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GOING DEEP INTO THE RIGHT DIRECTION: AN ANALYSIS OF FIGURATIVE LANGUAGE COMPREHENSION IN RIGHT HEMISPHERE DAMAGED INDIVIDUALS

Por

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ABSTRACT

GOING DEEP INTO THE RIGHT DIRECTION:

AN ANALYSIS OF FIGURATIVE LANGUAGE COMPREHENSION IN

RIGHT HEMISPHERE DAMAGED INDIVIDUALS

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UNIVERSIDADE FEDERAL DE SANTA CATARINA

2004

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Dr. Cássio Rodrigues

The purpose of this study is to analyze right hemisphere damaged individuals' performance in reading comprehension, investigating whether RHD individuals are impaired in differentiating literal from figurative language and in revising information, and also verifying their ability to attribute mental states to others.

Two groups participated in the study: GROUP A, composed by six RHD patients from Associação de Reabilitação de Santa Catarina and GROUP B, composed by six control participants from Florianópolis. They read 12 texts, among them Indirect Request, Simple Inference, Verbal Irony, Joke, Theory of Mind, and Physical Story texts. Immediately after reading each text, the participants' comprehension was assessed

by means of three tasks: the first one was a **Recall Task**, in which they were supposed to recall as many propositions from the text as possible. The second task was a **True/False Test**, in which they had to evaluate statements as true or false, according to their interpretation of the text. And, finally, the third task was a **Comprehension Task**, in which they were asked to answer an open question about each text they read.

Split-lot ANOVA (analysis of variance) and Chi Square tests performed in the data collected from the three reading tasks showed that, although not statistically significant, there was a trend for right hemisphere participants to present more problems in understanding texts which contained figurative language than the control participants. All the results were analyzed according to the schema theory's perspective of reading comprehension.

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RESUMO

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Esta pesquisa tem como objetivo analisar a performance de compreensão de leitura de indivíduos com lesão cerebral no hemisfério direito, investigando se eles realmente apresentam déficit em distinguir linguagem figurativa e literal e em revisar informações previamente apresentadas. Este trabalho também pretende verificar a habilidade destes indivíduos em atribuir estado mental aos outros.

Dois grupos participaram deste estudo: GRUPO A, composto por seis pacientes com lesão no hemisfério direito da Associação de Reabilitação de Santa Catarina e GRUPO B, formado por seis participantes não lesionados (controle) de Florianópolis. Todos leram 12 textos, entre eles textos contendo Pedidos Indiretos, Inferência Simples,

Ironia Verbal, Piada, Teoria da Mente e História Física. Imediatamente após a leitura de cada texto, a compreensão dos participantes foi acessada através de três tarefas de leitura: a primeira sendo uma Tarefa de Memória (**Recall Task)**, na qual eles deveriam lembrar das proposições existente no texto. A segunda tarefa foi um Teste Verdadeiro / Falso (**True/False Test)**, no qual os participantes deveriam avaliar as frases como verdadeiras ou falsas, de acordo com sua interpretação do texto. E, finalmente, a terceira tarefa foi uma Tarefa de Compreensão (**Comprehension Question Task)**, na qual eles deveriam responder uma pergunta feita pela pesquisadora sobre o texto lido.

Testes split-plot ANOVA (análise de variância) e Chi Square aplicados aos dados coletados das três tarefas de leitura demonstraram que, apesar de não ser significante, houve uma tendência dos participantes com lesão cerebral no hemisfério direito de apresentarem mais problemas na compreensão de textos que continham linguagem figurada do que os participantes controles. Todos os resultados foram analisados de acordo com a perspectiva da teoria dos esquemas da compreensão de leitura.

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CHAPTER 1

INTRODUCTION

"If the brain were so simple we could understand it, we would be so simple we couldn't."

Lyall Watson[1]

1.1 – RESEARCH PURPOSE

The objective of this research is to analyze right hemisphere damaged individuals' performance in reading comprehension, in agreement to what brain and language comprehension deficit studies have been presenting so far. Research has shown that damage in the right hemisphere can cause several cognitive-communication impairments, such as: spatial and perception abilities problems, inappropriate behavior and social judgment, short term memory problems, difficulties with producing and interpreting intonation contours; difficulties in extracting the main message from discourse; and problems in understanding and producing appropriate discourse structures and in comprehending non-literal language (Federmeier & Kutas, 1999). It can also result in hesitation and repetition in speech, which makes people speak in a monotone way and unable to recognize emotion in other people's voices (Code, 1997). After a right hemisphere brain damage, individuals are still able to understand literal meaning of words and isolated sentences, but they have problems to interpret narrative discourse or figurative language. Besides, they present determined deficits in relating new and old information (Kaplan et al., 1990). Most individuals cannot see the

[1] Reference: http://quotes.prolix.nu/Authors

difference between utterances– literal or non-literal (like sarcasm, jokes, metaphors, and verbal ironies) – in a certain context (Gellatly & Zarate, 1999) and do have difficulties in interpreting the meaning of conversational utterances, such as indirect speech acts (Kaplan et al., 1990).

In other words, right hemisphere damage impairs the integration of ideas so that individuals become no longer able to make inferences – the production of extra information not present in discourse.

1.2 – RESEARCH QUESTIONS AND STATEMENT OF THE PROBLEM

When reading a non-literal story task the right inferior frontal and the right middle temporal gyro areas are activated, trying to find the moral of the text (Nichelli et al., 1995). In the right hemisphere, which is responsible for the reorganization of ideas, the temporal and prefrontal cortices are involved in the thematic interpretation of a text. These areas are activated when identifying aspects of a story, such as grammatical, semantic, and the moral (Nichelli et al., 1995). Reading processing indirectly suggests the coordination of a network of areas, each of which may be specialized in one aspect and also requires coherent support from the others in order to perform a certain task. This fact suggests that a non-specific linguistic coding of story information is needed for a theme or moral to be processed and stored. Thus, in order to understand certain sorts of text, the right hemisphere activates more general concepts than the left one (Nichelli et al., 1995).

According to Hough (1990), in trying to understand a text, "individuals may change or add information in their interpretations in an attempt to compensate for their ability to apprehend discourse" (p. 275). Thus, since comprehending a text does not

mean understanding words, but the idea the writer wants to express, my objective in this research is to verify if individuals who have suffered right hemisphere damage are impaired to understand and interpret narratives and also to connect discourse into a coherent way (Hough, 1990). Therefore, the research questions I intend to answer are the following: 1)"How do participants perform in the reading comprehension tasks, in terms of number of recalled propositions?" and 2) "Among indirect request, verbal irony, joke, simple inference, physical stories, and theory of mind, what sort of texts do they present more problems with?"

1.3 – RESEARCH RELEVANCE

Throughout all these years, researchers have been trying to formulate theories to better explain brain processing and its functions. Springer and Deutsch (1998) observe that former research created a theory called the Dominance theory, in which much more focus was addressed to the left hemisphere of the brain, in the hypothesis that it controlled the entire language process. However, nowadays research has shown that this assumption might not be adequate. Both hemispheres have different functions toward language processing and studying these functions gives us the possibility to understand why people who have damage in the right hemisphere are impaired from comprehending certain sorts of text.

In addition, studying right hemisphere damage helps us to broaden our knowledge about the effects of brain damage on individual's reading comprehension. In fact, an interdisciplinary approach is needed to better understand and analyze the brain and language connection. Therefore, we, as language researchers, have to focus on all methods and tools available at present to implement new theories and ideas, in order to

redefine the brain-language relationship and better understand how it interacts to produce language. Regarding the lack of attention devoted to the importance of the right hemisphere in language functions, this research intends to be another step in the area of Brazilian cognitive studies, providing more results to the field, so that they can be compared and contrasted to what scholars have already gotten in their works.

The relevance of this type of research is that having specific knowledge about the affected language processes can lead researchers towards the implementation of more appropriate speech therapies in order to improve the quality of life of right hemisphere damaged individuals. Hence, research on this aspect of language processing becomes not only interesting, but also necessary.

This research is structured in five chapters: Chapter 1 introduces the present study; Chapter 2 presents the review of literature, discussing the main relevant aspects of language, brain functions, and schema theory; Chapter 3 shows the methodology carried out in this research, including the description of participants, the texts used, the pilot study, and the procedures of the reading tasks; in Chapter 4, results are analyzed in the light of the research questions stated in this first chapter; and, finally, Chapter 5 presents an overall conclusion and recommendations for future work.

CHAPTER 2

REVIEW OF LITERATURE

This chapter aims at reviewing some important aspects from the literature, which are more related to the objective of this research: topics about the brain, including a brief presentation of the cerebral functions; some types of brain damage that can impair linguistic ability; a comparison between the two hemispheres and their specific specializations, emphasizing the right hemisphere functions; a discussion of the reading comprehension process, mental models, coherence and text representations, inference generation, and mental model modification; and, finally, summarized ideas about the relationship between the right hemisphere and the theory of mind.

2.1 – THE BRAIN

Since this study lies upon the reading process, which is a mental process, it is appropriate to discuss some aspects of the physical entity – the human machine – called the brain.

Gellatly and Zarate (1999) have defined the brain as the biological organ that comprises nets of neurons, which are connected through electrical impulses and chemical reactions. The brain has about 100.000.000.000.000 (one hundred trillions) of cellular connections, called synapses, in an endless cycle of information exchange. It is an anatomic structure inside the skull that weights about 3lbs, and is divided in two hemispheres: the left hemisphere and the right hemisphere. Each hemisphere is composed of four lobes: frontal, parietal, temporal, and occipital. The brain is also

known as the organ of the mind (Kolb & Whishaw, 1996). Figure 1 below illustrates the brain and the following table (Table 1) shows the main functions performed by its lobes:

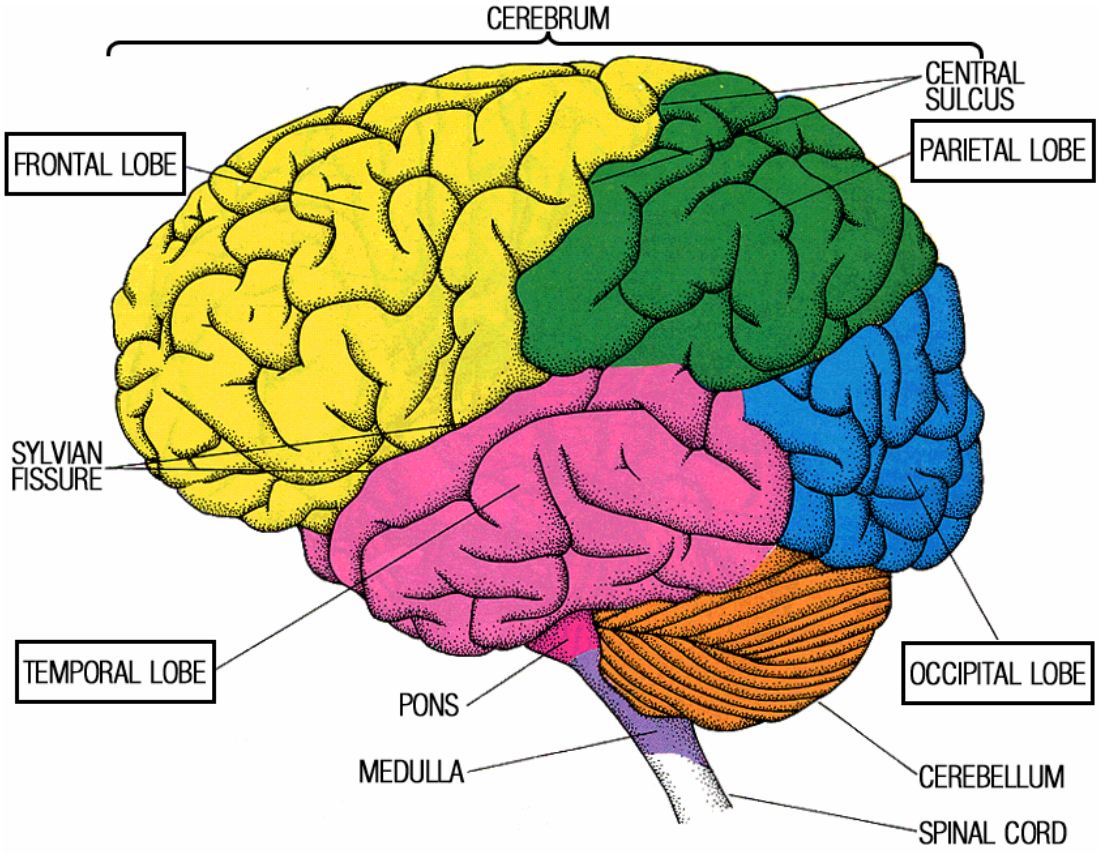

Figure 1: The brain regions: "left lateral view of the brain, showing the principal divisions of the brain and the four major lobes of the cerebrum" (Guyton, 1987, p.9)

Table 1

Functions of the brain lobes (Kolb & Whishaw, 1996)

Brain Lobes	Brain Functions
Frontal	Spatial and object-recognition functions, selecting behaviors in agreement with context and knowledge. It is divided in three parts: the motor cortex is responsible for producing movements; the premotor cortex selects these movements and the prefrontal cortex controls the cognitive processes so that movement and behavior happen according to time and place.
Parietal	Somatosensory functions, visual direction of movements of hands, fingers, limbs, head, and eyes, spatial recognition, arithmetic, and reading.
Temporal	Specialized for analysis of auditory and visual information, process of speech, and recognition of form.
Occipital	Responsible for vision, perception of form, movement, and color, specialization for word and facial recognition on the left and right hemispheres, respectively.

It is important to mention that, in this research, this classification of functions according to the brain lobes presented in Table 1 should be seen as a didactic tool for representing the specialization of each area of the brain in everyday processes. Therefore, as it is discussed in the end of this section, it does not mean that other areas do not participate in the extension of theses processes.

Language, which is directly connected to the brain (physically speaking), is an inherited ability to communicate and to represent the world. It liberates us in time and

space so that we can talk about the present, past, and future (Gellatly & Zarate, 1999). Language is also symbolic: it involves predication, it contains propositions, and it is structured and sequential. It carries ambiguity and contains multiple levels (such as letter, phoneme, lexico, etc.). Language is a code, but it is not as a simple as it seems, for each symbol interacts with others in order to establish each sentence meaning in each context.

In spite of the "the Localization Movement" theory, which tried to explain how the brain works, mapping it to specify which area was responsible for certain functions, nowadays, we know that the brain is not a uniform mass and that several mental faculties can be localized in different parts of the brain (Code, 1997). In this manner, mental life is the result of the coordinated activity of many different brain areas, each of which performing its own process, but working together with other areas in order to achieve a more global role, like reading comprehension, for instance. According to Springer and Deutsch (1998),

> sometimes a behavior thought to be a unitary mental process turns out to be a complex interaction; at other times, investigators discover that what were thought to be separate mental activities actually arise from the same brain mechanism (p. 160).

It is relevant to mention, though, in this sort of research, that there is an unavoidable difficulty in studying brain function from clinical data (Springer & Deutsch, 1998). This happens because the brain, through a process called plasticity, tends to adjust and optimize its operations in the presence of any damage. As a

consequence, researchers might not surely infer if intact areas are operating exactly as they would in a normal brain. According to Phelps (1999),

> when a brain lesion leads to a behavioral deficit, it is difficult to know the precise role of the brain area. Imagine if you knew radios played music, but did not know anything about how radios worked. If you one day removed the battery and discovered that music was no longer played, would you assume the battery makes music? Just because a lesion in a brain area leads to a behavioral deficit, this does not mean the brain area 'does' that behavior (p. 302).

Thus, since mental functions cannot be separated from other functions, damage to a small area of the brain can result in unpredictable consequences, deficits and changes in a number of different functions. As Rosen, Ojemann, Ollinger and Petersen (2000) explain, "one of the major underlying difficulties with studies in brain injured individuals is the difficulty in precisely identifying the structures damaged by the lesion or which one of the multiple damaged structures is responsible for the observed deficits" (p. 202). The next section discusses the most relevant brain damage and their consequences.

2.2 – STUDYING BRAIN DAMAGES

As it was presented previously, language problems are consequences of a certain neurological disorder. And, according to Kolb and Whishaw (1996), these disorders can

result from innumerous causes, such as headaches, tumors, vascular problems (commonly called strokes), infections, epilepsy, or cerebral trauma from head injury.

Springer and Deutsch (1998) say that since blood is supplied to each hemisphere separately, the brain damage resulted from one of these causes affects mostly only one of its halves. According to the intensity, the type of damage, the area affected, and the damage extent, a different type of language disorder — aphasia — may occur (Kolb & Whishaw, 1996).

In the Transcortical Aphasia, there is an inability to speak spontaneously, in spite of the possibility to repeat and understand words. In the Conduction Aphasia, although the patient is able to speak easily, she/he cannot repeat words. Differently, in the Anomic Aphasia, it is possible to repeat words, comprehend and produce speech, but patients present problems in naming objects.

Another sort of aphasia is Broca's Aphasia, which is localized in the dominant frontal inferior lobe, in the region of the motor cortex. In this case, the ability to produce language is impaired. Although having intact vocal mechanisms, people who have this type of aphasia present impairment in speech production, articulation of words, and lack of grammatical structures and functional words. Despite this deficit, Broca's aphasics are still able to comprehend language and also to perform automatic and involuntary reactions (Springer & Deutsch, 1998, Kolb & Whishaw, 1996). This type of language disorder is also closely associated with the beginning of the concept of different functions for the left and the right hemispheres.

Finally, the last type to be mentioned is Wernicke's Aphasia, which occurs as a result of damage in the temporal lobe area, more specifically in the first temporal gyrus. According to Kolb and Whishaw (1996), the individual presents the ability to speak fluently — yet confused and non-sense communication — but does not either

understand what she/he says or what she/he listens. However, the structure, the intonation, and the auditory mechanisms are not impaired. Wernicke proposed a model to explain how language is organized in the left hemisphere. In this model, he states that language would be a product of several sequential activities in the brain: thoughts, words, sounds, and muscle commands would result in language (Springer & Deutsch, 1998, Kolb & Whishaw, 1996). According to Gellatly and Zarate (1999),

> when we want to speak a thought, the words for it are put together in Wernicke's area and sent via a bundle of fibers called the arcuate fasciculus, to Broca's area. Here the correct sequence of speech movements is called up and sent to the nearly motor cortex which carries them out (p. 63).

This model also reinforces the theory that language is related to several areas within brain functions. In the next section, a comparison between the two hemispheres of the brain is presented, discussing their functional differences.

2.3 – COMPARING HEMISPHERICAL FUNCTIONS

Following Gellatly and Zarate's (1999) ideas, each cerebral hemisphere receives information from the opposite side of the body, which it also controls. Both of them can produce a very cohesive performance because they exchange information via a sheet of fibers, called corpus callosum. Anatomically, the hemispheres differ in terms of size, shape of landmarks, ratio of gray to white matter, neuronal number, neuronal size, among other aspects. Consequently, there are differences in their functions as well, such

as the nature of the perceptual information processed, attended, and stored, and the type and quality of motor control.

According to Federmeier and Kutas (1999), Table 2 below shows a snapshot of how the left and the right hemispheres process information differently, and how they connect this information to our world knowledge in distinct ways.

Table 2

Left and right hemisphere functions (Federmeier & Kutas, 1999)

	Left Hemisphere	Right Hemisphere
Thinking	Symbolic, analysis	Holistic, imagination
Focus on	Foreground, specific	Background, general
Aware of	Details	Overall picture
Better at	Structured tasks	Open-ended tasks
Language	Decoding, literal surface meaning	Context meaning, humor, metaphor

According to Table 2 above, while the left hemisphere is an expert in analytical processing, accessing highly specific knowledge / information, and being unable to grasp context in world knowledge, the right hemisphere in its global processing relies only on superficial information. For this reason, right hemisphere damaged individuals do not present problems in decoding language but are strongly literal in their interpretations, being unable to perceive the consequences caused by a determined event or to bridge the gap between “surface” and “deeper” meaning of thoughts conveyed by sentences.

Studies based on priming tasks (Federmeier & Kutas, 1999) showed that the left hemisphere is related to close lexical-semantic relationships (e.g. cat-mouse) and that the right hemisphere would correspond to more loosely related semantic association (e.g. cat-horse). Thus, as these authors state,

> the left hemisphere actively narrows its intentional focus to highly related words while the right hemisphere activates a broader range of words. The left hemisphere is more crucial for the rapid, focused meaning activation necessary for comprehending everyday language, whereas the right hemisphere's slower processing and more dispersed associations give it a critical role in the processing of non-literal language (pp. 374, 375).

Therefore, while the right hemisphere uses a more global strategy in scope, being able to keep large amounts of surface information over time, the left relies on a more narrow, short-term, and local view of context, in which the lexical input pre-activates information related to the item most expected to come next (Federmeier & Kutas, 1999).

In summary, the right hemisphere would be specialized for non-specific code and the left one for refined code. These results suggest that the two hemispheres activate general semantic information and use sentence context information when processing sentence reading differently. According to St. George, Kutas, Martinez and Sereno (1999),

> each word is associated with a large diffuse 'semantic' field in the right hemisphere and a smaller, more focal 'semantic' field in the left hemisphere. In other words, in the right hemisphere, many concepts give rise to weak activation for some time, whereas in the left hemisphere that activation is limited to the target and its most closely linked associates. In this way, semantically distant words needed to understand metaphors and draw inferences can be accessed and integrated (p. 1324).

This trade-off between the two hemispheres might explain better the bilateral cerebral activation that happens when processing figurative texts, such as indirect request, verbal irony, and joke, which require a greater activation of general concepts. On this regard, Federmeier and Kutas (1999) claim that

> the left hemisphere's processing of context is predictive (resulting in the activation of features associated with the item most likely to be encountered in the future) while the right hemisphere processing is integrative (involving direct comparisons between the features of items in the context and those of the current word (p. 388).

In other terms, we can say that both hemispheres process different strategies to extract meaning or information from discourse/sentence during normal language processing. The next section talks about this topic bringing into focus right hemisphere processes.

2.4 – RIGHT HEMISPHERE PROCESSING

According to Code (1997), the right hemisphere participates in several mental processes, including the origination and generation of non-propositional speech. In this process, which does not involve grammar components, utterances are highly conventionalized and context related, presenting low level in propositionality — because they do not involve generation and process of new ideas. Moreover, these utterances, which are automatic and involuntary, are processed like single items (as packages, in a holistic point of view), being related to social and emotional aspects of communication. Some examples could be given, such as slang, proverbs, repetition of familiar sentences, counting, and listing. Code (1997) also states that the sources and causes of non-propositional speech have not been defined yet and researchers have still been studying such explanation.

Similarly, many activities we perform in our everyday life are produced automatically. In Code's view (1997), when a child is learning how to speak, for example, an utterance is newly generated by the left hemisphere linguistic system. Later on, this utterance becomes familiar, formulaic, and automatic and, because it is redundant, it does not require left hemisphere processing anymore. Thus, it may be passed to a right hemisphere holistic speech lexicon, allowing the left hemisphere more processing space to perform the most demanding human activities. On this line of thought, the left hemisphere would be responsible for processing propositional language, while the right hemisphere would be more related to the use of automatic words. In other words, there would be an interaction between the left and the right hemispheres, in which they would be involved in the processing of non-propositional language (Springer & Deutsch, 1998).

According to Bogen (1997), the discovery of the fact that the right hemisphere possesses specialized functions — as the left hemisphere does — took so long because small lesions in the left hemisphere affected language abilities, but comparable damage in the right hemisphere, besides being difficult to analyze, did not seem equally serious.

In order to comprehend narrative discourse, normal individuals rely on an abstract structure, which includes the main idea or theme of a narrative (Kintsch & van Dijk, 1978; Bransford & Johnson, 1972 and Dooling & Lachman, 1971, as cited in Hough, 1990). Through theme they can extract meaning from individual sentences and then integrate that meaning with the context supported by other sentences. Hough (1990) says that "successful comprehension is dependent upon this integration process. Research with individuals with right hemisphere damage has revealed difficulties in the integration of linguistic information into coherent wholes" (p. 253). Therefore, discourse understanding depends mainly on this integration processed by the two hemispheres. When isolated meanings from the text are not correlated, comprehension may become a more complicated task.

Before understanding indirect requests or verbal irony, for example, the individual needs to comprehend the difference between literal meaning (what is actually said) and intended meaning (what is intended to be said). To perform this act, s/he must use her/his contextual knowledge to make hypotheses and predictions about the speaker's speech. Kaplan et al. (1990) assert that right hemisphere damaged individuals "showed a decreased ability to use prior context to disambiguate an utterance. This discourse deficit may reflect a diminished ability to predict what a speaker might say (or wish to imply) in a conversation" (p. 317).

The interpretation of other types of non-literal texts, such as jokes, for instance, requires the listener to revise and modify her/his initial understanding of what was

described previously in discourse. Right hemisphere damaged individuals present a tendency to choose non-related endings, instead of revising and adjusting the new information. As they are not able to make this connection — linking the sentences and their meanings — most of the times they end up arriving at an incoherent interpretation of discourse. Myers and Linebaugh (1981, as cited in Brookshire & Nicholas, 1984) report their reading experiment in which two-sentence stories were presented to three groups of participants: right hemisphere damaged, left hemisphere damaged, and non-brain-damaged listeners. Each story ended with a common idiomatic expression. The participants had to choose one picture, out of four, that represented their interpretation of the sentences. The result was that right hemisphere damaged listeners chose literal interpretations "significantly more often than either LHD or non-brain-damaged listeners" (p. 32). In other words, right hemisphere damaged individuals could not integrate ideas or make inferences, to adapt new to old information.

Molloy et al. (1990) remark that, differently from left hemisphere damaged individuals (who present impairment in speaking or understanding), right hemisphere damaged individuals are not usually impaired from naming objects or comprehending complex syntactic sentences. But they probably present comprehending problems regarding idiomatic and metaphoric statements, organizing conversations, paragraphs and narratives, using context information appropriately in their interpretations of linguistic or nonlinguistic messages, and distinguishing important from unimportant information.

In order to accomplish the purpose of this research, which is to analyze right hemisphere damaged individual(s)'s performance in a reading comprehension experiment, it is previously required from the researcher to have a reasonable

understanding about what reading comprehension is – as a mental process – and how this process is developed in normal readers. This is what is discussed in the next section.

2.5 – READING COMPREHENSION – WHAT IS READING?

"Reading is a powerful activity that confers knowledge, insight, and perspective on readers"

(Aebersold & Field, 1997, p.6).

Reading is an internal process that involves the reader, the text, and also an interaction between both, through which meaning is addressed to written symbols (Aebersold & Field, 1997). When performing a reading task, readers rely not only on the text itself, but also on a great amount of information that comes from her/his background knowledge, called **schema** (Carrell, 1988 and Davies, 1985). This information can be constructed by different sources, such as her/his family — behavior and attitudes toward reading —, community — values and knowledge regarding reading activities —, school, sociocultural environment — uses addressed to reading —, and individual differences — motivation, aptitude, intelligence, purpose, and anxiety influence the reader's performance during reading (Aebersold & Field, 1997).

