of the text depended mainly on the concreteness of the characters and their actions, with the animals rated higher than the political parties. These factors will appear again in the analysis of the recall results.

A half hour after reading and rating the stories, the subjects were asked to recall the first story read, and then the second story. The most interesting effects concerned the *proactive* influence of the first story upon recall of the second. Figure 5 shows percentage recall of the propositions of the second story depending upon its relationship to the first story the person read.

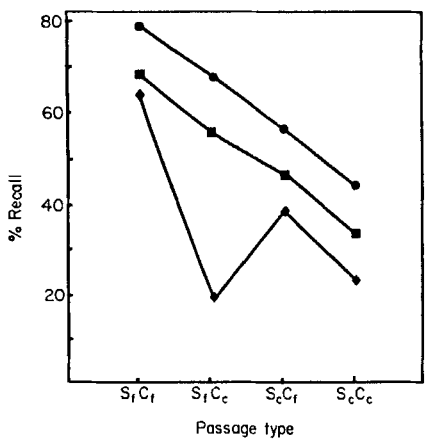

FIGURE 5. Percentage recall of propositions of the second passage read as a function of the type of passage and its relation to the first passage studied. Repeated structure (●); unrelated (■); repeated characters (◆).

Of first interest is to note how recall of the different texts varies when the second text is unrelated to the first (the middle line of Figure 5). First, the tightly-knit goal structure of the Farmer story was easier to recall than the plot of the Circle Island story—an outcome in line with the earlier comprehensibility ratings. (You may have also noticed that the Farmer passage involves much repetition of propositional elements, which probably contributes to its memorability.) Second, the concrete animal characters and their predictable actions are also more memorable than are the abstract political parties and their abstract manoeuvers—an outcome in line with the earlier imagery ratings. The middle line in Figure 5 suggests that these plot-structure and content variables had roughly additive effects upon recall.

The transfer effects between the two texts are obvious from the top and bottom lines in Figure 5. Recall of the second story is facilitated when it contains a

repetition of the same general plot structure though with different characters. But recall is poorer when the second story uses the same characters in a different plot performing quite different actions—for example, the farm animals are voting to decide whether to spend money to build themselves a new barn. The results are remarkably orderly.

We may interpret these results along the following lines. When the second story uses the same plot structure as the first, the reader can reinforce and use that already learned structure to ease his understanding of the second story. He can also use it later to recall the second story, including such items as the main goals of the protagonists, how many subgoals and attempts there were, the logical form of their inter-relation, and the form of the resolution. Despite the similar abstract plots, the two stories tend not to be confused with one another because they have quite different characters and actions. On the other hand, when the same characters occur in different plots, different goals and actions are being associated to a character, and over time these become confused between the two stories, so one observes associative interference.

This experiment is not appropriately analytic to assess two contributory factors to recall, namely, facilitation produced by learning across texts of the general types of information being mentioned, and interference and confusion created by learning different factual details about the same or similar characters in different texts. However, an earlier experiment of mine (Bower, 1974) brings out rather clearly these two factors in transfer between passages.

The materials for that experiment were biographies of fictitious English poets, as illustrated partially in Table IV. All subjects studied the original passage about Thomas Payton; they were then divided into two groups to study either two similar biographies (called the interpolated experimental passages) or two unrelated texts

TABLE IV

First quarter of sentences in the originally learned passage, in one of the interpolated experimental passages, and in one of the interpolated control passages

A Originally-learned passage	B Experimental passage	C Control passage
Thomas Payton was one of the finest poets England has ever known. Payton was born in Kensington at the end of October, 1812. His father was a merchant who worked in the nearby town of Blackrock. When Payton was only seven years old, his father was killed by a bear	Samuel Hughes was one of the finest poets England has ever known. Hughes was born in Paddington at the end of October, 1805. His father was a weaver who worked in the nearby town of Blackrock. When Hughes was only nine years old, his father was killed by a lunatic	Karisoon is a small island near the Aleutians. It has a diameter of about 12 miles and an area of about 120 square miles. It is sparsely populated, having only about 700 Aleuts who tend herds of wild reindeer . . . .

(control passages), one about a fictitious island in the North Pacific, another about the book collections of a library. Two interpolated passages were given to boost the amount of forgetting of the first passage. The subjects then recalled the first passage learned. The question was how the different interpolated passages would affect recall of the originally learned biography.

