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Technical Report No. 265

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Center for the Study of Reading

TECHNICAL REPORTS

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The National Institute of Education
U.S. Department of Education
Washington, D.C. 20208

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The research reported herein was supported in part by the National Institute of Education under Contract No. HEW-NIE-C-400-76-0116. Ed Lichtenstein is now at the Department of Communication Research, National Technical Institute for the Deaf, Rochester Institute of Technology. Requests for reprints should be addressed to William F. Brewer, Department of Psychology, University of Illinois, 603 East Daniel St., Champaign, Illinois, 61820, USA.

Abstract

This paper proposes that theory construction in the area of stories must distinguish between theories of plan comprehension, theories of narrative comprehension, and theories of the story schema. Evidence is provided which suggests that a number of theoretical and empirical findings that have been taken to contribute to theories of the story schema are better interpreted as relating to plan comprehension and narrative comprehension. The paper suggests that theory evaluation in this area must take into account the discourse force of the genre being investigated. The authors propose that stories are the subclass of narratives that have entertainment as their primary discourse force. Finally, a structural-affect theory is outlined and evidence is given to suggest that this theory gives a partial account of the reader's story schema.

Stories Are to Entertain: A Structural-Affect Theory of Stories

In this paper we intend to argue that much of the current controversy in the area of story theory derives from a failure to make clear the distinctions between (a) theories of plan comprehension, (b) theories of narrative comprehension, and (c) theories of the story schema. In very general terms we take a theory of plan comprehension to be a theory that attempts to account for the ability of humans to interpret the observed actions of another person in terms of that person's intentions. A theory of narrative comprehension is a theory that attempts to account for the ability of humans to understand narrative discourse. A theory of the story schema is a theory that attempts to deal with the individual's knowledge and enjoyment of the subclass of narrative discourses that are stories.

In the course of this paper we will distinguish between the underlying events described in a narrative and the linguistic presentation of the events in the narrative. This distinction was originally emphasized in the early writings of the Russian Formalists (Erlich, 1980) and has continued to play an important role in structuralist analyses of narrative (Chatman, 1978; Sternberg, 1978). We will use the term event structure to refer to the organization of events in the temporal sequence of a presumed event world, and we will use the term discourse structure to refer to the sequential organization of these events in terms of their occurrence in a narrative.

Plan Understanding

When an individual observes a sequence of actions by someone, the observer interprets the actions in terms of the actor's intentions. Recent

research in the area of artificial intelligence suggests that observers structure the observed actions in terms of plan schemas consisting of hierarchically organized goal-subgoal relationships (see Schmidt, Sridharan, & Goodson, 1978).

The area of plan understanding is of crucial importance for theories of narrative and theories of stories, since the core of most narratives and most stories is a description of a sequence of human actions (see van Dijk, 1975, 1976). In developing theories in this area it seems to us that one must be very careful to distinguish those aspects of the phenomena being studied that derive from general plan comprehension and those aspects that derive from other domains.

We have carried out a series of experiments on plan comprehension and memory for plans (Lichtenstein & Brewer, 1980; Brewer & Dupree, in press) which suggest that much of the previous work on narratives and stories must be reinterpreted. In these experiments we had subjects view videotapes of an actor carrying out a goal-directed event (e.g., setting up a slide projector) and then later tested recall or visual recognition of the original events. We developed rating procedures which showed that the subjects agree on their interpretation of the observed events in terms of a hierarchically organized plan schema. We used this data to empirically instantiate plan schemas for each of our videotaped actions and then related the plan schemas to the recall data. The data strongly support the view that plan schemas were being used to comprehend and recall the observed actions. We found that goal-directed actions were recalled better than non-goal-directed actions. Actions higher in the plan hierarchy were recalled better than actions lower in the hierarchy. Actions observed in

their canonical plan-schema position were recalled better than actions not in canonical position. Actions that were presented out of canonical position tended to shift in recall back to their canonical position.

