RUNNING HEAD: READER GOAL AND INFERENCE GENERATION

Reading purpose, type of text and their influence on think-alouds and comprehension measures

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Abstract

There are variations in the extent to which particular types of inferences or activations are made during reading (G. McKoon & R. Ratcliff, 1992; M. Singer, 1994). In this study, the authors investigated the influence of reading purpose (for entertainment or study) on inference generation. Participants read 2 texts aloud and 2 texts for comprehension measures. Reading purpose did not influence off-line behavior (comprehension) but did influence on-line reader behavior (thinking aloud). Readers with a study purpose more often repeated the text, acknowledged a lack of background knowledge, and evaluated the text content and writing than did readers with an entertainment purpose. This pattern was stronger for the expository text than for the narrative text. Reading purpose, and possibly text type, affects the kinds of inferences that readers generate. Hence, inferential activities are at least partially under the reader's strategic control.

The Influence Of Reading Purpose On Inference Generation And Comprehension In Reading

In this article we examine the influence of reading purpose on the type of inferential activities that readers perform. More specifically, we examine the effects of a particular reading purpose or orientation, that is, for study or entertainment, on comprehension behaviors during reading.

There is considerable research on inference generation in reading. Some investigations are based on speeded techniques in which one element is probed for activation during reading (e.g., O'Brien, Shank, Myers, & Rayner, 1988; Graesser, Singer, & Trabasso, 1994; see Singer, 1994, for a review). Other investigations of inference generation elicit think-aloud protocols in which a continuous record of inferences is produced (e.g., Pressley & Afflerbach, 1995; Trabasso & Suh, 1993; Trabasso & Magliano, 1996; Zwaan & Brown, 1996). In think-aloud research, readers have demonstrated a variety of reactions to text (Pressley & Afflerbach; 1995). Trabasso and Magliano (1996) identified three kinds of working memory operations occurring in think-aloud protocols: activation of relevant world knowledge, maintenance of information in working memory, and retrieval of text and prior thoughts from long-term memory. They noted that these were functionally necessary to the three kinds of inferences that they found: backward inferences (explanations), concurrent inferences (associations), and forward inferences (predictions) (see also van den Broek, 1990). The three kinds of inferences are explained as follows. Explanations concern the reasons why something occurs, such as a motive, physical cause, or enabling condition. These are generated in a wide variety of reading situations (e.g., Trabasso, van den Broek, & Suh, 1989; van den Broek, Fletcher, & Risden, 1993). Associations provide information on the features and functions of persons, objects, and events in the text. There is considerable evidence that associative inferences are not routinely generated during normal reading (e.g., Graesser, Singer, & Trabasso, 1994; McKoon & Ratcliff, 1992). Predictions occur when readers make inferences about future consequences of a focal event. Predictive inferences are hard to measure and are not often found except when a coherence break is resolved (Murray, Klin, & Myers, 1993), when the prediction is causally constrained within the text (Murray et al., 1993), or when the prediction is specifically foregrounded in the text (Whitney, Ritchie, & Crane, 1992).

There are variations in the extent to which particular types of inferences or activations are made (McKoon & Ratcliff, 1986; Singer, 1994), and researchers have become increasingly interested in determining exactly which circumstances lead to particular inferences. A considerable number of studies have focused on the effects of reader characteristics on inferential activity. For example, inferences have been found to differ as a function of language skill (Horiba, 1990; Horiba, van den Broek, & Fletcher, 1993; Zwaan & Brown, 1996), reading ability (Wolman, 1991; Wolman, van den Broek, & Lorch, 1997), and background knowledge—e.g., readers with expert background knowledge do more explaining (Chi, Feltovich, & Glaser, 1981; Chiesi, Spilich, & Voss, 1979) and analysis (e.g., Lundeborg, 1987; Wineberg, 1991). Whereas these studies have focused on differences between readers, much less attention has been given to the possibility that inferential activities also may differ within an individual reader.