As it turned out, answering this question required a rather careful analysis. A gross measure like percentage of propositions freely recalled from Passage 1 showed these two groups to be practically the same, which would suggest no transfer effect at all. But before concluding this, one needs to look carefully at the individual propositions of the original and the experimental passages. You will notice in Table IV that some specific details have been changed whereas many have been left intact and repeated. Moreover, even the changed details are giving just a different instance of the same class. For example, the last sentence shown has the general form "When the poet was only *some* years old, his father was killed by a *something*".

Consider then what will happen when the subject learns the experimental passage after the first passage. The unchanged facts that are repeated in the two passages —for example, that the father "worked in the nearby town of Blackrock"—these should be strengthened in memory. Moreover, even when the specific details are altered between texts, the person should be learning the general kinds of facts or categories that are being mentioned: he should learn to mention a birthdate and place, an occupation for the father, the age of the son when the father died, and so on. These general facts might be called the categorical macrostructure of these similar biographies. These categorical relations were being repeated and hence should be strengthened for subjects receiving the interpolated experimental passages. Although the subject should be learning to recall the right general class of facts, he should still be suffering associative interference in trying to recall the details of the original text that were changed in later texts—that is, he may intrude Paddington as the birthplace of Thomas Payton or misremember that Payton's father was a weaver, and so on. Thus, the prediction was that we would enhance learning of the conceptual macrostructure of the biography at the same time that we would interfere with recall of its changing details.

We divided the 63 atomic facts of the original passage into 22 that were changed in specific detail vs. 41 that were repeated, including some with changes of the poet's name. This division revealed quite clearly what was happening during final recall of the original passage. The results are shown in Table V for *changes* in free recall percentages for specific facts (left hand table). The control subjects, who learned unrelated interpolated texts, have change scores near zero, suggesting very little forgetting for them. The experimental subjects show a more interesting pattern. First, they improved by 14% their recall of specific facts that were repeated unchanged across the interpolated passages. On the other hand, their recall of details that were changed between the original and interpolated passages dropped significantly, largely due to explicit intrusion errors of the wrong names, places, dates, occupations and the like.

While noting this interference at the level of changing details, we can also examine whether subjects are recalling from the right general categories. The

TABLE V

Change scores (immediate minus delay) in percentage of propositions freely recalled from the originally learned biography

	Specific fact recall		General fact recall	
	Repeated details	Changed details	Repeated details	Changed details
Experimental group	+0·14	−0·14	+0·14	+0·14
Control group	+0·05	−0·02	+0·05	+0·04

changes in these "general fact recall scores" are shown in the right hand panel of Table V. Here we note that subjects studying the experimental passages improved in learning the correct categorical relations just as much (namely, 14%) whether the corresponding specific detail was changed or was repeated between the stories.

To summarize, then, the experimental subjects seemed to be learning the conceptual macrostructure of the biographies quite well while at the same time suffering some interference and getting somewhat confused about which altered detail goes with which poet. Relative to the controls, then, their total performance was a resultant of facilitated recall of the macrostructure along with interference in recall of changed details, these two effects being so balanced in this experiment as to create no net difference in final recall between the experimental and control groups. Thus, by attending carefully to the exact relations between the original and interpolated passages, we uncover quite selective interference or facilitation effects in transfer and retention.

Role of inferences in text understanding and memory

My final topic concerns the role of inferences in understanding text. Basically, the idea, promoted particularly by Roger Schank (1975), is that as a person hears a story, he is connecting up each sentence he is hearing to earlier sentences in the story. He is constantly asking himself, "Does this statement 'fit', given what I already know? Have the preconditions for this action been set up? If not, can they be inferred by bridging back to some earlier statement in the text? Is there a plausible causal chain I can infer from earlier statements to help me understand the reason for the current statement?" Thus, if I read in a newspaper story that U. S. President Ford fired Defence Secretary Schlesinger, I can relate that back to earlier statements in the text (or in my memory) about disagreements between Ford and Schlesinger regarding the United States' military posture during our period of detente. The claim is that we draw such backwards inferences automatically as we read text.

Figure 6 (from Thorndyke, 1975) schematizes this process of inferencing. As each event-statement comes in, we first check whether it fits into the active context or framework—if so, fine, we just plug the event into the frame, and continue on. For example, if the currently active frame is about a mechanic repairing a car

engine, we can easily understand a sentence about his checking over the carburator. However, I would momentarily boggle and have to do some extra cognitive work if the next sentence is "Suddenly, he went to the telephone and called Mrs Jones".