Davies (1985) believes that reading starts with the linguistic representation encoded by a writer and ends with the processing of constructing meaning, in which "the function of schemata is to provide frameworks for interpreting the world, including, in reading, the world of a text" (p. 66). Thus, throughout the interaction between the reader and the text, the reader adds, creates, and rejects new information, refines it, and modifies her/his schemata. While the written text does not change, the reader's schema is built through constant modifications, which makes her/his reading changeable as well.

The purpose of this section is to discuss the importance of schemata in reading comprehension, through which, readers build conceptual representations from information of morpho-lexical and syntactic structures of the text and, simultaneously, use their own prior knowledge representations stored in memory to construct the text representation.

For Goodman (1980), who defines reading as "a complex process by which a reader reconstructs, to some degree, a message encoded by a writer in graphic language" (p. 472), the reading activity starts with a combination of graphic language form and the readers' visual perception, and ends with meaning. Its purpose is to reconstruct meaning present in the readers' and writers' minds. In other words, meaning — the interaction between thought and language — depends on the readers' background knowledge in the reconstruction process and it is not given by the text, but interpreted by readers, according to their previous knowledge.

The reading process requires several sub-processes, including perception and visual recognition, access to semantic memory, and processing of phonological structure of the item (Morais, 1999). Following Tomitch (1991), in order to interpret a text, readers rely on three types of information at the same time: 1) grapho-phonic information: graphic (letters, punctuation), phonological (sound, intonations), and phonic (interaction between graphic and phonological information); 2) syntactic information: sentence patterns, functional words, and transformational rules; and 3) semantic information: experiences (readers bring their background knowledge and acquired linguistic competence to the graphic information), concepts (readers organize and construct concepts), and vocabulary (readers put into words the connections created by what is read).

Therefore, there is a limit to the amount of information that readers are able to receive, process, and remember, what makes readers unable to retain all information available in the text; instead, they choose the most relevant ideas, according to their schemata (Tomitch, 1995). Thus, it is possible to conclude that it is not the text that provides meaning to readers: readers by themselves achieve meaning through what they bring to the text — attitudes, beliefs, and ideas — during the comprehension process, integrating two kinds of information — linguistic and world knowledge.

Schemata structures are organized from the most general to the most specific information. The slots in a schema are fixed in terms of types and form, which turns them into expectable knowledge. In a "restaurant" schema, for example, the concept of "bed" is not expected, and would probably be rejected. This probably would not happen to concepts such as "table" and "menu".

The most important role of the readers' schemata is to enhance comprehension, process new information — linguistic or non-linguistic —, organize the process flow, and build a hierarchical structure of knowledge (Tomitch, 1991).

Thereby, during comprehension, readers perform a set of strategies, in which they: a) draw on their background knowledge; b) predict next information; and c) test/confirm predictions. In order to better comprehend a text, readers may rely on two types of schemata: formal schemata, which are their background knowledge about the rhetorical structure organization of the text (for example, readers must know the differences in the textual structures of fables, reports, jokes, and poetry, among other genres) and content schemata, their background knowledge about the content area of the text (for instance, when reading specifically about politics, readers must have prior knowledge about former politicians).

When a certain topic is in the readers' schemata, comprehension is facilitated because they do not need to construct a schema framework — it is ready. However, they need to compare and integrate new possible information with previous knowledge structures already stored in memory. According to Carrell (1988), readers may have problems in comprehending a text when they do not possess specific schema. Since schema is culture-limited, failure in comprehension may be caused by context/culture lack of knowledge, activation of the wrong schema, or even inexistence of schema (lack of text information about the content). Therefore, when the new input does not find its "mental place" to be connected to, readers may use compensatory strategies to overcome the problem (for example, rereading the passage or ignoring it). Due to this fact, readers comprehend better when dealing with a topic that is already stored in their memory. In this sense, lack of schema does not mean inability to comprehend the text; nevertheless, it surely means a higher level of difficulty in reading comprehension.

Activating relevant schemata is then crucial for successful text comprehension. Research studies have shown that in many cases readers misunderstand a text, not because they lack the appropriate schema, but because they activate an inappropriate schema (Carrell, 1988). In these cases, there may be a failure in the connections between the text and its context. In order to compensate that failure, there are some strategies readers should use when they lack a schema, such as: over-relying on text-based processes; trying to construct the meaning only based on textual input — this may be very difficult since no text possesses all information to be completely understood — and replacing the lacking schema for another one stored in their schemata, trying to relate the input to what is already activated. Hudson (1988) highlights that schematic knowledge is far more important than grammatical and syntactic knowledge, because it varies according to readers' "age, subculture, experience, education, interests, and belief

systems" (p. 185). For that reason, we can say that schemata are constantly modified by the readers' everyday activities, through which new information is integrated with old ones.

In conclusion, reading comprehension is the result of the interaction between conceptual abilities (semantic and syntactic), background knowledge, and strategies used by readers. The meaning of a text cannot be found in itself, but in the relationship between text and schemata. In Anderson and Pearson's (1988) standpoint, comprehension takes place when readers are able to establish a "mental home" for new information; that means, when they can integrate new input with their prior knowledge. In other words, readers may know the rules, words, and syntax of a language, but "new information, new concepts, new ideas can have meaning only when they can be related to something the individual already knows" (Kant, 1963, as cited in Carrell & Eisterhold, 1988, p. 73). Considering the fact that linguistic knowledge is not enough for the comprehension process, and taking into account the importance of schemata for reading, it is possible to characterize good comprehension as having good linguistic knowledge, good interaction between reader and text, and adequate access to reader's and writer's schemata. Conversely, bad comprehension may result from either good linguistic knowledge – but lack of relevant schemata – or activation of a wrong schema.

As presented in the next section, the interaction between the text and the reader are better explained through three reading models: (a) in the bottom-up, the reader builds her/his mental representation from small text units; (b) in the top-down model, the reader brings to the text comprehension information from her/his schemata; (c) and, in the interactive model, there is an interaction between both bottom-up and top-down processes.

2.6– READING AND MENTAL MODELS

"Reading is like an infectious disease: it is caught not taught. (And you can't catch it from someone who hasn't got it…)" (Christine Nuttall, 1983, as cited in Aebersold & Field, 1997, p.5.).

Reading comprehension models were created in an attempt to theoretically describe what happens in the mind (or memory) during the process of reading and how readers process textual information they cannot describe visually (Davies, 1985). According to Devine (1988), a reading model can be understood as a "set of assumptions about what happens when a reader approaches a text. That is, the ways a reader derives meaning from printed material" (p.127). The purpose of this section is to describe the three most important reading models — bottom-up, top-down, and interactive.

Early research, based on behaviorist ideas, suggested that reading was a passive, bottom-up process, in which readers would simply decode the meanings established by the author, through the recognition of printed letters and words (Carrell, 1988). Readers would then construct meaning from local textual units at the "bottom" to more global/general units at the "top". Gough (1972, as cited in Davies, 1985) characterized this serial model as having several discrete stages, in which each stage transforms information and passes it to the next higher stage for further changes and recoding. In the bottom-up processing point of view, failure in reading comprehension is directly related to decoding problems.

However, this decoding model cannot account for the reading process in its totality, because it does not take into consideration the readers' contribution to the construction of meaning. Contrary to what former researchers thought, readers do not perform a passive role, receiving information conveyed by the author in the text;

instead, they are active participants, who make predictions, process information, and construct textual meaning integrating the author's ideas with their own beliefs (Carrell, 1988). These assumptions are related to Goodman's (1969, 1970, 1975, and 1988, as cited in Davies, 1985) reading model called top-down.

Differently from the bottom-up model, the top-down model asserts that higher-level processing drives readers to the direction of meaning through predictions and hypotheses verification (Carrell, 1988). In other words, readers sample the text, create new inferences, and rely on their prior experiences, confirming or refuting their assumptions about the text. Nevertheless, the top-down model does not account for all levels of readers. Eskey (1988) points out that it does not emphasize, for example, lower-level processes, as if they had no importance for poor readers, who do not have decoding processes automatized. Here lies the importance of the bottom-up model for beginners. They spend much time thinking about what words mean and, at the same time, create expectations using the context to help them extract meaning. Fluent readers, on the other hand, possess automatic decoding skills, spending less time in lower-level processes.

Recent research has shown that for an effective reading comprehension, both bottom-up and top-down processes are necessary (Carrell, 1988). This interaction, the combination of textual and readers' information, in which these two reading processes take place simultaneously, is called interactive model, a model that has interacting hierarchical stages: the lower-level processing (including graphic features/ letter / words/ phrases/ sentences) and the higher-level processing (including local cohesion / paragraph structuring / topic of discourse / inferring / world knowledge), which give their contribution to the construction of meaning in the text (Grabe, 1988). Therefore, reading is taken as a kind of dialogue between the reader and the text (or the writer). It

is important to mention that, in this model, researchers acknowledge the importance of the role of background knowledge, in particular the culture-specific knowledge called schemata. They believe readers do not use all information present in the text, but make predictions (Carrell, 1988). According to Goodman (1973, as cited in Carrell & Eisterhold, 1988), "the better the reader is able to make correct predictions, the less confirming via the text is necessary" (p. 74). Briefly, meaning is constructed by the readers' focus on semantic, syntactic, and graphic aspects of language (bottom-up) and its relationship with the readers' past experiences and knowledge about the language (top-down). In Rumelhart's (1977, as cited in Davies, 1985) interactive model, information related to high stages of processing can influence lower stages of processing. Hence, readers' interpretation depends on the relationship between the context of the text and their knowledge about syntactic, semantic, lexical, and orthographic information. Rumelhart also claims that this interaction is performed by the message center, which has the function to process, hold, and store information in short-term memory (Carrell, 1988). In a nutshell, the interactive model accounts for the extent readers process lower-level skills (letter and word recognition and lexical information) and how these skills interact with higher-level strategies (background knowledge, expectations, and context information), which offers readers the possibility to derive meaning and construct an interpretation of the text.

According to Eskey (1988), the crucial difference between bottom-up and top-down models is that in the first one readers start by the printed input and develop processing to higher-level stages; while in the second model reading is initiated by the readers' predictions, assumptions, and beliefs and ends with their confirmation according to the printed input. Nonetheless, both models present their constraints: regarding the top-down model, readers may not have sufficient background knowledge

for certain types of texts. When new information does not find its "mental home" or familiar place to be related, readers try to revise information, in an attempt to somehow accommodate it to be understood (Carrell, 1988). But sometimes this is not possible. That may be the reason why a text on a familiar topic is better understood than one in an unfamiliar topic. The bottom-up model, on the other hand, can only account for beginning readers, who take a long time in recognizing letter and words. Their slow decoding is associated with high activation of background knowledge. But, for skilled readers lower-level processes are automatic and extremely effortless. Predicting is a more time-consuming process, which requires more resources. But as their automatic decoding processes free up resources, they can concentrate on high level predictions and inferences. That is the importance of having an interacting model, which can explain reading processes for beginners (slow recognition) and also skilled (automatic recognition) readers, depending on their deficits: lack of background or linguistic knowledge. Therefore, as different readers need different reading processes, they can draw on different sources of knowledge to comprehend the text.

In conclusion, reading models are created in an attempt to explain how "ideal" reading processes occur, taking into account both "ideal" readers, who have well-developed knowledge and skills, and "poor" readers, who have serious strategy constraints (Eskey & Grabe, 1988). In fact, researchers depend mainly on "real" readers' performance to draw conclusions on how they process bottom-up and top-down skills. Finally, throughout this section it is possible to realize that reading is not only related to understanding the meaning of words and sentences, but to integration of knowledge, either from the text or from the readers' background. In this way, bottom-up, top-down, and interactive models are metaphors used to describe the complex mental processes of reading, and all of them contribute in different ways to reading

comprehension which occurs in distinct contexts. In spite of the fact that further studies are still necessary to explain how and under what conditions knowledge is stored in our minds, reading models can surely address new problems and help broaden research perspectives regarding reading processes.

As aforementioned, comprehending a text means building a mental model or coherent mental representation structures. Shortly, we have to make connections between what is read – the text – and our previous background knowledge. But what do readers do when they try to understand a text? And how do they construct a memory representation about the text?

The mental model created by the reader represents her/his comprehension of the text. As put forth by Kintsch and Van Dijk (1978), mental models are "the cognitive representation of the events, actions, persons, and the situation that a text is about, not a representation of the text" (p. 271). This "meaning of the text" results from the interaction between the textbase and the situation model. The *textbase* is the semantic representation of the input information in episodic memory. That means the representation of the text as a result of local coherence. Differently, the *situation model* is what the text is about, its content – representation of people, setting, actions, and events that are explicitly mentioned in the text –, and what is already known about it. It implies both making inferences and integrating ideas. Zwaan and Brown (1996) define situation model as an integration of information "from different sentences as well as relevant information activated from long-term memory (LTM) into a coherent mental representation of a narrated sequence of events, actions and states" (p. 289). Thus, when generating the situation model, the reader sets her/his goals, tries to explain the events presented in the text, and also to construct a coherent meaning representation in both

levels – local and global. The next section will explore more deeply how coherence and the mental representation of a text take place during the reading process.

2.7– COHERENCE AND TEXT REPRESENTATIONS

Creating a coherent mental model depends particularly on the reader's inferential processes. Coherence, as an interaction between memory, background knowledge, textual constraints, and process limitation, is determined if the reader feels that no extra information is needed, for her/his comprehension completion. Otherwise, additional information is required (besides the fact that more inferential processes will occur) in order to integrate the extra information needed with the previous ones.

The more coherent the text is, the less demanding on working memory the task becomes. Connectives, as a source for coherence, contribute to free up working memory, because they reduce the number of inferences the reader may need to process to establish text comprehension. Murray (1995) says, " any text device that makes clearer the semantic relation between text units would produce a more accurate and more integrated memory representation of the text material" (p. 109). Therefore, connectives give the reader hints while she/he goes through the text, transforming the reading task much less time and resource consuming.

Text representations, elements for creating a coherent mental situation, are constructed in a sequence of propositions, in which word-by-word and sentence-by-sentence are processed individually. The result of each process is immediately integrated to what has been already processed and held in working memory. When dealing with ambiguity, the reader may move slowly in the process or go on reading looking for future propositions that might solve the problem. This means that at each

time a new proposition is processed, it is immediately integrated to the text representation. According to Tapiero and Otero (1999), we can analyze the text representation in three levels:

a) the surface level: it does not last long in working memory. It is related to the exact words and syntax presented in the text;
b) the semantic level: it incorporates two processes: microprocessing and macroprocessing. In the microprocessing, a coherent textbase is constructed, in which local inferences are generated. On the other hand, in the macroprocessing, the propositions of the textbase are organized in a hierarchical and coherent sequence or into a meaningful global coherence;
c) the situation model level: in this level the reader integrates her/his background knowledge with the textual information forming a coherent mental representation of the text.

The present research is based on the theoretical background provided by Kintsch (1998, as cited in Tapiero & Otero, 1999), on his Construction-Integration Model of Discourse Comprehension. According to Tapiero and Otero (1999), this model helps researchers understand how background knowledge is used during reading comprehension and how inferences take place in the process.

For Kintsch, comprehension is a cyclical process, which involves two stages: construction and integration. First, in the construction stage, propositions present in the text are interconnected in a network, which results in the textbase. Items from the textbase network, which are still held in working memory, activate nodes in the reader's background knowledge that maintain relations to each other. For instance, when reading "DOG", the word "CAT", which has a close relation to the previous one, is also

activated. Then, in the integration stage the node activations are spread, so that a coherent network can be constructed through an integration of the propositions to the reader's world knowledge. If the propositions are relevant to what is stored, the activation strength of the nodes is increased; otherwise, it is deactivated. All processes involved in the construction and integration stages represent a single cycle of this model. That means that each sentence of the text, one by one, goes through both stages. At the end of each cycle, relevant pieces of information are stored in working memory, so that they can be integrated to future information of the next sentence and so on. At this point of the reading process, integration is possible due to the fact that the information held in memory share features with the information to be processed. Actually, the more features are shared, the more coherent the construction of the mental representation of the text – the textbase – will be. The next section discusses of how readers create inferences in the search for meaning so that they can have a coherent mental model.

2.8 – CREATING INFERENCES

As it has been mentioned before, in order to understand the process of right hemisphere damaged individuals' comprehension, we should first analyze the reading process of non-brain-damaged individuals. And to perform reading comprehension, a normal reader needs to have a coherent textual mental model, which implies creating inferences about the text. In other words, it is the need for coherence that commands inferential processes.

In an attempt to generate inferences, the reader may be based in several sources: previous texts, the explicit text, knowledge activated during the comprehension of

previous sentences from the text, world knowledge structures stored in long-term memory, her/his reading goals, and the pragmatic context of a communicative exchange. The two most important types of relations to be explored in this research are local and global inferences.

According to Van den Broek, Risden, and Husebye-Hartmann (1995), local inferences are relations between information of a sentence that is being read and the information that has already been stored and remains activated in working memory. They are consecutive events that may be processed quickly and effortlessly, since they connect pieces of information locally placed in the text to the information in memory. Most models of reading comprehension support the assumption that local inferences are generated during the reading process. They facilitate the local process, establishing a coherent relation between what was previously mentioned in the text and the current information being read.

Differently, in the global inference process, events may not be consecutive and then the first statement read is no longer active in working memory. For this reason, no local connection can be established. Hence, they need to be reinstated from long term memory, reactivating related information needed for comprehension. In this type of relation the reader has to draw on her/his background knowledge searching for new concepts not explicitly described in the text to have a satisfactory explanation. Van den Broek, Risden, and Husebye-Hartmann (1995) state that

> the aim of these processes is to identify additional events that, alone or in combination with already activated information, supply sufficient cause for the current event. These processes can involve a search of memory for the prior text and/or the activation of background knowledge (p. 357).

For this reason, global relations are more effortful and resource/time consuming. In simpler terms, global inferences are the result of an interaction between the semantic text coherence and the reader's prior knowledge structure.

Thus, if the statement being read receives sufficient causal explanation about the statement previously processed, a local inference is created and no global connections occur. But, in the case of a non-satisfactory causal explanation, global inferences probably will happen, in order to maintain coherence during reading. As a result, it is possible to affirm that the standards adopted by the reader, together with the constraints from the text, determine if local relations give sufficient information or global inferences will have to be generated in order to complete the comprehension process.

Much has been discussed of which circumstances, local or global, inferences take place. Two main hypotheses are supposed to explain this issue: the minimalist and the constructivist. First, the minimalist hypothesis supports the idea that the reader goes through a text passively; to put it differently, the reader deals only with information available from the text. This theoretical approach might fail if a coherence break — insufficient causal explanation that provokes a local strategy failure — forces the reader to search for a global inference in order to be provided with satisfactory explanation about what is being read (O'Brien & Myers, 1999).

In the present research, the constructivist hypothesis is assumed. It lies in the assumption that the reader makes both local and global inferences during the reading process. As O'Brien (1995) stresses, "readers map incoming information onto information active in memory (i.e., local processing) and onto relevant information no longer active in memory (i.e., global processing)" (p. 160). In this way, readers go step by step in the text searching continually for meaning and establishing connections in

both local and global levels. In other words, there is a complete integration process of current information to what is stored in working and long-term memories.

2.8.1 - INDIVIDUAL DIFFERENCES IN LOCAL AND GLOBAL INFERENCES

When trying to comprehend a text and, as a consequence, making inferences, the reader may not only rely on the sources previously stated – previous texts, the explicit text, reading goals, and the pragmatic context of a communicative exchange. Van den Broek, Young, Tzeng and Linderholm (1999) maintain that there are other aspects that can contribute to the generation of inferences, such as:

a) Attentional capacities: readers can interpret the meaning of a text or sentence differently, depending on the amount of attention directed. Relevant information may not call the attention of the reader according to her/his objectives, motivation, fatigue, etc.;

b) Background knowledge: inference generation depends also on the extent the reader has access to her/his background knowledge. There are readers, for instance, who stay as close to the text as possible, trying not to complement their mental representations with information from background knowledge – they simply create a textbase from the information provided by the text. On the other hand, there are others who attempt to integrate every piece of information presented in the text with what is stored in their world knowledge – creating, this time, a situation model. Most readers are in the center of these two extremes: they eventually mix text information with their background knowledge.

c) Standards for coherence: depending also on the sort of the reader's strategy, local coherence processes tend to be established if the reader focuses attention only on textual relations, what results in a minimal understanding of the text. For example, when reading an academic paper, readers rely more often on syntax relations and spend more time rereading and paying attention to the text structure. However, if readers need a more complete comprehension (for instance, when reading a newspaper, they make more global mental representations) for lack of causal explanation, a global connection between the text relations and her/his world knowledge will be founded.

2.8.2 - ISOLATED AND DISCOURSE SENTENCE COMPREHENSION

According to Brookshire and Nicholas (1984), "studies of single sentence comprehension have provided a great deal of information about comprehension abilities of aphasic persons" (p. 22). However, these studies cannot generalize all assumptions regarding language comprehension deficits because there are substantial differences between sentence and discourse comprehension processes. One of these differences, in the authors' opinion, is that when reading discourse texts readers are able to predict inferences based on the context the text is inserted in. These inferential processes help the reader deduce her/his hypotheses and disambiguate the meaning of the sentences. On the contrary, when performing a reading task based on isolated sentences, readers are not provided with context, which may cause her/him problems with ambiguous words and/or sentences.

The following section discusses of how readers process the inference generation when they modify their mental representations.

2.9 – INTEGRATING NEW AND OLD INFORMATION – MODIFYING MENTAL REPRESENTATIONS

In daily routine, people are often exposed to initial misinformation that is corrected afterwards. When reading non-literal texts, for instance, readers usually are required to perform corrections on their primary comprehension processes. Comprehending a correction and, as a consequence, avoiding influence from misinformation, can be divided in two stages: surface updating and global updating. According to Johnson and Seifert (1999),

> *surface updating* entails noticing the correcting information, incorporating its text within a representation, and detecting that it has a correcting relationship with a specific piece of prior information. [while] *global updating* entails realizing the implications that a correction has for one's situation model and making appropriate inferences to update it (p. 303).

Thus, differently from *surface updating*, in *global updating* people would have to create alternative inferences about the event. In this sense, *surface updating* is not related to alteration in mental models, because recognizing misinformation does not mean correcting mental representations.

2.9.1 - SOURCES OF DIFFICULTY IN CORRECTION COMPREHENSION - INFLUENCES ON SURFACE UNDERSTANDING AND GLOBAL UPDATING

In case of problems with surface updating, people may be influenced by the incorrect information. That means, they are not going to notice that the propositions (the false and the right ones) are related. This fact can happen for a number of reasons:

a) People do not notice the correction immediately or forget it later;
b) People notice the correction, but do not realize it is inconsistent with the previous information. They just "simply encoded both statements without establishing the relation between them" (Johnson & Seifert, 1999, p. 306);
c) People notice the difference between the two propositions, but do not accept that the correct one invalidates the former. Thus, they can keep the propositions as contradictory and competing hypotheses.

Johnson and Seifert (1999) have realized that influence from a misinformation can also happen if a correction is not noticed or forgotten; but this is not a rule. Besides all these possibilities, their research has shown that people can fail in detecting a correction even when conditions are favorable to detection. For example, in the sentence "Ants have no noses. They use their sense of smell to find food", adults would probably think that ants possess their sense of smell in another location. And children would rarely notice that something is wrong with this sentence.

On the other hand, there are situations that are favorable for noticing misinformation. People tend to detect contradictions more easily when:

a) The differing propositions are close or together in a text;
b) Their literal forms have a high degree of common meanings;

c) The information is presented within the main clause, rather than subordinated clauses containing key information.
d) The correction is immediately presented after the misinformation;
e) The correction is repeated.

People may even detect there is a contradiction between the statements, but it does not mean they will completely update their situation model. In a word, influence from the misinformation can be explained through two possible circumstances: in the first one, people's judgments may be influenced by the failure to do surface updating following a correction, even when the conditions are the best for discovering it. In the second circumstance, people may have success in surface updating, establishing a relationship between the propositions in the text, but they fail to update their situation model of the current event.

Therefore, in order to perform a global updating, people would have to go further surface updating. This means that besides noticing the correcting information, incorporating its text into a representation, and detecting its relationship with a previous statement, people would have to modify their situation model according to the correction's implications. This modification would be made through two stages: first, they would produce inferences. As Johnson and Seifert (1999) say, "when initial information is corrected, people would need to evaluate any such inferences, and ignore or revise them if invalid" (p. 307); second, to completely comprehend the information given after a correction, there would be an integration process into the current story structure, where links would be established with the correct information, instead of the improper one.

The problem is that it is very hard for people to update their situation model when a correction has already occurred. They recognize it, comprehend it, but do not change its information in the model. Studies of Johnson and Seifert (1999) show that "people remember, acknowledge, and accurately answer direct questions about a correction. This suggests that people have the correcting information as part of the text representation that they have constructed" (p. 308).

Probably what makes it so difficult for humans to have changes in their situation models after the detection of a correction can be compared to the building of a brick wall. Suppose that a construction worker has just finished his brick wall. And suddenly he notices that one of these bricks, exactly in the middle of the wall, is broken. It would be extremely hard for him taking that brick out of the wall without major problems. This brick is a metaphor for the misinformation in the text. At the end of the comprehension process, it has already made several links and relations to other "bricks". And due to this fact, it becomes much more unlikely to remove it and construct other relations in its place, when everything seems to be "ready".

Johnson and Seifert (1999) believe that misinformation can still influence how people construct a representation, even after a correction occurs. If there were some delay between the initial and the correcting information, people would have much more opportunities to learn other facts and relate them to the initial information. At the point of the correction, they would need to re-evaluate the validity of these inferences, which may be difficult and effortful. On the other hand, a direct correction would give people less opportunity and time to make inferences involving the initial information because they would have learned fewer facts that the initial information could potentially explain. In this case, people would have much fewer inferences needing revision, which would facilitate the process of changing the situation model.

Research has shown that people tend to update a representation when the correction provides positive content (Johnson & Seifert, 1999). Even when invalidating the first information, this positive content does not simply deny it, but offers a concrete alternative to misinformation. In fact, people's attention is called to the discrepancy and then they are more likely to do surface updating and create new inferences.

In summary, people's opinions may be influenced by a failure on surface updating – when they do not notice the misinformation, or do not detect a discrepancy between the initial and corrected information, or when they do not believe the correction invalidates the previous statement – and/or in global updating – when people do not comprehend the correction's implications for the situation model. Following Johnson and Seifert (1999)'s line, I believe "people may need to re-evaluate and possibly revise any prior inferences they have made on the basis of misinformation" (p. 315). In addition to that, regarding comprehending correction, it is important to reinforce the following ideas:

a) Even when people are successful in surface updating influence can occur;
b) Decreasing the delay between the misinformation and the correction helps people to detect the discrepancy, but does not invalidate the influence;
c) Repeating the correction may contribute to correction detection;
d) People detect the correction more easily if it is within a simple clause structure;
e) If the correction presents positive content, people tend to modify their situation models more often.

