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READING COMPREHENSION: RETROSPECTIVES AND PERSPECTIVES REGARDING THE TEXT MEANING (RE)CONSTRUCTION

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Abstract

The comprehension of a text sets the general objective of a reader faced with the reading. Based on that, it is questioned how reading comprehension occurs from the psycholinguistic point of view. For that, a bibliographic research was developed, synthesizing one of the most influential models of text comprehension – the Kintsch and van Dijk' (1978). It was found that, in order to comprehend a text, the reader relies on a series of macrorules/macrostrategies to select the most relevant textual propositions with the purpose of constructing a coherent

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mental representation of what was read. Therefore, the reading comprehension is a cognitive task which requires the integration of the language input with the prior knowledge of the reader.

Keywords

Psycholinguistics. Reading. Comprehension.

INITIAL REMARKS

Reading is one of the most sophisticated cognitive tasks. Processing a text (understood in view of Kintsch and van Dijk (1978) as a set of explicit and implied propositions), begins, in general, with graphemic decoding and it possibly ends with a comprehension. In the meantime, various cognitive skills and processes are put into practice. In fact, (re)constructing the text meaning, i.e., comprehending it, is not an easy exercise. The reader needs to use a lot of information. As with other cognitive tasks, reading requires perception, attention, memory(ies).

The reading process, beforehand, is, besides constructive, a multi-component activity. About that, it is relevant point out the reading occurs because of the interaction of (extra)linguistic, (meta)cognitive and (inter)textual processes, that is, during the reading act, the reader needs to interrelate different knowledges – of the language, of the discouses and of the world. Thus, it appears reading has components, of which visual perception, graphemic decoding, word recognition, lexical access and comprehension stand out.

For the assessment of competences and abilities of Brazilian students in reading tasks, there are several test modalities, such as the Programme for International Student Assessment (Pisa), the Basic Education Assessment System (Sistema de Avaliação da Educação Básica – Saeb) and High School National Exam (Exame Nacional do Ensino Médio – Enem). Indicators often reveal alarming statistics: low levels of comprehension and marked functional illiteracy in both primary and tertiary education (FINGER-KRATOCHVIL, 2010; GABRIEL, 2010; HIRSCH, 2003; KLEIMAN, 2011; RODRIGUES, 2013; SOUZA, 2004).

In view of this conjuncture, this paper aims to (re)analyze how reading comprehension occurs in psycholinguistic terms. About the comprehension, the project of Kintsch and van Dijk (1978) is reputed. The work of these researchers has substantial influence on contemporary research. Together, they developed a consistent psychological-linguistic model of text processing in 1978. The model assumes that, in reading comprehension, a group of processes occur, often in parallel or sequentially. Considering the relevance of the work of these researchers as well as contemporary reflexes to the understanding of the reading ability, this precursor model of elucidating the mental process of reading was adopted to (re)studies.

With this paper, some theoretical considerations about the model are addressed. As the 1978 model is presented, a parallel is made with other works (VAN DIJK; KINTSCH, 1983; VAN DIJK, 1980; KINTSCH, 1988), which correspond to the improvement of the initial model. In advance of the presentation of the consistent model of how readers comprehend what they read, two interrelated concepts are re-visited: reading and comprehension.

It is emphasized that reading is the complex task of (re)constructing the meaning of a text. For this to be accomplished, a range of reading skills and strategies are put to use, in addition to the use of their prior knowledge (linguistic, textual and encyclopedic). When the (re)construction of the text meaning is successful, there is comprehension (GIRALDELLO, 2016a). Therefore, reading, as it has been pointed out in psycholinguistic studies, is nothing more than a specific modality of information processing. And comprehension corresponds to both the use and construction of mental representations of information. In this respect, the main question is:

- How does the reading comprehension occur?

Kintsch and van Dijk's research can answer that question.

THE READING

Reading, in accordance with Kleiman (2011), is a constructive activity. It is a process of construction as it emerges from the interaction of (extra) linguistic, (meta)cognitive, (inter)textual processes. In other words, reading

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comes from the interrelationship of different levels of the reader's knowledge. This knowledge refers to those of the language (grammar, pronunciation and lexicon), those of the world (situations, facts, events) and those of texts (genres, types, characteristics). Before that, reading requires prior knowledge (KLEIMAN, 2009).

Solé (1998) defines reading as an interaction process. She explains the reader has the task of text processing, that is, he needs to operate mentally in the selection of textual information for later use. It is not passive and does not replicate the preprogrammed meaning, but it builds the meaning of that text. For this, there is a need for an intrinsic relationship between expectations and goals with reading, inferences, predictions and use of prior knowledge.