One likely factor in determining intra-individual variation in the pattern of inferential activity during reading concerns reading purpose (e.g., Walker & Meyer, 1980). A critical role for reading purpose on the comprehension process is implicated by findings that orientation to

(or goal while reading) the text during reading influences recall (e.g., Pichert & Anderson, 1977; Anderson & Pichert, 1978). Furthermore, readers claim to modify their reading strategies according to reading goal. For example, Lorch, Lorch and Klusewitz (1993) asked readers what kinds of different reading tasks they experienced and how they perceived the processing demands for the different types of reading tasks. The participants broadly distinguished two categories of reading tasks, reading for school (study) purposes and reading for stimulation/entertainment. School reading was perceived as less interesting, slower, and involving less anticipation of future text events, involving more attempts at integration, more rereading, and as more taxing of understanding and memory. In contrast, reading for entertainment was perceived to involve an increased effort to find relations among ideas and events in the text, more anticipation of forthcoming text events, more interest, and more analysis of writing style. Lorch et al. (1993) provide a rich description of text types and reader perception of their demands. It is unclear, however, what readers actually do when they read with different purposes in mind.

The aim of the current study is to assess inferences readers make under different reading orientations. To do so, we contrast reading for entertainment and reading for study. These two purposes reflect the most frequent distinction that readers make in their introspections about their own reading behaviors (Lorch et al., 1993) and thus are likely to evoke differences in inferential behaviors. If readers are sensitive to the purposes with which they read and are able to modulate their comprehension activities accordingly, we would expect differences in the inferences that are generated. It is also possible, however, that readers do not adjust their comprehension activities according to their purposes. This is likely to occur, for example, if inference generation is largely automatic and/or bottom-up (i.e., text driven; McKoon & Ratcliff, 1992). In this case, no differences would occur.

Differences in inference generation may be quantitative or qualitative. One possibility is that a particular purpose for reading affects the overall amount of inferential activity but not the types of inferences that are generated. It is also possible, however, that reading purpose influences how the reader allocates his/her attention and hence what types of inferences are generated. For example, on the basis of readers' introspections one would expect a study purpose to result in slower reading and a greater number of text-based inferences than with an entertainment purpose (Lorch et al., 1993). Detailed analyses of the patterns of inference generation allow us to evaluate each of these possible scenarios: no differences, quantitative differences, or qualitative differences.

Our primary interest is in the comprehension process as it takes place on-line, in other words, during actual reading. We use two measures for on-line processing, activities (during thinking aloud) and speed (reading time). The combination of measures makes it possible to obtain converging evidence. Because reading times and think-aloud responses cannot be measured at the same time, we measure them on separate sets of texts. Although of secondary importance in this study, we used two off-line measures, recall and responses to comprehension questions, to test readers' representation of the texts once reading was completed. Again, we used two measures to provide converging evidence.

In selecting materials for this study, we chose to include two different types of text, expository and narrative. Regardless of text type, reading task components such as translation of symbols to meaning and linguistic structures are the same as are the cognitive 'hard- and

software' such as background knowledge and working memory capacity of the individual. Indeed, although most evidence on inferential processes during reading are based on studies using experimenter-generated narrative texts, similar processing have been observed with expository texts (Goldman & Varma, 1996) and literary texts (van den Broek, Rohleder, & Narvaez, 1996). However, systematic differences in how people respond to different types of texts, particularly narrative versus expository texts, also have been observed (e.g., McDaniel, Einstein, Cunay & Cobb, 1986; Einstein, McDaniel, Owen, & Coté, 1990; Zwaan, 1994). By including texts of each type we allowed for the greatest generalizability of the results and hoped to obtain preliminary evidence for inference pattern similarities and differences between the text types.

Method

Participants

Twenty undergraduate students from a large mid-western university who were enrolled in psychology courses participated in this study. They received course credit for their participation. There were 5 males and 15 females. Their ages ranged from 19 to 39 (M=23.14). Nine students majored in a science field, five had undeclared majors, and the remaining students majored in the humanities or education. All were native speakers of English. The groups for the two conditions had virtually equal ratios of males and females, and similar proportions of participants majoring in science.