In this research, participants will only be investigated as to they correct or not their mental models of the texts, i.e., if they accommodate the new information read in

the texts in their mental models. However, it would be interesting, in future studies, to analyze how people evaluate corrections when they are reading it, what previous inferences are revised and when, and how they are able to avoid misinformation when constructing their representation in models.

2.10 - RIGHT HEMISPHERE AND THEORY OF MIND

As regards Happé's et al. (1996) and Happé and Frith's (1999) studies, there is an evident relationship between Theory of Mind and right hemisphere damage. These researchers have studied autistic patients and their cognitive system deficits in producing coherent inferences and integrating context-realized information into higher level meanings. For Happé and Frith (1999), autism is

> a developmental disorder affecting approximately 1 in 100 individuals, and [is] characterized by qualitative impairments in social interaction and communication, and [by] and the presence of restricted and repetitive interests and activities (p. 18).

In their article, Bauron-Cohen and Houlin (1993, p. 467) list several Theory of Mind deficits (topics 3 and 8 are closely related to **Texts 9** and **3**, respectively, texts used in the data collection in this research), such as:

1. Insensivity to other people's feelings;
2. Inability to take into account what other people know about an event;
3. Inability to read intentions – good or bad;

4. Inability to read the listener's level of interest in one's speech;
5. Inability to anticipate what others might think of one's actions;
6. Inability to understand misunderstanding;
7. Inability to deceive or understand deception;
8. Inability to understand the reasons behind people's actions.

As it has been presented throughout this research, social and communicative abilities are part of the most affected linguistic aspect of a right hemisphere damaged individual. Happé (1993) and Happé and Frith (1999) also suggest that, taking into account the fact that Theory of Mind texts require mental state attribution for metaphorical language and activate widely right hemisphere areas of the brain – such as medial frontal and anterior cortex, and temporo-parietal regions –

> the socio-communicative deficits known to follow right hemisphere damage may resemble the pragmatic difficulties of high-functioning individuals with autism, and there is some evidence of Theory of Mind problems following right hemisphere stroke(p. 20).

Therefore, researchers believe that humans have developed a modular cognitive system specialized in mentalizing – which is domain-specific, innate, and predictable – that we call Theory of Mind mechanism, that stands for the formation of mental states representations and also has the power to accumulate social skills and knowledge (Happé & Frith, 1999, Gallagher et al., 2000), hence establishing a strong relationship between Theory of Mind capacity and figurative language comprehension (Happé, 1993). This might be the reason why right hemisphere damaged patients present an

inability to understand what other people think, feel, and also why they usually miss the point of conversations (Baron-Cohen & Houlin, 1993).

CHAPTER 3

METHOD

3.1 – PARTICIPANTS

The selection of right hemisphere damaged participants for this study was carried out at Associação de Santa Catarina de Reabilitação, a filantropic entity founded in 1961, which offers treatment services in several areas, such as health, pedagogical, and social aspects.

The process of selecting the participants to perform the research experiment was rather difficult. First, because exclusive right hemisphere damage cases were quite less common than left or left and right cerebral lesions. Besides, after finding possible participants who had suffered right hemisphere damage, the researcher had also to take into account the two variables established a priori: age and level of education. Ironically, this limitation turned out the process to be even more complicated, due to the fact that, among all possible participants selected at Associação de Santa Catarina de Reabilitação, most of them were over 70 years old or illiterate. Despite all these constraints, six right hemisphere damaged participants were finally selected for this study. The next step was to collect six non-brain-damaged participants who could be compared to the first group. Thus, the researcher's main concern at this point was to find normal participants as similar as possible to the right hemisphere damaged group in order to play the role of the control participants for this present research. The control group participants were selected in the researcher's neighborhood, according to their age and educational level. The relationship between the researcher and the control

participants was rather friendly, even because some of them belonged to her family. Table 3 below presents a more complete information background about the participants engaged in this study in terms of age and level of education.

Table 3

Age and level of education of participants

Participants	Age	Level of education
	RHD group	
Participant 1	75	High school – complete
Participant 2	49	Elementary school – incomplete
Participant 3	53	Elementary school – incomplete
Participant 4	48	High school – complete
Participant 5	48	Elementary school – complete
Participant 6	62	Elementary school – incomplete
	Control group	
Participant 7	56	Elementary school – incomplete
Participant 8	50	Elementary school – complete
Participant 9	53	High school – complete
Participant 10	62	Elementary school – incomplete
Participant 11	51	Elementary school – incomplete
Participant 12	51	Graduation – complete

From Table 3 above, we can observe that both groups selected were quite similar in terms of age (average of 55.8 years old to the RHD group and 53.8 to the control group) and educational level. According to Barbetta (1998), the main objective in the

selection of participants is to select groups that can be compared, that means, groups that can only be differentiated by one factor: the presence of a brain lesion. Therefore, in order to interpret the results for the purpose of this research, this equivalence of variables was considered as a very important aspect of the study.

In relation to the right hemisphere damaged participants, the researcher tried to select patients who presented cerebral lesion as similar as possible, in terms of brain damage location. The information collected from the participants' tomography exams are shown in Table 4 below:

Table 4

Brain Lesion Information

RHD Participants	Tomography results	Lesion Date
Participant 1	Ischemic cerebral vascular accident (CVA) Left hemiplegy and hemiparesy Microangiopathic encephalopathy, periventricular leukoarayosis and right corona radiata lacune absence of territorial cortical stroke (infra or supratentorial)	December 2002
Participant 2	Left hemiplegy Lacunar lesions in posterior fossa Diffuse alteration in the periventricular subcortical white substance and in the semi-oval centers, associated with lacunar stroke areas in the right corona radiata, and lentiform nucleous, related to ischemic events.	January 2003
Participant 3	Right temporal-parietal hematoma Hemorrhagic cerebral vascular accident Left hemiparesy Cortic-subcortical irregular area localized in the insular, right basal ganglia and homolateral parietal areas. Volumetric reduction in the right cerebral pedunculus (Wallerian degeneration) Ischemic stroke in the right insulo-ganglionic, homolateral parietal, post-central gyrus, right corona radiata, and right semi-oval regions.	July 2002
Participant 4	Hemorrhagic lesion localized in the thalamus and right lentiform nucleous and in the supra and infra-tentorial ventricular system. Hemorrhagic vascular accident Cyst localized in the right occipital lobe and splenius of corpus callosum (related to neurocysticercosis)	November 2002
Participant 5	Left hemiparesy Hemorrhagic lesion in the corona radiata and right capsular nuclear region (acute ischemic stroke)	March 2003
Participant 6	Left hemiplegy and hemiparesy Ischemic cerebral vascular accident Acute capsular stroke in right hemisphere with expansive effect	October 2002

As we can observe, although all participants' lesions occurred in the last two years, the researcher could not control the variable *lesion location*, what might be the

responsible for future differences in their performance in the reading experiment. Despite this fact, all participants from the right hemisphere damaged group presented left hemiplegy, left hemiparesy, coordination problems, and were right handed.

3.2 – MATERIALS

3.2.1 – TEXTS AND READING ACTIVITIES

Following Molloy et al.'s (1990) studies, this research aims at examining in details the quality and the extent of right hemisphere damaged individuals' comprehension of six types of texts (Indirect Requests, Simple Inferences, Verbal Ironies, Jokes, Theory of Mind and Physical Stories[2]). The researcher selected 12 texts (Texts 1, 2, 4, 5, 7, 8, 10, and 11 adapted from Molloy et al. (1990)'s article, Texts 3, 6, 9 and 12 translated from Fletcher et al. (1995)'s article). There were 2 texts of each type mentioned previously. (See Appendix C and F for more details).

The main criterion in the selection of the texts used in this research study was related to the length and to the level of difficulty of the texts. Considering the fact that it would be fairly difficult to find English-speaking-right-hemisphere-damaged patients in Florianópolis, it was decided that the English stimuli would be translated in order to be provided in the patients' native language – in this case, Portuguese. Therefore, the researcher tried to select texts which were constituted by everyday language, based on general interests and information people usually come across, facilitating the generation of mental models and schemas. In this sense, in order to ease the participants'

[2] Although Theory of Mind and Physical Stories are not considered type of texts, in this research it is taken as so for practical terms.

comprehension process, the texts used in this research were quite short – due to memory constraints, texts ranged from 25 to 97 words, as it is showed in Table 5 below.

Table 5

Number of words of texts

Text	Number of Words
Text 1	31
Text 2	25
Text 3	70
Text 4	53
Text 5	65
Text 6	71
Text 7	49
Text 8	28
Text 9	91
Text 10	55
Text 11	55
Text 12	97

The purpose of the experiment followed studies carried out by Kaplan et al. (1990), Hough (1990), and Molloy (1990), who have also tested interpretation of discourse in adults with right hemisphere damage and non-damaged control individuals.

The texts were selected according to the task purposes. Thus, while Indirect Request and Verbal Irony tasks contemplate the ability to distinguish between literal

and figurative language, Joke and Simple Inference tasks aim at observing the capacity to modify mental models. And, finally, Theory of Mind and Physical Story tasks have the objective to analyze the ability to attribute mental states to others (Molloy, 1990, Hough, 1990, Happé, 1999).

In Indirect Request and Verbal Irony tasks, readers are required to make the distinction between literal and intended (figurative) meanings. As these tasks are ambiguous, readers will have to draw on the context to produce inferences and assumptions related to the appropriate meanings. Then, their comprehension is from context to words, which characterizes top-down processing. Molloy et al. (1990) define an indirect request as a "question that is meant as a request for action but that takes the form of an inquiry about a fact (e.g. 'Can you fix the typewriter?')" (p. 115). In other words, to really comprehend whether the 'correct' meaning is either the sentence meaning or the intended meaning, readers need context information. Consider, for instance, this question: 'Do you have change for a dollar?' in the following two contexts: 1) spoken by two boys competing for having the greater number of change possibilities; 2) spoken by a person to another on the street. In the first context, the intended meaning is related to the ability of thinking about mathematical combinations for "one dollar". In the second, however, the intended meaning is related to the need of getting change. The context, as we can observe, drives the reader to the correct comprehension in both cases. Considering the question "Do you have change for a dollar?", right hemisphere individuals would probably misunderstand the point of the speaker.

In accordance with Federmeier and Kutas (1999) and Kaplan et al. (1990), who state that right hemisphere damaged individuals present problems in understanding discourse related to non-literal language (intended meaning), these individuals would

possibly choose the literal language context and probably would give short answers, such as “Yes” or “No”. Therefore, it would be necessary for the speaker to produce a more literal utterance, such as “Change one dollar for me, please?” for successful comprehension.

In Jokes and Simple Inferences, readers perform bottom-up processes, because they are supposed to modify their mental models according to the context provided by the last information to, consequently, accommodate the new information. However, processes of understanding jokes are a little more complex than reading indirect requests or verbal ironies. When starting to read a joke, the reader has to create some preliminary assumptions about what is happening and what will occur at the end. The punch line (usually the last sentence) provokes surprise, because it disrupts these assumptions previously created. Then, consequently, the reader will have to revise her/his preliminary assumptions in order to keep a coherent mental representation of the event. According to Molloy et al. (1990),

> an ability to engage in such revision can quickly lead to confusion. Without repair and updating, the mutual knowledge shared by participants in a conversation (…) may rapidly diminish to the point where those involved are talking about very different topics and will misunderstand each other (p. 121).

As previously mentioned, since right hemisphere damaged individuals are impaired in revising their assumptions and integrating new to old information, they eventually choose non-related endings when reading jokes (Molloy et al., 1990, Gellatly & Zarate, 1999, Kaplan et al., 1990, Hough, 1990, Brookshire & Nicholas, 1984). Now

we should consider the cases of simple inferences. The following made up sentences could be good examples.

Example 3.2.1.1: John hurried to school after lunch.

Example 3.2.1.2: He realized he had left his wallet under his desk.

The first sentence may give us the idea that John was late for school. However, the second sentence modifies the initial meaning provided by the first statement. John, in fact, was not going to school, but he was going back to get something he had left there. Thus, after reading the final statement, the reader needs to revise and modify her/his mental representation of the event. This inference would be very unlikely in a right hemisphere individual's comprehension process.

Differently, in Theory of Mind and Physical Story texts, participants deal with stories which are related to mental states and physical behavior, respectively. Happé et al. (1996) pose that Theory of Mind is "the everyday ability to attribute mental states to ourselves and others in order to predict and explain behavior" (p. 197). In this sense, a Theory of Mind task provides the reader a connection between reading her/his own mind and also other people's minds, being able to predict and explain behavior according to their beliefs and desires (Happé & Frith, 1999, Fletcher et al., 1995). Thereby, taking into account that a Theory of Mind text requires inference generation beyond the information presented in the text, and that right hemisphere damaged individuals are impaired in understanding what people think, feel or even what the real purpose of their utterances is – i.e., in reading between the lines of a conversation –, successful comprehension would probably not be established.

Physical Stories, instead, require from the readers logical comprehension about the literal meaning of the story, without relating it to mental states of its characters –

what they feel or think (Fletcher et al., 1995). Thus, in a comparison between Theory of Mind and Physical Stories, it is possible to say that both require attention to the meaning of the sentences, and also integration of information from the text into a coherent narrative structure, or in a network of meaning associations. However, Physical Story texts do not invite readers to consider characters' mental states (Fletcher et al., 1995). Therefore, as they deal with literal language, right hemisphere damaged individuals have a great possibility to understand what is said in the Physical Story texts.

Consider the next two texts: STORY A and STORY B.

STORY A:

Two enemy powers have been at war for a very long time. Each Army has won several battles, but now the outcome could go either way. The forces are equally matched. However, the Blue Army is stronger than the Yellow Army in foot soldiers and the artillery. But the Yellow Army is stronger than the Blue Army in the air power. On the day of the final battle, which will decide the outcome of the war, there is a heavy fog over the mountains where the fighting is about to occur. Low-lying clouds hang above the soldiers. By the end of the day, the Blue Army has won. (Fletcher, 1995, p. 124)

STORY B:

During the war, the Red Army capture a member of the Blue Army. They want him to tell them where his Armies' tanks are. They know that they are either by the sea or in the mountains. They know that the prisoner will not want to tell them, he will want to save this army, and so he will certainly lie to them. The prisoner is very brave and very clever, he will not let them find his tanks. The tanks are really in the mountains.

Now when the other side asks him where his tanks are, he says: “They are in the mountains”. (Fletcher, 1995, p. 124).

The first story is a Physical Story, because it only presents to the reader a logical and chronological order of events that lead to an outcome: the victory of the war. The reader then is given the information that the Blue Army controls the “earth” and the Yellow Army controls the “sky”. As at the battle day the weather is foggy and cloudy, logically the Yellow Army could not win the war. Thus, the reader understands that the positive outcome could only belong to the Blue Army.

On the other hand, although the second story also deals with a chronological order of events, it – most importantly – presents to the reader attributions of a mental state to its main character: the member of the Blue Army. By reading the text, a normal reader may understand that the prisoner told the others the truth because he predicted they would think he was lying. This inference process would probably not be performed by a right hemisphere damaged individual, who certainly would not comprehend why the prisoner told the Red Army the tanks were really in the mountains.

Taking into account all points discussed so far, the major aspect to be investigated in this research is whether right hemisphere damage individuals are impaired in differentiating literal from figurative language (in Indirect Requests and Verbal Ironies), in revising information (in Jokes and Simple Inferences), and also in verifying their ability to attribute mental states (in Theory of Mind and Physical Stories) to others, lack of which might cause an inability to comprehend discourse coherently.

3.3 – PILOT STUDY

A Pilot Study was carried out in July 2003, two weeks before the researcher collected data. The three participants who were engaged in the pilot experiment were not brain damaged, age ranging from 25 to 30 years old. The Pilot Study was carried out in only two sessions of 60 minutes each. Its relevance was shown in the sense that it helped the researcher to reconsider several aspects, within the research procedures, such as:

1. **Timing**: time is a very important variable, once long reading tasks might make participants feel tired and not motivated enough to perform them. This fact may have influenced the data collected by the researcher. The pilot study confirmed the researcher's prediction that the collecting data session should be divided in four sessions of 30 minutes each. right hemisphere damaged participants could get deeply tired and consequently lose their motivation in reading the texts.
2. **Vocabulary Choice**: in order to provide texts that could be easily understood, the pilot study participants were asked to raise questions about the words used in the tasks. For example: following a pilot participant's suggestion, the researcher included an oral explanation for the word "sarcástico" in the tasks of Texts 4 and 10. This procedure probably avoided misinterpretations, facilitating meaning negotiation.

3.4 – DESIGN AND PROCEDURES

In order to answer the research questions ("How do participants perform the reading comprehension tasks in terms of number and quality of recalled propositions?" and "What sort of texts do they present more problems with?"), the researcher applied reading experiments using figurative language texts (Simple Inference, Indirect Request, Verbal Irony, and Joke), Physical Stories, and Theory of Mind texts, to two groups of participants — right hemisphere individuals (RHD group) and non-brain-damaged individuals (control group) — in an attempt to find out possible deficits regarding reading comprehension.

The research experiment was carried out in August 2003 in four sessions, which lasted 30 minutes each. For the right hemisphere damaged group, it was conducted at Associação de Reabilitação de Santa Catarina and the control group had their data collected at their own homes. The researcher herself conducted all experiment procedures and all participants received the same instructions before each reading activity began. Instructions (see Appendix A) were given to participants right before they performed each task.

The distribution of reading texts was done according to their length. Thus, as tasks using indirect request and verbal irony language took pilot participants more time for reading than jokes and simple inference texts, the researcher believed it would be more appropriate to separate reading texts according to their types. This choice could keep participants motivated to perform the reading tasks, so that they would not get bored or tired throughout the experiment. The same fact did not happen to theory of mind or physical story texts, because they are very similar in terms of number of words. Thus, the researcher decided to present them only in sessions 1 and 3. The distribution

of the reading texts used in the study of this research was done as it follows in Table 6 below.

Table 6

Task distribution

Session 1	Indirect Request (text 1)
	Simple Inference (text 2)
	Theory of Mind (text 3)
Session 2	Verbal Irony (text 4)
	Joke (text 5)
	Physical Story (text 6)
Session 3	Indirect Request (text 7)
	Simple Inference (text 8)
	Theory of Mind (text 9)
Session 4	Verbal Irony (text 10)
	Joke (text 11)
	Physical Story (text 12)

As we can observe above, in the first and in the third sessions, participants read Indirect Request, Simple Inference, and Theory of Mind texts. The second and the fourth sessions were concerned with Verbal Irony, Joke, and Physical Story reading texts, instead. The steps followed by the participants, including the text and the set of instructions given to each text while reading, are summarized in Table 7 below.

Table 7

Task procedures

TEXT	Indirect Request
	Simple Inference
	Verbal Irony
	Joke
	Theory of Mind
	Physical Story
INSTRUCTIONS	Read the text aloud, sentence by sentence
	Recall propositions from the text (Task 1)
	Answer True/False Test (Task 2)
	Answer a question (Task 3)

After being placed in a quiet room, each participant, in each session, was informed they would read aloud three short texts and perform three tasks on each text: the first one being to recall as many propositions from the texts as they could; the second task being to read aloud a set of sentences about the text and address them true or false values; and the last one being to answer a question about the text they would read. In this last task, the researcher let participants take their time to freely answer the question. As the instruction was fairly long, the researcher repeated it whenever the participant showed misunderstanding. (See Appendix A for the instructions used by the researcher).

The researcher started collecting data by listening to the propositions recalled by the participants. For this task, a report file was built to compare all propositions present in the text to the ones recalled by the participants. Therefore, as soon as participants

recalled the propositions, the researcher checked their presence in the recalling report. (See Appendix B for more details about the report file).

All reading texts and tasks were presented in a three-sheet report file: each page contained a text, followed by a true/false task and a comprehension task. (See Appendix C for more details). To conclude, all procedures carried out throughout this study were appropriately audio recorded for later transcription, as a tool for helping solve doubts during data analysis.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 – PRELIMINAIRES – PURPOSE, PARTICIPANTS, AND TASKS

The purpose of this study was to analyze right hemisphere damaged individuals' performance in reading comprehension, investigating whether right hemisphere damaged individuals are impaired from differentiating literal from figurative language, in revising information, and also in verifying their ability to attribute mental states to others.

Two groups participated in the study: GROUP A, composed by six right hemisphere damaged patients from Associação de Reabilitação de Santa Catarina and GROUP B, composed by six control participants from Florianópolis. They read 12 texts, among them Indirect Request, Simple Inference, Theory of Mind, Verbal Irony, Joke, and Physical Story texts. Immediately after reading each text, the participants' comprehension was assessed by means of three tasks: the first one was a **Recall Task**, in which they were supposed to recall as many propositions from the text as possible. The second task was a **True/False Test**, in which they had to evaluate statements as true or false, according to their interpretation of the text. And, finally, the third task was a **Comprehension Task**, in which they were asked to answer a question about each text they read.

4.1.1 – STATISTICAL FRAMEWORK

According to Vieira and Hoffman (1989), in order to plan an experiment, it is crucial to define the experimental unit and what will be measured or observed (variables) on this unit. Then, after that, the researcher needs to establish the treatments that will be compared. The present research was planned as follows:

a) Experimental unit: two groups of participants: GROUP A, composed by six RHD participants and GROUP B, composed by six non-brain damaged participants.
b) Variable being analyzed: reading comprehension measured by the difference between successful performances of both groups.
c) Treatments: figurative (Indirect Request, Verbal Irony, Joke, Simple Inference, Theory of Mind) and literal texts (Physical Story).

Vieira and Hoffman say that in order to test the hypothesis that individuals who have suffered right hemisphere damage present impairment to understand and interpret figurative narratives, and to connect discourse coherently (Hough, 1990), we have to suppose that the average of successful comprehension of both samples of participants — in the case of this research, groups A and B — is equivalent.

This research presents treatments of permanent effects, due to the fact that the researcher herself specified the sorts of texts participants would work with in order to compare their reading performance. The present study is also considered an experimental research because the researcher controls the whole process that is applied to the participants. The target population of this research is right hemisphere damaged

people in general, but the population that participated in this research was from the Associação de Reabilitação de Santa Catarina. The outcomes will, therefore, be exclusively related to this sample of participants.

This chapter presents two sorts of analysis: a statistical analysis and a data description analysis. The second one seeks to organize, summarize, and present data for later interpretation, observing important aspects and designing hypotheses which are able to explain the results. According to Barbetta (1998),

> this kind of analysis, called exploratory data analysis, is an attempt to capture the essence of the information present in the data, through a proper description using tables and graphics. It is a search for a pattern which can guide us in later analysis (researcher's translation - pp. 12 -13)[3].

However, in order to consider the difference between the two groups not merely casual, resulting from the sample characteristics, it is necessary to analyze the results from a probability models' perspective – called statistical analysis, which gives us some way to measure the uncertainty and consequently provide us with a greater certainty – through the test of significance (analysis of variance).

[3] "Este tipo de análise é chamada de análise exploratória de dados, que é uma tentativa de captar a essência das informações contidas nos dados, através da descrição adequada em tabelas e gráficos. É a busca de um padrão que possa nos orientar em análises posteriores." (BARBETTA, 1998, pp. 12 -13).

4.2 – RESULTS – a statistical analysis

The ANOVA (analysis of variance) and the Pearson's Chi Square analysis performed in the data collected (results) from the three reading tasks showed that, although not significantly, the lesion presence had an effect on reading comprehension, i.e., right hemisphere damaged participants tended to present more problems in understanding some texts which contained figurative language than the control participants. All the results were analyzed according to the schema theory's perspective of reading comprehension.

All tasks had the same value and were scored by the researcher on a scale from 0 to 1. Therefore, in the **Recall Task**, the propositions recalled by the participants were scored 1; in the **True/False Test** the correct answer was scored 1, and, finally, a satisfactory answer in the **Comprehension Task** was also attributed score 1 (See Appendix E for the participants' responses).

As presented on the next pages, three tables were built from the data colleted: Table 8 shows the scores on the **Recall Task**, Table 9 presents the scores given to the **True/False Test**, and Table 10 displays the results gathered in the **Comprehension Task**. In order to make them clear, the results are shown in proportions rather than raw scores (for the raw scores see Appendix D and E).