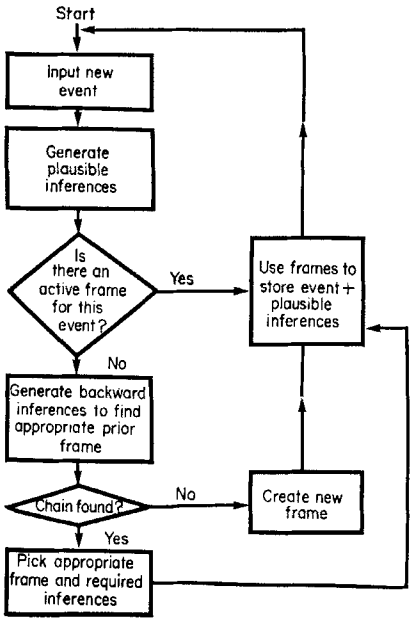

FIGURE 6. Flow chart of the inference-drawing process.

I could understand that only by getting outside the "car-repair frame", remembering that the car belongs to Mrs Jones, and that she had asked to be called to okay any expensive repairs. So, I would infer that the mechanic has located an expensive malfunction and is probably calling to inform her of this. Moreover, I will store in memory the telephoning event plus the inferential chain needed to connect up the two statements. For example, I would store the inference that the mechanic discovered that the car repair would be very expensive.

If we come across a sentence we cannot connect up to earlier events, either we assume some completely new episode has started or else we leave in memory some sort of "peculiarity" tag on the proposition—a "what's that again?" tag. For instance, if after establishing that the main character is blind, I tell you that he likes to attend art shows, the statement should receive some kind of peculiarity marking because it violates expectations.

Such anecdotes illustrate that we often monitor for whether a given statement fits into the prevailing context. If there is no direct fit, then we try to link up the statement by a causal chain to an earlier event or frame of the story. The particular implication that we tested in an experiment by Thorndyke (1976*b*) is that a person's memory of a story contains these bridging inferences.

Figure 7 schematizes the inference process as well as the experiment done to test this process. A story line is going along when a statement occurs describing

some event, call it event A. For example, the event statement might be "The school teacher swung her hand at little Mary who was misbehaving". We suppose that such statements give rise to a potentially large number of inferences, more or less simultaneously (see, e.g., Reiger, 1975). Possible inferences might be that the teacher swung and missed, that the teacher was angry, that Mary was a problem child, that the teacher injured Mary, and so on. There are many such

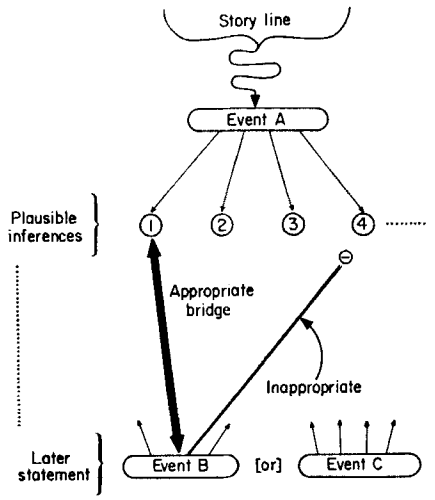

FIGURE 7. Schematic of backwards inferencing process for the neutral (event C) vs. the loaded (event B) texts. Inferences 1, 2, 3, 4 are implicitly activated when event A occurs.

inferences one could draw, and one or more may be relevant to what might occur later. Thorndyke made up two stories that were identical except for a later statement inserted a few lines later in the text. Let us call these statements describing events B or C. Event C is neutral and irrelevant to the plausibility of the several inferences from event A. For example, event C might be the later statement "Mary heard some birds singing outside the classroom window"; this would not alter the plausibility of any of the former inferences from A. The other text, however, contains statement B which describes a loaded event such as "Mary noticed that her lip was bleeding". This event can be understood by bridging back to event A via the inference (marked (1) in Figure 7) that the teacher actually hit Mary and injured her. So, by the bridging hypothesis, we expect a proposition corresponding to inference (1) to become more plausible and to be incorporated into the memory representation of the story because it has served to bind together causally two events in the story. Therefore, on a later recognition memory test, subjects who read the "bloody lip" statement should false alarm a lot to inference (1), saying that the teacher injured Mary. For the same reason, the "bloody lip" event B lowers the plausibility of other potential inferences from event A, in particular that labelled (4) here—for example, the inference that "The teacher's hand missed Mary" has been lowered in plausibility. Note that these inferences are

not logically required, only strongly implied—the teacher could have missed and Mary could have bit her lip, causing it to bleed. Finally, there are some inferences from event A which do not have their plausibilities altered according to whether events B or C occur—these inferences, labelled (2) and (3) in Figure 7, comprise neutral inferences like "The teacher was angry at Mary", "The teacher believes Mary is a problem-child", and so on.