It is these findings that suggest to us that much of the previous research on stories must be reinterpreted. The findings in our plan experiments are essentially the same as those of the basic experiments on story understanding and story recall (e.g., Black & Bower, 1980; Mandler, 1978; Rumelhart, 1977; Stein & Nezworski, 1978; Thorndyke, 1977). Yet, the subjects in our experiments were simply recalling a sequence of goal-directed events that they had seen on a videotape. This strongly suggested that the basic findings of the earlier story experiments were not related to story structure, but were predominately due to the plan schema that subjects developed to understand the actions of the characters described in the stories they heard.

In order to make this interpretation stronger, Lichtenstein and Brewer (1980) carried out two additional experiments that did not involve videotaped stimuli. Instead, in these experiments the subjects were given narrative texts to recall. The narratives consisted of descriptions of the videotaped actions used in the earlier experiments. The recall results with these narratives essentially replicated the results of the videotape experiments and also once again those of the story-memory experiments. Overall, this set of results lends strong support to the position that many of the empirical findings relating to story memory are attributable to the goal-directed action sequences described in the texts and that the theoretical successes were due to the incorporation in the "story grammars" of plan schemata (notice the explicit shift to plan schemata between Rumelhart's 1975 paper and his 1977 paper). Thus, it appears that the most

consistent empirical findings of the story grammar tradition (the story recall findings of Mandler, 1978; Rumelhart, 1977; Stein & Nezworski, 1978; and Thorndyke, 1977) provide strong evidence for the importance of plan schemas in understanding human actions, but little evidence for a theory of the story schema.

The logic of the argument for the reinterpretation of the story grammars also holds for story theories from the artificial intelligence tradition. Examination of Meehan's (1976) program for story production shows that it is essentially a program for representing plans for goal-directed actions and movements in three-dimensional space. Similarly Wilensky's (1978) program for story comprehension can be seen as a program for representing the interaction of an individual's plans or the interactions of the plans of two different individuals.

If one accepts the argument for the reinterpretation of these story theories, it appears that the implications are different depending on the underlying motivation of the investigators. In retrospect it seems to us that some of these investigators (Rumelhart, 1977; Bower, 1978; and perhaps Black & Bower, 1980) were actually just using stories as a convenient way to study plan schemas. For these researchers the reinterpretation simply consists of making explicit what they were already doing. However, for those theorists who were attempting to give an account of the reader's story schema, this reinterpretation has more impact since it suggests that much of the earlier work was capturing phenomena related to general plan schemas, and not to story schemas.

Narrative Understanding

Theories of narrative understanding must be clearly separated from theories of plan comprehension and theories of the story schema. In general, the process of discourse comprehension can be thought of as the process of forming a mental model (Johnson-Laird, 1980) from some segment of discourse. The closer the resulting mental model is to that intended by the individual who constructed the discourse, the better the comprehension. Discourse is taken to be modality free so that the same discourse organization could potentially be expressed in written or spoken language or in a nonlinguistic form such as a silent movie (see Chatman, 1978, for a discussion of this point).

Brewer (1980) has suggested that the form of the underlying mental model may be different for different types of discourse. Thus, there may be some form of visual-spatial representation for descriptive discourse, some form of abstract logical representation for expository discourse, and some form of plan representation for narrative discourse. Clearly these are idealizations and the mental model for a given narrative text would typically include visual-spatial aspects of the location and a representation for the attributes of the characters. However, in this paper we will focus on the plan-schema aspects of the narrative mental model.

The resources of the language make it possible for the author of a narrative to arrange the events in the discourse in any order the author wishes (e.g., flashbacks and flashforwards). The author also has the ability to include or omit from the narrative any of the events in the underlying event sequence (scene vs. summary). The author of a written narrative has one interesting device that is not available in ordinary

human plan comprehension. The author can use various types of point of view that allow the reader to have direct access to the characters' plans and intentions (in story-grammar terms these are the "goal" category--see Mandler & Johnson, 1977, and Stein & Glenn, 1979).

In attempting to understand a narrative, the reader's job is to derive the intended mental model from the presented discourse. The range of techniques available to the author of a discourse make possible an enormous number of discourse organizations for a given underlying event sequence. The goal of a theory of narrative comprehension is to give an account of the mental processes in narrative understanding, including those that lead some discourse organizations to be harder to understand than others.