Table 8

General participants' scores in the Recall Task

Participants	Recall Task											
	Text 1	Text 2	Text 3	Text 4	Text 5	Text 6	Text 7	Text 8	Text 9	Text 10	Text 11	Text 12
RHD												
Participant 1	0.75000	0.66667	1.00000	0.83333	0.40000	0.80000	0.80000	0.66667	0.66667	0.85714	1.00000	1.00000
Participant 2	0.75000	0.66667	0.80000	0.66667	0.80000	0.60000	0.60000	0.66667	0.66667	0.57143	0.60000	0.80000
Participant 3	1.00000	0.66667	0.80000	1.00000	1.00000	0.80000	0.60000	0.66667	0.50000	0.85714	1.00000	0.80000
Participant 4	1.00000	1.00000	1.00000	0.83333	1.00000	0.80000	0.80000	0.66667	0.83333	0.71429	0.80000	0.80000
Participant 5	0.75000	1.00000	0.80000	0.66667	1.00000	0.80000	1.00000	1.00000	1.00000	1.00000	1.00000	0.60000
Participant 6	0.75000	0.66667	0.20000	0.50000	0.00000	0.00000	0.80000	0.33333	0.33333	1.00000	0.80000	0.40000
Average	0.83333	0.77778	0.76667	0.75000	0.70000	0.63333	0.76667	0.66667	0.66667	0.83333	0.86667	0.73333
Stand. Error	0.129099	0.172131	0.294392	0.1748	0.414729	0.320416	0.150555	0.21082	0.235703	0.167005	0.163299	0.206559
Control												
Participant 7	1.00000	1.00000	1.00000	1.00000	0.80000	0.80000	0.80000	1.00000	0.66667	0.71429	0.80000	1.00000
Participant 8	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	0.71429	1.00000	1.00000
Participant 9	0.75000	1.00000	1.00000	0.83333	1.00000	0.60000	0.80000	1.00000	0.66667	1.00000	1.00000	0.40000
Participant 10	1.00000	1.00000	1.00000	0.83333	0.80000	0.80000	1.00000	1.00000	1.00000	0.71429	0.80000	1.00000
Participant 11	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Participant 12	1.00000	1.00000	1.00000	0.83333	0.40000	0.80000	0.80000	1.00000	0.83333	0.71429	1.00000	1.00000
Average	0.95833	1.00000	1.00000	0.91667	0.83333	0.83333	0.90000	1.00000	0.86111	0.80952	0.93333	0.90000
Stand. Error	0.102062	0	0	0.091289	0.233809	0.150555	0.109545	0	0.163864	0.14754	0.10328	0.244949

Table 9

General participants' score in the True/False Test

Participants	True/False Test											
	Text 1	Text 2	Text 3	Text 4	Text 5	Text 6	Text 7	Text 8	Text 9	Text 10	Text 11	Text 12
RHD												
Participant 1	0.66667	0.50000	0.75000	0.66667	0.00000	0.50000	0.33333	0.33333	0.25000	0.33333	0.50000	0.75000
Participant 2	0.50000	0.50000	0.50000	0.66667	0.25000	1.00000	0.50000	0.00000	0.50000	0.16667	0.75000	0.75000
Participant 3	0.50000	0.50000	0.75000	0.66667	1.00000	1.00000	0.66667	0.33333	0.50000	0.50000	1.00000	1.00000
Participant 4	0.66667	0.50000	1.00000	1.00000	0.75000	1.00000	0.50000	0.33333	1.00000	1.00000	0.75000	1.00000
Participant 5	0.66667	1.00000	0.75000	0.66667	0.25000	1.00000	0.66667	0.66667	0.75000	0.66667	0.50000	0.75000
Participant 6	0.33333	0.50000	0.75000	1.00000	0.25000	0.50000	0.50000	0.33333	0.75000	0.83333	1.00000	0.75000
Average	0.55556	0.58333	0.75000	0.77778	0.41667	0.83333	0.52778	0.33333	0.62500	0.58333	0.75000	0.83333
Stand. Error	0.136085	0.204124	0.158114	0.172131	0.376386	0.258199	0.125465	0.21082	0.262202	0.311804	0.223607	0.129099
Control												
Participant 7	0.83333	0.50000	0.75000	1.00000	0.25000	1.00000	0.66667	0.33333	1.00000	1.00000	1.00000	1.00000
Participant 8	1.00000	1.00000	1.00000	1.00000	0.50000	1.00000	0.50000	0.66667	1.00000	1.00000	1.00000	1.00000
Participant 9	0.66667	1.00000	1.00000	0.66667	0.50000	1.00000	0.66667	0.66667	0.50000	0.83333	1.00000	1.00000
Participant 10	1.00000	1.00000	0.75000	0.83333	1.00000	1.00000	0.50000	1.00000	0.50000	0.83333	1.00000	1.00000
Participant 11	0.66667	0.50000	0.75000	0.83333	0.50000	1.00000	0.50000	0.33333	1.00000	0.83333	1.00000	1.00000
Participant 12	0.66667	1.00000	0.75000	1.00000	1.00000	1.00000	0.50000	1.00000	0.50000	1.00000	1.00000	1.00000
Average	0.80556	0.83333	0.83333	0.88889	0.62500	1.00000	0.55556	0.66667	0.75000	0.91667	1.00000	1.00000
Stand. Error	0.163864	0.258199	0.129099	0.136082	0.306186	0	0.086068	0.298144	0.273861	0.091289	0	0

Table 10

General participants' scores in the Comprehension Task

Participants	Comprehension Task											
	Text 1	Text 2	Text 3	Text 4	Text 5	Text 6	Text 7	Text 8	Text 9	Text 10	Text 11	Text 12
RHD												
Participant 1	0	0	0	1	1	0	0	0	0	0	1	1
Participant 2	0	0	0	1	0	1	0	0	0	1	1	0
Participant 3	0	0	1	1	1	1	0	0	0	0	1	1
Participant 4	1	0	1	1	1	1	0	0	1	1	0	1
Participant 5	1	0	1	1	1	1	0	1	1	0	1	1
Participant 6	0	1	0	1	1	0	0	0	0	0	1	1
Average	0.33	0.17	0.50	1.00	0.83	0.67	0.00	0.17	0.33	0.33	0.83	0.83
Stand. Error	0.516398	0.408248	0.547723	0	0.408248	0.516398	0	0.408248	0.516398	0.516398	0.408248	0.408248
Control												
Participant 7	1	1	1	1	1	1	1	0	1	1	1	1
Participant 8	1	1	1	1	0	1	0	1	1	1	1	1
Participant 9	1	1	0	1	1	1	1	1	0	0	1	1
Participant 10	1	1	1	1	1	1	1	1	0	1	1	1
Participant 11	0	0	1	1	0	0	1	0	0	1	1	1
Participant 12	1	1	0	1	1	1	1	1	1	1	1	1
Average	0.83	0.83	0.67	1.00	0.67	0.83	0.83	0.67	0.50	0.83	1.00	1.00
Stand. Error	0.408248	0.408248	0.516398	0	0.516398	0.408248	0.408248	0.516398	0.547723	0.408248	0	0

Two split-plot ANOVA tests were performed on Tables 8 and 9, and 12 Pearson's Chi Square analysis were applied to Table 10, with the assistance of Professor Karen Waldie, a PhD. from the Psychology Department at Auckland University, using SPSS software.

In order to affirm that results are significant, we have to analyze its statistical significance, which is the condition to reject or accept Ho (the null hypothesis). Thus, when $p<0.05$ (level of significance) the pre-requirement is to reject the null hypothesis. There are three null hypotheses in this research:

1. The first null hypothesis is related to the lesion factor. It states that the sum of both groups' performance is equivalent:

Ho > μRHD = μCONTROL

2. The second null hypothesis is concerned with the text factor. It expresses that the sum of both group's performances in all texts is the same:

Ho ? μTEXTO1 = μTEXTO2 = μTEXTO3 = ... = μTEXTO12

3. The third null hypothesis is regarding to the interaction between lesion and text factors. It declares that there is no interaction between these factors:

Ho? no interaction

As this research deals with two independent variables – (1) Group, with two conditions (lesion, no lesion) and (2) Text Type, with six conditions (indirect request, simple inference, theory of mind, verbal irony, joke and physical story) – the researcher combined the data collected taking the average percent scores for each type of text. The participants read 12 texts, but there were only six "text type" experimental conditions, in fact. Thus, Text 1 represents the average for texts 1 and 7 (Indirect Request), Text 2 for texts 2 and 8 (Simple inference), Text 3 for texts 3 and 9 (Theory of Mind), Text 4 for

texts 4 and 10 (Verbal irony), Text 5 for texts 5 and 11 (Joke), and, finally, Text 6 for texts 6 and 12 (Physical Story). The following tables and figures show the ANOVA results for the reading tasks performed by the two groups:

4.2.1 – Recall Task

Table 11

Descriptive analysis for means and standard deviation for each text combination

Text	Group	Mean	Standard deviation	N
1	Lesion	80.0000	8.06226	6
	not lesion	92.9167	9.00231	6
	total	86.4583	10.57755	12
2	Lesion	72.2234	17.21254	6
	not lesion	100.0000	.00000	6
	total	86.1117	18.57656	12
3	Lesion	71.6667	22.97352	6
	not lesion	100.0000	.00000	6
	total	85.8334	21.42053	12
4	Lesion	79.1664	10.50697	6
	not lesion	86.3096	8.67492	6
	total	82.7380	9.91476	12
5	lesion	78.3333	23.16607	6
	not lesion	88.3333	13.29160	6
	total	83.3333	18.74874	12
6	lesion	68.3333	24.83277	6
	not lesion	86.6667	18.61899	6
	total	77.5000	23.01185	12

Table 12

Split-plot Anova Test applied to Table 8 (Recall Task): Tests of Between-Subject and Within-Subject Effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig
Intercept		503957.299	1	503957.299	680.298	.000
GROUP		5460.439	1	5460.439	**7.371**	**.022**
Error		7407.894	10	740.789		
TEXT	Sphericity Assumed	689.610	5	137.922	1.021	.415
	Greenhouse-Geisser	689.610	2.985	231.014	1.021	.397
	Huynh-Feldt	689.610	4.821	143.030	1.021	.414
	Lower-bound	689.610	1.000	689.610	1.021	.336
TEXT * GROUP	Sphericity Assumed	1224.425	5	244.885	1.813	.127
	Greenhouse-Geisser	1224.425	2.985	410.173	1.813	.166
	Huynh-Feldt	1224.425	4.821	253.954	1.813	.130
	Lower-bound	1224.425	1.000	1224.425	1.813	.208
Error (TEXT)	Sphericity Assumed	6754.172	50	135.083		
	Greenhouse-Geisser	6754.172	29.851	226.259		
	Huynh-Feldt	6754.172	48.214	140.086		
	Lower-bound	6754.172	10.000	675.417		

Table 11 presents the means and standard deviation for each text combination related to group (lesion, no lesion) by text type (indirect request, simple inference, theory of mind, verbal irony, joke, physical story) split-plot ANOVA, with recall as the

dependent variable. Then, Table 12, as the result of the test, shows us that there is only one significant main effect ($p<.05$), which is the group (lesion, no lesion) effect [$F(1, 10) = 7.37$, $p = .022$]. Table 13 below displays the means and standard deviations for the two conditions and Figure 2 illustrates this effect.

It is also possible to observe that there is no main effect of text type or a group by text interaction (the p value was greater than 0.05). For illustrative purposes, Table 14 and 15 present the means and standard deviations for the (non-significant) text type effect and the group by text interaction. Figures 3 and 4 also demonstrate the two groups' performances in relation to the texts read. Therefore, overall, it was concluded that the control participants recalled significantly more information (across every type of text) than the right hemisphere damaged subjects.

Nevertheless, the three null hypotheses posed on this research can be evaluated as following: the first hypothesis, concerned with the dichotomy LESION PRESENCE x NOT LESION PRESENCE in both groups of participants, asserts that the performance of RHD participants is the same as the control's performance. This assumption implies that the lesion factor does not perform any significance to the data results.

As shown in Table 11 and 12 above, the ANOVA test showed us that the first null hypothesis Ho was rejected. Since the Group main effect was significant, treatment (lesion presence) then, had a statistically significant effect on recalling. This means that the *lesion* factor did determinate a significant difference in recalling the textual propositions.

However, the second and the third null hypotheses, related to the sorts of texts used in this research, were accepted. They state that the performance of both groups was the same in all texts read and that there was no interaction between the two variables in

terms of performance. As we can observe, the Text Type main effect and the Group by Text Type effect were not significant. That means that as there was no significant interaction between Group and Text Type, the right hemisphere damaged subjects did not differ significantly from the Control subjects with regard to the type of text they read.. In conclusion, in the recalling proposition task, there were main effects of Group, but no Text Type or interaction main effect.

Table 13

Means and standard deviations for the Group dependent variable

			95% Confidence Interval	
Group	Mean	Std. Error	Lower Bound	Upper Bound
lesion	74.954	4.536	64.847	85.061
no lesion	92.371	4.536	82.264	102.478

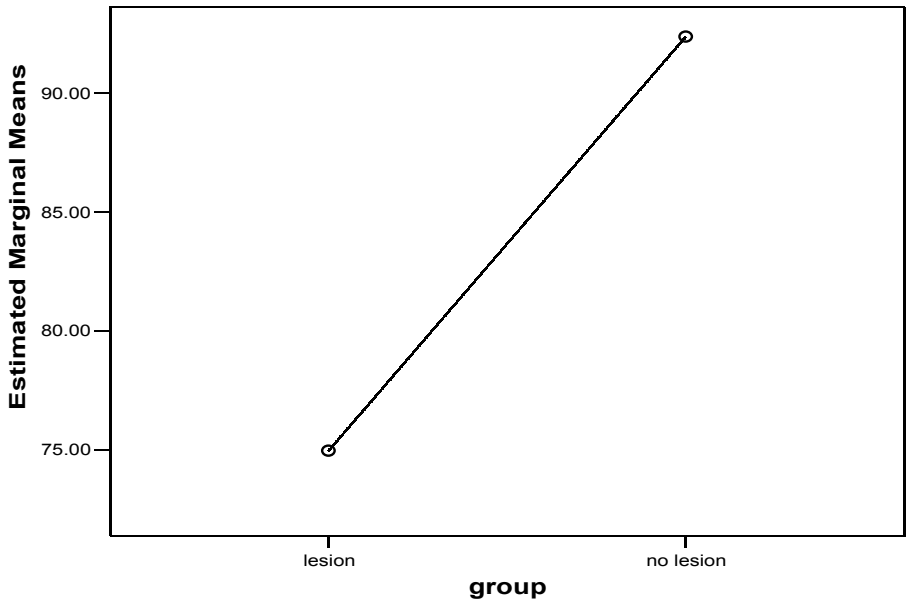

Figure 2: Significant Group (lesion, no lesion) main effect

Table 14

Means and standard deviations for the Text dependent variable

			95% Confidence Interval	
TEXT	Mean	Std. Error	Lower Bound	Upper Bound
1	86.458	2.467	80.962	91.955
2	86.112	3.513	78.283	93.940
3	85.833	4.689	75.385	96.282
4	82.738	2.781	76.541	88.935
5	83.333	5.452	71.186	95.481
6	77.500	6.336	63.384	91.616

Table 15

Means and standard deviations for the Group and Text Type interaction

				95% Confidence Interval	
Group	TEXT	Mean	Std. Error	Lower Bound	Upper Bound
Lesion	1	80.000	3.489	72.227	87.773
	2	72.223	4.969	61.152	83.295
	3	71.667	6.632	56.890	86.444
	4	79.166	3.933	70.402	87.930
	5	78.333	7.710	61.154	95.512
	6	68.333	8.960	48.370	88.297
no lesion	1	92.917	3.489	85.144	100.690
	2	100.000	4.969	88.929	111.071
	3	100.000	6.632	85.223	114.777
	4	86.310	3.933	77.546	95.074
	5	88.333	7.710	71.154	105.512
	6	86.667	8.960	66.703	106.630

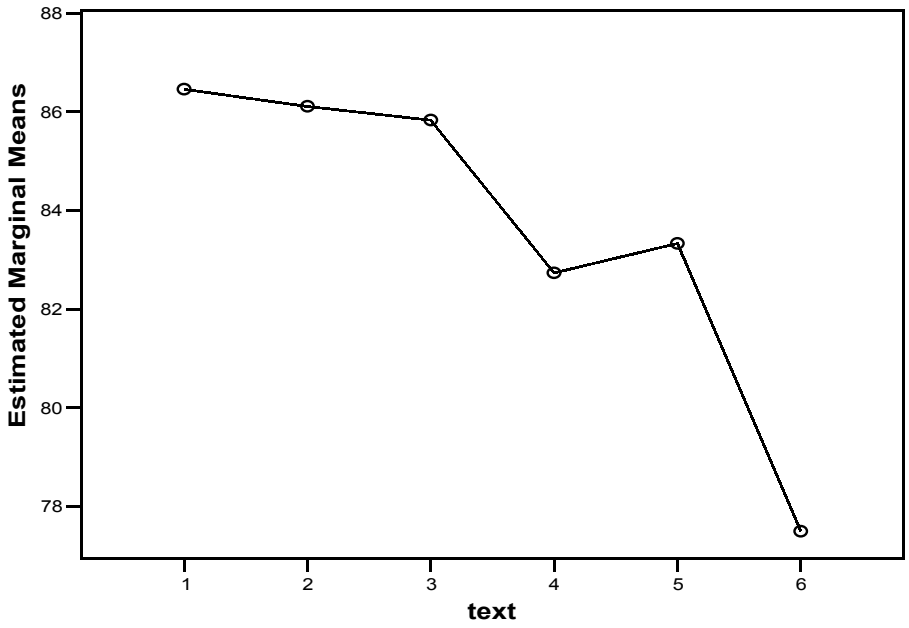

Figure 3: Not significant Type of text (indirect request, simple inference, theory of mind, verbal irony, joke, physical story) main effect

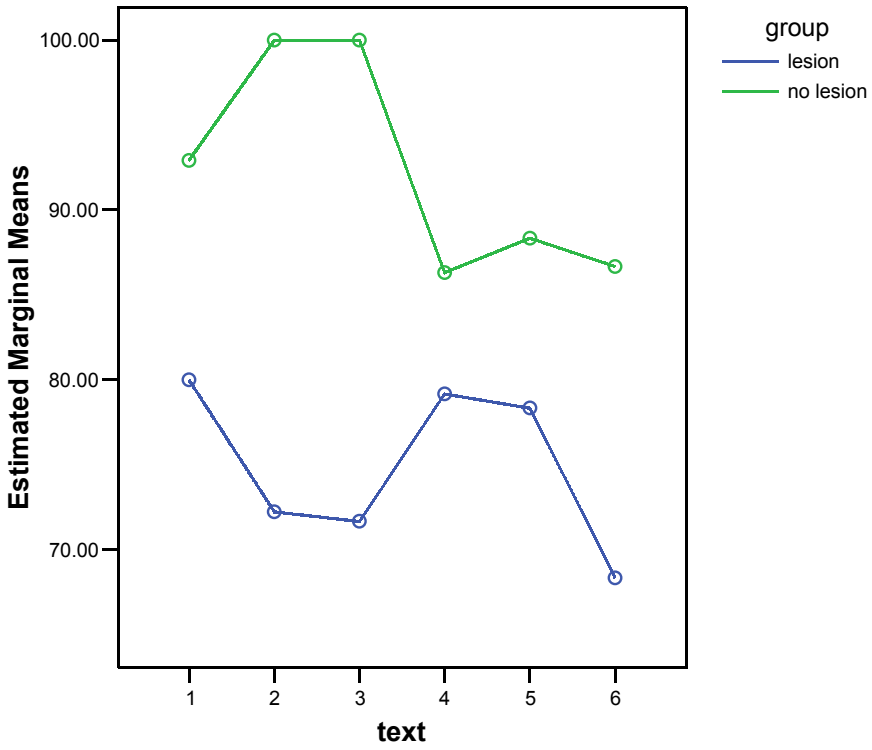

Figure 4: Not significant Group by Text Type interaction effect

4.2.2. – True/False Test

Table 16

Split-plot Anova Test applied to Table 9 (True/False Text): Tests of Between-Subject and Within-Subject Effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig
Intercept		380385.802	1	380385.802	663.834	.000
GROUP		6644.483	1	6644.483	**11.596**	.007
Error		5730.131	10	573.013		
TEXT	Sphericity Assumed	8361.304	5	1672.261	**6.413**	.000
	Greenhouse-Geisser	8361.304	2.945	2839.056	6.413	.002
	Huynh-Feldt	8361.304	4.726	1769.227	6.413	.000
	Lower-bound	8361.304	1.000	8361.304	6.413	.030
TEXT * GROUP	Sphericity Assumed	702.160	5	140.432	**.539**	.746
	Greenhouse-Geisser	702.160	2.945	238.416	.539	.656
	Huynh-Feldt	702.160	4.726	148.575	.539	.737
	Lower-bound	702.160	1.000	702.160	.539	.480
Error (TEXT)	Sphericity Assumed	13037.230	50	260.745		
	Greenhouse-Geisser	13037.230	29.451	442.675		
	Huynh-Feldt	13037.230	47.260	275.864		
	Lower-bound	13037.230	10.000	1303.723		

As shown above on Table 16, the analysis revealed a significant main effect of Group [$F(1,10) = 11.60$, $p = .007$] and a significant main effect of Text Type [$F(5,50) =$

6.4, p<.001]. The Group by Text Type interaction was not significant. Therefore, it is possible to verify that the Lesion group (M = 63.08% ± 3.99) performed significantly more poorly than the Control group (M = 82.29% ± 3.99) in the True/False Test. Figure 5 illustrates this finding:

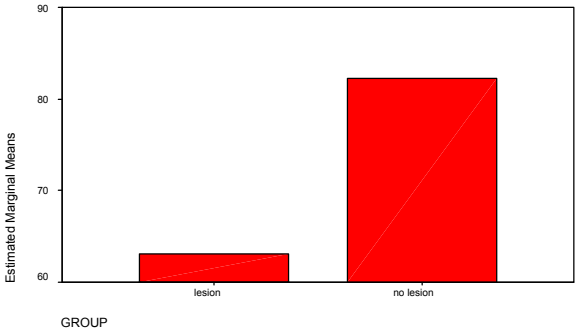

Figure 5: Lesion and No lesion Groups' performance in Task 2

Post-Hoc tests with a Bonferroni adjustment were not performed on this significant Group effect because it only has two levels (i.e., two conditions – lesion, no lesion). However, post-hoc findings from the significant Text Type main effect should be reported because it has six levels (i.e., six types of texts). Tables 17 and Figure 6 show the mean values of each Text Type condition in numbers and error bars; in turn, Table 18 present the post-hoc test for the Text Type main effect.

Table 17

Mean values of each Text Type

			95% Confidence Interval	
TEXT	Mean	Std. Error	Lower Bound	Upper Bound
1	61.11	2.445	55.662	66.560
2	60.417	6.783	45.304	75.530
3	73.958	4.952	62.925	84.992
4	79.167	5.252	67.464	90.869
5	69.792	6.336	55.674	83.910
6	91.667	3.486	83.899	99.434

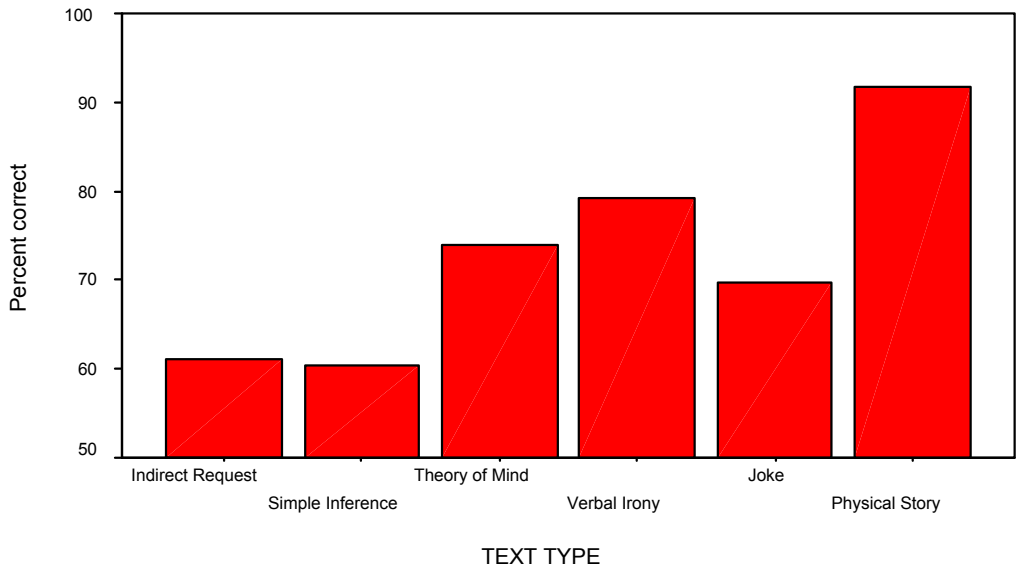

Figure 6: Groups' performances in Task 2

Table 18

Post-Hoc test for the Text Type main effect

(I) TEXT	(J) TEXT	Mean Difference (I-J)	Std. Error	Sig. [a.]	95% Confidence Lower Bound	95% Confidence Upper Bound
1	2	.694	6.402	1.000	-23.810	25.199
	3	-12.847	4.824	.356	-31.309	5.615
	4	-18.056	5.727	.154	-39.973	3.862
	5	-8.681	6.855	1.000	-34.918	17.557
	6	-30.556*	3.074	.000	-42.322	-18.789
2	1	-.694	6.402	1.000	-25.199	23.810
	3	-13.542	9.045	1.000	-48.160	21.077
	4	-18.750	8.269	.702	-50.400	12.900
	5	-9.375	8.398	1.000	-41.518	22.768
	6	-31.250*	7.512	.029	-59.999	-2.501
3	1	12.847	4.824	.356	-5.615	31.309
	2	13.542	9.045	1.000	-21.077	48.160
	4	-5.208	3.769	1.000	-19.632	9.215
	5	4.167	8.042	1.000	-26.612	34.945
	6	-17.708	5.124	.092	-37.321	1.904
4	1	18.056	5.727	.154	-3.862	39.973
	2	18.750	8.269	.702	-12.900	50.400
	3	5.208	3.769	1.000	-9.215	19.632
	5	9.375	7.118	1.000	-17.867	36.617
	6	-12.500	6.117	1.000	-35.913	10.913
5	1	8.681	6.855	1.000	-17.557	34.918
	2	9.375	8.398	1.000	-22.768	41.518
	3	-4.167	8.042	1.000	-34.945	26.612
	4	-9.375	7.118	1.000	-36.617	17.867
	6	-21.875*	5.291	.030	-42.125	-1.625
6	1	30.556*	3.074	.000	18.789	42.322
	2	31.250*	7.512	.029	2.501	59.999
	3	17.708	5.124	.092	-1.904	37.321
	4	12.500	6.117	1.000	-10.913	35.913
	5	21.875*	5.291	.030	1.625	42.125

Based on estimated marginal means

* The mean difference is significant at the .05 level.

[a.] Adjustment for multiple comparisons: Bonferroni

From Table 18 we can verify that there are 3 significant "pairwise" effects: All subjects performed significantly better with the Physical Story texts than with the

Indirect Request texts (p < .001), the Simple Inference texts (p = 029), and the Joke texts (p = .03). Figure 7 illustrates this finding:

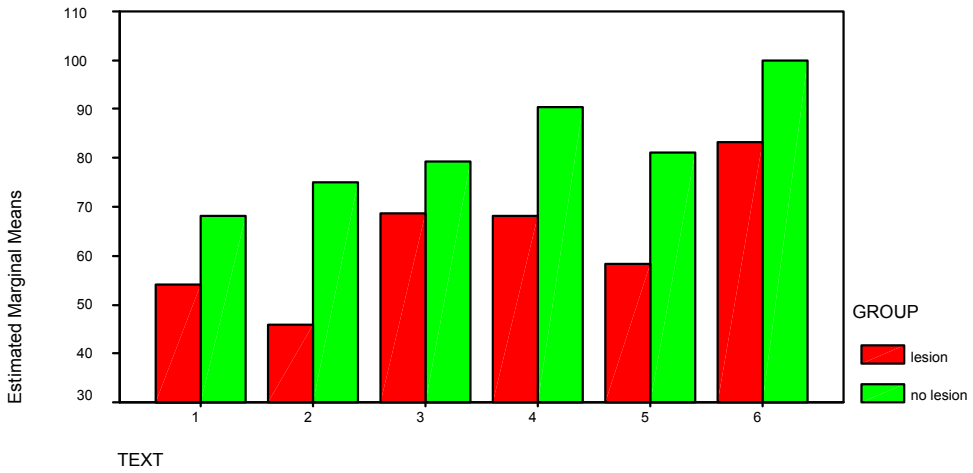

Figure 7: Description of groups' performances in Task 2

Consequently, as shown in Table 16, 17, and 18 above, and according to the ANOVA and Bonferroni tests, the researcher concluded that the first hypothesis, concerned with the dichotomy LESION PRESENCE x NOT LESION PRESENCE in both groups of participants, was rejected. Since the Group main effect was significant, the lesion presence had a statistically significant effect on comprehension. This means that the *lesion* factor did determinate a significant difference in reading and comprehension performance of the participants.