From this outline, the design of the experiment should be reasonably obvious. Subjects studied four different passages of 20 sentences. Each passage contained two such critical "event A" sentences. Different subjects read stories that were identical except for the loaded B statement or the neutral C statement. Two different groups were tested; one rated the plausibility of various inferences whereas the other performed a recognition memory test. After reading each story, the raters judged on a seven-point scale the plausibility or likely truth-value of various inferences, such as inferences 1, 2, 3 and 4 in Figure 7. The average plausibility ratings are shown in Figure 8, and they simply validate the construction of the stories in that appropriate inferences used in chaining from the loaded event

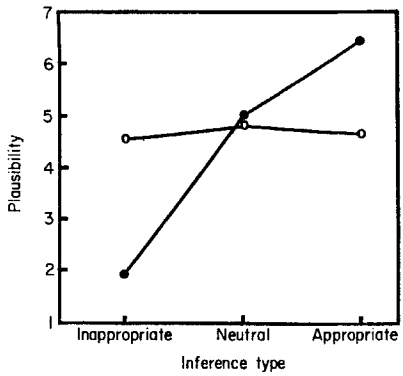

FIGURE 8. Plausibility ratings for appropriate (1), neutral (2 and 3), and inappropriate (4) inferences, for the control (AC) (○) passage and the experimental (AB) (●) passage.

are viewed as very plausible in the Experimental (AB) stories whereas other inferences incompatible with the loaded event are seen as having low plausibility. The inferences were pre-selected so that they seemed of medium plausibility for the control ("AC") story.

The second group in this experiment read all four stories, then had a recognition memory test over 24 actual statements along with 24 inferences of the three types. These subjects judged whether or not each test sentence had been stated explicitly in one of the four stories they had read.

The results are shown in Figure 9, revealing that for the experimental passages the likelihood of identifying an inference as having been in the text increased directly with its plausibility. Appropriate inferences drew 58% false alarms, whereas inappropriate inferences drew 6% false alarms. The control subjects

who read the neutral later sentence (event C) treat all the inferences more or less alike, as deserving of about 25% false alarms. Test statements that were verbatim true were checked as seen 85% of the time.

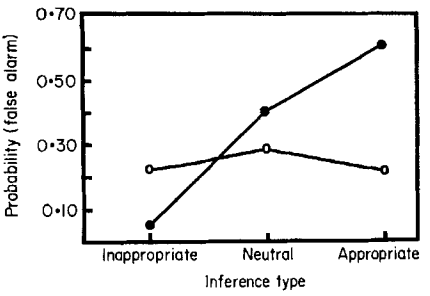

FIGURE 9. Probability of a false-positive recognition decision for inferences of the three types for the experimental (●) and control (○) passages.

As always, the subject confused in memory what was said explicitly with what inferences were plausible based on what was said. The results suggest that the memory representation of a story does not include all possible inferences potentially derivable from each event; rather, nonessential inferences naturally fade away and our memory keeps only those central inferences used in bridging between salient events of the text. The appropriate inferences are strengthened in memory, I suppose, because they are activated twice, once at input of event A and once upon reactivating this inference while finding the causal bridge to event B.

This account supposes the effect of the loaded-event story is to increase the activation or strength of a bridging inference in memory at the time the text is read. An alternative and equally plausible account currently being tested is that the effect is not due to strength in memory of the bridging inference but rather is due to a subject's willingness ("response bias") during testing to accept any statement that he does not remember but which has high plausibility based on the propositions (like A and B) that he can remember. Differentiating these two explanations involves some theory-bound complications I will not go into here.

Summary and ending

Let me summarize my main points.

First, simple stories or folktales have a definite abstract structure, which is so regular in fact that some people are tempted to write a set of rules for generating the general class of episodes in problem-solving stories.

Second, from experiencing hundreds of such stories over their lifetime people acquire this abstract framework about simple stories. They then apply this tacit framework to sort out and understand any new story they hear: they instantiate concepts such as setting, protagonist, goals, and problem-solving actions in terms of the concrete particulars of the given story. They also use this framework to reconstruct a story they have heard.

Third, if a text violates some of the critical rules—for example, by leaving out the theme or main goal of the central character—then the text seems less coherent, is harder to learn, and is forgotten more readily.

Fourth, the story grammar we considered assigns a hierarchical description to the propositions of the few stories considered. Elements at higher levels in this hierarchy proved to be the more important components of the story; they are most likely to be remembered and to be included in summaries; since details are forgotten, over time the recall of a story tends increasingly to look like a summary of it.

Fifth, we may distinguish the plot structure of a story from its content. Recall varies according to the concreteness of the characters and their actions and also according to the coherence or "goodness" of the plot structure.