If one accepts this analysis of narrative comprehension, then several of the findings from the story-grammar literature can be seen to be dealing with narrative comprehension. The initial studies on this topic were fairly unsophisticated. They consisted of randomizing or misarranging discourse elements in a narrative without using the usual linguistic devices to establish cohesion (e.g., tense markers, conjunctions) and then examining the comprehension or recall of the resulting narrative texts (Kintsch, Mandel, & Kozminsky, 1977; Stein & Nezworski, 1978; Thorndyke, 1977). The general finding from this research is that comprehension and memory processes are facilitated when the order of elements in the discourse map the order of elements in the event sequence. Recently Mandler and Goodman (n.d.) have carried out a series of much more sophisticated studies of narrative comprehension with essentially the same findings as the earlier studies. Some of van Dijk's work on macrostructures (1980) can be viewed as working out the relations between discourse structures that contain

omitted information and their intended mental model. However, it is clear that narrative comprehension is a difficult topic and it will require considerably more work before we have an adequate account of the psychological processes that are used to generate a mental model from a given discourse structure.

Story Schema

It appears to us the goal of a theory of the story schema is to account for those phenomena that are unique to stories. A theory of plan comprehension is designed to deal with any observed or reported human action. A theory of narrative comprehension is designed to deal with the comprehension of the broad class of narratives (e.g., stories, newspaper articles, history texts, directions, etc.). A theory of the story schema can assume the existence of the more general theories of plans and narrative comprehension, but must provide an account of the psychological processes that are uniquely related to stories.

In order to understand the properties of stories, it is necessary to examine the function of different types of discourse. Brewer (1980) has argued that in classifying the different types of discourse one must postulate a higher order construct of discourse force. The discourse force of a text is the overall purpose of the text. Thus, within the class of narratives: Instructions and newspaper articles are primarily designed to inform; propaganda and fables are primarily designed to persuade; while popular stories and novels are primarily designed to entertain. Some texts have a fairly pure discourse force (e.g., popular westerns or mystery stories), whereas other texts are deliberately designed to have several forces (e.g., fables are designed to entertain and to persuade).

The concept of discourse force has powerful consequences for theories in this area, since the discourse organization is frequently determined by the discourse force and the criteria which should be used to evaluate a theory are strongly influenced by the postulated discourse force.

A number of recent researchers in this area have argued that stories are somehow different from other types of narratives (de Beaugrand & Colby, 1979; van Dijk, 1976; Kintsch, 1980; Meehan, 1976; Wilensky, 1978) and that they must contain something of interest to a reader. We agree, and want to make the more specific claim that stories are a subclass of narratives which have entertainment as their primary discourse force. In Western written literature this would cover genres such as the detective story, the western, the spy story, the romance, the horror story, the Gothic, the adventure story, and science fiction. For discussion of these genres and arguments that they are primarily designed to entertain see Cawelti (1976), Mellard (1972), and Nye (1970). Many current works of "serious literature" do not have entertainment as their primary discourse force and thus would not be considered stories by this definition (see the introduction to Stevick's 'Anti-Story', 1971, for a discussion of this issue). This definition of story can also be applied to traditional oral narratives in nonliterate cultures (see Brewer, forthcoming). Researchers interested in oral narratives frequently classify these narratives into three basic types: legend, myth, and folktale (Bascom, 1965; Dégh, 1972). The first two often serve the function of Western religion, history, science, and philosophy. The class of narratives labeled "folktales" is usually considered to have entertainment as its primary discourse force (see, Brunvand, 1968, p. 103; Dégh, 1972, p. 60).