The second null hypothesis, related to the sorts of texts used in this research, was also rejected. Simply as a reminder, Ho states that the performance of both groups was the same in all texts read and that no type of text had a significant difference in terms of performance. As we can observe, the Text Type main effect was significant, once the tests revealed a significant difference in the texts read, in which all participants obtained more successful results in Physical Stories than in Indirect Request, Simple Inference or Joke texts.

As opposed to the first and the second null hypotheses, the tests indicated that the third null hypothesis was accepted. There was no significant interaction between Group and Text Type — that means, the right hemisphere damaged subjects did not differ significantly from the Control subjects with regard to the type of text they read. In conclusion, there were main effects of Group and Text Type but no interaction.

4.2.3 – Comprehension Question Task

The 12 Chi Square analysis (categorical yes/no) performed on the data of Table 10 (comprehension dependent variable) — one for each of the texts — found two significant differences between the groups: Indirect request: $\chi 2(1) = 8.6$, $p = .003$ and Simple inference: $\chi 2(1) = 5.3$, $p = .021$. No other comparison was significant.

This means a significant difference in text reading performed by the participants in terms of reading comprehension, because out of all 12 of the texts, two of the texts were significantly different between the groups (Indirect Request, Simple Inference = 16.7%). In other words, control participants were significantly more likely than right hemisphere damaged participants to give the correct answer to one simple inference passage and to one indirect request passage. Actually, the researcher predicted that right hemisphere damaged participants would have different levels of understanding, according to the literal and figurative language factor.

Therefore, although not statistically significant, due to the fact that there was no Group by Text Type interaction in the Recall Task or in the True/False Test, and that only 2 texts out of 12 showed differences on the Comprehension Question Task, it is possible to say that there was a trend for the right hemisphere damaged group to have

more difficulty in understanding texts which contained figurative language than the control participants.

This means that both groups' performances were not exclusively dependent on the texts they read. While the control group, in general terms, had a better reading performance, independently on the text, right hemisphere damaged participants, on the other hand, presented less success in their reading comprehension throughout most of the tasks, what suggests that their performance was not only related to the text, but also to their cognitive condition of having suffered a brain lesion.

Thus, according to the results yielded, there was no interaction between text and lesion factors. This research intended to examine trends in the data; so even though the tests did not show significant group differences according to the type of text they read, it was of interest to look in detail at the subtle differences that were revealed in the data.

To conclude, differently from experiment studies carried out by Kaplan et al. (1990), Hough (1990), and Molloy (1990), who have also tested interpretation of discourse in adults with right hemisphere damage and non-damaged control individuals and found significant interaction main effect on their reading performances, the researcher expected to find out group differences in the types of texts, which the analysis did not reveal.

4.3 – DISCUSSION – a descriptive analysis

The discussion section of this research intends to be a descriptive analysis on the right hemisphere damaged participants' performance on the reading comprehension tasks, including information gathered throughout the collection of data in all texts. It is

important to say that all participants, including the control group, reread the texts to keep the propositions in mind or to understand them more properly.

4.3.1 - Texts 1 and 7 – Indirect Request

Specifically related to Indirect Request texts, right hemisphere damaged participants had much difficulty in understanding the difference of literal meaning and intention when João asked Maria the question "Can you see the number of the house?" in both texts. In fact, João did so for two possible reasons: 1. to check if the number was visible at the wall (**Text 1**); 2. to be informed about the number of the house (**Text 7**). Most of participants comprehended that by saying "Yes, it's 259" (**Text 1**) or "Yes, I can see it very well" (**Text 7**), Maria answered João's question adequately. As in Example 4.3.1.1, most of them did not relate the question to the context of the situation: they simply relied on the "Yes" said by Maria and ignored the rest of information given by her, in the case of "It's 259" (**Text 1**) or overlooked the information which was missing, in the case of the number of the house (**Text 7**).

Example 4.3.1.1: "A resposta de Maria é verdadeira, porque dá pra ver o número". (**Text 1,** *Participant 1*)

In **Text 1**, for example, right hemisphere damaged participants did not seem to wonder why Maria gave extra information, if it would be completely normal for a couple to know the number of their own house. They should have perceived that "Yes, it's 259" is not related to what João really wanted to know.

The same happens in **Text 7**, when participants should have observed that some information was missing to fully satisfy João's indirect request: the number of Marcos' house.

Differently, *Participant 2*, in an attempt to organize ideas and understand what was happening in the text, added information from her elaborative inferencing. Example 4.3.1.2 shows us that, first, she doubted if Maria could really see Marcos' house's number:

Example 4.3.1.2: "Será que dava pra ver?" (**Text 7,** *Participant 2*)

In Example 4.3.1.3, the same participant emphasized the act of seeing the number as more relevant than observing if the answer given was adequate or not. Then, she added even more:

Example 4.3.1.3: "Ela diz que em alta velocidade ela não ia conseguir ver. Então ele abaixou." (**Text 7,** *Participant 2*)

Similarly, *Participant 4* also contributed with extra information creating elaborative inferences, as in Example 4.3.1.4:

Example 4.3.1.4: "Maria disse, sim, realmente esse é o número da casa de Marcos". (**Text 7,** *Participant 4*)

In fact, by knowing that *that* was really Marco's house, João's question would be satisfied. However, there is a gap in *Participant 4*'s interpretation, because it was

written in **Text 7** that neither João or Maria knew the correct address of Marco's house, which includes the house number as well.

Participant 6 also contributed with elaborative inferencing not allowed by the text to his interpretation of **Text 7**. This participant, particularly, activated in his situational model of the text an element present in the schema "party": drinks. Therefore, he concluded that João asked Maria to tell him the number of the house because he had already drunk too much at the party and was unable to see things around him while driving. However, even through this attempt to understand the text, *Participant 6* did not realize that the main information had not been provided by Maria when she answered João's question. Besides that, facts seem not to be properly organized in his mental model: how could João be drunk if he had not arrived at the party yet?

Participant 3, by his turn, tried to find out a possible reason for Maria saying that the house number was 259 in **Text 1**. See Example 4.3.1.5:

Example 4.3.1.5: "Ele [João] esqueceu." (**Text 1,** *Participant 3*)

Similarly, *Participant 3* did not suspect that Maria was providing the wrong information and yet overemphasized João's request. The researcher expected to find participants' literal interpretations more often when reading Indirect Request texts, as it happened to *Participant 3*, in the following examples:

Example 4.3.1.6: "João pediu só pra ver se dava pra olhar". (**Text 7,** *Participant 3*)

Example 4.3.1.7: “João perguntou à Maria porque o número da casa estava um pouco escondido ou era número miúdo”. (**Text 1,** *Participant 6*)

In the **True/False test**, we can observe that most of right hemisphere damaged participants comprehended propositions number 3 and 4 as having the same meaning: specifically because they were the ones which highlight the distinction between literal and intended meanings, respectively.

The next example presents how *Participant 5* processed his interpretation of the last proposition of the **True/False test** in **Text 1**:

Example 4.3.1.8: “Sim, porque ela responde com o número. Se ela sabe o número é porque ela consegue ver”. (**Text 1,** *Participant 5*)

Again, one more participant did not comprehend that the problem was in Maria’s answer and not in João’s question. Actually, *Participant 5* inferred that if Maria could see the number as she says, that means that she could see the number on the wall. But this inference does not make part of Maria’s answer, but just of *Participant 5*’s interpretation.

4.3.2 - Texts 2 and 8 – Simple Inference

As in Example 4.3.2.1, in **Text 2**, *Participant 1* presented an inability to revise his mental model:

Example 4.3.2.1: “Ela sempre chegava atrasada”. (**Text 2,** *Participant 1*)

This means that the last proposition, which represented the new information of the text, that should modify the mental model of the textual interpretation, was not incorporated or integrated to the old textual information in **Text 2**. Therefore, *Participant 1* did not produce any inference related to the last proposition. This might be the reason why *Participant 1* did not comprehend the last sentence of the **True/False test**: as if it were lost in the text; obviously, it did not have any association in *Participant 1*'s interpretation with other facts from **Text 2**.

The same happens in **Text 8**, in which *Participant 1* comprehended that Pedro was going to school to take the test. This suggests that again his mental model was not modified or corrected by the new fact presented in the last proposition of the text.

Participant 2 had a very similar comprehension process in **Text 8**. Example 4.3.2.2 displays how she got confused after reading the last proposition:

Example 4.3.2.2: "Como que ele foi pra escola se ele tinha esquecido da prova?" (**Text 8,** *Participant 2*)

This question shows us that she did not understand Pedro had forgotten his test *under the desk*. As she did not process the last proposition, not modifying her mental model, this information got lost in the text and, as a consequence, gave her the impression of disorder.

Participant 3 behaved in the same way in **Text 2**, what shows a failure in the comprehension of the last proposition. Moreover, he also got confused in reading **Text 8**. Read the following example:

Example 4.3.2.3: “Se ela chegou correndo é porque tava atrasada mesmo” (**Text 2,** *Participant 3*)

“Pedro foi pegar qualquer coisa lá na escola.” (**Text 8,** *Participant 3*)

Throughout the entire collecting data, this “thing” [coisa] he mentions when reading **Text 8** was never related to the test under the desk.

Participant 4 agreed with *Participant 3* in his interpretation about **Text 2**, as it becomes clear below:

Example 4.3.2.4: “Se ela entrou correndo no consultório, é porque ela chegou atrasada. É tão verdadeiro que ela chegou a se esquecer da bolsa dela”. (**Text 2,** *Participant 4*)

At this point, *Participant 4* still remembered about the “bag”, but quickly incorporated it to the previous information: the character of the story was such in a hurry that she had left her bag on the table. This is an evidence of another situation of non-processing of the last proposition of the text; in other words, another example of a non-corrected mental model and failure in revising information.

As we can observe in the examples below, in **Text 8**, *Participant 4* has similarly stated his misunderstanding of the text, processing that “something” was under the table; but this “it” was not – in any moment – related to the text:

Example 4.3.2.5: “Quando ele chegou no local é que ele se lembrou que tinha esquecido da cola, não sei, não deu pra entender direito, debaixo da carteira”. (**Text 8,** *Participant 4*)

Example 4.3.2.6: “Se ele saiu correndo, é porque estava atrasado (...) ele tinha se esquecido que naquele dia ele tinha que fazer uma prova”. (**Text 8,** *Participant 4*)

Example 4.3.2.7: “ Se ela entrou correndo é porque ela tava atrasada” (**Text 2,** *Participant 5*)

Differently, *Participant 6* in **Text 2** relied on non-related information in an attempt help him understand the text. See the example below:

Example 4.3.2.8: “Será que ela tá com problema de dente?” (**Text 2,** *Participant 6*)

4.3.3 - Texts 3 and 9 – Theory of Mind

Participant 1 added information to **Text 3**:

Example 4.3.3.1: “Ele fugiu para não ser identificado”. (**Text 3,** *Participant 1*)

As we can see in the example above, by adding information to **Text 3** , *Participant* 1 produced a type of inference which may have happened in order to compensate for an unsatisfactory comprehension of the text. In this sense, right hemisphere damaged participants may have added elaborative inferences that possibly could have happened in the story. Most of the times these inferences are events which belong to the referred schema – in this case of a “thief”. We could ask ourselves: “what does a thief normally do after a robbery?” Obviously, *Participant 1*’s interpretation fits

our expectation: the thief usually runs away, trying to escape not to be identified or arrested.

In **Text 9**, this same participant found himself in a contradiction, as it is shown in the statement that follows:

Example 4.3.3.2: “Ele disse que os tanques estavam escondidos e ele não podia revelar o segredo porque era um segredo de guerra (...) Ele não disse a verdade porque ele não podia entregar os outros, né?”. (**Text 9,** *Participant 1*)

This participant was not able to attribute mental states to others, as previously discussed in the review of literature. It was more natural and coherent for the participant to believe that the prisoner did not say the truth, ignoring the information present in the text that he really did not lie to the Red Army. In an attempt to compensate for this lack of comprehension, *Participant 1* added the following information:

Example 4.3.3.3: “Ele falou a verdade para as tropas irem para o lado dele”. (**Text 9,** *Participant 1*)

As we have seen before, people who have suffered a right hemisphere damage tend to create incoherent mental models when reading texts containing Theory of Mind. The next example shows that in **Text 3**, *Participant 2* also compensated for her inability to comprehend texts that presented Theory of Mind:

Example 4.3.3.4: “Como o policial desconfiou dele, daí o prendeu (...) Ele se entregou por honestidade, se arrependeu”. (**Text 3,** *Participant 2*)

Accordingly, being unable to attribute mental states to the thief, this participant preferred to add new information not present in the text – that would seem, to her, more natural to occur.

Equally, in **Text 9,** *Participant 2* also interpreted the text incoherently:

Example 4.3.3.5: "Ele mentiu com medo de entregar os outros". (**Text 9,** *Participant 2*)

Lying would be the first logical, automatic and most expected reaction of the prisoner. And this might be the reason why *Participant 2* interpreted that he had lied. In addition, she might have considered the text according to her world knowledge, according to what *she* would have done in his position and not to what is written in the text. This personal interpretation did not bring her the need for attributing mental states to the character, turning the reading process into a much easier task.

The following example presents a very similar interpretation that happened to *Participant 3*:

Example 4.3.3.6: "Com medo que eles iam matar ele, ele falou a verdade". (**Text 9,** *Participant 3*)

In agreement with what has been stated before, being afraid of dying would be a much more probable behavior than taking risks of telling the truth. A greater possibility added to an inability to predict what other people think ends up in *Participant 3*'s interpretation.

Participant 6 also contributed with information from his world background, possibly in an attempt to explain the presence or the role of the policeman in the story. See the case below:

Example 4.3.3.7: “O policial chegou e prendeu”. (**Text 3,** *Participant 6*)

This participant also interpreted that the policeman had found the thief’s *bag* (not his gloves), what would be more comprehensible for his understanding that the thief accepted to be arrested.

Also in **Text 9**, *Participant 6* seemed to create in his mind an image of a prisoner who certainly was a liar:

Example 4.3.3.8: “Se ele era corajoso, ele não diria a verdade”. (**Text 9,** *Participant 6*)

Therefore, lying would be (to him) the first reaction, differently from what really happened in the text. *Participant 6*’s prediction did not correspond to the textual information, so he understood that the tanks could not be in the mountains, because the prisoner wanted to trap the Red Army. The following excerpt explains what he said:

Example 4.3.3.9: “Ele queria arrumar uma cilada pra eles”. (**Text 9,** *Participant 6*)

4.3.4 - Texts 4 and 10 – Verbal Irony

Trying to understand why José complimented Carlos in **Text 4**, *Participant 1* created an inference that Carlos was playing in another soccer championship, in which he did play well and, therefore, deserved José's compliment:

Example 4.3.4.1: "No final da partida, ele inscreveu-se em um outro campeonato e passou a jogar bem. O José elogiou o amigo". (**Text 4,** *Participant 1*)

In short, in **Text 4** *Participant 1* misunderstood José's intention. An interesting fact occurred in **Text 10**, in which *Participant 1* was not able to modify his mental model about José and Carlos' previous story, where they were friends. Although in **Text 10** it was stated that José and Carlos did not like each other, Example 4.3.4.2 shows that *Participant 1* did not process this information, interpreting the last line of the story just as a José's attempt to "overcome an unpleasant situation between them". According to what we have discussed before, *Participant 1* showed, by his reading interpretation, another evidence of right hemisphere damaged participants' inability to revise and modify mental models.

Example 4.3.4.2: "José queria apagar aquela mágoa que existia entre os dois, para tirar a má impressão". (**Text 10,** *Participant 1*)

Observing the next example, *Participant 2* and *Participant 3* overemphasized the fact of lying in **Text 4**, as it would not be accepted lying to friends. They did not

seem to comprehend the real reason for lying, but after reading the last proposition of the **True/False Test**, they became more confident to say that José lied to please his friend.

Example 4.3.4.3: "Mentiu para ele porque ele jogou mal". (**Text 4,** *Participant 2* and *Participant 3*)

Participant 3, as *Participant 1* in **Text 10**, did not revise or modify his mental situation of the text. Thus, he did not process the information that José and Carlos *were not* friends in this text. Due to this fact, *Participant 3* created an elaborative inference, as shown below:

Example 4.3.4.4: "José elogiou Carlos porque, mesmo sendo amigos, Carlos era meio violento e José ficou com medo. Para o Carlos não brigar com ele, ele pregou uma mentira." (**Text 10,** *Participant 3*)

This is another instance of not stated information that enabled the creation of an elaborative inference, which was necessary for the participant's coherence.

Participant 4 and *Participant 5* got very confused in **Text 4** and **Text 10**, reading the texts for several times. Finally, after reading the statements from the **True/False Test**, they answered correctly. Both also overemphasized the fact of lying to a friend. Example 4.3.4.5 suggests that *Participant 5* presented an impairment to comprehend the text when he said that José lied trying to be Carlos's friend, to motivate him to play in another match. This might also suggest a not-modified mental model.

Example 4.3.4.5: “Pela frase ele jogou bem, mas na realidade ele jogou mal. [Foi] pra incentivar ele a jogar outra partida”. (**Text 4,** *Participant 5*)

Participant 6 also got very confused and did not understand the ironic meaning of José’s compliment in **Text 10**. Instead, as it is described below, he used his previous mental model from **Text 4** to infer that José said that Carlos had played well in order to motivate Carlos, even though they were enemies:

Example 4.3.4.6: “[José disse que Carlos tinha jogado bem] para incentivar Carlos, apesar de que eles eram inimigos. Mas futebol não tem nada a ver com inimizade”. (**Text 10,** *Participant 6*)

It is possible to say that this inference produced by *Participant 6* was the last piece of the puzzle that made his textual interpretation complete.

4.3.5 - Texts 5 and 11 – Jokes

Example 4.3.5.1: “Ele era um mentiroso, porque ninguém vive 300 anos”. (**Text 5,** *Participant 1*)

Although *Participant 1* interpreted **Text 5** correctly, basing his interpretation on his real world, he showed comprehension problems when reading the propositions from the **True/False Test**. For example, in the first proposition, he inferred that the man was a liar, so the sentence was, consequently, false. In fact, he transferred the value of the character of the text to the sentence being read.

Regarding **Text 11**, *Participant 1* also had a fairly successful comprehension, except for the fact that he understood the woman and the man were alone at the scene – and not in a crowded square, as it was clear in the text. This might have happened because, when activating his schema of "thief" and "robbery", *Participant 1* also activated the information that thieves usually act, not in crowded, but in isolated and deserted places, where they can not be noticed. As it was explained previously in Chapter 2, section 2.5, information belonging to schemata structures are organized from general to specific and its slots, regarding type and form, are fixed. Therefore, throughout the reading process, the reader builds up options for expectable information to come. Probably, "crowded square" was not an expected concept to be considered by the reader in this text.

Participant 2 behaved very much like *Participant 1* in relation to **Text 5**. She presented a reading comprehension failure in the **True/False Test** propositions. This participant understood the proposition in itself was a lie. She also showed herself very unsure about the **Comprehension Question** in **Text 5**.

Again, *Participant 4* related his interpretation of the text to his world knowledge in **Text 5**, as the following example portrays:

Example 4.3.5.2: "Não, não existe poção milagrosa". (**Text 5,** *Participant 4*)

As *Participant 1*, *Participant 4* also activated the schema of "thief" and, hence, interpreted that the characters were alone in the square.

In the **Comprehension Question** of **Text 11**, *Participant 4* answered incoherently and seemed to misunderstand the point of the text:

Example 4.3.5.3: “A mulher deve ter chegado nesta praça primeiro do que ele, deve ter vindo a um local diferente do dele. Por isso é que é falsa”. (**Text 11,** *Participant 4*)

Participant 5 showed himself very confused in his interpretation of **Text 5**. After reading the third proposition of the **True/False Test**, he stated his inference, as presented below:

Example 4.3.5.4: “Então porque é verdade, né? Ele foi verdadeiro, mas não soube dizer a verdade” (**Text 5,** *Participant 5*)

However, in the last Task of the text (the **Comprehension Question**) he showed that his coherence seemed to be floating as he went on reading the text. See his point:

Example 4.3.5.5: “Não, mesmo na história não. O nome já diz: ‘poção milagrosa’”. (**Text 5,** *Participant 5*)

Participant 6, recursively, added extra information to his interpretation of **Text 5**. He stated that the man was selling drugs to overreach people, but the fact was that drugs are harmful:

Example 4.3.5.6: “O homem tava vendendo drogas pra enganar o povo, só que a droga era prejudicial”. (**Text 5,** *Participant 6*)

Besides producing a literal interpretation of **Text 5**, he also did not understand the first proposition of the **True/False Test**, as we can see in the next example:

Example 4.3.5.7: “Ele [assistant] conseguiu trabalhar 100 anos pra ele [vagabond]. Então ele [assistant] é bem velho também, né? (**Text 5,** *Participant 6*)

“É droga, como é que pode? Droga não pode ser poção mágica”. (**Text 5,** *Participant 6*)

Therefore, due to his own incoherent inference that the potion was, in fact, drugs, he was not able to give the correct answer or to comprehend the last question either, showing that his interpretation was strongly related to the information he had added.

In **Text 11**, *Participant 6* also misinterpreted the facts, what showed that he reorganized the story to have a more literal interpretation, but was still unable to understand the text:

Example 4.3.5.8: “O homem veio com aquele papo diferente, de repente pegou a bolsa da mulher (...) deu uma de policial. A mulher pensou que ele fosse um policial e foi nessa que ela entrou pelo cano”. (**Text 11,** *Participant 6*)

4.3.6 - Texts 6 and 12 – Physical Stories

Example 4.3.6.1: “No susto, o bicho é que assustou o ladrão, fazendo com que ele pisasse no alarme”. (**Text 6,** *Participant 1*)

In the example above, *Participant 1* showed a reorganization of facts that turned the story comprehensible to him. Concerning the **Comprehension Question**,

Participant 1 produced a very general inference, exposing a disconnection between the situational context and the question, as follows:

Example 4.3.6.2: “Porque tá dando sinal de arrombamento”. (**Text 6,** *Participant 1)*

Participant 2, in turn, did not understand who switched the alarm off:

Example 4.3.6.3: “Quando uma pessoa bate… será que o bicho bateu no alarme? Não sei...” (**Text 6,** *Participant 2*)

This reluctance to believe that the animal could have touched the alarm ray was a consequence of the activation of her mental schema of “alarm”, which probably contained only the attribute “people who set the alarm off”. Therefore, it was rather unlikely to her to think about animals performing this action.

In **Text 12**, *Participant 2* also had difficulty to believe that airplanes may be unable to see over heavy clouds. This passage is illustrated next:

Example 4.3.6.4: “Será que é tão difícil ver por baixo com tanta neblina? Os aviões quando andam nas nuvens... como é que eles conseguem? (...) como é que na vida real os aviões conseguem e aqui na história não?” (**Text 12,** *Participant 2*)

This participant’s interpretation brought us more evidence that right hemisphere damaged participants may present problems in understanding figurative narrative without relating them exclusively to their real world, what leads them to produce over-literal interpretation.

Participant 6 also presented reading comprehension difficulties and, consequently, incoherent interpretations with **Physical Stories**. We could observe that he added information from his background knowledge in an attempt to understand **Texts 6** and **Text 12**, respectively:

Example 4.3.6.5: "Se ele pisou em algo macio, ele pisou em cima do alarme, não foi em cima do bicho. E assim mesmo ele consegue pegar as jóias, né? O problema é ele achar a direção da porta, né? Ele não achou". (**Text 6,** *Participant 6*)

"Porque o avião lá em cima, nessa altura, era amarelo. Então dava pra se ver. Amarelo é uma cor diferente". (**Text 12,** *Participant 6*)

In summary, throughout this section the researcher could verify that the right hemisphere damaged participants engaged in this research had difficulty in:

a) understanding the difference of literal and intended meaning: in order to compensate their impairment, they contributed with extra information creating elaborative inferences;
b) modifying and/or correcting their mental model of the texts: the last proposition, which represented the new information of the text, that should modify the mental model of the textual interpretation, was not incorporated or integrated to the old textual information;
c) attributing mental states to others: people who have suffered a right hemisphere damage tend to create incoherent mental models when reading texts containing Theory of Mind. They also prefer to add new information not present in the text – that would seem, to her, more natural to occur.

d) understanding textual facts: they reorganized the story to have a more literal interpretation, but were still unable to understand the text. Besides, the right hemisphere damaged participants presented problems in understanding figurative narrative without relating them exclusively to their real world, what led them to produce over-literal interpretation.

4.4 – RESEARCH QUESTIONS

In order to interpret the results presented previously, the research questions will be retaken and analyzed:

RESEARCH QUESTION 1: "How do participants perform in the reading comprehension tasks, in terms of number of recalled propositions?

TASK 1 – Recalling propositions from texts

As pointed out by Tomitch (1995), readers are not able to remember all information they read. Consequently, they select the most important knowledge correspondingly to their schemata. Considering that each reader possesses different schema structures, she or he selects different information to keep in memory. According to Table 19 below, control participants' performance was satisfactory (average of 91% of success), once the researcher was not expecting right hemisphere damaged participants or control participants to recall all propositions present in the text. From the results obtained, we can say that control participants had a more successful performance in recalling the textual propositions than right hemisphere damaged participants, which **—** according to the ANOVA test applied to Table 8 discussed on the section **4.2 – a statistical analysis—** represents a statistically significant difference between the two groups: 91% for control participants and 74.9% for RHD participants.

Table 19

Participants' performance in the Recall Task by text

TEXTS	Average RHD Group	Standard Deviation (RHD)	Average Control group	Standard Deviation (Control)
Text 1	0.8333	0.129099	0.9583	0.102062
Text 2	0.7778	0.172131	1.0000	0
Text 3	0.7667	0.294392	1.0000	0
Text 4	0.7500	0.1748	0.9167	0.091289
Text 5	0.7000	0.414729	0.8333	0.233809
Text 6	0.6333	0.320416	0.8333	0.150555
Text 7	0.7667	0.150555	0.9000	0.109545
Text 8	0.6667	0.21082	1.0000	0
Text 9	0.6667	0.235703	0.8611	0.163864
Text 10	0.8333	0.167005	0.8095	0.14754
Text 11	0.8667	0.163299	0.9333	0.10328
Text 12	0.7333	0.206559	0.9000	0.244949
Average	**0.7495**	0.083933	**0.9121**	0.083227

On the other hand, taking into account factors such as attention and motivation, despite this significant difference, it is interesting to say that the right hemisphere damaged group was much more motivated and had its focus of attention on the text more expressively than control participants. In the researcher's point of view, by experiencing and sharing moments with them, this fact might have happened because the right hemisphere damaged people selected for this study were very pleased to participate and help a scientific research. Being part of the group made them feel important and increased their motivation and self-esteem level. These participants used

to go to the interviews very early, excited, and anxious to start reading. They, in fact, seemed to have part of their role in society back, in spite of all motor and cognitive difficulties they had to deal with. This is corroborated in Tomitch (1988), when she asserts that "the subject's involvement and participation during the learning situation leads to a deeper processing of information" (p. 63). She believes this factor might have influenced their comprehension and recall. Accordingly, motivation, as a positive attitude towards reading the text, might have played its role in the present study, influencing the recall process.