Materials

Texts. Participants read four short texts, two narrative literary texts and two expository texts. One text of each type was used for think-aloud protocols. The participants read the two other texts silently, one of each type, and answered comprehension questions about the texts (see procedures below). The narrative texts were Spa (34 sentences, 116 clauses) and All about suicide (31 sentences, 116 clauses). Spa, is a fictional story by Carmen Martin Gaite (1993) about a bellboy who hears strange sounds from a hotel room and, after a long decision process, breaks into the room to save the woman in the room. An excerpt illustrates the narrative style: "The bellboy stops knocking for a moment and sticks his ear to the door; he doesn't know whether to go in or leave." All about suicide, is a fictional story by Luisa Valenzuela (1988) about a politician contemplating suicide. It begins: "Ismael grabbed the gun and slowly rubbed it across his face." The expository texts were Comet fire (19 sentences, 81 clauses) and Viruses (23 sentences, 82 clauses). Both these texts were used in previous research on the comprehension of expository texts (De Vega, 1990) and typify the kinds of information encountered in textbooks. Comet fire, adapted from Time Magazine (1985), is about scientific theory and evidence concerning what caused the eradication of the dinosaurs. An excerpt illustrates the style: "According to the much debated theory proposed in 1980 by the team of Luis Alvarez and his son Walter, an asteroid or comet hit the earth at the end of the Cretaceous Era, 65 million years ago, hurling such a quantity of dust into the atmosphere that the sun was darkened for months." Viruses, adapted from Time Magazine (1986), concerns the effects of the AIDS virus on the body. It begins: "It is a tiny invader, more or less one sixteen thousandth of the size of a pin head, and it often penetrates a victim's bloodstream after sexual contact." The practice texts were similar to each kind of target text.

Questionnaire of metacognitive strategies. To ascertain whether participant awareness of strategies was affected by reading goal, participants were asked to complete a questionnaire.

Participants received the same questionnaire but were asked to respond according to the reading purpose they had been given ("When reading for entertainment…" or "When reading to study…"). The questions included: When you feel that you have really understood something that you read, what does that mean? What sort of problems can occur in trying to comprehend, and is there anything you can do when one encounters such a problem? What sorts of problems do you think other people have most often in reading. What would you tell them to do about them?

Procedure

Participants were randomly assigned to the study or the entertainment condition. Both groups were told:

> We are interested in how people read, and in how we can design strategies for improving instruction. As a first step, we want to find out what good readers do when they read. Today, you will read several texts, and we will ask you about how you read. These questions are not about the specific texts, but about your reading experience in general. This is not an examination. We are only interested in what you do spontaneously."

The orientation for the study condition was the following:

> "Imagine that you are studying a text. For example, imagine that you want to learn the information in the text or that you are preparing for an examination. Try to imagine yourself where you would usually study, perhaps sitting in the library or in your room, studying the text."

Those in the entertainment condition were told:

> Imagine that you are reading for pleasure. For example: you are at home, have made yourself comfortable, turned on some nice music and are now going to read a book. Or you are at the lake on a nice sunny day, and you decide to read a magazine. Try to imagine yourself in a situation like that: pleasant, relaxed. You are reading for fun or pleasure. You can even sit how you would in a situation like that."

Participants were tested alone. They completed the tasks in two sessions, one week apart. Each session took less than one hour.

Session 1. In the first session after orientation, participants practiced reading aloud with an expository and a narrative text. They were given examples of think-aloud comments and told to practice saying everything that passed through their minds while reading a text. The researcher coached them in making sure to pause during reading to express their thoughts. After practicing reading these texts they completed a questionnaire about reading strategies according to their reading purpose (studying or entertainment). The participants then read two texts while thinking aloud: the expository text, Comet fire, was read first, followed by the narrative text, Spa. The entire session was tape-recorded for later transcribing and scoring.