Sixth, transfer learning effects can be examined across successive passages. In one experiment, repetition of the plot structure with new characters facilitated remembering, whereas repetition of the characters in a new plot interfered with recall of the second story. Some transfer effects require very careful analysis. For example, we found across three biographies selective facilitation or interference of specific facts depending on whether they were repeated or changed. Furthermore, the later biographies enhanced the person's learning of the overall structure or the general form of these biographical passages. The subject seemed to be learning the general framework for similar texts involving similar characters, at the same time as he was becoming increasingly confused about the precise details of a particular story.

Seventh, understanding some sentences in a story requires the listener to build a backwards bridge of inferences to information provided by an earlier statement in the text. Often the bridge comprises a plausible causal chain from a selected earlier event to the present event. It is claimed that this bridging inference thereby gains in plausibility and is likely to enter the person's memory representation of the story. This special status of a bridging inference from the earlier statement is in contrast to the many other potential inferences which are never needed for connecting up to later events in the text. This account of how inferences are activated and lodged in memory was supported by high false alarm rates to such bridging inferences.

In closing, let me note that these are only beginning steps in analyzing what is surely a very complex phenomena, namely, how people process and understand text. Nonetheless, I think the topic is too central to cognitive psychology for us to continue postponing investigating it until we first figure out how lists of nonsense syllables are learned. I think there is every indication that studies of story understanding and recall provide an experimental microcosm in which are revealed the operation of the most sophisticated cognitive machinery that men have assembled. I believe such studies have a really exciting future.

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References

ABELSON, R. P. (1975). Concepts for representing mundane reality in plans. In BOBROW, D. G. and COLLINS, A. (Eds), *Representation and Understanding*. Pp. 273–309. New York: Academic Press.

BOWER, G. H. (1974). Selective facilitation and interference in retention of prose. *Journal of Educational Psychology*, **66**, 1–8.

COLBY, B. N. (1973). A partial grammar of Eskimo folktales. *American Anthropologist*, **75**, 645–62.

KINTSCH, W. (1974). *The representation of meaning in memory*. Hillsdale, New Jersey L. Erlbaum Assoc.

KINTSCH, W. and VAN DIJK, T. (1976). Recalling and summarizing stories. *Language*, In press. (In French).

MINSKY, M. (1975). A framework for representing knowledge. In WINSTON, P. (Ed), *The Psychology of Computer Vision*. Pp. 211–277. New York: McGraw-Hill.

NEWELL, A. and SIMON, H. A. (1972). *Human Problem-Solving*. Englewood Cliffs, New Jersey: Prentice Hall.

PROPP, V. (1968). *Morphology of the Folktale*. Austin: University of Texas Press.

RIEGER, C. J. (1975). Conceptual Memory and Inference. In SCHANK, R. C., *Conceptual Information Processing*. Chapter 5. Amsterdam: North-Holland Publishing Co.

ROSCH, E., MERVIS, C. B., GRAY, W., JOHNSON, D. and BOYES-BRAEM, P. (1976). Basic objects in natural categories. *Journal of Experimental Psychology: General*. **105**, in press.

RUMELHART, D. E. (1975). Notes on a schema for stories. In BOBROW, D. G. and COLLINS, A. (Eds), *Representation and Understanding*. Pp. 211–236. New York: Academic Press.

SCHANK, R. C. (1975*a*). The structure of episodes in memory. In BOBROW, D. G. and COLLINS, A. (Eds), *Representation and Understanding*. Pp. 237–272. New York: Academic Press.

SCHANK, R. C. (1975*b*). *Conceptual information processing*. Amsterdam: North Holland Publishing Co.

SCHANK, R. C. *et al.* (1975). *SAM-A Story Understander*. Department of Computer Research Science Research Report ≠ 43. Yale University: New Haven, Conn.

THORNDYKE, P. W. (1975). *Cognitive Structures in Human Story Comprehension and Memory*. Ph.D. Thesis, Department of Psychology, Stanford University, Stanford, Calif. Also *Technical Report P*–5513. The Rand Corporation: Santa Monica, Calif,

THORNDYKE, P. W. (1976*a*). Cognitive structures in comprehension and memory of narrative discourse. *Cognitive Psychology*. In press.

THORNDYKE, P. W. (1976*b*). The role of inferences in discourse comprehension, *Journal of Verbal Learning and Verbal Behaviour*. In press.

VAN DIJK, T. A. (1975). Recalling and summarizing complex discourse. University of Amsterdam mimeo. Department of General Literary Studies.