Irrespective of having a better performance, control participants did not take the reading tasks so seriously or devoted so much attention to them, or expressed their opinion about the importance of their participation. While right hemisphere damaged participants, even having doubts, paused more often and wanted to be really sure about the text, avoiding mistakes that, in their view, could "spoil" the researcher's study, control participants on their hand, sometimes, guessed the answers.

Still discussing of the first Task, we can observe in Table 19 that right hemisphere damaged participants performed better in **Text 10** (Verbal Irony) than control participants in the same text, with a slight difference of 2% (RHD with 83% and control with 81%). Interestingly, this was the only measure right hemisphere damaged participants scored higher than the control participants. Nonetheless, the same did not happen in **Text 4**, in which we have a considerable difference of 75% for RHD and 91% to control participants. Therefore, the result presented in **Text 10** might be a mere coincidence, once the ANOVA test applied to the recalling data collected showed that the type of text did not exert any significant influence over the participants' performance in the recalling process.

Moreover, according to Table 19 above, while right hemisphere damaged participants recalled **Text 11** better, control participants recalled 100% of propositions in **Texts 2, 3,** and **8**. In this task, right hemisphere damaged participants performed an average of 74.95% of success compared to 91.21% of control participants. These numbers suggest a decreasing ability to remember facts in narratives — because facts are not properly connected, right hemisphere damaged people can be lost, unable to establish associations to be retrieved from memory.

Observing Table 20 below, we can observe that control participants had 100% of success in **Texts 2** and **Text 8** (**Simple Inference**) and 93.06% in **Texts 3** and **Text 9** (**Theory of Mind**). Control participants presented more difficulty in recalling facts from **Verbal Irony** texts (**Text 4 and Text 10**), reaching 86.31% of success.

Table 20

Participants' performance in the Recall Task by type of text

TEXTS	Average RHD Group	Standard Deviation (RHD)	Average Control group	Standard Deviation (Control)
Text 1 e 7	0.8000	0.047136	0.9292	0.04124554
Text 2 e 8	0.7222	0.078567	1.0000	0
Text 3 e 9	0.7167	0.070711	0.9306	0.09821
Text 4 e 10	0.7917	0.058923	0.8631	0.075766
Text 5 e 11	0.7833	0.117853	0.8833	0.070711
Text 6 e 12	0.6833	0.070711	0.8667	0.047143
Average	**0.7495**	0.024144	**0.9121**	0.034116

In relation to right hemisphere damaged participants, we can say that they performed the task better in **Texts 1** and **Text 7** (**Indirect Request**) with 80% of success and also in **Texts 4** and **Text 10** (**Verbal Irony**) with 79.17% of successful recall – interestingly, the ones with higher difficulty in comprehension. The researcher speculates that the level of difficulty might have influenced their recalling process, calling their attention to these specific texts. On the other hand, right hemisphere damaged participants presented more problems in recalling propositions from **Texts 6** and **Text 12** (**Physical Story**) with 68.33% of success. The researcher was expecting exactly the opposite — what confirms the results from the ANOVA test—, once this kind of text did not include figurative language. Following the idea presented previously, as this type pf text does not represent great difficulty to right hemisphere damaged readers, they might have addressed their focus of attention to the other texts.

From Table 20 above, we can also observe that in all types of texts, right hemisphere damaged group's performance was inferior to that of control participants. Another interesting fact is that there was no coincidence of texts in which both groups of participants performed better or more poorly — confirming the ANOVA results: no significant main interaction effect —, what might suggest that damage in one specific area does not mean damage in a specific function performed by that area. As a network system, brain cognitive functions might change and get reorganized to compensate the damaged area. This fact corroborates with the ANOVA analysis, as the first null hypothesis is rejected and the second and third accepted. In sum, while the type of text did not produce a significant difference in the groups' performance regarding the Recall Task, the lesion factor did influence significantly their recalling process, suggesting that right hemisphere damaged participants recall more poorly than control participants.

RESEARCH QUESTION 2: "Among Indirect Request, Verbal Irony, Joke, Simple Inference, Physical Story, and Theory of Mind texts, in what sort of text do participants present more problems?

TASK 2 – True/False Test

Table 21

Participants' performance in True/False Test by text

TEXTS	Average RHD Group	Standard Deviation (RHD)	Average Control group	Standard Deviation (Control)
Text 1	0.5556	0.136085	0.8056	0.163864
Text 2	0.5833	0.204124	0.8333	0.258199
Text 3	0.7500	0.158114	0.8333	0.129099
Text 4	0.7778	0.172131	0.8889	0.136082
Text 5	0.4167	0.376386	0.6250	0.306186
Text 6	0.8333	0.258199	1.0000	0
Text 7	0.5278	0.125465	0.5556	0.086068
Text 8	0.3333	0.21082	0.6667	0.298144
Text 9	0.6250	0.262202	0.7500	0.273861
Text 10	0.5833	0.311804	0.9167	0.091289
Text 11	0.7500	0.223607	1.0000	0
Text 12	0.8333	0.129099	1.0000	0
Average	**0.6308**	0.161581	**0.8229**	0.150179

Confirming the analysis performed on the ANOVA test, Table 21 above shows that right hemisphere damaged participants had inferior performance in all types of texts compared to control participants, with a difference of 63.08% of success for RHD and 82.29% for control participants. In the True/False Test, right hemisphere damaged participants performed better in **Text 6** and **Text 12** (with 83.33% of correct scores), which were **Physical Story** texts, confirming the researcher's expectations: Right hemisphere damaged participants do have less difficulty in reading comprehension when texts do not contain figurative language.

Furthermore, right hemisphere damaged participants presented more problems with **Text 8** (**Simple Inference**) with only 33.33% of correct scores. This result, that was also expected to be verified, once Literature has reported studies suggesting that right hemisphere damaged people find difficulty in producing simple inferences and also in modifying and correcting specific mental models or situation models of texts being read (Molloy, 1990).

Control participants, in turn, presented more difficulty in **Text 7** (with 55.55% of right scores) which was an **Indirect Request** text. This success rate was very close to right hemisphere damaged participants' (who scored 52.77% of right answers), what called the researcher's attention more specifically. Despite the fact that in **Text 1**, that is also about **Indirect Requests**, control participants had a rather superior success in comparison to right hemisphere damaged participants (80.55% for control and 55.55% for right hemisphere damaged participants), it seems that **Indirect Request** texts demanded more information from the context and special attention than the other types of texts. Observing that almost all control participants got half of **True/False** propositions right in **Text 7**, it is possible to say that, by lack of attention, control

participants might have based their interpretation on their previous situation model about **Text 1**, what might have lead to an incoherent interpretation.

Therefore, by checking Table 21, it is reasonable to affirm that besides having performed all texts with superior success rate in comparison to right hemisphere damaged participants (63.08% for RHD and 82.29% for control) control participants had 100% of correct performance in **Texts 6**, **11**, and **12,** fact that did not happen in any text as to right hemisphere damaged participants' responses. Thus, the researcher concluded that the right hemisphere damaged participants tended to have more difficulty in interpreting some texts which contain figurative language than the other participants.

Additionally, Table 22 below shows that right hemisphere damaged participants, in comparison to control participants, presented more problems with **Simple Inference** texts (**Text 2** and **8** with 45.83% of success), due to their inability to modify their mental model of the texts or to integrate old and new information. Also, it is important to highlight their level of success in reading and interpreting literal texts, such as the **Physical Story** texts, presented in this study as **Texts 6** and **12**. In this case, right hemisphere damaged participants reached 83.33% of success in their reading performance, which suggests their impairment from interpreting figurative narratives.

Table 22

Participants' performance in the True/False Test by type of text

TEXTS	Average RHD group	Standard Deviation (RHD)	Average Control group	Standard Deviation (Control)
Text 1 e 7	0.5417	0.019643426	0.6806	0.176776695
Text 2 e 8	0.4583	0.176776695	0.7500	0.117846416
Text 3 e 9	0.6875	0.088388348	0.7917	0.058923208
Text 4 e 10	0.6806	0.137496914	0.9028	0.019643426
Text 5 e 11	0.5833	0.235699903	0.8125	0.265165043
Text 6 e 12	0.8333	0	1.0000	0
Average	**0.6308**	0.091374377	**0.8229**	0.101382392

TASK 3 – Comprehension Questions

Table 23

Participants' performance in the Comprehension Question by text

TEXTS	Average RHD Group	Standard Deviation (RHD)	Average Control group	Standard Deviation (Control)
Text 1	0.3333	0.516398	0.8333	0.408248
Text 2	0.1667	0.408248	0.8333	0.408248
Text 3	0.5000	0.547723	0.6667	0.516398
Text 4	1.0000	0	1.0000	0
Text 5	0.8333	0.408248	0.6667	0.516398
Text 6	0.6667	0.516398	0.8333	0.408248
Text 7	0.0000	0	0.8333	0.408248
Text 8	0.1667	0.408248	0.6667	0.516398
Text 9	0.3333	0.516398	0.5000	0.547723
Text 10	0.3333	0.516398	0.8333	0.408248
Text 11	0.8333	0.408248	1.0000	0
Text 12	0.8333	0.408248	1.0000	0
Average	**0.5000**	0.189399	**0.8056**	0.214541

Table 24

Participants' performance in the Comprehension Question by type of text

TEXTS	Average RHD group	Standard Deviation (RHD)	Average Control group	Standard Deviation (Control)
Text 1 e 7	0.1667	0.233345238	0.8333	0
Text 2 e 8	0.1667	0	0.7500	0.113137085
Text 3 e 9	0.4167	0.120208153	0.5833	0.120208153
Text 4 e 10	0.6667	0.473761543	0.9167	0.120208153
Text 5 e 11	0.8333	0	0.8333	0.233345238
Text 6 e 12	0.7500	0.113137085	0.9167	0.120208153
Average	**0.5000**	0.17818062	**0.8056**	0.073846688

Similarly to the second reading task, the results gotten in the Comprehension Questions analyzed by the Pearson's Chi Square test show a clear difference between the performances of both groups in answering comprehension question about the texts read: while control participants reached successful comprehension in 80% of questions, RHD participants understood only 50% of them. Therefore, observing Tables 23 and 24 above, we can infer that control participants had in general terms a higher success rate in the performance of **Task 3**, especially in **Texts 4**, **11**, and **12**, in which they had 100% of comprehension. However, although RHD participants performed well in **Text 4** (100%), **11** (100%), and **12** (83%), they presented problems in understanding questions about most of the texts, mainly for **Text 7**, in which they had 0% of comprehension.

In addition, in Table 24, it is possible to detect that right hemisphere damaged participants' best performance (83%) is related to **Jokes** (**Texts 5** and **11**), which was

surely a surprise to the researcher who was expecting to find a better performance in the **Physical Story** texts (**Texts 6** and **12**) – which was exactly the second more successful performance of RHD participants (75%). Therefore, while control participants had performances ranging from 75% to 91% of success – except for **Texts 3** and **9** (**Theory of Mind**) in which they got 58% – keeping an average of 80% of success in comprehension questions, right hemisphere damaged participants presented only 50% of success in this same task, what clearly confirms their difficulty in understanding figurative language texts.

Differently from the other tables, Table 23 above shows a moment that had not occurred in the data analysis so far. Regarding right hemisphere damaged and control participants' performance in **Text 4** (**Verbal Irony**), we can observe that both groups had 100% of success in the **Comprehension Question Task**. This result suggests that all participants understood this specific text, despite the figurative language presented in it. In fact, although both texts (**Text 4 and 10**) belong to the Verbal Irony category, **Text 4** carries fewer signs of **Verbal** I**rony**. In **Text 4**, participants are asked to interpret José's intention in relation to Carlos, what possibly does not correspond to an ironic intention. This leads the researcher to believe that here might be the reason for a higher level of comprehension in the right hemisphere damaged group.

On the other hand, RHD participants' performance in **Text 10** (33% of success) confirm that as it refers to **Verbal Irony** language, they present more difficulty in reading comprehension. This fact did not happen to the control participants in **Text 10**, who had a success rate of 83%.

The control participants' failure in **Text 4** might be merely occasional, once it was the only moment in the study in which their performance was not superior to the right hemisphere damaged participants'.

In **Text 11** (**Joke**), participants had a fairly small difference in their performance, in which the RHD participants succeeded in 83% and the control group in 100%. By this result, the researcher does not have arguments enough to state that right hemisphere damaged participants present serious impairment from comprehending questions about **Texts 5** and **11** (**Jokes**) – at least to the extent of what can be said about these six participants. The researcher believes that these numbers result from the fact that in **Texts 5** and **11** participants answered yes/no questions, which give them the possibility of 50% to get the answers right.

Table 23 above also brings us to the conclusion that right hemisphere damaged participants presented more problems in the **Comprehension Question Task** in **Texts 2** and **8** (**Simple Inference**) and in **Texts 1** and **7** (**Indirect Request**) , while control participants performed more poorly in **Text 9** (**Theory of Mind**).

CHAPTER 5

FINAL REMARKS, CONCLUSIONS, LIMITATION OF THE STUDY, AND RECOMMENDATION FOR FUTURE RESEARCH

The objective of this research was to analyze right hemisphere damaged individuals' performance in reading comprehension, by means of non-literal texts in comparison to non-brain-damaged individuals. The purpose was also to verify if the right hemisphere damaged participants who carried out the reading comprehension tasks in this study presented difficulty in interpreting figurative language texts.

The data collected by the researcher, when compared to the results provided by the tests, confirmed the initial expectation that both groups participating in this study would perform the reading activities differently: Right hemisphere damaged participants tended to show more difficulty in all three tasks proposed than control participants, as it is presented in Table 25 below:

Table 25

Groups' performances in the reading tasks

Performances (Average in %)	Group A: RHD participants	Group B: control participants
Task 1: Recall Propositions	74 %	91%
Task 2: True/False Test	63%	82%
Task 3: Comprehension Question	50%	80%

Therefore, it is possible to conclude that, there was a trend for the right hemisphere damaged group to have more difficulty in understanding some texts which contained figurative language and also in connecting discourse coherently than the control participants. According to the constructivist hypothesis briefly presented in the Review of Literature (section 2.8 – Creating Inferences), in which readers go step by step in the text searching for meaning and establishing local and global inferences continually, it is possible to observe that, in this case, the right hemisphere damaged participants engaged in this study were not able to perform a complete integration process of information stored in working and long-term memories due to their damaged right hemisphere.

As it has been mentioned previously in Chapter 2, creating a coherent mental model depends on the reader's inferential processes that can be based on bottom-up — the reader's focus is on lower-level processes, such as decoding —, and/or top-down

processes — when the reader creates his/her new inferences, which is considered a higher-level process (Carrell, 1988).

When reading a text, the reader provides both local and global inferences. The first type refers to the connection, generated during the reading process, of pieces of consecutive information locally placed in the text, to information in memory. The second type of inference is related to reactivated information from long-term memory, which results from an interaction between the semantic text coherence and the reader's prior knowledge structure (Van den Broek, Risden, & Husebye-Hartmann, 1995).

We know that coherent mental models drive the reader to comprehension, in the sense that when a coherent textbase is constructed, local inferences might not be enough for reaching comprehension. Then, the propositions of the textbase are organized in a hierarchical and coherent sequence for a meaningful global coherence, which possibly completes the need for cohesion. Briefly, the reading process is not only related to understanding the meaning of words and sentences performed by local cohesion, but also to the integration of knowledge provided by successful global inferences, by which the reader is able to integrate her/his background knowledge with the textual information forming a coherent mental representation of the text.

Except for the Physical Stories (**Texts 6 and 12**), all the selected texts demanded global inferences, because they presented insufficient causal explanation that provoked a local strategy failure, forcing the reader to search for global inferences in order to have a satisfactory comprehension of what was being read (O'Brien & Myers, 1999). As right hemisphere damaged participants present difficulty in generating global inferences, they probably did not construct coherent mental models to reach comprehension of the texts.

According to Anderson and Pearson's (1988) ideas, comprehension takes place when readers are able to establish a "mental home" for new information; that means, when they can integrate new input with their prior knowledge. Being unable to perform global inferences, right hemisphere damaged readers were impaired from integrating new and old information, which justifies their inability to revise mental models.

Regarding right hemisphere damaged individuals' comprehension processes, one possibility for their impairment from correcting mental representations is suggested by Molloy (1990), when he states that "the right hemisphere maintains the ability to hold different meanings of a word available for use, whereas the left hemisphere is more inclined to select a single meaning quickly" (p. 127). This fact may explain why right hemisphere damage causes inability to revise hypotheses: no more meanings of words available, no more corrections in comprehension.

As it has been said before, text comprehension does not mean understanding isolated words, but ideas extracted from the text. When people engage in text comprehension processes, they are focused to maintain coherence in their understanding of what they read. According to Van den Broek, Young, Tzeng and Linderholm (1999), "the outcome of a successful reading process is a coherent mental representation of the text." (p. 78) and it can be achieved mostly through inferential processes that occur when the reader attempts to understand statements, searching for a related and coherent connection between what she/he has in memory to what is in the text. Inferences, as a matter of fact, are processes which need to be completed toward the reader's needs, and, consequently, lead her/him to comprehension. From the text information, the reader "rules" the creation of inferences – local or global –, whenever she/he decides it is necessary.

In brief, when we read, we create mental representations. And these mental representations can be incoherent if global connections are not done properly. Following St. George, Kutas, Martinez, and Sereno's study (1999), right middle temporal regions are strongly connected with integrative processes, which make the reader able to perform global inferences, achieving, consequently, global coherence in discourse comprehension processing.

The objective of this research was to evaluate the hypothesis that individuals who have suffered right hemisphere damage are impaired to understand and interpret narratives and also to connect discourse into a coherent way (Hough, 1990). It is based on the possibility that when attempting to understand a text, most of right hemisphere damaged individuals are only able to perform local inferences – since their left hemisphere capability is intact. But local inferences sometimes are not enough for a complete text comprehension. Therefore, being unable to make global inferences, they rely only on their textbases, which are probably incomplete, lacking a coherent situation model that would be provided by global inferences. This could be absolutely possible for an undamaged right hemisphere.

Summing up, language comprehension processes include lexical, syntactic, semantic, pragmatic, and discourse sub-processes, which are functions provided by both brain hemispheres. Therefore, an intact right hemisphere contributes to higher successful integrative processes and discourse coherence. To comprehend discourse, readers are required to perform mental connections throughout the text. That means sentences are connected and their meanings are integrated in working memory, in order to achieve a preliminary "local coherence", which will be connected to the macrostructure to be "transformed" into or to become "global coherence". At this point, the problem of most of right hemisphere damaged individuals is that they only perform

local connections. In other words, right hemisphere language functions are not only related to the processing of non-literal speech, but they are also responsible for much more complex matters, as for example, the construction of coherent mental representations in discourse. This important linguistic function, under the right hemisphere's responsibility, makes people able to understand not only "what others say", but "what is behind their words".

5.1 - LIMITATIONS OF THE STUDY AND RECOMMENDATIONS FOR FUTURE RESEARCH

The results presented in this research do not reflect significantly — and exactly —what has been studied in the literature (Molloy, 1990). Hence, more than ever, several studies in this area need to be carried out before drawing final conclusions in the field of reading comprehension. Therefore, the outcomes obtained are exclusively related to this sample of participants. Some limitations of this present research that could have altered the results can be pointed out as follows:

1. Right hemisphere damaged participants did not have lesion exactly at the same brain area.

2. The number of right hemisphere damaged participants and, consequently, of the control group was fairly small, due to the difficulty of finding appropriate participants for the study, namely, specific cases of exclusively right hemisphere damage in Florianópolis. Literacy, for example, was a very hard variable to control. Most of right hemisphere damaged participants at Associação de Santa Catarina de Reabilitação did not know how to write or read.

3. The number of texts and tasks could have been greater. But then collecting data would become a much more complicated process in terms of time available by the participants and their psychological exhaustion.

4. The researcher could have controlled how many times participants read each text. This number could have suggested a difference in the recall task, i. e., the researcher could have analyzed if participants who read the texts more than once recalled more propositions than the other participants.

5. **Task 3 (Comprehension Questions)** could have been presented before **Task 2 (True/False Test)**. In the **True/False Test**, participants had the chance of guessing the correct answer for the propositions with a possibility of 50%. Also, all participants had to do was to recognize the propositions as true or false. In other words, the sentences were ready to be read and had a high possibility to be incorporated to their mental model of the text and accepted as true. This fact might have influenced their responses in **Task 3** (**Comprehension Questions**). Therefore, when asked to answer a comprehension question about the text they read, possibly not all participants had the same effort to recall their textual mental model to retrieve the information from memory. They simply reproduced what was presented in the **True/False Test** sentences.

This research intends to corroborate and also add some ideas to the next steps on the studies of the relationships between brain and language. In the future, hopefully, we might be able to integrate research with clinical data, so that psychologists, speech pathologists, and neuroscientists will be able to better analyze language disorders and implement their theoretical knowledge. Improvement in language disorder studies will also lead to the development of new theories of learning, regarding the differences among human language users in their social contexts (Chiarello, 2000). Obviously,

brain and language studies also depend on several other areas of research to be based on and integrated with new methods, theories, and models.

Considering all that has already been discovered, technology has provided researchers a set of powerful tools in the area of neuroscience that could be used to broaden our knowledge about the brain-language relationship: structural neuroimaging, computational modeling, precise psycholinguistic processes, and methods to analyze cerebral asymmetries and brain activation (Chiarello, 2000). Fortunately, nowadays researchers can study not only damaged brains (e.g. cases of split brains, aphasia, early epilepsy, and hemi decorticates), but also normal brains. This brings us hope to be able to study and maybe avoid diseases before they occur.

Keeping in mind that "the map is not the territory", researchers should take a look at the whole picture, instead of focusing explicitly on specific areas (such as Wernicke's and Broca's, for instance) – as if they were the only responsible for the important language functions. In fact, we should analyze them as single components of a bigger system, in which all parts together process the primary human characteristic: language.

As Beeman and Chiarello (1998) say, language functions were created to communicate ideas through discourse, by which the speaker / writer selects a set of words (spoken / written) so that the listener / reader can decode the input (speech / text) to eventually interpret the intrinsic meanings of the words. According to their studies, "understanding the nature of right hemisphere language processing besides broadening our knowledge of the full range of language processes also provides insight into why the left hemisphere excels in language processing" (p. 337). And as, during reading, right hemisphere contributes to both bottom-up (in a more widespread word meaning activation) and top-down (in a more widespread construction of mental representations)

processes, we can conclude that language comprehension is not limited to the left hemisphere. According to Waldie (2004), the point is not

> whether the normal right hemisphere can process words, but how and when it does so; [besides that, the right hemisphere] may be particularly important when reading passages of text silently – responding to semantic-thematic cues and recognizing word patterns [in a holistic manner] (…) for non-impaired readers although the left hemisphere's involvement during reading is developmentally stable, the contribution of the right hemisphere changes dynamically as reading experience increases (original in English by the author).

Therefore, we have to consider both the left and the right sides of the story. In a word, although some processes are specialized to each hemisphere, all kinds of linguistic knowledge are present in both. For instance, sharp focused semantic activation in the left hemisphere — which is modular, restricted, possesses interconnections of local interactions — and diffuse semantic activation in the right hemisphere —which is, in turn, less modular, possesses interconnections that allow greater interregional (global) interaction.

To conclude with, it is relevant to remember that every moment new theories about brain processing are being created and, in spite of all knowledge scientists may have accumulated throughout the past 10 years, new studies are still necessary, in order to establish a more complete relationship between the language functions performed by the cerebral system. We should not forget that language is the essence of human race and that it is through language that human beings formulate thoughts and convey

messages to others, analyzing and judging the world, solving problems and planning actions. That may be the reason why language impairment affects a person's life emotionally and socially: it deeply enfeebles her/his ability to live independently. Therefore, from the moment researchers identify linguistic difficulties, new specific strategies may be implemented to maximize and optimize the communicative potential of right hemisphere damaged individuals. At last, fortunately for us, researchers, there is still a lot to be investigated.

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APPENDIX A

INSTRUCTIONS

INSTRUCTIONS given during data collection – at the beginning of each section
"Today you are going to read aloud 3 short texts. After reading each text, you are going to do three activities. First, you are going to try to remember all facts that you read and understood about the text. Second, you are going to read a set of sentences and then say if they are true or false, according to the text. And, third, you are going to answer a question. Are you ready?"
INSTRUÇÕES Dadas durante a coleta de dados – no início de cada sessão
"Hoje você vai ler em voz alta três textos pequenos. Depois de ler e entender cada texto, você vai fazer três atividades. Primeiro, você vai tentar lembrar de tudo que leu no texto. Segundo, você vai ler um conjunto de frases e vai dizer se elas são verdadeiras ou falsas de acordo com o texto. E, por último, você vai responder a uma pergunta sobre o texto. Está pronto?"

APPENDIX B

DATA COLLECTION REPORT – PORTUGUESE VERSION

A COMPREENSÃO DA LINGUAGEM FIGURADA EM INDIVÍDUOS COM LESÃO CEREBRAL NO HEMISFÉRIO DIREITO

Participante _____

Sessão 1

Texto 1 – **Proposições a serem lembradas:**
( ) João e Maria são casados.
( ) João está colocando um número no muro de sua casa.
( ) João pergunta à Maria se ela consegue ver o número da casa.
( ) Maria responde que sim e diz que o número é 259.

Texto 2 - **Proposições a serem lembradas:**
( ) Jane era uma mulher muito esquecida
( ) Jane entrou correndo no consultório do dentista.
( ) Ela viu sua bolsa na mesa de centro da sala de espera.

Texto 3 - **Proposições a serem lembradas:**
( ) Um ladrão que roubou uma loja está fugindo.
( ) O ladrão deixa cair uma luva.
( ) Um policial, que não sabe que ele é um ladrão, vê e decide avisá-lo.
( ) Quando o policial grita, o ladrão se entrega.
( ) O ladrão admite que roubou a loja.

Sessão 2

Texto 4 - **Proposições a serem lembradas:**
( ) José e Carlos jogavam futebol.
( ) José e Carlos eram parceiros e amigos por muitos anos.
( ) Carlos estava jogando em um campeonato.
( ) Carlos jogou muito mal.
( ) José assistiu aos jogos de Carlos.
( ) No fim da partida, José disse a Carlos que ele tinha jogado bem.

Texto 5 - **Proposições a serem lembradas:**
( ) Um malandro estava vendendo uma poção milagrosa.

( ) Essa poção fazia as pessoas viverem por muitos longos anos.
( ) Este malandro dizia ter mais de 300 anos de idade.
( ) Uma pessoa perguntou ao assistente se o malandro era tão velho assim.
( ) O assistente disse que não sabia, pois trabalhava para o malandro só há 100 anos.