Session 2. In the second session, participants were reminded of their orientation in the first session. In order to recreate their response set from the week before, they were asked to read two new texts, Viruses, and All about suicide. They were asked to write down the time when they started and when they finished reading each text by referring to a clock in the room. When they were finished, they were asked to recall the texts they had read aloud the previous week. After recall, they answered comprehension questions about the two new texts without referring to the texts.[1] See the appendix for the questions and correct answers for both texts.

Scoring

The think-aloud protocols were transcribed from the tapes and then scored for several categories of response by a researcher blind to the conditions. We used a categorization scheme similar to Zwaan and Brown (1996). The following are the categories, accompanied by examples from participant comments: 1) associations include background knowledge associations (e.g., "This reminds me of a planetarium show I saw") and text-based associations (e.g., "Okay, this is in the spa"); 2) explanations include explanations based on background knowledge (e.g., "I think that is the cause of the ice age") and text-based explanations (e.g., "This must be what they meant by ash"); 3) predictions are forward inferences (e.g., "Okay, the gases will lead them to the actual object"); 4) evaluations are comments about the content of the text (e.g., "I think that's such a strong assertion"), on the writing of the text (e.g., "That sentence was difficult to say-- it has too many words"), or on the reader's state (e.g., "I'm kind of losing track here, being distracted"); 5) text-based coherence breaks were statements about the coherence of the content of the text (e.g., "That doesn't make any sense"); 6) knowledge-based coherence breaks were statements about the reader's inability to understand due to lack of experience or knowledge (e.g., "It's kind of hard to imagine, I mean, in space"); 7) repetitions are repetitions of words or phrases in the text.

The recall protocols were also scored by a judge blind to the conditions. The texts were parsed into clauses and readers' protocols matched against the original clauses. Credit was given for gist recall of a clause. Twenty percent of the think-aloud and recall protocols were scored by another judge. Interrater reliability kappa was .99 for recall and .95 for think-aloud categories (both p's$<.01$). Disagreements were resolved by discussion.

The answers given to the questionnaire on reading strategies were scored according to three basic categories: 1) taking care of a problem while reading (rereading, slowing down, checking the context), 2) trying to resolve the problem after reading (e.g., make a note of it), and 3) ignoring a reading problem (e.g., read on). The judges agreed 100%.

Results

All statistical analyses were conducted with an alpha level of .05 per test and tests were two-tailed. We report the results of non-parametric tests, Mann-Whitney U Test for between-group comparisons and Wilcoxon Sign Ranks Test for within-group comparisons.

The effect of reading purpose on inferential processes and comprehension

Reading purpose (studying or entertainment) significantly affected three types of on-line responses: repetitions, knowledge breaks and evaluations. Table 1 summarizes the results. Cell entries indicate the average number of inferences per participant and statement. Repetitions were more frequent in the study condition ($p<.0001$). Text-based coherence breaks were not affected by condition ($p<.370$), but knowledge-based coherence breaks were significantly more frequent in the study condition ($p<.004$). For example, participants in the study condition more often made comments like: "I don't know, I still need more proof as to whether this, if it's really a comet fire, it seems like there's a lot of ways it could go besides a collision" or, "I don't know what I just read;" or "Well, why would they check all these different areas-- I mean, I guess I don't understand…I mean it doesn't seem like a real random thing seeing as Denmark and Spain are both in Europe." In addition, evaluative comments on content and writing occurred more often in the study condition ($p<.004$). For example, comments made include the following: "Now it seems to be making a lot more sense—easier to comprehend;" or "This is a very strange story;" or "This is really annoying—it's like it keeps shifting in verb tense or something."

There were no significant effects for the other inference types. Reading purpose did not affect the number of associations to background knowledge or prior text material ($p<.201$). Reading purpose did not significantly influence the number of explanations made by the reader ($p<.412$), indicating that there is no evidence of differences in the number of backward causal inferences, based on background knowledge or on the text. The number of predictions or forward inferences also was not dependent on reading purpose ($p <.456$). Although there were more comments per event in the study than in the entertainment orientation, this difference did not reach significance ($p<.112$).