The concept of discourse force has profound implications for theory evaluation in this area. If one is studying a genre such as propaganda, where the discourse force is to persuade the reader, then the appropriate way to test theories about the discourse organization of propaganda is to examine the theory's success in predicting changes in the attitudes and opinions of the reader. If one is studying a genre such as instructions, where the discourse force is to inform, then the appropriate way to test theories about the discourse organization of instructions is to examine the theory's success in predicting the degree to which the text correctly and efficiently transmits information to the reader. If one is studying a genre such as stories, where the discourse force is to entertain, then the appropriate way to test theories about the discourse organization of stories is to examine the theory's success in predicting the reader's enjoyment of the text. It seems to us that most of the researchers from cognitive psychology and artificial intelligence who have recently proposed theories of the story schema have implicitly or explicitly assumed that the discourse force of stories is to inform and thus have used memory and comprehension to test their theories. This is the reason why we have suggested that much of the previous work is more appropriately taken to be studies of plan comprehension or narrative comprehension.

An example of the implications of the discourse force argument can be seen in an examination of the discourse organization of common types of stories. In the earlier discussion of narrative comprehension we noted that there was growing experimental evidence to support the view that comprehension and memory are facilitated by having the events in the discourse map the order of the events in the event structure. Thus, if stories

are designed to inform, the appropriate discourse organization for stories ought to be this one. Yet, many naturally occurring stories such as the typical mystery story are not organized in this fashion. The underlying events for a prototypical mystery story include the murderer developing a motive, obtaining a weapon, murdering the victim, the discovery of the body, the arrival of the detective on the scene, the detective searching for clues, and finally the detective solving the crime. If one wanted to organize a discourse containing these events that was designed for maximum ease of comprehension, then the discourse organization would simply be that order given above. Yet, actual mystery stories are not organized in this way. In typical mystery stories the discourse begins at some point after the murder, and discourse information about the earlier events is scattered throughout the remaining discourse, with at least one crucial piece of information not made explicit in the discourse until very near the end of the text. If one adopts the view that stories are designed to inform, then this seems somewhat paradoxical. However, if one assumes that stories are designed to entertain, then it becomes obvious that the writer has deliberately organized the discourse to evoke the curiosity of the reader. Notice that if one used ease of comprehension as the criterion for the "correct" discourse organization, as have most recent empirical studies of stories, then one would probably conclude that mystery stories, as a class, are "poorly organized" or are "ungrammatical."

Observational and Descriptive Adequacy

In addition to the argument about memory and comprehension criteria that have been used in theory evaluation, an important debate has raged around the traditional linguistic criteria of observational and descriptive

adequacy. We will use the terms as they were originally defined by Chomsky (1964): A theory is observationally adequate if it accounts for a finite corpus of data, and a theory is descriptively adequate if it accounts for the linguistic intuitions of native speakers. As applied to stories, the criterion of observational adequacy would involve showing that a theory could account for the structure of some particular corpus of stories, while the criterion of descriptive adequacy would involve showing that a theory could account for the story intuitions of members of a particular story culture.

Black and Wilensky (1979) have recently argued that story grammars are not descriptively adequate. They did this by giving examples of narratives that did not fit the structural criteria of story grammars and yet met their intuitions of storyhood. They also gave examples of narratives that did fit the structural criteria of story grammars and yet did not meet their intuitions of storyhood. Mandler and Johnson (1980) objected to the specific examples used by Black and Wilensky and have suggested that they were content to aspire to observational adequacy for the domain of folk-tales from the oral tradition. Whatever the merits of the particular arguments in this debate, it does suggest that another way to contrast theories in this area is to gather data on story intuitions and test the theories for descriptive adequacy.

A Structural-Affect Theory of the Story Schema

In two recent papers (Brewer & Lichtenstein, 1981, submitted) we have tried to develop accounts of some of the psychological processes that are relevant to the special subclass of narratives that are stories. Since the basic discourse force of stories is assumed to be the entertain force, we

have attempted to examine some of the fundamental structural properties that lead to enjoyment. In overview, we have related particular discourse organizations to particular affective responses in the reader, and then we have related these discourse organizations and affective responses to the reader's liking judgments and story intuition judgments. The discourse organization component has been strongly influenced by literary theorists from the structuralist tradition (Chatman, 1978; Culler, 1975; Sternberg, 1978). The affective component has been influenced by the work of the psychologist Berlyne (1971).