Texto 6 - **Proposições a serem lembradas:**
( ) Um ladrão está arrombando uma joalheria.
( ) Ele alcança a chave e passa por baixo do raio do alarme.
( ) Se ele encostar no raio, o alarma dispara.
( ) Quando ele pega as jóias, ele pisa em algo macio.
( ) O alarme dispara.

Sessão 3

Texto 7 - **Proposições a serem lembradas:**
( ) João e Maria são casados.
( ) João está dirigindo para a casa de seu novo amigo Marcos.
( ) Eles não conhecem a casa dele.
( ) João pergunta se Maria consegue ver o número da casa.
( ) Maria responde que sim, que ela consegue ver o número da casa muito bem.

Texto 8 - **Proposições a serem lembradas:**
( ) Pedro era um menino que esquecia de tudo.
( ) Pedro lembrou da prova e saiu correndo pra escola.
( ) Ele lembrou que tinha esquecido a prova debaixo de sua carteira.

Texto 9 - **Proposições a serem lembradas:**
( ) O Exército Vermelho capturou um homem do Exército Azul.
( ) Eles queriam saber onde estavam os tanques do Exército Azul.
( ) O Exército Vermelho sabia que o Exército Azul estava por mar ou nas montanhas.
( ) O Exército Vermelho achava que o prisioneiro mentiria.
( ) Os tanques estavam nas montanhas.
( ) O prisioneiro disse que os tanques estavam nas montanhas.

Sessão 4

Texto 10 - **Proposições a serem lembradas:**
( ) José e Carlos jogavam futebol.
( ) José não gostava de Carlos.
( ) José achava que Carlos era mal-educado e violento.
( ) Carlos estava jogando em um campeonato.
( ) Carlos jogou muito mal.
( ) José assistiu aos jogos de Carlos.
( ) No fim da partida, José ironizou Carlos, dizendo que ele tinha jogado muito bem.

Texto 11 - **Proposições a serem lembradas:**
( ) Havia uma praça lotada de gente.

( ) Um homem se aproxima de uma mulher.
( ) Ele pergunta se ela viu um policial.
( ) Esta mulher responde dizendo que não viu nenhum policial por perto.
( ) Então o homem manda a mulher entregar o relógio e a bolsa bem depressa.

Texto 12 - **Proposições a serem lembradas:**

( ) Dois exércitos estavam em guerra.
( ) O Exército Azul era melhor em soldados e artilharia.
( ) O Exército Amarelo era melhor em força aérea.
( ) No dia da batalha, tinha muita neblina nas montanhas.
( ) O Exército Azul ganha.

APPENDIX C

DATA COLLECTION REPORT – ENGLISH VERSION

GOING DEEP INTO THE RIGHT DIRECTION:

AN ANALYSIS OF FIGURATIVE LANGUAGE COMPREHENSION IN

RIGHT HEMISPHERE DAMAGED INDIVIDUALS

Participant _____

Session 1

Text 1 - **Propositions to be recalled:**

( ) João and Maria are married.
( ) João is affixing a number on the wall of his house.
( ) João asks Maria if she can see the number of the house.
( ) Maria answers 'yes' and says that the number is 259.

Text 2 - **Propositions to be recalled:**

( ) Jane was a very forgetful woman
( ) Jane got into the dentist's Office in a hurry.
( ) She saw her bag on the table in the waiting room.

Text 3 - **Propositions to be recalled:**

( ) A burglar who has just robbed a shop is running away.
( ) The burglar drops his glove.
( ) A policeman, who does not know he is a burglar, sees that and decides to warn him.
( ) When the policeman shouts, the burglar gives himself up.
( ) The burglar admits that he did the break-in at the shop.

Session 2

Text 4 - **Propositions to be recalled:**

( ) José and Carlos played soccer.
( ) José and Carlos were partners and friends for a long time.
( ) Carlos was playing in a championship.
( ) Carlos played very badly.
( ) José watched the matches.
( ) At the end, José said to Carlos that he had played well.

Text 5 - **Propositions to be recalled:**

( ) A quack was selling a miraculous potion.
( ) He said this potion made people live for long years.
( ) He also said he was more than 300 years old.
( ) A person asked his assistant if his boss was as old as he said.
( ) The assistant said that he did not know because he had been working for him for only 100 years.

Text 6 - **Propositions to be recalled:**

( ) A burglar is breaking into a jeweler's shop.
( ) He picks the lock and crawls under the electronic detector beam.
( ) If he breaks this beam it will set off the alarm.
( ) As he reaches the gems out, he steps on something soft.
( ) The alarm sounds.

Session 3

Text 7 - **Propositions to be recalled:**

( ) João and Maria are married.
( ) João is driving to Marcos' house, his new friend.
( ) They do not know his house.
( ) João asks Maria if she can see the number of the house.
( ) Maria answers 'yes', that she can the number of the house pretty well.

Text 8 - **Propositions to be recalled:**

( ) Pedro was a very forgetful boy.
( ) Pedro remembered his test and rushed to his school.
( ) He remembered he had left his test under the desk.

Text 9 - **Propositions to be recalled:**

( ) The Red Army captured a man from the Blue Army.
( ) They wanted to know where the Blue Army's tanks were.
( ) The Red Army knew the Blue Army were either by the sea or in the mountains.
( ) The Red Army thought the prisoner would lie to them.
( ) The tanks were really in the mountains.
( ) The prisoner said that the tanks were in the mountains.

Session 4

Text 10 - **Propositions to be recalled:**

( ) José and Carlos played soccer.
( ) José did not like Carlos.
( ) José thought Carlos was impolite and violent.
( ) Carlos was playing in a championship.
( ) Carlos played very badly.
( ) José watched the matches.
( ) At the end, José said sarcastically that Carlos had played very well.

Text 11 - **Propositions to be recalled:**

( ) There was a crowded square.
( ) A man approaches a woman.
( ) He asks if she had seen a policeman around.
( ) This woman says she had not seen any policeman around.
( ) Then the man orders her to give him her watch and purse.

Text 12 - **Propositions to be recalled:**

( ) Two enemy powers were at war.
( ) The Blu Army was stronger in foot soldiers and artillery.
( ) The Yellow Army was stronger in air power.
( ) On the day of the battle, there was heavy fog over the mountains.
( ) The Blue Army wins the war.

APPENDIX D

DATA COLLECTION – PORTUGUESE VERSION

COLETA DE DADOS

A COMPREENSÃO DA LINGUAGEM FIGURADA
EM INDIVÍDUOS COM LESÃO CEREBRAL NO HEMISFÉRIO DIREITO

SESSÃO 1

Participante: _____

TEXTO 1

João e Maria são casados.
João está colocando um número no muro de sua casa.
Então João pergunta à Maria: "Dá pra ver o número da casa?"
Ela responde: "É 259."

ATIVIDADE 1: Lembre-se de tudo que acontece no texto.

ATIVIDADE 2: Marque um X em V (Verdadeiro) ou F (Falso):

- Maria é a esposa de João. **V ( ) F ( )**
- João está colocando um novo número no muro de sua casa. **V ( ) F ( )**
- João pergunta à Maria se ela sabe o número da casa. **V ( ) F ( )**
- João pergunta à Maria se dá pra ela enxergar direito o número da casa. **V ( ) F ( )**
- Maria responde que ela não consegue ver o número direito. **V ( ) F ( )**
- Maria respondeu o que João perguntou. **V ( ) F ( )**

ATIVIDADE 3: Responda: Por que João pergunta à Maria "Dá pra ver o número da casa?"?

TEXTO 2

Jane era uma mulher muito esquecida.
Jane entrou correndo no consultório do dentista.
Ela viu sua bolsa na mesa de centro da sala de espera.

ATIVIDADE 1: Lembre-se de tudo que acontece no texto.

ATIVIDADE 2: Marque um X em V (Verdadeiro) ou F (Falso):

- Jane chegou atrasada para a consulta com o seu dentista. . **V ( ) F ( )**
- Jane tinha esquecido sua bolsa no consultório do dentista naquele dia. **V ( ) F ( )**

ATIVIDADE 3: Responda: Por que Jane entrou correndo no consultório do dentista?

TEXTO 3

Um ladrão que acabou de roubar uma loja está fugindo.
Ao correr para sua casa, um policial vê que ele deixou cair sua luva.
O policial não sabe que ele é um ladrão e só quer avisá-lo que sua luva tinha caído.
Mas quando o policial grita 'Ei, você, pare aí!', o ladrão vira-se e se entrega.
O ladrão coloca as mãos na cabeça e admite que roubou a loja."

ATIVIDADE 1: Lembre-se de tudo que acontece no texto.

ATIVIDADE 2: Marque um X em V (Verdadeiro) ou F (Falso):

- O policial vê o ladrão roubando a loja. **V ( ) F ( )**
- O policial não sabe que ele é um ladrão. **V ( ) F ( )**
- O ladrão foge do policial. **V ( ) F ( )**
- O ladrão acha que o policial o viu roubar a loja. **V ( ) F ( )**

ATIVIDADE 3: Responda: Por que o ladrão se entregou?

COLETA DE DADOS

A COMPREENSÃO DA LINGUAGEM FIGURADA
EM INDIVÍDUOS COM LESÃO CEREBRAL NO HEMISFÉRIO DIREITO

SESSÃO 2

Participante: _____

TEXTO 4

José e Carlos eram jogadores de futebol.
José já tinha jogado com Carlos por muitos anos e gostava muito dele.
Carlos inscreveu-se em um campeonato.
Ele jogou muito mal, errando muitas jogadas fáceis.
José assistiu aos jogos e sentiu pena do amigo.
No final da partida ele disse a Carlos, "Você jogou bem."

ATIVIDADE 1: Lembre-se de tudo que acontece no texto.

ATIVIDADE 2: Marque um X em V (Verdadeiro) ou F (Falso):

- José e Carlos jogavam futebol e eram amigos. **V ( ) F ( )**
- José e Carlos jogavam futebol, mas não eram amigos. **V ( ) F ( )**
- Carlos jogou muito mal no campeonato. **V ( ) F ( )**
- No final da partida, José disse a Carlos a verdade, que ele tinha mesmo jogado bem. **V ( ) F ( )**
- No final da partida, José tentou ser sarcástico com Carlos, dizendo que ele tinha jogado bem. **V ( ) F ( )**
- No final da partida, José mentiu para Carlos, dizendo que ele tinha jogado bem, para não magoar o amigo. **V ( ) F ( )**

ATIVIDADE 3: Responda: Por que José disse a Carlos "Você jogou bem"?

TEXTO 5

Um malandro estava vendendo uma poção milagrosa.
Ele dizia que a poção fazia as pessoas viverem por muito tempo.
Ele também dizia que ele mesmo era são e saudável e com mais de 300 anos de idade.
'Ele é tão velho assim mesmo?', perguntou uma pessoa ao jovem assistente do malandro.
'Não sei dizer', respondeu o assistente. 'Eu só trabalho pra ele há 100 anos.'

ATIVIDADE 1: Lembre-se de tudo que acontece no texto.

ATIVIDADE 2: Marque um X em V (Verdadeiro) ou F (Falso):

- O malandro dizia às pessoas que a poção era mágica. **V ( ) F ( )**
- O assistente não sabia se seu mestre havia tomado a poção ou não. **V ( ) F ( )**
- O assistente disse a verdade para a pessoa que lhe perguntou sobre a idade do malandro. **V ( ) F ( )**
- O assistente mentiu sobre a idade dele e a do malandro. **V ( ) F ( )**

ATIVIDADE 3: Responda: A poção era mesmo milagrosa?

TEXTO 6

Um ladrão está arrombando uma joalheria.
Com habilidade, ele alcança a chave na porta.
Com muito cuidado, ele engatinha por baixo do raio de luz do alarme.
Se ele encostar-se a este raio, o alarme dispara.
Mas, quando ele consegue pegar as jóias, ele pisa em algo macio.
O ladrão ouve um grito
Um bicho peludo passa perto dele em direção à porta da loja.
Na mesma hora o alarme dispara.

ATIVIDADE 1: Lembre-se de tudo que acontece no texto.

ATIVIDADE 2: Marque um X em V (Verdadeiro) ou F (Falso):

- O bicho peludo disparou o alarme. **V ( ) F ( )**
- O ladrão encosta no raio de luz do alarme. **V ( ) F ( )**

ATIVIDADE 3: Responda: Por que o alarme dispara?

COLETA DE DADOS

A COMPREENSÃO DA LINGUAGEM FIGURADA
EM INDIVÍDUOS COM LESÃO CEREBRAL NO HEMISFÉRIO DIREITO

SESSÃO 3

Participante: _____

TEXTO 7

João e Maria são casados.
João está indo de carro para uma festa na casa do seu novo amigo Marcos.
Eles não conhecem a casa dele.
Então João diminui a velocidade e pergunta à Maria: Dá pra ver o número desta casa?"
Ela responde: "Sim, dá pra ver bem".

ATIVIDADE 1: Lembre-se de tudo que acontece no texto.

ATIVIDADE 2: Marque um X em V (Verdadeiro) ou F (Falso):

- Maria é a esposa de João. **V ( ) F ( )**
- Maria e João vão à festa de Marcos de carro. **V ( ) F ( )**
- João pede para Maria dizer o número da casa. **V ( ) F ( )**
- João pergunta à Maria se ela consegue enxergar o número da casa. **V ( ) F ( )**
- Maria responde que ela não consegue ver o número direito. **V ( ) F ( )**
- Maria respondeu o que João perguntou. **V ( ) F ( )**

ATIVIDADE 3: Responda: Por que João pergunta à Maria "Dá pra ver o número da casa"?

TEXTO 8

Pedro era um menino que esquecia de tudo.
Pedro lembrou da prova e saiu correndo pra escola.
Ele lembrou que tinha esquecido a prova debaixo de sua carteira.”

ATIVIDADE 1: Lembre-se de tudo que acontece no texto.

ATIVIDADE 2: Marque um X em V (Verdadeiro) ou F (Falso):

- Pedro esqueceu que teria prova na escola. **V ( ) F ( )**
- Pedro estava atrasado pra prova na escola. **V ( ) F ( )**
- Pedro lembrou que tinha esquecido de entregar sua prova. **V ( ) F ( )**

ATIVIDADE 3: Responda: Por que Pedro foi correndo à escola?

TEXTO 9

Durante a guerra, o exército Vermelho capturou um homem do exército Azul.
Eles queriam que ele falasse onde estavam os tanques do exército Azul.
Eles sabiam que o inimigo estava ou no mar ou nas montanhas.
Eles também sabiam que o prisioneiro não diria a verdade, para proteger seu exército.
Então ele certamente mentiria para eles.
O prisioneiro era muito corajoso e inteligente para deixar eles encontrarem os tanques.
Os tanques estavam na verdade nas montanhas.
Então quando o exército Vermelho perguntou onde os tanques estavam, ele disse 'Estão nas montanhas'

ATIVIDADE 1: Lembre-se de tudo que acontece no texto.

ATIVIDADE 2: Marque um X em V (Verdadeiro) ou F (Falso):

- O prisioneiro disse a verdade com medo de ser morto. **V ( ) F ( )**
- O Exército Vermelho achou que o prisioneiro estava mentindo. **V ( ) F ( )**
- O prisioneiro achou que eles não acreditariam nele. **V ( ) F ( )**
- Os tanques não estavam nas montanhas. **V ( ) F ( )**

ATIVIDADE 3: Responda: Por que o prisioneiro disse que os tanques estavam nas montanhas?

COLETA DE DADOS

A COMPREENSÃO DA LINGUAGEM FIGURADA
EM INDIVÍDUOS COM LESÃO CEREBRAL NO HEMISFÉRIO DIREITO

SESSÃO 4

Participante: _____

TEXTO 10

José e Carlos eram jogadores de futebol.
José não gostava de Carlos.
Carlos não era educado com os outros jogadores e às vezes era violento.
Carlos inscreveu-se em um campeonato.
Ele jogou muito mal, errando muitas jogadas fáceis.
José assistiu aos jogos e no final da partida ele disse a Carlos, 'Você jogou muito bem!'"

ATIVIDADE 1: Lembre-se de tudo que acontece no texto.

ATIVIDADE 2: Marque um X em V (Verdadeiro) ou F (Falso):

- José e Carlos jogavam futebol e eram amigos. **V ( ) F ( )**
- José e Carlos jogavam futebol, mas não eram amigos. **V ( ) F ( )**
- Carlos jogou muito mal no campeonato. **V ( ) F ( )**
- No final da partida, José disse a Carlos a verdade, que ele tinha mesmo jogado bem. **V ( ) F ( )**
- No final da partida, José tentou ser sarcástico com Carlos, dizendo que ele tinha jogado bem. **V ( ) F ( )**
- No final da partida, José disse por engano que Carlos tinha jogado bem. **V ( ) F ( )**

ATIVIDADE 3: Responda: Por que José disse a Carlos "Você jogou bem"?

TEXTO 11

Numa praça cheia de gente, um homem se aproxima de uma senhora.
Ele pergunta: 'Com licença. Por acaso a senhora viu um policial em algum lugar por aqui?'
'Não...', a mulher respondeu, 'eu não vi nenhum aqui por perto'.
Então o homem respondeu, 'Tudo bem, então me passa seu relógio e a bolsa bem depressa.'"

ATIVIDADE 1: Lembre-se de tudo que acontece no texto.

ATIVIDADE 2: Marque um X em V (Verdadeiro) ou F (Falso):

- O homem e a mulher estavam sozinhos na praça. **V ( ) F ( )**
- O homem estava mesmo à procura de um policial. **V ( ) F ( )**
- O homem na verdade era um assaltante. **V ( ) F ( )**
- O homem perguntou sobre o policial para ter certeza que poderia assaltar a mulher. **V ( ) F ( )**

ATIVIDADE 3: Responda: O homem estava mesmo à procura de um policial?

TEXTO 12

Duas forças inimigas estão em guerra por um longo tempo.
Cada exército já ganhou várias batalhas.
Mas a batalha final pode ser conquistada por qualquer um dos dois.
O exército Azul é mais forte do que o exército Amarelo em soldados e artilharia.
Mas o exército Amarelo é mais forte do que o Azul em força aérea.
No dia da batalha final, que irá decidir o resultado da guerra, tem uma grande neblina nas montanhas onde a luta está para acontecer.
Nuvens baixas pairam sobre os soldados.
No final do dia, o exército Azul ganha a batalha."

ATIVIDADE 1: Lembre-se de tudo que acontece no texto.

ATIVIDADE 2: Marque um X em V (Verdadeiro) ou F (Falso):

- Os Exércitos eram iguais em tudo. **V ( ) F ( )**
- Os Exércitos possuíam forças diferentes. **V ( ) F ( )**
- Os aviões do Exército Amarelo não podiam ver através da neblina. **V ( ) F ( )**
- O Exército Azul tinha soldados muito fracos. **V ( ) F ( )**

ATIVIDADE 3: Responda: Por que o Exército Azul ganha a batalha?

APPENDIX E

DATA COLLECTION – ENGLISH VERSION

GOING DEEP INTO THE RIGHT DIRECTION:

AN ANALYSIS OF FIGURATIVE LANGUAGE COMPREHENSION IN

RIGHT HEMISPHERE DAMAGED INDIVIDUALS

SESSION 1

Participant: _____

TEXT 1

João and Maria are married.
João is affixing a number on the wall of their house.
Then João asks Maria: "Can you see the number of the house?".
Maria answers: "Yes, it's 259".

ACTIVITY 1: Remember of all facts from the text.

ACTIVITY 2: Mark "X" in T (True) or in F (False):

- Maria is João's wife. **T ( ) F ( )**
- João is affixing a new number on the wall of their house. **T ( ) F ( )**
- João asks Maria if she knows the number of the house. **T ( ) F ( )**
- João asks Maria if she can see the number of the house perfectly. **T ( ) F ( )**
- Maria says she can not see the number properly. **T ( ) F ( )**
- Maria answered what João asked her. **T ( ) F ( )**

ACTIVITY 3: Answer: "Why does João ask Maria 'Can you see the number of the house'?"

TEXT 2

Jane was a very forgetful woman
Jane got into the dentist's Office in a hurry.
She saw her bag on the table in the waiting room.

ACTIVITY 1: Remember of all facts from the text.

ACTIVITY 2: Mark "X" in T (True) or in F (False):

- Jane arrived late for her appointment at the dentist. **T ( ) F ( )**
- Jane had forgotten her bag at the dentist's office that day. **T ( ) F ( )**

ACTIVITY 3: Answer: "Why did Jane enter the dentist's office in a hurry?"

TEXT 3

A burglar who has just robbed a shop is making his getaway.
As he is running home, a policeman on his beat sees him drop his glove.
He doesn't know the man is a burglar, he just wants to tell him he dropped his glove. But when the policemen shouts out to the burglar, "Hey, you! Stop!", the burglar turns round, sees the policeman, and gives himself up.
He puts his hands up and admits that he did the break-in at the local shop.

ACTIVITY 1: Remember of all facts from the text.

ACTIVITY 2: Mark "X" in T (True) or in F (False):

- The policeman sees the burglar robbing the shop. **T ( ) F ( )**
- The policeman does not know he is a burglar. **T ( ) F ( )**
- The burglar escapes from the policeman. **T ( ) F ( )**
- The burglar thinks that the policeman saw him robbing the shop. **T ( ) F ( )**

ACTIVITY 3: Answer: "Why did the burglar give himself up?"

TEXT 4

José and Carlos were soccer players.
José had already played with Carlos for many years and liked him very much.
Carlos got enrolled to a championship.
He played very badly.
José watched him and was very sorry for his friend.
At the end of the match, he Said to Carlos, "You played well."

ACTIVITY 1: Remember of all facts from the text.

ACTIVITY 2: Mark "X" in T (True) or in F (False):

- José and Carlos played soccer and were friends. **T ( ) F ( )**
- José and Carlos played soccer, but they were not friends. **T ( ) F ( )**
- Carlos played very badly in the championship. **T ( ) F ( )**
- At the end, José said to Carlos the truth, that he had really played well. **T ( ) F ( )**
- At the end, José tried to be sarcastic with Carlos, saying that he had played well. **T ( ) F ( )**
- At the end, José lied to Carlos, saying that he had played well, not to hurt his friend. **T ( ) F ( )**

ACTIVITY 3: Answer: "Why did José say to Carlos 'You played well'?"

TEXT 5

A quack was selling a miraculous potion.
He said the potion would make people live for many years.
He also said himself was very healthy, with his 300 years old.
'Is he so old?', asked a person to his young assistant.
'I can not say', answered his assistant. 'I've worked for him for only 100 years.'

ACTIVITY 1: Remember of all facts from the text.

ACTIVITY 2: Mark "X" in T (True) or in F (False):

- The quack told people the potion was magic. **T ( ) F ( )**
- The assistant did not know if his boss had drunk the potion or not. **T ( ) F ( )**
- The assistant said the truth to the person who asked him about his boss' age. **T ( ) F ( )**
- The assistant lied about his own age and his boss's. **T ( ) F ( )**

ACTIVITY 3: Answer: "Was the potion really miraculous?"

TEXT 6

A burglar is about to break into a jeweler's shop.
He skillfully picks the lock on the shop door.
Carefully he crawls under the electronic detector beam.
If he breaks this beam it will set off the alarm.
Quietly he opens the door of the store-room and sees the gems glittering.
As he reaches out, however, he steps on something soft.
He hears a screech and something small and furry runs out past him towards the shop door. Immediately the alarm sounds.

ACTIVITY 1: Remember of all facts from the text.

ACTIVITY 2: Mark "X" in T (True) or in F (False):

- Something soft set the alarm off. **T ( ) F ( )**
- The burglar breaks the electronic detector beam. **T ( ) F ( )**

ACTIVITY 3: Answer: "Why did the alarm go off?"

TEXT 7

João and Maria are married.
João is driving to a party in Marcos' house, his new friend.
They do not know his house.
Then João slows down and asks Maria: "Can you see the number of this house?"
Maria answers: "Yes, I can see it pretty well".

ACTIVITY 1: Remember of all facts from the text.

ACTIVITY 2: Mark "X" in T (True) or in F (False):

- Maria is João's wife. **T ( ) F ( )**
- Maria and João go driving to Marcos' house. **T ( ) F ( )**
- João asks Maria to tell him the number of the house. **T ( ) F ( )**
- João asks Maria if she can see the number of the house. **T ( ) F ( )**
- Maria says she can not see the number properly. **T ( ) F ( )**
- Maria answered what João asked her. **T ( ) F ( )**

ACTIVITY 3: Answer: "Why does João ask Maria 'Can you see the number of the house'?"

TEXT 8

Pedro was a very forgetful boy.
Pedro remembered his test and rushed to his school.
He remembered he had left his test under the desk.

ACTIVITY 1: Remember of all facts from the text.

ACTIVITY 2: Mark "X" in T (True) or in F (False):

- Pedro forgot he would have a test at school. **T ( ) F ( )**
- Pedro was late for the test at school. **T ( ) F ( )**
- Pedro remembered he had forgotten to hand in the test. **T ( ) F ( )**

ACTIVITY 3: Answer: "Why did Pedro rush to school?"

TEXT 9

During the war, the Red Army capture a member of the Blue Army.
They want him to tell them where his armies' tanks are.
They know that they are either by the sea or in the mountains.
They know that the prisoner will not want to tell them, he will want to save his Army, and so he will certainly lie to them.
The prisoner is very brave and very clever, he will not let them find his tanks.
The tanks are really in the mountains.
Now when the other side asks him where his tanks are, he says 'They are in the mountains'.

ACTIVITY 1: Remember of all facts from the text.

ACTIVITY 2: Mark "X" in T (True) or in F (False):

- The prisoner said the truth because he was afraid of being dead. **T ( ) F ( )**
- The Red Army thought the prisoner was lying. **T ( ) F ( )**
- The prisoner thought the Red Army would not believe him. **T ( ) F ( )**
- The tanks were not in the mountains. **T ( ) F ( )**

ACTIVITY 3: Answer: "Why did the prisoner say the tanks were in the mountains?"

TEXT 10

José and Carlos were soccer players.
José did not like Carlos.
Carlos was not polite with the other players and sometimes he was violent.
Carlos got enrolled to a championship.
He played very badly.
José watched him and was very sorry for his friend.
At the end of the match, he Said to Carlos, "You played well."

ACTIVITY 1: Remember of all facts from the text.

ACTIVITY 2: Mark "X" in T (True) or in F (False):

- José and Carlos played soccer and were friends. **T ( ) F ( )**
- José and Carlos played soccer, but they were not friends. **T ( ) F ( )**
- Carlos played very badly in the championship. **T ( ) F ( )**
- At the end, José said to Carlos the truth, that he had really played well. **T ( ) F ( )**
- At the end, José tried to be sarcastic with Carlos, saying that he had played well. **T ( ) F ( )**
- At the end, José mistakenly said to Carlos that he had played well. **T ( ) F ( )**

ACTIVITY 3: Answer: "Why did José say to Carlos 'You played well'?"