Table 2 presents the effects of reading purpose on the other measures: recall, comprehension following reading, and reading speed. For the texts read normally for comprehension (i.e., without the think-aloud procedure), there were no differences in reading time ($p<.824$) or comprehension question responses for the two conditions ($p<.603$). For the off-line task of recall for the think-aloud texts, there were no differences by condition ($p<.261$).

In summary, readers with a study purpose produced more repetitions, acknowledgments of knowledge breaks, and evaluations than did readers with an entertainment purpose. There were no differences in reading time, recall or answers to comprehension questions as a function of reading purpose.

The effect of reading purpose on inferential processes and comprehension as a function of text type

To determine whether the above effects of reading purpose were consistent across text types, additional analyses were performed with both reading purpose and text type as factors. First, we contrasted the two types of text. As can be seen in Table 3, reader responses differed by text type with respect to several inference categories: explanations, predictions, knowledge-based coherence breaks, evaluations, and associations. Readers produced more explanations ($p<.006$) and more predictions when reading the narrative text than when reading the expository text ($p<.013$). For the expository text, more knowledge-based coherence breaks were expressed ($p<.011$), as were evaluations ($p < .01$) and associations ($p<.001$). There were no significant differences in number of repetitions made for the types of text ($p<.729$), number of text-based coherence breaks reported ($p<.057$), nor was there a significant difference in total number of comments per event ($p<.077$).

Table 4 presents the effects of text type on the other measures, comprehension following reading and reading speed. Reading time was affected by text type. Participants spent significantly ($p<.001$) more time reading the expository text (M=3.40 minutes, $S.D.$= 1.39) than the narrative text (M= 2.30 minutes, $S.D.$= 1.13), despite the fact that the former is shorter than the latter (23 sentences/82 clauses and 31 sentences/116 clauses for the expository and narrative text, respectively). There were no differences as a function of text type in the off-line measures (recall of the texts read for think-aloud and question-answering for the text read silently).

Subsequently, we examined whether the effects of reading purpose differed across the two types of text. For three types of responses, evaluations, repetitions and knowledge-based coherence breaks, the effects of reading purpose depended on text type. Table 5 provides the means, standard deviations, and significant p-values for these inference pattern differences. The group with a study purpose made more evaluative comments than the group with an entertainment purpose while reading the expository text ($p<.001$) but not while reading the narrative text ($p<.080$). Second, those reading with a study purpose made more repetitions than

those reading for entertainment while reading both the narrative and the expository texts but this effect was stronger for the expository ($p<.0001$) than for the narrative text ($p<.016$). Third, the group with a study purpose expressed significantly more knowledge-based coherence breaks than the group reading with an entertainment purpose during the reading of the expository text ($p<.004$), whereas no such effect was obtained during the reading of the narrative text ($p<.552$).

Furthermore, there was a significant difference between reading purpose and text type in their effects on reading time. There were no significant differences in reading speed between the two reading purpose groups for either the narrative or the expository texts ($p < .196$ and $p < .453$, respectively). But the earlier finding of slower reading for the expository text than for the narrative text (Table 4) was stronger for those reading with a study purpose ($p<.010$) than for those reading for entertainment ($p<.024$).

In summary, the effects of reading purpose partly depended on the type of text. Readers with a study purpose expressed more evaluations and knowledge-based coherence breaks in the think-aloud protocols than did readers with an entertainment purpose, but this difference was significant for the expository text and not the narrative text. Furthermore, readers with a study purpose included significantly more repetitions than did readers with an entertainment purpose, but this effect was stronger for the expository than for the narrative text. Finally, readers with either reading purpose read the expository text more slowly than the narrative text but the difference was greater for those with a study purpose. In general, the narrative text elicited more explanations and predictions than did the expository text. Conversely, readers produced more associations and evaluations when reading the expository text than when reading the narrative text.