Comprehension is not the best process that characterizes the actor to read. This is because comprehension is not only the skill required in reading (MORAIS; LEITE; KOLINSKY, 2013). According to them, comprehension is the main goal with reading, however the reading is not a decoding process or the simple result of the decoding. Therefore, decoding, word recognition and comprehension are components of reading, not reading itself.

Spinillo, Mota, and Correa (2010) state reading is the process of producing textual meanings (comprehension). However, it is not just that. Comprehension is based on the exercise of graphemic processing skills (decoding, for example). Therefore, reading is the multiplicative result of decoding with comprehension (decoding x comprehension = reading). There can be no reading without either of these two skills.

With this, in short, we can come up with a synthesis concept of reading. Reading is the interactive process of (re)construction of textual meaning that is supported by the use of prior (extra)linguistic, (meta)cognitive and (inter)textual knowledge. The reading process begins with graphemic decoding, involves various (meta)cognitive skills and culminates with reading comprehension. The successful effort to (re)create textual meaning characterizes comprehension (KATO, 2007; KLEIMAN, 2009, 2011; MORAIS; LEITE; KOLINSKY, 2013; SOUZA, 2004; SOLÉ, 1998; SPINILLO; MOTA; CORREA, 2010).

Moreover, in general, it is emphasized that the texts are produced by someone. The writer is this figure and he intends to communicate something to an interlocutor (reader). This something (meaning) can be recovered (comprehended) by the reader through his prior knowledge and by means of linguistic clues (referential, lexical, sequential, discursive operators) left by the writer.

Thus, in addition to comprehension what was read, the reader needs to interpret it. Multiple interpretations of the same text can be performed by different readers. However, the text does not make any interpretation legitimate.

Interpreting, wherefore, is to accept a type of reading that a particular text has programmed (SOLÉ, 1998). On the one hand, the reader must analyze whether there is internal coherence in his interpretation, that is, if it does not contradict what is exposed in the text. On the other hand, he needs to look for external coherence, that is, if the interpretation does not conflict with encyclopedic and cultural information. Therefore, when the (real) reader comes into contact with a text, in reading, it has to relate to a predefined (virtual) reader. This task of approximation leads the (real) reader to a more legitimate interpretation and with a greater possibility of textual validation.

THE READING COMPREHENSION

The text is a set of propositions, some explicitly expressed other implied ones (KINTSCH; VAN DIJK, 1978). To comprehend means to represent the text propositions gradually and mentally in semantic networks. Therefore, comprehension involves constantly the use of knowledge and inferential processes (GIRALDELLO, 2016b). As van Dijk and Kintsch (1983) point out, it is necessary for the reader to draw on a variety of information, such as 1. linguistics (lexical, semantic, syntactic, textual), 2. procedural cognitive knowledge and 3. contextual (situation facts, interaction). When integrated, they enable comprehension.

To be comprehensible, in the first instance, the reader does the word recognition, based on the decoding of the text. With this, it recovers phonological and semantic aspects of the words. In other words, at this stage, comprehension starts from bottom-up processes through lexical access. Subsequently, the individual meanings of the words of a simple/compound sentence are combined in working memory, forming an abstract semantic unit – the proposition (KINTSCH; VAN DIJK, 1978). Linguistically, proposition is the unit of meaning of a sentence. Psychologically, proposition is the conceptual representation of a sentence in the mind.

A proposition ends up being related to others by co-referencing, referential cohesion and sequential cohesion. This interrelationship of propositions,

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according to Kintsch and Rawson (2013), forms micropropositions: local and specific units of meaning. Together, micropropositions make up the microstructure of the text. In other words, textual microstructure is the network of interconnected micropropositions, responsible for local coherence, which encompasses details of textual meaning.

Micropropositions, in turn, also interrelate, forming portions of more general meanings of the text and carrying more fundamental ideas of it, related to the subject. Thus, this general meaning, commonly corresponding to that of paragraphs, is called macroproposition – global semantic unity. The sum of macro propositions composes the textual macrostructure, the network of macropropositions responsible for the global coherence and for a sort of summarization of the text.

It is emphasized that the semantic structure of the text is characterized by micro and macro structures. The textual microstructure contains individual propositions, with specific information about the text (i.e., micropropositions). The textual macrostructure, however, contains generic propositions, with general information about the text (i.e., macropropositions). Both propositions (micro and macro) are related. This relationship occurs through macrorregras (macrorules).