TEXT 11

In a crowded square, a man approaches a woman.
He asks her: ‘Excuse me. Have you seen a policeman around here?’
‘No...’, the woman answered, ‘I have not seen any around’.
So the man replied, ‘Ok, so give your watch and your bag right away’”.

ACTIVITY 1: Remember of all facts from the text.

ACTIVITY 2: Mark “X” in T (True) or in F (False):

- The man and the woman were alone at the square. **T ( ) F ( )**
- The man was really looking for a policeman. **T ( ) F ( )**
- Actually, the man was a burglar. **T ( ) F ( )**
- The man asked the woman about the policeman to be sure he could rob her. **T ( ) F ( )**

ACTIVITY 3: Answer: “Was the man really looking for a policeman?”

TEXT 12

Two enemy powers have been at war for a long time.
Each army has won several battles, but now the outcome could go either way.
The forces are equally matched.
However, the Blue Army is stronger than the Yellow Army in foot soldiers and artillery.
But the Yellow Army is stronger than the Blue Army in air power.
On the day of the final battle, which will decide the outcome of the war, there is heavy fog over the mountains where the fighting is about to occur.
Low-lying clouds hang above the soldiers.
By the end of the day the Blue Army has won.

ACTIVITY 1: Remember of all facts from the text.

ACTIVITY 2: Mark "X" in T (True) or in F (False):

- The Blue Army and the Yellow Army had equal forces. **T ( ) F ( )**
- The Blue Army and the Yellow Army had different forces. **T ( ) F ( )**
- The Yellow Army's airplanes could not see through the fog. **T ( ) F ( )**
- The Blue Army had too poor soldiers. **T ( ) F ( )**

ACTIVITY 3: Answer: "Why did the Blue Army win the battle?"

APPENDIX F

PARTICIPANTS' PERFORMANCE IN THE READING TASKS - RAW SCORES

Participants	**Recall Task**											
	Indirect Request		**Simple Inference**		**Theory of Mind**		**Verbal Irony**		**Joke**		**Physical Story**	
RHD	**Text 1**	**Text 7**	**Text 2**	**Text 8**	**Text 3**	**Text 9**	**Text 4**	**Text 10**	**Text 5**	**Text 11**	**Text 6**	**Text 12**
Participant 1	3/4	4/5	2/3	2/3	5/5	4/6	5/6	6/7	2/5	5/5	4/5	5/5
Participant 2	3/4	3/5	2/3	2/3	4/5	4/6	4/6	4/7	4/5	3/5	3/5	4/5
Participant 3	4/4	3/5	2/3	2/3	4/5	3/6	6/6	6/7	5/5	5/5	4/5	4/5
Participant 4	4/4	4/5	3/3	2/3	5/5	5/6	5/6	5/7	5/5	4/5	4/5	4/5
Participant 5	3/4	5/5	3/3	3/3	4/5	6/6	4/6	7/7	5/5	5/5	4/5	3/5
Participant 6	3/4	4/5	2/3	1/3	1/5	2/6	3/6	7/7	0/5	4/5	0/5	2/5
Control												
Participant 7	4/4	4/5	3/3	3/3	5/5	4/6	6/6	5/7	4/5	4/5	4/5	5/5
Participant 8	4/4	5/5	3/3	3/3	5/5	6/6	6/6	5/7	5/5	5/5	5/5	5/5
Participant 9	3/4	4/5	3/3	3/3	5/5	4/6	5/6	7/7	5/5	5/5	3/5	2/5
Participant 10	4/4	5/5	3/3	3/3	5/5	6/6	5/6	5/7	4/5	4/5	4/5	5/5
Participant 11	4/4	5/5	3/3	3/3	5/5	6/6	6/6	7/7	5/5	5/5	5/5	5/5
Participant 12	4/4	4/5	3/3	3/3	5/5	5/6	5/6	5/7	2/5	5/5	4/5	5/5

Participants	True or False Test											
	Indirect Request		Simple Inference		Theory of Mind		Verbal Irony		Joke		Physical Story	
RHD	Text 1	Text 7	Text 2	Text 8	Text 3	Text 9	Text 4	Text 10	Text 5	Text 11	Text 6	Text 12
Participant 1	4/6	2/6	1/2	1/3	3/4	1/4	4/6	2/6	0/4	2/4	1/2	3/4
Participant 2	3/6	3/6	1/2	0/3	2/4	2/4	4/6	1/6	1/4	3/4	2/2	3/4
Participant 3	3/6	4/6	1/2	1/3	3/4	2/4	4/6	3/6	4/4	4/4	2/2	4/4
Participant 4	4/6	3/6	1/2	1/3	4/4	4/4	6/6	6/6	3/4	3/4	2/2	4/4
Participant 5	4/6	4/6	2/2	2/3	3/4	3/4	4/6	4/6	1/4	2/4	2/2	3/4
Participant 6	2/6	3/6	1/2	1/3	3/4	3/4	6/6	5/6	1/4	4/4	1/2	3/4
Control												
Participant 7	5/6	4/6	1/2	1/3	3/4	4/4	6/6	6/6	1/4	4/4	2/2	4/4
Participant 8	6/6	3/6	2/2	2/3	4/4	4/4	6/6	6/6	2/4	4/4	2/2	4/4
Participant 9	4/6	4/6	2/2	2/3	4/4	2/4	4/6	5/6	2/4	4/4	2/2	4/4
Participant 10	6/6	3/6	2/2	3/3	3/4	2/4	5/6	5/6	4/4	4/4	2/2	4/4
Participant 11	4/6	3/6	1/2	1/3	3/4	4/4	5/6	5/6	2/4	4/4	2/2	4/4
Participant 12	4/6	3/6	2/2	3/3	3/4	2/4	6/6	6/6	4/4	4/4	2/2	4/4

Participants	Comprehension Task											
	Indirect Request		Simple Inference		Theory of Mind		Verbal Irony		Joke		Physical Story	
RHD	Text 1	Text 7	Text 2	Text 8	Text 3	Text 9	Text 4	Text 10	Text 5	Text 11	Text 6	Text 12
Participant 1	0	0	0	0	0	0	1	0	1	1	0	1
Participant 2	0	0	0	0	0	0	1	1	0	1	1	0
Participant 3	0	0	0	0	1	0	1	0	1	1	1	1
Participant 4	1	0	0	0	1	1	1	1	1	0	1	1
Participant 5	1	0	0	1	1	1	1	0	1	1	1	1
Participant 6	0	0	1	0	0	0	1	0	1	1	0	1
Control												
Participant 7	1	1	1	0	1	1	1	1	1	1	1	1
Participant 8	1	0	1	1	1	1	1	1	0	1	1	1
Participant 9	1	1	1	1	0	0	1	0	1	1	1	1
Participant 10	1	1	1	1	1	0	1	1	1	1	1	1
Participant 11	0	1	0	0	1	0	1	1	0	1	0	1
Participant 12	1	1	1	1	0	1	1	1	1	1	1	1

APPENDIX G

PARTICIPANTS' RESPONSES TO THE COMPREHENSION QUESTION TASK

Text 1- Indirect Request

Participant 1: "Porque ela não conseguia ver direito".
Participant 2: "Porque ela tá enxergando".
Participant 3: "Porque não deu pra ele enxergar; ele tá do lado de dentro do muro e ela tá por fora".
Participant 4: "Ele pergunta porque provavelmente ele tá colocando o número e quer saber se daonde ela está ela consegue ver o número, para facilitar que as outras pessoas vejam".
Participant 5: "Porque ele quer saber se ficou num lugar adequado e visível".
Participant 6: "Ou estava um pouco escondida ou é número miúdo".

Participant 7: "Pra os outros poderem ver o número da casa".
Participant 8: "Porque ele não tá vendo".
Participant 9: Pra ver se tava bem visível".
Participant 10: "Pra ver se o povo consegue ver o número".
Participant 11: "Porque ele queria saber se ela tava enxergando o número correto".
Participant 12: "Porque ele poderia ter colocado numa posição errada, fora do alcance da visão".

Text 2 – Simple Inference

Participant 1: "Ela foi fazer uma consulta pra ver como é que estavam os dentes".
Participant 2: "Apressadinha".
Participant 3: "Porque chegou atrasada".
Participant 4: "Porque ela chegou em cima do horário. Porque ela já tava atrasada".
Participant 5: "Porque estava atrasada. Se ela entrou correndo é porque ela tava atrasada".
Participant 6: "Porque ela tinha esquecido a bolsa".

Participant 7: "Pegar a bolsa".
Participant 8: "Pegar sua bolsa".
Participant 9: "Porque ela se esqueceu da bolsa na mesa".
Participant 10: "Porque tinha esquecido a bolsa".
Participant 11: "Porque ela era uma mulher esquecida".
Participant 12: "Pela história aqui não dá pra saber. A não ser que ela realmente tivesse esquecido lá e veio ver se tava a bolsa dela ainda".

Text 3 – Theory of Mind

Participant 1: "O ladrão se entregou porque viu o policial. Se ele não visse o policial, jamais se entregaria".

Participant 2: “Ele se entregou porque ele tinha roubado. O policial desconfiou por causa da luva. Ele se entregou por honestidade... ele se arrependeu”.
Participant 3: “Ele se entregou porque ele achou que o policial tinha visto ele roubando”.
Participant 4: “Ele se entregou porque ele achou que o policial tinha visto ele roubando a loja e não simplesmente pra entregar a luva que ele tinha deixado cair”.
Participant 5: “Ele se entregou porque ele entendeu que o policial tinha visto ele roubar a loja. A primeira reação de um ladrão quando vê um policial é se entregar”.
Participant 6: “Foi por causa da bolsa dele ter caído. O policial achou a bolsa”.

Participant 7: “Porque ele achava que o policial tinha visto ele roubando”.
Participant 8: “Porque ele tinha culpa no cartório. Ele achou que o policial tinha visto ele roubar a loja”.
Participant 9: “Porque ele se sentiu culpado”.
Participant 10: “Com medo do policial ter visto ele roubar a loja”.
Participant 11: “Porque ele pensou que o policial viu” .
Participant 12: “Porque estava com a consciência pesada”.

Text 4 – Verbal Irony

Participant 1: “Para procurar agradar”.
Participant 2: “Pra deixar ele satisfeito e contente”.
Participant 3: “Para não magoar o amigo”.
Participant 4: “Porque ele é muito amigo e não queria magoar o amigo... queria incentivá-lo a jogar e melhorar cada vez mais”.
Participant 5: “Pra incentivar, não quis deixar o amigo magoado”.
Participant 6: “Pra não desprezar o amigo”.

Participant 7: “Porque eles eram amigos e ele não queria decepcionar ele”.
Participant 8: “Pra não magoar o amigo”.
Participant 9: “Para não magoar o amigo”.
Participant 10: “Pra não magoar o Carlos”.
Participant 11: “Porque eles eram amigos”.
Participant 12: “Para não magoar o amigo dele”.

Text 5 – Joke

Participant 1: “Era mentirosa”.
Participant 2: “Pelo o que o rapaz falou, não. Porque o rapaz falou que não sabia a idade. Então ele estava mentindo”.
Participant 3: “Não, ele tava enrolando os pobres”.
Participant 4: “Não, não existe poção milagrosa”.
Participant 5: “Não, mesmo na história, não. O nome já diz ‘porção milagrosa’”.
Participant 6: “Não, porque era droga”.

Participant 7: “Não”.
Participant 8: “De acordo com o texto sim. Mas o cara é um malandro, como é que pode ser milagrosa?”.
Participant 9: “Era enganosa”.

Participant 10: “Não”.
Participant 11: “Ele dizia que sim”.
Participant 12: “Não”.

Text 6 – Physical Story

Participant 1: “Porque tá dando sinal de arrombamento”.
Participant 2: “Quando uma pessoa bate. Deve ser o bicho que bateu, não sei... será que o bicho bateu no alarme? Acho que foi o bicho”.
Participant 3: “Porque ele encostou-se ao raio de luz... o ladrão”.
Participant 4: “Porque o bicho peludo provocou o disparo do alarme, que se assustou e passou pelo raio”.
Participant 5: “Porque o gato fez disparar o alarme”.
Participant 6: “Ele encostou... o ladrão pisou em cima”.

Participant 7: “Porque o gato bateu no alarme”.
Participant 8: “O bicho peludo correu pra porta. Daí disparou”.
Participant 9: “Porque o bicho bateu no alarme”.
Participant 10: “Porque o bicho peludo passou na luz do alarme”.
Participant 11: “O ladrão encostou no raio”.
Participant 12: “Porque o animal interrompeu o feixe de luz do alarme”.

Text 7 – Indirect Request

Participant 1: “Porque ele saiu sem saber o número da casa e confiou nela, que ela sabia o número da casa”.
Participant 2: “Porque ele tava em alta velocidade e não tava conseguindo”.
Participant 3: “Porque o número tava meio escondido”.
Participant 4: “Porque ele tava dirigindo e do lado dele ele não conseguia ver o número da casa. E ele tava prestando atenção no trânsito”.
Participant 5: “Porque ele tá guiando o carro e deve tá prestando atenção no trânsito”.
Participant 6: “Porque ele deve estar meio grogue; tomou uns negócios na festa; dirigindo ele não enxerga bem”.

Participant 7: “Pra ele saber se estavam na casa certa”.
Participant 8: “Porque ele tá dirigindo”.
Participant 9: “Porque ele tava dirigindo e não conseguia ver direito. Ele perguntou pra Maria para ela ajudar ele a achar o número”.
Participant 10: “Porque ele não conseguia ver o número”.
Participant 11: “Porque ele não sabia direito o número da casa”.
Participant 12: “Porque ele tava procurando e tava vendo se era possível identificar a casa da rua”.

Text 8 – Simple Inference

Participant 1: “Porque ele ia estudar e tinha que fazer a prova”.
Participant 2: “Porque ele lembrou que tinha prova”.
Participant 3: “Porque ele já estava atrasado”.
Participant 4: “Porque ele tinha se esquecido que naquele dia ele tinha que fazer uma prova”.

Participant 5: “Porque ele se lembrou que tinha esquecido a prova debaixo da carteira”.
Participant 6: “Porque acordou atrasado”.

Participant 7: “Porque tava atrasado”.
Participant 8: “Porque ele tinha esquecido a prova debaixo da carteira”.
Participant 9: “Porque ele tinha se esquecido da prova debaixo da carteira”.
Participant 10: “Pra pegar a prova que tinha esquecido debaixo da carteira”.
Participant 11: “Ele lembrou que tinha prova na escola”.
Participant 12: “É que ele esqueceu de entregar a prova”.

Text 9 – Theory of Mind

Participant 1: “Porque era na realidade o esconderijo dos tanques, para falar a verdade, para as tropas irem para o lado dele”.
Participant 2: “Ele mentiu, com medo de entregar os outros”.
Participant 3: “Com medo que eles iam matar ele, ele falou a verdade”.
Participant 4: “Porque o prisioneiro sabia que o pessoal do Exército não iria acreditar na resposta que ele desse, porque ele não iria jamais entregar seus amigos. Daí ele imaginou ‘Eu vou falar a verdade’. Ele deu um golpe, um blefe”.
Participant 5: “Porque ele sabia que o inimigo não ia acreditar nele”.
Participant 6: “Porque ele queria arrumar uma cilada para eles”.

Participant 7: “Porque eles achavam que ele estava mentindo e iam pro mar”.
Participant 8: “Porque eles achavam que o prisioneiro estava mentindo. Daí mentindo, eles não iam nas montanhas”.
Participant 9: “Pra não ser morto”.
Participant 10: “Porque ele sabia que os tanques estavam nas montanhas. Ele entregou com medo de ser morto”.
Participant 11: “Porque ele não queria contar onde estavam os tanques”.
Participant 12: “Porque eles esperavam que ele mentiria”.

Text 10 – Verbal Irony

Participant 1: “Pra tentar convencer e apagar aquela mágoa que existia entre os dois... pra tirar a má impressão”.
Participant 2: “Falsidade. Foi debochar do outro”.
Participant 3: “Porque o Carlos era meio violento e ele ficou com medo. Pro Carlos não brigar com ele, ele pregou uma mentira”.
Participant 4: “Porque ele não gostava de Carlos e quis fazer uma gozação dele”.
Participant 5: “Pra tentar ser amigo de Carlos, pra incentivar ele a jogar outra partida”.
Participant 6: “Pra incentivar o Carlos, apesar de que eles eram inimigos. Futebol não tem nada a ver com inimizade”.

Participant 7: “Pra debochar do amigo”.
Participant 8: “Porque ele não gostava dele”.
Participant 9: “Pra não magoar ele, não sei”.
Participant 10: “Só pra tirar gozação dele”.
Participant 11: “Ele quis ser sarcástico com o cara”.
Participant 12: “É uma vingancinha”.

Text 11 – Joke

Participant 1: “Não, jamais, ele não queria ser preso. Por isso que ele perguntou se tinha algum policial por perto, pra que ele pudesse consumar o assalto”.
Participant 2: “Não. Era um assaltante. Ele queria é roubar a mulher’.
Participant 3: “Ele tava perguntando se não tinha policial ali pra poder assaltar ela”.
Participant 4: “Não, a mulher deve ter chegado nesta praça primeiro do que ele, ela deve ter vindo a um local diferente do dele. Por isso é que é falsa”.
Participant 5: “Não, ele queria é saber se tinha algum por perto, pra poder assaltar a velhinha com tranqüilidade”.
Participant 6: “Foi conversa dele pra iludir a mulher”.

Participant 7: “Não, ele queria ter certeza que não tinha policial”.
Participant 8: “Não”.
Participant 9: “Não, ele queria é fazer o assalto sem a presença do policial”.
Participant 10: “Não. Ele queria ver se tinha algum policial pra poder fazer o assalto dele”.
Participant 11: “Não”.
Participant 12: “Não. Ele queria saber se havia algum policial por perto pra executar o trabalho dele”.

Text 12 – Physical Story

Participant 1: “A neblina impede o avião de voar. O amarelo conseguia lutar na neblina e o azul por causa da aviação, a neblina impedia o vôo dos aparelhos”.
Participant 2: “Pois agora? Se eram só mais soldados como é que ele ganhou? Por cima é mais fácil de matar do que por baixo, né? Na guerra então é diferente? Como é que na vida real o avião consegue e aqui na história não?”.
Participant 3: “O azul ganhou porque o amarelo tava só com o avião e não conseguia enxergar embaixo”.
Participant 4: “Porque... por causa da dificuldade do Exército amarelo de poder colocar em batalha a sua força aérea, devido à neblina que dificultava (...) a visibilidade dos aviões”.
Participant 5: “Porque o Exército azul... porque o forte do Exército amarelo ficou inoperante porque tinha neblina”.
Participant 6: “O azul tava sendo tapado por camadas de neblina. O avião no ar não conseguia enxergar o azul embaixo”.

Participant 7: “Por causa da neblina”.
Participant 8: “Porque o azul conseguia ver através da neblina”.
Participant 9: “Por causa da neblina”.
Participant 10: “Por causa da neblina, o amarelo não pôde ver”.
Participant 11: “Porque as nuvens atrapalham o Exército amarelo”.
Participant 12: “Porque o Exército amarelo não pôde usar a força aérea”.

APPENDIX H

SOURCES FOR TEXT ADAPTATION AND TRANSLATION[4]

TEXT 3 (Fletcher et al. (1995)):

A burglar who has just robbed a shop is making his getaway. As he is running home, a policeman on his beat sees him drop his glove. He doesn't know the man is a burglar, he just wants to tell him he dropped his glove. But when the policemen shouts out to the burglar, "Hey, you! Stop!", the burglar turns round, sees the policeman, and gives himself up. He puts his hands up and admits that he did the break-in at the local shop.

TEXT 6 (Fletcher et al. (1995)):

A burglar is about to break into a jeweler's shop. He skillfully picks the lock on the shop door. Carefully he crawls under the electronic detector beam. If he breaks this beam it will set off the alarm. Quietly he opens the door of the store-room and sees the gems glittering. As he reaches out, however, he steps on something soft. He hears a screech and something small and furry runs out past him towards the shop door. Immediately the alarm sounds.

TEXT 9 (Fletcher et al. (1995)):

During the war, the Red Army capture a member of the Blue Army. They want him to tell them where his armies' tanks are. They know that they are either by the sea or in the mountains. They know that the prisoner will not want to tell them, he will want to save his Army, and so he will certainly lie to them. The prisoner is very brave and very clever, he will not let them find his tanks. The tanks are really in the mountains. Now when the other side asks him where his tanks are, he says 'They are in the mountains'.

Question: Why did the prisoner say that?

[4] Texts 3, 6, 9, 12 were translated from the original texts above, extracted from Fletcher (1995), pp. 124-125.

TEXT 12 (Fletcher et al. (1995)):

Two enemy powers have been at war for a long time. Each army has won several battles, but now the outcome could go either way. The forces are equally matched. However, the Blue Army is stronger than the Yellow Army in foot soldiers and artillery. But the Yellow Army is stronger than the Blue Army in air power. On the day of the final battle, which will decide the outcome of the war, there is heavy fog over the mountains where the fighting is about to occur. Low-lying clouds hang above the soldiers. By the end of the day the Blue Army has won.

Question: Why did the Blue Army win?

APPENDIX I

LIST OF EXAMPLES – ENGLISH VERSION

Example 4.3.1.1: “Maria’s answer is true because it is possible to see the number”. (Text 1, Participant 1)

Example 4.3.1.2: “Would it be possible to see it?” (Text 7, Participant 2)

Example 4.3.1.3: “She said that in high speed she would not be able to see it. So, he slowed down”. (Text 7, Participant 2)

Example 4.3.1.4: “Maria said, yes, this is really Marcos’ house’s number”. (Text 7, Participant 4)

Example 4.3.1.5: “João forgot the number”. (Text 1, Participant 3)

Example 4.3.1.6: “João asked her just to check if it would be possible to look at it”. (Text 7, Participant 3)

Example 4.3.1.7: “João asked Maria because the number of the house was not visible or it was too small”. (Text 1, Participant 6)

Example 4.3.1.8: “Yes, because she uses the number in her answer. If she knows the number, it is because she can see it”. (Text 1, Participant 5)

Example 4.3.2.1: “She always got late”. (Text 2, Participant 1)

Example 4.3.2.2: “How did he go to school if he had forgotten about the test?”. (Text 8, Participant 2)

Example 4.3.2.3: “If she arrived in a hurry, it is because she was really late”. (Text 2, Participant 3)

Example 4.3.2.3: “Pedro went to school to get something there”. (Text 2, Participant 3)

Example 4.3.2.4: “If she arrived in a hurry, it is because she was late. This is so true that she ended up forgetting about her bag”. (Text 2, Participant 4)

Example 4.3.2.5: “When he arrived at the place, he remembered he had forgotten about the paper, I do not know, I could not understand, under the desk”. (Text 8, Participant 4)

Example 4.3.2.6: “If he run out to school, that is because he was late (…) he had forgotten in that day he would have a test”. (Text 8, Participant 4)

Example 4.3.2.7: “If she arrived in a hurry, it is because she was late”. (Text 2, Participant 5)

Example 4.3.2.8: “I wonder if she had problems in her teeth”. (Text 2, Participant 6)

Example 4.3.3.1: “He ran away not to be identified”. (Text 3, Participant *1*)

Example 4.3.3.2: “He said the tanks were hid and that he could not reveal his secret because it was a war secret (...) He could not say the truth because he could not give the others in, could he?”. (Text 9, Participant 1)

Example 4.3.3.3: “He said the truth so that the troops would be on his side”. (Text 9, Participant 1)

Example 4.3.3.4: “As the policeman suspected of him, he arrested the burglar (...) he gave himself in for honesty, he regretted”. (Text 3, Participant 2)

Example 4.3.3.5: “He lied because he was afraid to denounce the others”. (Text 9, Participant 2)

Example 4.3.3.6: “He was afraid of being killed, so he said the truth”. (Text 9, Participant 3)

Example 4.3.3.7: “The policeman arrived and arrested him”. (Text 3, Participant *6*)

Example 4.3.3.8: “If he was brave, he would not tell the truth”. (Text 9, Participant *6*)

Example 4.3.3.9: “He was planning a trap to them”. (Text 9, Participant *6*)

Example 4.3.4.1: “At the end of the match, he got enrolled to another championship and started playing well. José complimented his friend”. (Text 4, Participant 1)

Example 4.3.4.2: “José wanted to forget any sorrow that existed between them”. (Text 10, Participant 1)

Example 4.3.4.3: “He lied to him because he played well”. (Text 4, Participants 2 and 3)

Example 4.3.4.4: “José complimented Carlos because, even being friends, Carlos was pretty violent and José was afraid of him. He lied to Carlos to prevent a fight.” (Text 10, Participant 3)

Example 4.3.4.5: “By the sentence, he played well, but actually he played badly. [It was] to motivate him to play another match”. (Text 4, Participant 5)

Example 4.3.4.6: “[José said Carlos had played badly] to motivate Carlos, in spite of the fact they were enemies. But soccer has nothing to do with enmity”. (Text 10, Participant 6)

Example 4.3.5.1: “He was a lier, because nobody lives 300 years”. (Text 5, Participant 1)

Example 4.3.5.2: “No, there is no magic potion”. (Text 5, Participant *4*)

Example 4.3.5.3: “The woman must have arrived at this square first, he must have come from a different place. That is because it is false”. (Text 11, Participant 4)

Example 4.3.5.4: “So it is true, right? He was sincere, but did not know how to say the truth”. (Text 5, Participant 5)

Example 4.3.5.5: “No, even in the story. The name is clear: ‘miraculous potion’”. (Text 5, Participant 5)

Example 4.3.5.6: “The man was selling drugs to overreach people, the problem was that drugs are harmful”. (Text 5, Participant 6)

Example 4.3.5.7: “He [the assistant] worked 100 years for him [the vagabond]. So he [the assistant] is very old too, isn’t he?”. (Text 5, Participant 6)

Example 4.3.5.8: “The man started to talk, suddently he grabed the woman’s bag (...) he pretended to be a policeman. The woman thought he was a policeman and she got in troubles”. (Text 11, Participant 6)

Example 4.3.6.1: “The animal scared the burglar, so that he stepped on the detector beam”. (Text 6, Participant 1)

Example 4.3.6.2: “Because there are cracking signs”. (Text 6, *Participant 1)*

Example 4.3.6.3: “When a person touches… could the animal touch the detector beam? I do not know...” (Text 6, Participant 2)

Example 4.3.6.4: “Is is so difficult to see underneath if it is foggy? When airplanes fly over the clouds... how can they do that? (...) how come in real life airplanes can see people below and in this story they cannot?” (Text 12, Participant 2)

Example 4.3.6.5: “If he stepped on something soft, he stepped on the detector beam, not on the animal. And even so he managed to get the gems, didn’t he? The problem was that he could not find the door, wasn’t it? He did not find it”. (Text 6, Participant 6)