The effects of reading purpose on readers' awareness of comprehension strategies.

There were no significant differences between readers with different reading purposes in their responses to the questionnaire on reading strategies. This suggests that reading purpose did not affect the strategies readers considered relevant to comprehension. However, a small sample size may have contributed to the null effect.

Discussion

The participants in this study were active in their reading. They "constructively responded" to the task of reading and thinking aloud (Pressley & Afflerbach, 1995) with inferences and reactions to the text. Our data suggest several specific conclusions.

Reading purpose influenced the pattern of inferences that readers generated as they read. Readers with a study goal were more likely to engage in repeating and evaluating the text and to indicate knowledge-based coherence breaks than were readers who were reading for entertainment. This pattern of findings corroborates readers' assessments of their own reading processes, in particular their perception that school/study reading involves more rereading and attempts at integration (Lorch, et al., 1993). The findings also suggest that the "search-after-meaning" principle (Graesser et al., 1994; van den Broek, 1990), according to which the reader attempts to explain each element in the text before continuing to the next element, applies particularly to readers who are reading to study rather than to readers who simply read for entertainment.

Furthermore, the fact that readers adjust their inferential activities to reflect particular reading goals contradicts the view that inference generation during reading is a purely automatic, text-driven process. Although bottom-up processes certainly are involved (e.g., Kintsch & van

Dijk, 1978; McKoon & Ratcliff, 1992), they are complemented, and possibly modified, by powerful influences from top-down processes, originating from reader characteristics such as reading purpose.

Reading purpose influenced inferential activity during the reading of both types of text, but the above-mentioned patterns were more pronounced for the expository text than for the narrative text. Expository texts seem to evoke study-type behaviors, specifically the generation of repetitions, evaluations, and the identification of knowledge-based coherence breaks. Processing of narratives appears to be much less affected by reading goal. Conversely, even though shorter, the expository text was read more slowly than the narrative text. These findings need to be interpreted with caution because they concern only one text of each type and, hence, may be caused by text properties other than whether it is a narrative or expository text. However, the patterns are intriguing because they raise the possibility that readers also adjust their inferential activities to the type of text they are reading, and that such adjustments interact with top-down reading goals. In particular, they suggest that the comprehension processes that are elicited by having a study goal are further strengthened if the text at hand is expository.

Regardless of reading goal, readers gave more explanations and predictions when reading the narrative text than when reading the expository. Conversely, the expository text evoked more associations, repetitions, evaluations and indications of knowledge-based coherence breaks. The research literature provides various reasons for why one might expect different comprehension processes for narrative and expository text: (1) Narratives may elicit more interest, promoting more explanations and predictions than expository texts (e.g., Olson et al., 1981; Perrig & Kintsch, 1985; Schmalhofer & Glavanov, 1986; Trabasso & Magliano, 1996; van Dijk & Kintsch, 1983); (2) Narratives may promote increased inferencing resulting, for example, in readers making nine times as many inferences during stories as during expository texts (Graesser, 1981); (3) Readers have early and extensive practice making inferences while reading stories because stories are used when learning to read and because everyday life is constructed much like a story (Britton, van Dusen, Glynn, & Hemphill, 1990); (4) The structure of expository texts is more variable than that of narratives (Bock & Brewer, 1985); (5) Narratives activate schema and script structures that support inference generation (Britton, et al., 1990); (6) Narratives may rely more on familiar forms of causality than do expository texts, thus prompting more explanations and predictive inferences. Circumstantial evidence that inferential activities indeed differ during the reading of narrative versus expository texts comes from findings that readers' memory representations for these types of texts differ (Einstein et al., 1990; Zwaan, 1994). The current results provide a more direct indication that different text types may evoke different inferences and, furthermore, that such differences depend on the reader's goal.