Macrorules, according to Kintsch and van Dijk (1978), are a set of specific rules of semantic mapping. They are nothing more than rules of semantic reduction, that means, rules for the exclusion of propositions irrelevant to the constitution of the textual macrostructure. In fact, most macropropositions are constituted by micropropositions. Other textual propositions already carry global meanings. Therefore, they are macropropositions.

The main rules are the deletion (propositions irrelevant to a reading task and redundant and that are not useful for the interpretation of other propositions are deleted from the textual macrostructure, but not from memory), generalization (text propositions are combined through generalization) and construction (propositions based on text information are constructed). It is emphasized that macro-operators change "propositions of a text base into a set of macropropositions that represent the gist of the text. They do so by deleting or generalizing all propositions that are either irrelevant or redundant and by constructing new inferred propositions" (KINTSCH; VAN DIJK, 1978, p. 372). In this way, macro-operators have the function of reducing textual information to its essence (constructing the macrostructure of the text).

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Macro-operators are controlled by the reader's objectives for a reading. Thereafter, there is the possibility of including one or another proposition (both micro and macro) to the macrostructure of the text.

In 1980, van Dijk proposed updates to the proposed macrorules of 1978, admitting four macrorules: deletion, selection, generalization and construction. He suggests addressing the propositions exclusion macrorule as deletion. However, he points out that there are two modalities: weak deletion and strong deletion. In the former, the reader excludes irrelevant propositions (because they are redundant or unnecessary to the reading task) of the macrostructure. In the latter, he excludes propositions that are even relevant, but carry very specific meanings (they belong to the microstructure and are micropropositions).

In addition, van Dijk (1980) proposes a variant modality of the deletion macrorule – the selection rule. As one reads, irrelevant propositions are deleted (deletion) and consequently the relevant ones are selected (selection). In turn, the selection macrorule also has a variant: the zero rule. As some propositions of the text already carry general meanings, they are macropropositions and do not go through rules of semantic reduction (macrorules).

Similarly, van Dijk (1980) proposes a specific modality of the generalization rule, which he calls interpretation/evaluation. When using both textual propositions and prior knowledge about events, facts, situations to effect the rule of generalization, we have an example of the interpretation rule.

In addition, by adding the interrelationship of micro and macrostructural propositions of a text, the reader arrives at its base (KINTSCH; FRANZKE, 1995). I.e., the micro and macrostructure form the text base. Therefore, the text base is its meaning based on elements of the text itself – the linguistic input, that means, a coherent sequence of propositions.

As the reader comprehends a text, its generic meanings are transformed into mental representations. By constructing this text base, a comprehension is guaranteed. However, as it rests primarily on information provided by the text, it is superficial. So, for comprehension to occur at deep levels, while constructing the text base, the activation of information related to the situation described in the long-term memory text is presupposed (KINTSCH, 1988). This information is nothing more than the cognitive representations of events, people, contexts, actions. Finally, of situations in general, which are used to make inferences and fill gaps in meaning in the text. At this point, it should

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be noted that comprehension depends on top-down processes. Finally, by integrating the essential points of the text (macropropositions) with the prior knowledge of the reader, a situation model is constructed mentally.

Accordingly, in relation to text comprehension, van Dijk and Kintsch (1983, p. 24) argue that it "involves not only the representation of a text base in memory, but also, at the same time, the activation, updating, and other uses of a so-called situation model in episodic memory […]". Thus, in order to comprehend sufficiently a text, the reader must, in addition to 1. represent propositional and mentally text ideas, 2. activate through the working memory information related to the text situation from the long-term memory. From that, the reader constructs a situational model of the text, which is stored next to the cognitive structure of the reader. Therefore, comprehension is the mental representation of global semantic units of a text (macropropositions). This representation, in the end, is unitary and encompasses two parts: the text base and the situation model.

Regarding the processing of the text, it occurs sequentially. Due to the limitation of working memory, the text is processed from chunks to cycles. Specifically, seven to twelve propositions are processed each cycle. The amount of these text parts varies in relation to the complexity of the text, to the working memory capacity of the reader and to the reader's maturity (KINTSCH; VAN DIJK, 1978).

Therefore, as the reader reads, portions of propositions are processed. In the first processing cycle, some can be judged as micropropositions and others as macropropositions. With the second cycle, the propositions of the linguistic input (text) are confronted with the macropropositions of the first cycle (working memory). Some macropropositions of the first cycle can be excluded from the textual macrostructure, i.e., they become part of the microstructure, forming a microproposition. Thus, at each cycle, a new semantic network is constructed (in fact, rectified), in which the propositions coming from the text are integrated with what remained in the short-term memory. Therefore, finally, a single network of macropropositions is structured, which will be the mental representation of the text.