Berlyne attempted to use constructs from motivational and physiological psychology to produce a general theory of pleasure. He postulated that enjoyment is produced by moderate increases in arousal ("arousal boost") or by a temporary sharp rise in general arousal followed by reduction of the arousal ("arousal jag"), and if both processes operate together enjoyment is produced by both the rise and the subsequent drop in arousal ("arousal-boost-jag"). We attempt to use this general approach to account for the fact that certain narratives are enjoyed and others are not.

In Brewer and Lichtenstein (1981, submitted) we proposed that there are three major discourse structures which account for the enjoyment of a large proportion of stories.

Surprise. A surprise event structure must contain critical expository or event information early in the event sequence. In a surprise discourse organization, the critical information from the beginning of the event structure is omitted from the discourse, without letting the reader know that it has been omitted, and then is inserted later in the discourse. We assume that the reader will be surprised when the reader reaches the point

where the omitted information is revealed, and that the surprise is resolved when the reader reinterprets the underlying event sequence in light of this new information. An example of a minimal surprise discourse structure is: "Charles got up from the chair. He walked slowly toward the window. The window broke and Charles fell dead. The sound of a shot echoed in the distance." In the underlying event sequence, a sniper has come within range of Charles' window, but this critical event information has been omitted from the discourse structure to produce surprise (see Brewer & Lichtenstein, submitted, for a more detailed discussion of resolving and nonresolving surprise).

Suspense. A suspense discourse organization must contain an initiating event or situation. An initiating event is an event which could lead to significant consequences (either good or bad) for one of the characters in the narrative. The event structure must also contain the outcome of the initiating event. In a suspense discourse organization the initiating event occurs early in the discourse. The initiating event causes the reader to become concerned about the consequences for the relevant character and this produces suspense. Typically, additional discourse material is placed between the initiating event and the outcome event, to encourage the build up of the suspense. The suspense is resolved when the outcome is presented in the discourse. Thus, in a suspense discourse structure, the order of events in the discourse can map the order of events in the event structure. An example of a minimal suspense discourse organization from the event sequence used above is: "The sniper was waiting outside the house. Charles got up from the chair. He walked slowly toward the window. There was the sound of a shot and the window broke. Charles fell dead." Notice that it

is the reader's affect that is crucial. In this case the reader is placed in suspense, while the character doesn't know that he is in danger.

Curiosity. A curiosity event structure must contain a significant event early in the sequence. In a curiosity discourse organization the significant event is omitted from the discourse, but (unlike surprise) the reader is given enough information to know that the event is missing. This discourse organization leads the reader to become curious about the withheld information. The curiosity is resolved by providing enough information in the later parts of the discourse for the reader to reconstruct the omitted significant event. This is, of course, the discourse organization of the classic mystery story. An example of a minimal curiosity discourse structure for the event sequence used above is: "Charles fell dead. The police came and found the broken glass, etc."

Story liking. The discourse organization component and the affective component are used to make a fundamental prediction from the theory: Readers will enjoy narratives whose discourse organizations succeed in producing surprise and resolution, suspense and resolution, or curiosity and resolution. Thus, for example, readers will prefer discourse organization that produces suspense to discourse organizations that do not produce any affect. Readers will prefer discourse organizations that produce and resolve suspense to those that just produce suspense. This theory attempts to account for many of the plot-related components of liking. However, clearly other aspects of narratives such as content, characterization, and style also enter into the overall liking judgment.

Story intuitions. We have hypothesized that story intuitions are based on the canonical discourse organizations outlined above. In Brewer and

Lichtenstein (submitted) we argue that story intuitions (unlike liking judgments) are not related to the affect felt while reading a narrative. One can know that a particular text is a story without directly feeling a particular pattern of affect or liking the text. In that paper we suggested that story intuitions result from the reader's knowledge of the conventionalized discourse organizations or through the reader's meta-knowledge about the affective responses which the discourse organization might produce in another reader.

Empirical Tests of the Structural-Affect Theory

In Brewer and Lichtenstein (1981, submitted) we carried out a number of tests of our structural-affect approach to the story schema. In those experiments we developed narratives in which we manipulated the basic discourse organizations described above. We asked subjects to read the narratives and then stopped them at fixed points in the narratives and asked them to make affect judgments (e.g., degree of suspense, surprise, curiosity). In addition, after reading the entire narrative the subjects were asked to make liking judgments and story intuition judgments.