Readers do not necessarily use strategies that help them in their reading purpose. Specifically, readers with a study purpose did not employ explanations to a greater degree than those with a narrative purpose. Yet high use of explanation while reading expository text has been related to increased understanding (Chi, de Leeuw, Chiu, & LaVancher, 1994). The fact that the readers with a study purpose did not use explanations more frequently lends support to speculations that readers do not automatically use the best strategies when studying and that they need assistance in learning them (Spring, 1985). For example, Spring (1985) studied a group of university freshman which included good and poor readers. The participants were asked to rate the frequencies with which they applied particular text-processing strategies while reading

textbooks. The factor analysis distinguished between comprehension strategies (identifying causal relations) and study strategies (strategies used to remember the text after comprehension like asking questions or outlining). Reading strategies in which causal relations were central were related to better reading comprehension (see also van den Broek & Kremer, in press). In the current study, the narrative text evoked more of such behaviors--explanations and predictions,--behaviors linked to causal understanding, and the kinds of behaviors that have been associated with increased reading comprehension (Palincsar & Brown, 1984; Trabasso & Magliano, 1996). Readers in the study condition (especially with the expository text) used the study strategies that Spring (1985) found less effective for comprehension. They did not use methods that support the "transformation" of knowledge into the type of mental representation that promotes long-term learning (Scardamalia & Bereiter, 1984).

The results suggest several educational implications. First, instructors, curriculum writers, and students need to realize that associative elaborations alone are not enough for learning (see Trabasso & Magliano, 1996). Explanatory inferences are also vital (e.g., van den Broek & Kremer, in press). Second, texts and instructors need to ask the questions that will lead the reader to make inferences that are related to increased retention such as causal relations between elements of the text, predictions, and explanations. Students naturally perform these behaviors with narrative texts and need to activate such strategies when studying. Third, readers need to be coached to monitor their comprehension strategies and activate comprehension-enhancing techniques. Our results show that such training is particularly important if students' comprehension of expository texts is to be successful.

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Footnotes

[1] Thus, this task served a dual purpose: to recreate the response set from the first session (Thorndyke, 1977) and to obtain on- and off-line measures to texts that were not influenced by think-aloud protocols.

Appendix

Comprehension Questions and Correct Responses for “Viruses”

1. How big is the AIDS virus when it gets into the blood stream?
One sixteen thousandth of the size of a pin head.
2. What did the "tulipmania" consist of?
An infection in tulip bulbs produced a new variety of flower with spectacular color combinations, giving rise to a financial crisis in Holland in the seventeenth century
3. In general terms, what is the effect of the AIDS virus on the organism?
The AIDS virus defeats the immune system making it vulnerable to diseases normally defeated by the immune system.
4. What did Ramses V died of?
Smallpox.
5. What's the initial composition of the AIDS virus when it enters the organism?
An RNA strand and a double-layered protein envelope.
6. What does the text say about the effect of the virus on humanity?
Viruses have been killing humans for thousands of years.
7. What are the cells called "macrophages"?
The macrophage is the large explorer cell of the immune system.
8. What happens a half an hour after the AIDS virus becomes embedded in the membrane of the immune system's T-cell?
The RNA strand and an accompanying enzyme will be floating in the cytoplasm of the cell.
9. What is the principal transformation caused by the AIDS virus once it enters the organism, and
what is the effect of this transformation?
The AIDS virus converts its RNA into DNA and takes charge of the cell’s machinery, creating more viruses. The cell eventually swells and dies, releasing more viruses.

Comprehension Questions and Correct Responses for “All About Suicide”

1. How many drinks did Ismael have before deciding to kill himself?
Three.
2. In what location was the trigger of the revolver pulled?
In an office.
3. What death is referred to (or explained) in the text?
Ismael’s death.
4. Where was the revolver found?
In his desk drawer.
5. Why does the protagonist consider the decision to die irrevocable?
There is no way to go back and change it.
6. What is the sequence of actions leading up to the pulling of the trigger?
He enters the building, says hello to the guard, opens the door to his office, goes to his desk, takes the revolver out of a drawer, rubs it against his temple.
7. What was the writing table/desk covered by?
Glass.
8. What is the experience of the protagonist after pulling the trigger?
Almost sensual and quite unexpected.