In advance, observe Diagram 1, which systematizes some main aspects of the Kintsch and van Dijk's comprehension model.

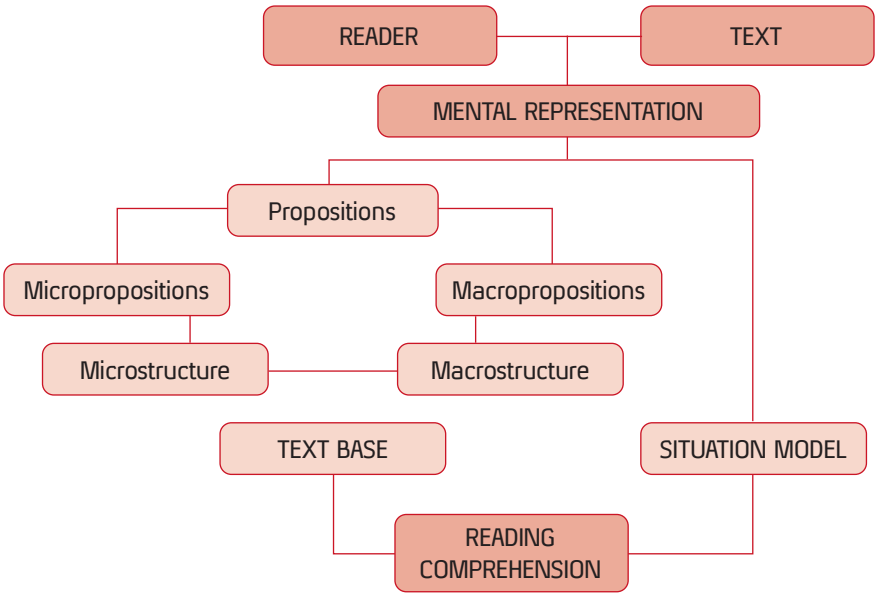

Diagram 1 – Text comprehension model.

Source: Diagram creation based on Kintsch and van Dijk (1978) and van Dijk and Kintsch (1983).

The text comprehension model from 1978 is extended, modified and reworked by van Dijk and Kintsch in 1983. The new model is essentially a constructivist perspective: the first version of the model was structural. Now, they emphasize dynamicity in textual processing, and call it strategic. The textual processing is a strategic process since the mental representations of the text in the memory are constructed by the use of external information (text input) and internal (prior knowledge).

From the changes, the concept of macrostrategy is proposed. Basically, it is a strategy used to infer macropropositions, in other words, to distinguish which of the textual propositions are micro and which are macropropositions. Thus, textual strategies are actions for the (re)production and comprehension of the text. Macrostrategies have a flexible and heuristic character. The former, because the reader does not need to finish reading the paragraph or text to know their topics; the latter, since the reader is the one who discovers/develops tactics to comprehend the text (VAN DIJK; KINTSCH, 1983). Through a few text propositions, the reader is able to infer many things about the text subject.

In addition, the term *macrostrategy* was proposed to broaden what was termed *macrorule* in 1978. Strategy, roughly, is an organized action to achieve

a goal: a tactic. Specifically in comprehension, strategies are intentional actions of the reader, with awareness and with controlled behavior, to process the text (to comprehend). For van Dijk and Kintsch (1983), text strategies are actions to represent the text mentally, that means, to select from the dozens of textual propositions only the most relevant (macropropositions) for cognitive representation. While rules correspond to actions, defined by convention, that regulate reader behavior in the face of texts, strategies concern these actions (rules), but are used subjectively to achieve a reading (comprehension) goal.

Other changes in relation to the textual comprehension model of Kintsch and van Dijk (1978) were proposed. In 1988, no longer working together with his colleague, Kintsch proposes the Construction-Integration Model. This one encompasses the characteristics of the former. However, at this point of theoretical maturation, prior processing and prioritization is prioritized rather than text representation.