Affect curves. The discourse organizations gave the predicted results: Narratives without a significant event showed little suspense. Narratives with suspense discourse organization showed a strong rise in suspense ratings and then a drop at the point of resolution. Narratives with a curiosity discourse organization showed a rise in curiosity when information about the significant event was introduced into the discourse and a sharp drop in curiosity when the significant event was disclosed in the discourse. Narratives with a surprise discourse organization showed a

sharp rise on the surprise scale at the point where the crucial information was introduced into the discourse.

Liking judgments. The liking judgments were related to the affect curves as predicted by the theory. Narratives with appropriate affect curves were liked better than those with none, and narratives with resolved affect were liked better than those in which the affect was not resolved. Thus, the structural-affect theory is able to account for some of the structural properties that produce enjoyment in stories.

Story intuitions. The story judgments were as predicted. Narratives lacking an hypothesized story component (e.g., an initiating event or an outcome) were not considered to be stories, whereas narratives with suspense discourse organizations, surprise discourse organizations, and curiosity discourse organizations were all considered to be stories. Thus, the structural-affect theory shows a considerable degree of descriptive adequacy.

Other theories. One of the experimental conditions in Brewer and Lichtenstein (1981) involved the use of coherent narratives describing problem-solving, goal-directed events (e.g., a man driving home from the office). The story-rating data on these narratives can be used to test the descriptive adequacy of plan-based theories of stories that do not include the requirement of a difficult goal (e.g., Black & Bower, 1980). These narratives meet the requirements of a plan-based theory and thus should have been rated as stories according to these theories. These narratives do not have one of the basic discourse structures and do not show any of the standard hedonic affect curves, so the structural-affect theory predicts that they should not be rated as stories. The data showed that these base narratives were not rated as stories by most of the subjects.

These findings provide support for the descriptive adequacy of the structural-affect theory and evidence against the descriptive adequacy of simple plan-based story theories.

In a more recent unpublished study we have contrasted the structural-affect theory with other classes of theories in a different fashion. All of the recent story theories, both plan-based and story grammars, incorporate a goal-directed action sequence as a necessary part of their theoretical machinery. The structural-affect theory relates story intuition judgments to the basic discourse organizations and affective curves and thus doesn't necessarily require that a story have an underlying goal-directed action sequence. In order to contrast the two classes of theories we wrote narratives which had a suspense discourse organization but contained no goal-directed action sequences. Thus, for example, in one of the narratives a tank of nerve gas explodes and a cloud of gas rolls down a hill toward a sleeping village. The majority of the subjects who read these narratives considered them to be stories. Thus, the data provide evidence that the story grammars and the plan-based story theories are not descriptively adequate, whereas the data support the descriptive adequacy of the structural-affect theory.

Ecological validity. In another unpublished study we have recently attempted to examine the success of the structural-affect theory in dealing with naturally occurring stories. We sampled narratives from popular magazines (e.g., 'Alfred Hitchcock's Mystery Magazine') and narratives from avant-garde writers (e.g., Robbe-Grillet). We obtained affect curves and story intuition judgments on these narratives. We found the hypothesized affect curves for almost all of the narratives taken from popular

magazines and for almost none of the avant-garde narratives. The story intuition data was related to the affect curves as predicted. Those narratives that produced one of the predicted affect curves were judged to be stories, while those narratives that did not show the predicted affect curves were not judged to be stories.

Conclusions

We think that the analysis of recent work on stories in terms of theories of plan comprehension, theories of narrative comprehension, and theories of the story schema makes the nature of these contributions much clearer.

We feel that the arguments for relating theory and theory evaluation to discourse force are important. We have frankly been surprised by the degree to which our own thinking has been changed by taking seriously the proposal that stories are the subclass of narratives that have entertainment as their primary discourse force.

It seems to us that theories of the story schema ought to attempt to account for story-specific phenomena, independent of the more general phenomena related to plan understanding and narrative comprehension. We hope the structural-affect theory is a step in the right direction.

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