9. What motives are offered to explain the firing of the revolver?
He couldn't tell what he knew about his former friend, now a minister and a traitor.

Table 1
The Effect of Reading Goal on Inference Generation: Sum of Ranks for Mann-Whitney U Test and Significance for Each Inference Category

	Purpose		
Inference Category	Entertainment	Study	p
Repetitions	.015 (.012)	.059 (.022)	.0001
Coherence breaks: text	.010 (.018)	.017 (.022)	ns
Coherence breaks: knowledge	.002 (.003)	.011 (.007)	.004
Evaluations	.052 (.020)	.111 (.045)	.004
Associations	.028 (.019)	.018 (.012)	ns
Explanations	.013 (.015)	.006 (.007)	ns
Predictions	.005 (.006)	.008 (.007)	ns
Total Comments[a]	.298 (.020)	.440 (.016)	ns

Note. Numbers indicate the average frequency of each inference type, per participant and per statement. Standard deviations are in parentheses.
[a]Numbers indicate the average number of comments per participant and per statement.

Table 2
The Effect of Reading Purpose on Recall, Comprehension, and Reading Speed

	Purpose		
Measure	Entertainment	Study	p
Recall	.065 (.056)	.100 (.062)	ns
Comprehension	.685 (.160)	.707 (.182)	ns
Reading time[a]	6.33 (3.16)	5.18 (1.25)	ns

Note. Cell means refer to average frequency per participant and per statement; standard deviations are in parentheses.
[a] Numbers indicate reading time in minutes per text.

Table 3
The Effect of Text Type on Inference Generation

	Type of Text		
Measure	Narrative text	Expository text	p
Inference Category			
Repetitions	.030 (.013)	.050 (.013)	ns
Coherence breaks: text	.015 (.021)	.013 (.021)	ns
Coherence breaks: knowledge	.002 (.005)	.010 (.012)	.01
Evaluations	.070 (.041)	.100 (.061)	.01
Associations	.010 (.011)	.040 (.024)	.001
Explanations	.020 (.015)	.004 (.008)	.006
Predictions	.010 (.013)	.002 (.005)	.02
Comments per event[a]	.030 (.021)	.040 (.019)	ns

Note. Numbers indicate the average frequency of each inference type, per participant and per statement. Standard deviations are in parenthesis.
[a]Numbers indicate the average number of comments per participant and per statement.

Table 4
The Effect of Text Type on Recall, Comprehension, and Reading Speed

	Type of Text		
Measure	Narrative text	Expository text	p
Recall	.088 (.07)	.079 (.06)	ns
Comprehension	.700 (.24)	.717 (.22)	ns
Reading time[a]	2.30 (1.13)	3.40 (1.39)	.001

Note. Cell means refer to average frequency per participant and per statement; standard deviations are in parentheses.
[a]Numbers indicate reading time in minutes per text.

Table 5
The Effect of Reading Purpose and Text Type on the Generation of Inferences and Reading Speed

Inference Type	Text Type / Reading Purpose			
	Narrative		Expository	
	Entertainment	Study	Entertainment	Study
Evaluations	.05 (.020)	.08 (.050)	.08(.05)	.14(.05)[1]
Repetitions	.02(.02)	.04(.02)[2]	.02(.006)	.08(.04)[3]
Knowledge-based Coherence Breaks	.001(.003)	.003(.006)	.003(.005)	.019(.01)[4]
Reading Time	2.67 (1.41)	2.00 (.77)	3.67 (1.88)	3.18 (.87)

Note. Cell means indicate average frequency per participant per statement; standard deviations are in parentheses. Significance levels are based on Wilcoxon Signed Ranks Test of differences between reading purpose conditions.
[1] $p<.001$
[2] $p<.016$
[3] $p<.0001$
[4] $p<.004$