The Construction-Integration Model emphasizes substantially the prior knowledge in constructing the mental representation of the text: "To construct even a single proposition, an appropriate frame must be retrieved from one's store of knowledge, and its slots must be filled in the way indicated by the text" (KINTSCH, 1988, p. 180). In the previous model of Kintsch and van Dijk (1978), they believed the textual base represented mentally in a propositional network was a simple "translation" of the linguistic input. However, "not only does it [mental representation] contain the propositions directly derivable from the text, but also each of these propositions brings with it a number of other propositions that are closely connected to it in the general knowledge net" (KINTSCH, 1988, p. 180). Thus, during the reading, text propositions are constructed, which are structured in networks. These propositional text networks cause the activation (of long-term memory) of semantically related networks available in the prior knowledge of the reader. Kintsch (1988) states knowledge is represented in semantic networks, where each node corresponds to a proposition/concept (unit with meaning).

In addition, in the Construction-Integration Model, two phases are embedded in the process of mental representation of the text: construction and integration. In the former, it is explained the representation of the text base through the linguistic input (text propositions) and the prior knowledge of the reader. In the latter, it is clarified how textual representation integrates into the cognitive structure of the reader.

In the construction phase, as Kintsch (1988) explains, the beginning of textual processing is strictly bottom-up. Soon after, it becomes top-down and interacts with the ascending mode. Through word identification and lexical access, explicit text bases are formed with activated vocabulary meanings. On the other hand, implicit propositions (implicit text base) are also formed based on the use of prior knowledge. From the sum of these propositions, a network of meanings is formed – the semantic network of the text. It is noted that the effect of the construction process is "a network [...] consisting of all the lexical nodes accessed, all the propositions that have been formed, plus all the inferences and elaborations that were made at both the local and global level and their interconnections" (KINTSCH, 1988, p. 168).

In short, the result of the creation of a mental representation of the text is a semantic network consisting of text macropropositions and prior knowledge information related to these macropropositions. Already in the integration phase, the mental representation of the text is integrated into the cognitive structure of the reader (HARLEY, 2008). Put another way, the semantic network that configures the mental representation of the text is added to the others. Finally, new knowledge is definitely stored. Consequently, learning has occurred.

FINAL REMARKS

Reading, in graphocentric societies, is an essential skill for the exercise of citizenship. With this in mind, the objective was to elucidate the process of reading comprehension based on the psycholinguistic bias. To make this objective effective, one of the most influential models of text comprehension was re-studied: the Kintsch and van Dijk' (1978).

From the analysis of the obtained information, it is possible infer the reader uses a series of information (visual and non-visual) to reconstruct the meaning of a text, that means, to comprehend it. The result of comprehension is always mental representations, results of encodings of sensory information. Therefore, when we say we comprehend a text, it means, theoretically, that it had its meaning reconstructed and, finally, mentally represented. That process of representation involves the appreciation of meanings of words, sentences and paragraphs and their interrelations, as well as of what is already known about the situation addressed in the text.

In summary, it is observed that the reading comprehension is configured in a process of 1. interpretation of written language (decoding), 2. summary of main ideas of a text (macropropositions), 3. activation of prior knowledge and 4. mental representation of the semantic units of the text. In fact, the result of text comprehension is always mental representations. It is emphasized that there is the integration – sometimes alteration, complementation or elimination – of information in the cognitive structure of the reader when he comprehends texts.

In simple terms, reading is the interactive process of (re)construction of a text meaning that is supported by the use of prior (extra)linguistic, (meta)cognitive and (inter)textual knowledge. The reading process begins with graphemic decoding, involves several (meta)cognitive skills and culminates in reading comprehension. The successful effort to (re)create textual meaning characterizes comprehension.

Lastly, it is emphasized that the Kintsch and van Dijk's work (1978) has brought many contributions to the achievement of the mental process of the reading activity. Undoubtedly, it is recommended that teachers become aware of this psycholinguistic model in order to, consequently, improve their pedagogical practices.

Compreensão leitora: retrospectivas e perspectivas acerca da (re)construção do sentido textual

Resumo

A compreensão de um texto configura o objetivo geral de um leitor perante a leitura. Com base nisso, questiona-se como ocorre a compreensão leitora pelo prisma psicolinguístico. Para isso, desenvolveu-se uma pesquisa bibliográfica, sintetizando-se um dos mais influentes modelos de compreensão textual – o de Kintsch e van Dijk (1978). Constatou-se que, a fim de compreender um texto, o leitor vale-se de uma série de macrorregras/macroestratégias para selecionar proposições textuais mais relevantes com vistas a construir uma representação mental coerente do que foi lido. Por conseguinte, a compreensão leitora é uma tarefa cognitiva que demanda a integração do *input* linguístico com o conhecimento prévio do leitor.

Palavras-chave

Psicolinguística. Leitura. Compreensão.

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