not all linguistic passages fit them (e.g., text books, diaries, journal articles). Because of this lack of generality, van Dijk has chosen not to devote much attention to this generative grammar for stories and rather concentrates on macrostructure.

One reason van Dijk devised macrorules and investigated macrostructures might have been due to his experimental results. He asked subjects to read a story and later recall it. Other subjects were asked to read and summarize the same passages. He found a great deal of consistency in the recalls and in the summaries. The common propositions found in all subjects' recall formed a sort of story itself and it was quite close to the summaries from the other subjects. These consistently recalled propositions are considered to comprise the macrostructure. Propositions most likely to be recalled either introduce main characters, give the characters' goals, or describe the actions leading to these goals and results from the attempts. Propositions concerned with settings, mental actions, etc., tend to be ignored.

In van Dijk's analysis, the microstructure usually entails the macrostructure. He derives three macrorules: generalization, deletion, and construction. These are posited to transform a text base into the core or essential macrotext base. The rule of *generalization* allows one to summarize a sequence of statements. There exist different levels of generality of abstraction entailed by the level of explicit text. The level of abstraction that is taken is the least general which also defines the smallest superset. The abstraction process stops when a superclass would not shorten the number of propositions. For example, statements in a text such as "Peter has a dog and three cats. He has a parakeet, etc." would be reduced to "Peter has pets," not "Peter has animals" or "Peter has things." A double application of the generalization rule can occur in a case where both the subjects and predicates of sentences are generalized: "Mommy was baking cakes, Daddy was gardening while their son washed the car, and their daughter sewed a dress," can be summarized as "The family was working on household chores." Inferences of this type can be said to be true by definition.

Inferences using the *rule of construction*, on the other hand, are probably true but not necessarily true. Construction refers to finding a summary term for a set of actions. With this rule, the summary term is not *entailed* by the actions, but if all the required actions are stated, one infers the event. For example, "Peter laid foundations, built walls, built a roof ..." becomes "Peter built a house." Whether one infers a particular summary depends upon the independent likelihood of that interpretation. If one reads that John went to the train station, a summary may be that he is going to take a trip, although this interpretation does not have to be true.

The other important macrorule, the *rule of deletion* does not involve inferences. It follows the principle of irrelevancy, that is, delete propositions that have no consequence, that are merely details. For example, one may delete from "Mary hit a blue ball that broke a window," the detail that the ball was blue. Other types of deletions include omitting extra specification of an act. The phrases "John went to London yesterday. He went to the airport, purchased a ticket and got on a plane bound for London." are rewritten as "John went to London yesterday." One often deletes preconditions, normal conditions, and some normal consequences, so that "John went to the bank to cash a check" may be sufficient to assume that the bank was open and that he received money and, therefore, that it is not necessary to worry how he got there.

Van Dijk and Kintsch have continued to explore the usefulness of the notion of macrostructures (Kintsch, 1977; Kintsch & van Dijk, 1975; van Dijk & Kintsch, 1976). They are not interested in the role of inferences per se, but wish to demonstrate the importance of macrostructures for comprehension. However, their results also demonstrate how the reader uses conceptual structures and world knowledge to infer what must be the appropriate organization of the text. Subjects read passages with the intraparagraph organization intact, but the interparagraph organization scrambled for half of the readers. They felt that this essentially scrambled macrostructures without disturbing microstructures. Although subjects took much longer to read stories with distorted macrostructures, the time to generate summaries was not significantly longer for the scrambled group. The summaries made by subjects who read scrambled passages could not be distinguished (by other subjects) from summaries of subjects who read normal passages. These results are consistent with the notion that subjects work harder to assemble or infer the macrostructure when paragraphs have been scrambled (hence, the longer reading time), but that once this is done, the representation will be the same as that for an unscrambled passage. This study resembles that of Kintsch and Monk (1972) described earlier.

In a related experiment with children, Poulsen, Kintsch, Kintsch and Premack (in press) have found a great deal more consistency in recall of the important (macrostructure) propositions of a story when the story was presented with the macrostructure intact. Both this study and the one just described above, were taken as evidence of the existence of macrostructures. Although the notion of macrostructures is a useful one and the experiments are suggestive, one should ask how many of the possible set of outcomes from their experiments would be considered as consistent with the notion of macrostructures. Note that in the case of the children's data, a failure to make use of the scrambled order was considered as evidence for the existence of macrostructures in children; for adults, the ability to overcome the scrambled order and produce a summary indistinguishable from those of normal passages is also considered as evidence for macrostructures.

Greeno and Noreen (1974) demonstrated the importance of structure to comprehension in a study similar to those of van Dijk and Kintsch. They measured the time to read each sentence of a story and varied the ease with which the organization of the passage containing the sentences could be inferred. They gave subjects one of two presentation sequences. In either case, the information could be represented as a set of linked hierarchies. In the difficult condition, the information was presented to the subject in bottom-up order; in the other condition, the subject read the sentences top-down. It took subjects only two-thirds as long to read low-level sentences in the hierarchy if they were preceded by sentences above them in the hierarchy. There was not a comparable savings for high-level sentences preceded by low-level ones. Greeno and Noreen suggest that this result occurred because relationships involved in low-level sentences are consistent with the more general ones given in the higher level statements. Subjects can process these lower level sentences faster because part of the conceptual structure has already been built. When the order is reversed, the procedure is less efficient. As would be expected by these notions, a sentence inconsistent with the structure took longer to process only when it was read after high-level statements. When the same sentence was read before the structure was obvious, the subsequent sentences took longer to read because they